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# An Assessment of the Sustainability and Desirability of a Currency Board Arrangement, with Special Reference to Bosnia and Herzegovina

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**Abstract**

The purpose of this research is to investigate whether the currency board arrangement (CBA) in Bosnia and Herzegovina (BH) is sustainable and desirable by assessing its credibility and its effect on the economy. A CBA is a rigid monetary regime under which a country fixes its exchange rate to some foreign currency and maintains 100 percent backing of its monetary base with foreign exchange. In 1997, BH adopted a CBA in its endeavour to achieve macroeconomic stabilisation in the post-war period. As BH is now moving towards accession to the EU, an important question concerns the desirability and sustainability of its CBA in the short to medium term. Since there is no long data span for estimating the effects of the CBA in Bosnia and Herzegovina in the empirical analyses other countries are also investigated. Using a survey database for Central and South-Eastern European countries the biprobit analysis finds that, other things being equal, a CBA is likely to increase the credibility of the monetary authority, even in periods of crisis, since the period for which credibility is investigated is the period of the global financial crisis and the euro crisis (2009-2011). The results also suggest that CBAs are more likely to increase the credibility of the monetary authority the lower the level of trust in government and the worse the perceptions about the economic situation in a country. In order to assess the desirability of a CBA its effect on macroeconomic performance is investigated. The results of panel analyses of 25 transition countries with a range of different monetary/exchange rate regimes, suggest that a CBA has a negative effect on inflation, over and above that due to the fixed exchange rate and high degree of central bank independence. The investigation of the effect of CBA on the subjective evaluation of national economic performance suggests a negative effect of CBA, presumably due to the strictness of the monetary authority under a CBA. The important additional finding is that this negative effect becomes significantly smaller the lower the trust in government. This again implies that a CBA is more effective in a low trust environment, where it is more likely to be viewed as necessary for stabilisation. Since the political situation in Bosnia and Herzegovina is still complex and uncertain, the benefits of maintaining its CBA appear to be higher than the costs and the regime is sustainable and desirable in the short to medium run.

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**List of Abbreviations**

AME - Average marginal effect
BAM - The international code for Bosnia and Herzegovina's currency
BH - Bosnia and Herzegovina
CA - Current account
CBA - Currency board arrangement
CBBH - Central Bank of Bosnia and Herzegovina
CBI - Central bank independence
CCBI – Cukierman's Central bank independence index
CEB - Central Eastern Europe and Baltic
CEFTA - Central European Free Trade Agreement
CIS - Commonwealth of Independent States
CP - Consumer price
CPI - Consumer price index
EBRD - European Bank for Reconstruction and Development
ECB - European Central Bank
EMU - European Monetary Union
ER - Exchange rate

ERMII - Exchange Rate Mechanism II
ERR - Exchange rate regime
EU - European Union
Euribor- Euro interbank offered rate
FBH - Federation of Bosnia and Herzegovina
FDI - Foreign direct investment
FE - Fixed effect
FED - Federal Reserve System
FEVD - Fixed effect vector decomposition
FMDI - Financial market development indicator
FR - Foreign reserves
GARCH - Generalised AutoRegressive Conditional Heteroskedasticity
GDP - Gross domestic product
GFC - Global financial crisis
GMM - General methods of moments
HIBOR - Hong Kong Interbank Offer Rate
i.d.d - Independent and identically distributed
IMF - International Monetary Fund
IT - Inflation targeting
LFS - Labour force survey
LIBOR - London Interbank Offered Rates
LLR - Lender-of-last resort
LR - Long-run
MB - Monetary base
MER - Marginal effect at representative values
OCA - Optimum currency area
OECD - Organisation for Economic Co-operation and Development
OeNB - Österreichische Nationalbank (Austrian National Bank)
QM - Quasi money
R - Reserves
RE - Random effect
REER - Real effective exchange rate
RP - retail price
RS - Republika Srpska
SD - Standard deviation
SDR - Special Drawing Right
SEE - South-Eastern Europe
SEs - Standard errors
SFRY - Socialist Federal Republic of Yugoslavia
SR - Short-run
SUR - Seemingly unrelated regression
UNDP - United Nations Development Programme
US - United States
USD - United States dollar
VAR - Vector autoregression
VAT - Value-added tax
VCE - Variance component estimation

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## Preface

Since the abandonment of the gold standard, there has been a continuing debate about the most appropriate monetary and exchange rate regime. Although it has been suggested that the appropriateness of a specific monetary and exchange rate regime depends on the country's size, income, the level of openness and some other characteristics, there is little evidence that a particular regime is more appropriate for certain (types of) countries than others (Rose, 2011). The recent crisis confirmed the importance of monetary/exchange rate policy as a stabilisation tool. The monetary authorities of many economies, especially the large ones, reacted aggressively to the global financial crisis (GFC) in order to mitigate its effect on the real sector. However, most of the economies that had rigid monetary and exchange rate regimes before the crisis retained them during the crisis, even though these regimes prevented countries from insulating themselves from the spillover effects of foreign capital flows. According to Rose (2013), economies with very rigid regimes (hard pegs) performed similarly to those with more flexible regime (inflation targeting) during and after the GFC. Although one should not conclude from this finding that, the type of the regime does not matter. If the Federal Reserve System, European Central Bank and the Bank of England had pursued more rigid regimes during the GFC, which would have prevented them from reacting aggressively to mitigate the shock, the crisis may have had worse consequences on their and other countries' economies. On the other hand, if countries with rigid regimes had had more flexibility they may have been better able to protect their economies.

In European countries that experienced periods of high inflation at the beginning of their transition to market economies, the introduction of fixed exchange rate regimes helped in lowering their inflation rates and in establishing monetary stability (for more details see Inoue, 2005). Some European transition countries introduced an even stricter regime than a fixed exchange rate in order to establish and maintain monetary stability. Besides fixing the exchange rate to some foreign currency this regime, called a currency board arrangement (CBA), also requires maintenance of 100 percent backing of its monetary base with foreign exchange. Under a CBA, central banks have very limited discretion and restricted ability to use monetary policy instruments. This regime was widely used in British colonies in the first half of the twentieth century to facilitate monetary relationships between the colonies and the ‘mother’ country. It again became popular in 1990s in transition economies: Estonia introduced it in 1992, Lithuania 1994, Bulgaria 1997 and Bosnia and Herzegovina 1997. In BH and Bulgaria it is still in use, while Estonia and Lithuania implemented the regime until the accession to the European Monetary Union in 2011 and 2015, respectively).

Modern CBAs have been introduced in countries that needed to achieve macroeconomic stability and credibility and which are in the process of transition to a market economy and/or desire to integrate further with the country to whose currency they are pegging. Although it has frequently been associated with the achievement of these desired goals, its overall effect on economic performance is not straightforward, since a currency board may inhibit economic growth, especially in a period of financial crisis, as monetary policy actions are constrained. Therefore, it is likely that the sustainability and desirability of the regime depend on the specific circumstances in the country.

The sustainability of a monetary policy (and a CBA specifically) may be defined as the capability of the monetary authority to maintain its announced policy (which is under a CBA the maintenance of a fixed exchange rate) in the medium-to-long run[1], while sustaining economic stability, especially during a crisis. The latter is also related to the desirability of the regime since its effect on macroeconomic stability and performance affects the appropriateness and attractiveness of the regime. To investigate the sustainability and desirability of a CBA regime, its effect on the credibility of the monetary authority and macroeconomic performance needs to be analysed. If credibility is increased, as expected, inflation expectations should be lower and consequently inflation rates should be maintained at lower levels. Monetary stability and low inflation rates, if achieved, are further likely to increase overall macroeconomic stability in a country. On the other hand, under a CBA, a central bank cannot stimulate growth or provide a buffer to shocks. However, the overall effect of a CBA depends also on the initial state of the economy, specific (political and institutional) circumstances and the degree of exposure to crises

[1] For European transition countries this 'medium-to-long run' period can be argued to be the period until EMU accession.

(Blackburn and Christensen, 1989; Desquilbet and Nenovsky, 2007). By estimating the effect on credibility and overall macroeconomic performance, we can draw conclusions regarding the appropriateness of the monetary policy for specific countries in a specific period. Although this empirical analysis is conducted for all European transition countries with a CBA for which the data is available, the implications of the analyses are discussed in more length for the country of interest, Bosnia and Herzegovina (BH).

In 1997, after the civil war (1992-1995), BH adopted a CBA as its solution to achieving monetary and overall macroeconomic stabilisation in the post-war period. As BH is currently moving towards accession to the European Union (the Stabilisation and Association Agreement was signed in June 2008), an important question concerns the appropriateness of the monetary regime that is currently in use. BH is a country that needs additional investment to build its infrastructure, support the development of the real sector and promote economic growth. However, commercial banks' lending interest rates are high and conditions for receiving a loan are hard to meet. Under a CBA, a central bank cannot affect those interest rates and conditions, nor can it help to finance the government's development projects. Since implementation of this regime prevents a country from using one of the most important macroeconomic tools for stimulating economic growth and buffering shocks, the maintenance of this regime can be justified only if its effect on macroeconomic stability is high, especially when the other tool, fiscal policy, is weak and limited. In BH fiscal revenues are limited due to the high level of unemployment and large shadow economy. On the expenditure side, most of the government spending is directed to financing the large government administration sector, reflecting the nature of the Dayton Peace Agreement, and the high social benefits (partially due to a large number of war invalids and soldiers' families which are supported from the governments' budget). However, in a politically disintegrated country, that lacks high quality institutions and rule of law, like BH, discretionary monetary policy could have resulted in irresponsible decisions and direction of more expenditure into unproductive areas. This would eventually undermine monetary credibility, raise inflation and overall instability. Therefore, the sustainability and desirability of the regime depend on specific national circumstances that should be investigated and controlled for in the empirical analysis and considered when making assessments about the appropriateness of a regime for a specific country.

The research programme reported in this thesis addresses a gap in the literature. Studies of the CBA in BH are relatively scarce and lack any empirical analysis of its sustainability and desirability. There are some cross-country studies that have estimated the effect of CBAs on macroeconomic performance (proxied by inflation, growth and growth volatility), but they categorised this regime as a hard peg[2], not as a monetary framework and included both developing and developed countries in their analyses (Gosh et al., 1998, 2000; Wolf et al., 2008). However, as noted above, a CBA is more than a hard peg regime, since the abilities and limitations of monetary policy are specified within the regime and it should therefore be treated as a unique monetary framework. Moreover, developed and developing countries have different characteristics and hence Frankel (2010) argued should be treated separately. Some studies have investigated the sustainability of a CBA regime in a particular country by observing differences in the money market interest rates in the CBA and anchor currency country (Alavez-Plata and Schrooten, 2003; Ho and Ho, 2009). Others have examined the macroeconomic performance of a country with a CBA subject to external shocks (Sepp and Randver, 2002a; Minea and Rault, 2011). We argue that the usage of subjective attitudes for the evaluation of a CBA's sustainability and desirability is preferable, especially when only a short time span of data for macroeconomic variables is available, as is the case for most of the European transition countries.

In order to investigate the sustainability and desirability of a CBA, with special reference to BH, this thesis is organised as follows. *Chapter 1* starts with an introduction to the main macroeconomic trends and the progress of transition of BH. The major part of this chapter is devoted to the analysis of the monetary policy and financial sector in BH. The reasons for the introduction of the CBA and trends in the main monetary variables in BH are presented. By analysing the trends in the

[2] Studies in which a panel of countries was used estimated the effect by including a full set of dummy variables for different exchange rate regimes, treating a CBA as a type of the hard peg (Ghosh et al., 1998, 2000; Wolf et al., 2008).

financial and real sectors after the introduction of the CBA, the context for the estimation of the medium-run desirability and sustainability of the CBA in BH is set.

In *Chapter 2,* the origins of the CBA from the gold standard and its evolution through time are examined. This chapter elaborates the main characteristics of a CBA and its strengths and weaknesses. The framework of a CBA is outlined and the approach to using this variable in the empirical analyses in the thesis is explained. The effect of a CBA is estimated by the inclusion of dummy variable, which allows us to compare its effect with that of all other monetary-exchange rate combinations used in other countries in the sample. In comparison with the cross-country studies mentioned above, this approach simplifies the model and saves degrees of freedom therefore gaining efficiency for the small sample properties. Finally, the CBA regime is discussed in the context of transition (CBAs in Estonia, Lithuania, Bulgaria and BH).

In *Chapter 3*, after examining the concepts of sustainability and desirability of a CBA, studies that have investigated the sustainability of a CBA are critically assessed. The main features of a CBA's sustainability and desirability, and the interrelation between the two, are explored. The most important feature of a monetary policy's sustainability, its credibility, is discussed in detail. The specific approaches to assessing the sustainability and desirability of a CBA, which are applied in the empirical analyses in the following chapters, are introduced and explained. *Chapter 4* assesses monetary policy credibility in Bosnia and Herzegovina and Bulgaria. The increased credibility of the monetary authority is the most emphasised advantage of a currency board arrangement. This credibility is usually argued to be the main source of the regime's stability and sustainability, since it is expected not only to reduce the time-inconsistency problem and therefore to provide lower inflation expectations, but also to lower speculative attacks, contribute to macroeconomic stability and attract foreign investment. As an indicator of the credibility of the monetary authority/regime the perceptions and expectations of residents about the stability of their local currency are used. Using a sample of transition countries with and without a CBA enables the estimation of the effect of CBA on the perceptions/expectations of currency's stability, after controlling for other relevant factors. In addition, the effects of a CBA conditional on residents' level of trust in government and their perceptions/expectations about the economic situation in a country are investigated. These analyses are conducted through a biprobit model using the evidence from the surveys conducted from 2009 to 2011 by the Austrian National Bank (OeNB Euro Survey). This is a novel and, it is argued in this thesis, a superior approach to assessing the credibility of a monetary authority. The OeNB surveys were exclusively made available for this research by the Austrian National Bank and have not previously been used outside the Bank or indeed for this kind of research[3].

As explained in Chapter 3, the concepts of sustainability and desirability are intertwined and a CBA's positive effect on monetary credibility is likely to lower inflation rates and increase macroeconomic stability. In *Chapter 5* the effect of CBA on inflation is investigated by comparing the inflation performance into countries with and without a CBA through a (static and dynamic) panel analysis that includes transition countries. Moreover, countries with CBA are divided to strong (more strict) and weak (more flexible) CBA in order to investigate whether more rigid rules improve inflation performance. This is just one part of the investigation of CBA's desirability. In *Chapter 6*, its effect on growth, growth volatility and subjective perceptions/expectations about the economic situation in country are investigated. Since, both on theoretical and empirical grounds, there are reasons to doubt whether the effect of monetary regime (and CBA specifically) on growth and growth volatility can be accurately observed, in the second part of this chapter a new strategy for estimating the effect of CBA on macroeconomic performance is developed and applied. This strategy relies on the usage of residents' subjective evaluations of national economic performance as an indicator of overall country's performance, again using the Austrian National Bank surveys. In *Chapter 7* the main findings, contributions and limitations of the analyses conducted in the thesis are elaborated. In addition, conclusions regarding the medium-run desirability and sustainability of the CBA in BH are drawn from the above analyses, taking the specific circumstances and future goals of BH into account.

[3] Some of the data used in this analysis (in Chapters 4 and 6) are derived from the OeNB Euro Survey which have been provided by the OeNB solely for research purposes. These data are obtained under special contractual arrangements from the OeNB and are not available from the author.

# CHAPTER 1: MACROECONOMIC TRENDS IN BOSNIA AND HERZEGOVINA WITH A FOCUS ON MONETARY AND FINANCIAL SECTORS



## 1.1 Introduction

Bosnia and Herzegovina (BH) is a small, open, Western Balkan country, which became independent in 1992. During the period 1992-1995 BH experienced a severe war, which resulted in human and economic losses. Since BH had no experience in discretionary central banking, confidence and economic stability in the country had to be restored, BH adopted a currency board arrangement (CBA) as a monetary regime. This regime was first introduced in some British colonies in order to completely anchor the monetary regime of colonies with Britain's monetary policy. This regime in BH was set by the Dayton Arrangement, which was signed in 1995, which brought the war to its end. The implementation of the regime started in 1997. This type of regime was argued to be needed given the complex process of transition in unstable circumstances in a country after the war. Prasnikar et al. (2003) identified three processes of transition that were happening simultaneously in BH after the war: a transition from a wartime economy to a peacetime economy; a transition to nationhood and a transition from a command economy to a market-oriented economy. In these circumstances a rigid regime was needed to assure the neutrality of the monetary regime from political influence and pressures. However, the low level of development and low flexibility of other sectors and mechanisms (such as the trade sector and price and wage flexibility) in the economy may question the sustainability and the desirability of the regime in the medium-to-long term. As noted in the Preface this chapter aims at investigating these other sectors and mechanisms in the country, which will contribute to drawing overall conclusions about the regime's sustainability and desirability.

In the first part of this chapter (Section 1.2) the main trends in the economy after the war to the present time and the progress of transition will be critically assessed. The specific circumstances, due to which the CBA was introduced at the first place, will be presented and assessed in the context of whether that regime should be maintained revised or abandoned after seventeen years of operation. Since this monetary regime is rigid, other flexibilities, such as the flexibility (and soundness) of fiscal policy, as well as flexibilities of prices and wages, will be appraised. Moreover, key trends in the economy, such as the level of external debt, current account deficits, the level of unemployment and movements of the real exchange rate, which may also affect sustainability and desirability of the CBA, will be investigated. In the second part of the chapter the main characteristics and operation of the CBA in BH will be analysed. Furthermore, the degree of convergence with the anchor currency zone will be investigated and the extent of financial sector (in)stability assessed. The main limitations and threats from the financial sector, which functions within the CBA framework, will be examined (Section 1.3), especially in the light of the latest global financial crisis (GFC).

## 1.2 The macroeconomic situation in BH – historical facts and recent trends

### 1.2.1 The pre-war role of BH in ex-Yugoslavia, the impact of war and the country's post-war constitution

Bosnia and Herzegovina is a small, open economy with a population of 3,791,622 people[4]. It is a multinational country with three major ethnic groups (Bosniaks, Serbs and Croats). According to the pre-war census, BH's population was 4.4 million of which: 44 percent declared themselves as Bosniaks, 31 percent as Serbs, 17 percent as Croats, and 5 percent as Yugoslavs (Agency for Statistics of BH, 1991)[5]. From 1963 until 1992 BH was one of the six socialist republics of Socialist Federal Republic of Yugoslavia, SFRY[6]. As a federal unit of the SFRY, BH was one of the major providers of raw materials and energy for the economic development of the country. Furthermore, it was one of the three Yugoslav republics which had a positive balance of foreign trade between 1985 and 1991, as a result of extensive production and export of medium and higher value-added industrial products (Dželilović and Čaušević, 2007).

At the end of 1991 Macedonia, Croatia and Slovenia declared independence from the SFRY. In March 1992 BH also declared independence, as a result of a majority vote in the independence referendum. This resulted in a boycott by the great majority of Serbs which escalated into the open warfare in April 1992. Just after the beginning of the war, in May 1992, the Republic of Bosnia and Herzegovina was admitted to the membership in the United Nations. During the period 1992 - 1995 BH experienced a war, which was described as the worst in Europe since World War II. The losses were huge: about 200,000 people were dead or missing; about a million people left the country; overall war damage was estimated US$60-80 billion; by 1996 GDP had shrunk to less than a third of its pre-war level (GDP per capita had collapsed to less than US$500); industrial production had fallen more than 90 percent; at the end of

[4]This is the preliminary result of the 2013 census of population, households and dwellings in Bosnia and Herzegovina (Agency for Statistics of BH).

[5] In preliminary results of the latest census, which was conducted in 2013, there is no data on ethnic groups. According to informal results published in the local newspapers this structure in 2013 was: 48.4 Bosniaks, 32.7 Serbs, 14.6 Croats and 4.3 'others'.

[6] Until 1991 SFRY consisted of: Bosnia and Herzegovina, Croatia, Macedonia, Montenegro, Serbia, and Slovenia. In this constitution it was first established in 1918 under the name of the *Kingdom of Serbs, Croats and Slovenes*, and in 1945 it was renamed the *Democratic Federal Republic of Yugoslavia* and finally to the *Socialist Federal Republic of Yugoslavia (SFRY)* since 1963.

1996 unemployment was about 45 percent, and those employed were infrequently and poorly paid (World Bank, 1997). Beside the massive destruction of physical capital, trade channels were disrupted, many people lost their jobs and savings, much agricultural land was mined and government, institutions and the legal system were destroyed (European Commission and World Bank, 1999).

The war was brought to an end by the Dayton Peace Agreement in December 1995. Although the Dayton Peace Agreement established BH as a sovereign country it did not bring economic or political unity or pacification to the country. As defined in the Dayton Peace Agreement BH is a state with two entities (the Federation of Bosnia and Herzegovina, FBH, and Republika Srpska, RS) and these entities were given a range of responsibilities, including many which are typically held by national governments, such as: internal affairs, taxation and customs administration, agriculture, energy, health and social policies, which point to the complex political and institutional environment in the country after the war. FBH further consists of ten cantons, which also have a high range of responsibilities. Additionally, following a decision by the International Arbitration Commission for Brčko, in 2000, Brčko District became a third division, independent of both entities. Although without many crucial competences, the state-level institutional structure, as determined by Dayton Peace Agreement, is also complex, with a Presidency that consists of three (rotating) members, one from each ethnic group, a Council of Ministers (executive branch) and a Parliamentary Assembly that consists of the House of Representatives and House of Peoples. This political and economic fragmentation of the country has constrained the formation of a single economic space and the implementation of economic reforms.

Synchronisation of policies in key areas has not yet been achieved by the entities and since ethnic parties still continue to dominate the political environment, the base for sustainable growth and development is still not fully established. Even though not specified in the Dayton Agreement, the High Representative, who was appointed by the United Nations Security Council, has played an important role in the post-war period in BH, due to the inability of the BH government to agree on the major issues[7] (such as the enforcement of a new currency, the establishment of some of the key state institutions and laws at the state level). Although it was introduced as a transition institutional framework the High Representative is still present today which implies that Bosnia and Herzegovina is not yet functioning as an integrated state and that the international community still plays an important role in BH. When BH became a member of the International Monetary Fund, IMF, (in 1992) and the World Bank (in 1996) economic reforms and transition towards a market-oriented economy were a compulsory element of the internationally assisted reconstruction programme (Dželilović et al., 2004). Therefore, the process of transition towards a free market economy has been conducted at the same time as the process of reconstruction, before the grounds for an efficient transition were set. This process will be critically assessed in the next section as it is important for setting the framework in which the CBA has been functioning.

### 1.2.2 The process of transition towards a market-oriented economy

Although it was initiated immediately after the war, the process of transition towards a free market economy in reality did not start until the late nineties, due to infrastructural and institutional constraints, as well as political disagreements between the entities. The adoption of state-level laws and the implementation of policies which required some degree of state-level policy making were frequently boycotted by the entities' governments, resulting in a failure of BH's institutions "to provide a minimal framework of legislative, executive and judicial authority required for the introduction and implementation of reforms" in the first years after the war (Dželilović et al., 2004, p.5). Therefore, the international community continued to play a major role in supporting the process of transition. This process was primarily based on monetary, financial and fiscal reform, privatisation, and trade liberalisation.

[7] The High Representative's power was increased from monitoring the implementation of the civilian aspects of the Dayton Peace Agreement to enforcement of the reforms and progress of transition, and legal compliance to decree in the case of unresolved issues at the state level.

*Monetary and financial reform*

During the war and in the following years BH’s monetary and financial sectors were unregulated and fragile: there were three agencies acting as central banks: the National Bank of Bosnia and Herzegovina, the National Bank of Republika Srpska and the Mostar ZAP; four currencies were in circulation only one of which, namely the deutsche mark, was accepted in the whole country and there were a large number of small, fragile commercial banks none of which operated over the whole country. All these characteristics, together with the specific economic and political circumstances after the war, indicated that there was a need for strict regulation, especially in the monetary field. *Monetary reform* included the establishment of a central bank at the state level, and issuing of a (one) national currency called the ‘konvertibilna marka’ (BAM is the international currency code for the konvertibilna marka). Strict rules were set by the establishment of a CBA in 1997, which limited the monetary sovereignty of BH in order to eliminate political pressures in the monetary field. Additionally, for the first six years a foreign citizen was appointed to undertake the governor role. The establishment of a CBA seemed to be the best solution for establishing firstly monetary, and then overall, macroeconomic stability in a destroyed economy (Kreso, 1997; Kovačević, 2003). Although it can be argued that similar results could have been achieved through full euroization as was to be the case in Kosovo, the introduction of a national currency had a symbolic meaning in terms of the country’s sovereignty after the war (Kreso, 1997). On the other hand, the introduction of the CBA prevented the Central Bank of Bosnia and Herzegovina (CBBH) from influencing the direction of domestic economic activity and from directly stimulating economic development. Nineteen years after the end of the war BH still operates a CBA which was introduced as a transitional mechanism. This suggests that political risks are still present in the country and that the monetary authority is still not ready to increase its discretionary powers and to independently manage monetary policy (this issue will be discussed more in Section 1.2.4 where recent trends in the country are presented). Another indicator of current political risk is evident in the structure of the CBBH. Namely, the members of the governing board are chosen by Presidency and were usually involved in politics prior to their nomination to the Board. Moreover, the members of the Board and vice governors (which are chosen by the Board) are chosen primarily on the basis of their ethnicity (so that the main ethnic groups are represented) rather than their expertise in central banking. Furthermore, beside a head office in the capital, CBBH has three main units: one in Republika Srpska and two in FBH; and two branches; one in Brčko District and the other one in Republika Srpska.

*Financial sector reform* was one of the most rapid areas of reform during early transition. It involved reform of the payments system (BH was the first country in the region to reform their system[8]), privatisation of the banks, elimination of the state control over interest rates, free entry of foreign banks and free international movement of capital. It was primarily based on commercial banking sector reform, as the commercial banks played the major role in the BH's financial sector since the war, with the big share of foreign-owned banks (this will be discussed in more details in Section 1.3.4). Although the presence of foreign banks increased the quantity and quality of banking services, they remained largely unwilling to invest in projects which could stimulate the development of the BH economy (as will be shown in Section 1.3.4). Due to its undeveloped capital market and other financial institutions, as well as limited government expenditure (and the very low share of these expenditures supporting economic activity), BH remained a very unfavourable environment for business development, which was almost totally dependent on commercial banks' loans.

Apart from the central bank, which was established at the country level, the rest of the process of financial liberalisation was implemented at the entities level: the establishment of entities' banking agencies (which are in charge of bank supervision and issuing of banking licences), the establishment of the (relatively underdeveloped) capital market, with all regulating institutions established at the entity level as well, which again points to the problem of complexity and fragmentation of decision-making in the BH economy. The trends and deficiencies of the monetary and financial sectors will be assessed in more detail in Section 1.3. Next, the reforms in other sectors will be elaborated.

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[8] The reform from the centrally organised (and in the case of BH entities based) payment system (conducted through entities' institutes for payment transitions, which were controlled by political structures) to banks (commercial banks and the Central Bank) led payment system was, on the initiative and support of international community, conducted within six months in 2001 in BH and is compatible with TARGET interbank payment system (http://www.cbbh.ba/index.php?id=747&lang=hr, last accessed: 27/09/2014).

*Other reforms and their weaknesses*

After the war fiscal policy was conducted wholly by the entities, without any powers given to the state. As a result *fiscal reform* was conducted at a slow pace and was driven by political interests rather than economic principles (Dželilović et al., 2004). Additionally, the fiscal system of BH is very complicated with a complex administrative structure, especially in the FBH, as it consists of ten cantons, which are also given high degree of competences. Consequently, the fiscal system in BH is usually considered a further obstacle to business development and economic growth, as it is too complicated, inefficient and unharmonized between entities. Consequently, reform and the process of transition faced many obstacles and were conducted at a slower pace and less efficiently than planned. The process of transition perhaps started too early, before the economy was recovered and before the needed institutional support for the efficient implementation of the process was established. A process of privatisation was planned in 1996, though it did not start until 1999. Although progress in the process of privatisation is evident, though it is not yet completed, there are some criticisms of the process itself. As the international community, in order to stimulate transition towards the market economy, directed its funds primarily to private companies, BH "rushed" into process of privatisation before the conditions for effective conduct of this process were established. These conditions primarily relate to the establishment of a capital market, which has an essential role in controlling managers through shareholders, as well as the development of financial intermediation and a money market (Čaušević, 2007). Another issue was a lack of expertise and institutional, technological and legal competence/frameworks prior to the introduction of the process of privatisation. The process of privatisation was also characterised as "ethnicized", as it was based on entities' laws and concentrated within the ethnic groups (Čaušević, 2007). Additionally, the new owners did not have a contractual obligation to invest in their companies which resulted in a lack of funds to finance company restructuring (Dželilović et al., 2004).

In 1998 the Foreign Trade Law, which introduced a liberal trade regime in BH, was adopted at the state level. This Law set the conditions for bilateral free trade agreements (signed from 2001 until 2004), and subsequently multilateral agreement

CEFTA, signed in 2006, between South Eastern European countries, and for starting negotiations on the accession of BH to the World Trade Organisation. The economy started to open up rapidly towards neighbouring countries and the European Union (EU). However, trade liberalisation did not have the expected (positive) effects on BH's balance of payment because, before this opening of its borders, the restructuring process has not yet been completed. Potential exporters lacked the necessary funds which would support their production growth: finance was only available under unfavourable conditions (after the war the interest rates were high and loans were only available up to 300,000 BAM (153,387.56 euros), which hindered the reestablishment of domestic companies and their expansion of production). Financial obstacles, together with the lack of supporting institutions (such as the institutions for quality control), as well as the absence of any support from government or protection of domestic producers by adequate laws, resulted in a persistent trade deficit, which has put direct pressure on the monetary base and threatened monetary contractions and depression of the economy when capital inflows were insufficient (as under the CBA, the main source of money creation is through the balance of payments, as it will be explained in Chapter 2). These reforms were part of the overall process of transition that BH has been going through since the war. Although there are many weaknesses in this process some progress has been made.

### 1.2.3 Assessing the progress of transition – quantitative and qualitative approach

One of the ways of assessing the progress in transition is through observing the transition indicators. Even though they have some potential imperfections (the subjective nature of the scoring, possible non-transparency of the demarcation between categories, and disregard of quality of the assessed processes) the *EBRD (European Bank for Reconstruction and Development) transition indicators* are the most frequently used indicators of the progress in transition. Those indicators assess progress in the enterprise sector, markets and trade, financial sector and infrastructure (Table 1.1). These indicators imply that the main elements of a market economy are now present in BH, in terms of the dominance of private sector activity and the presence of price and trade liberalisation. The slowest progress, according to the indicators, was achieved in enterprise reform, implementation of competition policy and reform of non-banking financial institutions (the progress in these reforms are assigned a grade 2, out of 4, in the last three years, indicating only a small movement from a rigid centrally planned economy). According to the EBRD's assessment (EBRD, 2013) BH's progress in transition in the last few years can only be described as very slow. Consequently, BH's average transition score, as measured by the EBRD and reported each year in the Transition Report, is the lowest in Central or South Eastern Europe (EBRD, 2010).

Table 1.1: EBRD transition indicators (1995-2013)

| Year/indictor | 1995 | 2000 | 2005 | 2010 | 2013 |
|---|---|---|---|---|---|
| **Enterprises** | | | | | |
| EBRD index of small-scale privatisation | 1.0 | 2.0 | 3.0 | 3 | 3 |
| EBRD index of large-scale privatisation | 2.0 | 2.3 | 2.7 | 3 | 3 |
| EBRD index of enterprise reform | 1.0 | 1.7 | 2.0 | 2 | 2 |
| **Markets and trade** | | | | | |
| EBRD index of price liberalisation | 1.0 | 4.0 | 4.0 | 4 | 4 |
| EBRD index of forex and trade liberalisation | 1.0 | 3.0 | 3.7 | 4 | 4 |
| EBRD index of competition policy | 1.0 | 1.0 | 1.0 | 2 | 2+ |
| **Financial sector** | | | | | |
| EBRD index of banking sector reform | 1.0 | 2.3 | 2.7 | 3 | 3- |
| EBRD index of reform of non-bank financial institutions | 1.0 | 1.0 | 1.7 | 2- | 2+ |
| **Infrastructure** | | | | | |
| EBRD index of infrastructure reform | 1.0 | 2.0 | 2.3 | 3- | 2.7 |

Note: The transition indicators range from 1 to 4+, with 1 representing little or no change from a rigid centrally planned economy and 4+ representing the standards of an industrialised market economy.
Source: EBRD transition reports, various issues

Although, according to the transition indicators, BH has made progress in many fields, there were (and still are) many weaknesses which have undermined the overall efficiency of transition and which inhibit further progress. These transition indices provide only an overview and do not assess the overall performance of the economy. They focus on a specific area at the moment of evaluation and do not assess whether the basis for the sustainable development is present. Moreover, these indicators do not take into account all specific circumstances and limitations which were emphasised in the previous section and which may undermine further progress and development. Therefore, a more descriptive approach is necessary which was provided in the previous section where the weaknesses of the post-war reforms were examined. The general criticisms of the transition process in BH can be summarized as follows.

First, the complex BH constitutional and political structure (established by the Dayton Peace Agreement) inhibits creation of a unified economic policy which could generate strong economic growth. Namely, the creation of a self-managed and sustainable economy is constrained by political obstructions due to the opposed interests of the ethnic groups and the difficulty of reaching a consensus between those groups regarding issues of interest to all citizens. Second, this division of the country was even reinforced during the process of transition by the adoption of laws and creation of the supporting institutions at the entities level, which resulted in inconsistent implementation of reforms. Third, the state "rushed" into the process of transition without sufficient knowledge and necessary expertise for carrying out reforms in a comprehensive manner, which resulted in a sporadic and slow reform process (Dželilović et al., 2004). Fourth, the process of transition was initiated and supported by the international community, which did not create grounds for the sustainable development as some necessary preconditions for economic development were not previously established. Those conditions included the establishment of the legal state, transparent institutions and the rule of law at the state level. The international community expected that the development of the market-oriented economy would automatically change the inhibiting political and social structures and lead to well-being and prosperity, which did not happen (Papić, 2001). The main weakness, in this sense, was the simultaneous implementation of the processes of transition, without taking into account specific post-war conditions and the absence of unity and concord within the country, which have resulted in the creation of an aid-dependent development.

Although nineteen years have passed since the end of the war BH still continues to require support from the international institutions, mostly from the World Bank, IMF, EBRD and the EU institutions (the total donor aid in the most intensive reconstruction period, 1996-1999, is estimated to total between US$ 1.8 to 4.9

billion[9])). Much of this support (especially from the IMF and the World Bank) is aimed at stabilising the fiscal position and filling budgetary gaps, as well as strengthening the level of reserves held at the central bank (EBRD, 2010). The question of funding BH’s economic development is still not solved as the country has limited access to international funding, and corporate funding conditions in the domestic market are unfavourable, with high lending interest rates and the absence of government incentives to stimulate business investment and with only a limited access to the domestic under-developed stock markets. Moreover, the development of transparent state institutions and the rule of law, as conditions for ending dependency, are still not achieved. According to the World Economic Forum’s Global Competitiveness Report, which assesses the business environment based on surveys of managers and on statistical data, Bosnia and Herzegovina was the lowest ranked country in the region (Čaušević, 2013). Moreover, in the last three years, managers in BH ranked access to finance as the biggest obstacle to doing business, while the institutional obstacles have been consistently ranked among top five in all the reports published. Next, recent trends in the main economic indicators, which are also important in the setting of a framework for assessing the sustainability and desirability of CBA, will be investigated.

### 1.2.4 Key economic indicators

BH has experienced substantial economic growth during the transition period. GDP per capita grew from 560.17 US dollars in 1995 to 4,657 US dollars in 2013. However, this is expected, given the severe fall during the war (as presented in Section 1.2.1). This economic growth has been attributed predominantly to greater capacity exploitation in business and industry, privatisation, restructuring, strengthening of the financial sector and attracting foreign direct investment (Dželilović and Čaušević, 2007). According to the GDP data (Table 1.2), BH recorded continuous growth until 2009 when the economy entered a sharp decline due to the global financial crisis. This decline was a result of various factors,

[9] Because of the absence of a general overview of all donations the data for the total donor aid in the most intensive reconstruction period (1996-1999) differ between different sources. The main reasons for these differences are the lack of transparency of domestic authorities and uncertainty about the misuse of these funds, on which there has been no serious investigation, but which was evidently present (Papić, 2001).

including the drying-up of bank credit, a severe contraction in foreign direct investment, lower demand from regional neighbours and the European Union for exports and a fall in remittances from workers abroad (EBRD, 2009). The current account balance has been negative throughout the post-war period due to the lack of competitiveness of BH products in regional and international markets, which is partially the result of the weaknesses in the process of transition elaborated in the Section 1.2.2. The decrease in the current account deficit which was evident in 2006 and 2009 (Table 1.2) was not a result of increased exports and competitiveness but of lower imports of goods caused by the introduction of value added tax (VAT) and the decrease in domestic aggregate demand, respectively. However, more positively, the fall in the current account deficit in 2013 was a result of increased exports and decreased imports. The persistent current account deficit is especially dangerous for BH's economy if there are no offsetting capital inflows, as under the CBA's strict rules, balance of payments transactions are the major determinant of money supply stability. Moreover, there is a high level of imports of raw materials and intermediate goods, which makes the country dependent on imports. The only category in which exports are higher than imports is the 'durable consumer goods' group, namely, final consumption goods. The export to import ratio remains low, even though it increased from 29 percent in 2003 to 55.2 percent in 2013 (see BHAS, 2014, p. 13). This performance is important when assessing the consequences of the inability to devalue the currency, as is the case under a CBA, and this issue will be investigated in the concluding chapter before making conclusions regarding the maintenance of the CBA in BH. The remittances and the capital and financial net inflows decreased in 2009 and 2010 as financial aid and foreign direct investments, which have been important factors in financing current account deficit, continued to fall (CBBH, 2009a).

The unemployment rate in BH is, after Macedonia, the highest in the region. According to the Labour Force Survey the unemployment rate in 2013 was 27.5 percent, while the formally registered unemployment rate reached 45.9 percent. This is an acute problem, especially in countries with rigid monetary regime, such as a CBA, through which economic activity and the employment rate cannot easily be stimulated. This is a bigger problem the lower the capacity and efficiency of fiscal policy, which is the only macroeconomic tool for stimulating the economic activity in the economy with a rigid monetary regime. Moreover, the high and persistent unemployment could be a potential threat for CBA's credibility, since the residents might expect the regime to be abandoned if the unemployment rate is high for a long period of time (this issue will be investigated in Chapters 3 and 4). Observing the growth of average net salary we can conclude that it did not follow economic conditions in the country. While the GDP growth rate was either negative or below 1 percent after 2008 (until 2013) and unemployment was increasing (reaching 12.8 percentage increase in 2010 compared to 2009), the average net salary was increasing in real terms (Table 1.2). By comparing gross wages and productivity Kristić (2007) found that there was clear wage inflationary pressures, since in the observed period (1999-2005) wages were growing faster than productivity. Kristić further found that this trend is driven by the rise of wages in the public sector, since excluding the activities that are prevailingly state-owned, productivity grew much faster than wages.

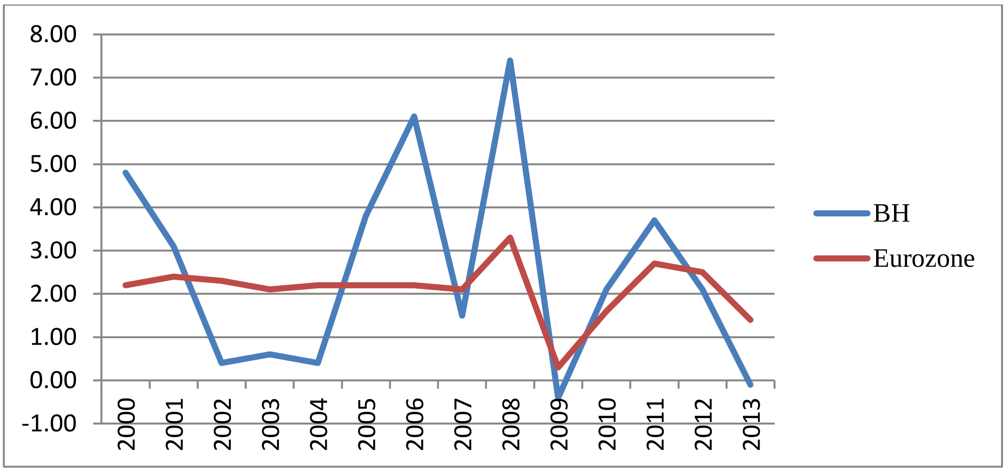
Table 1.2: Selected economic indicators, Bosnia and Herzegovina (2000 – 2013)

| **Variable/year** | **2000** | **2001** | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** | **2008** | **2009** | **2010** | **2011** | **2012** | **2013** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GDP per capita (in USD) | 1,471 | 1,523 | 1,754 | 2,211 | 2,634 | 2,837 | 3,265 | 4,017 | 4,865 | 4,496 | 4,383 | 4,773 | 4,406 | 4,657 |
| Real GDP (growth rate in percent) | 5.50 | 2.40 | 5.00 | 3.90 | 6.30 | 3.90 | 5.70 | 6.00 | 5.60 | -2.70 | 0.80 | 1.00 | -1.20 | 2.50 |
| Inflation* | 4.80 | 3.10 | 0.40 | 0.60 | 0.40 | 3.80 | 6.10 | 1.50 | 7.40 | -0.40 | 2.10 | 3.70 | 2.10 | -0.10 |
| Trade balance (as a percentage of GDP) | -49.80 | -51.20 | -49.40 | -48.90 | -45.10 | -45.20 | -34.00 | -40.50 | -42.70 | -32.00 | -30.70 | -32.40 | -32.80 | -29.9 |
| Current account balance (as a percentage of GDP) | -7.10 | -12.90 | -17.60 | -19.20 | -16.20 | -17.10 | -7.80 | -9.00 | -14.10 | -6.50 | -6.10 | -9.70 | -9.30 | -5.50 |
| Unemployment rate** | | 22.90 | 21.10 | 19.60 | 21.50 | | 31.10 | 29.00 | 23.40 | 24.10 | 27.20 | 27.60 | 28.00 | 27.50 |
| Change in unemployment rate | | | -7.86 | -7.11 | 9.69 | | | -6.75 | -19.31 | 2.99 | 12.86 | 1.47 | 1.45 | -1.79 |
| Expenditure of General Government (as a percentage of GDP) | 52.10 | 46.30 | 37.20 | 40.80 | 38.80 | 39.10 | 41.10 | 43.40 | 45.80 | 47.00 | 46.10 | 45.30 | 46.60 | 45.60 |
| Overall balance of General Government (as a percentage of GDP) | -6.00 | -3.00 | -0.10 | 0.70 | 1.60 | 2.40 | 2.80 | 1.20 | -2.20 | -4.40 | -2.50 | -1.30 | -2.00 | -2.20 |
| External Debt of Government Sector (as a percentage of GDP) | 34.30 | 34.90 | 30.70 | 27.30 | 25.20 | 25.30 | 20.80 | 18.00 | 17.00 | 21.50 | 25.30 | 25.80 | 27.80 | 28.20 |
| Real effective exchange rate (REER), (2005=100) | | | | | | 100.00 | 102.33 | 99.82 | 101.3 | 102.66 | 101.85 | 101.9 | 101.2 | 99.68 |
| Growth rate of net salaries | | 9.95 | 9.05 | 8.52 | 4.34 | 6.53 | 8.92 | 10.07 | 16.59 | 5.06 | 1.04 | 2.22 | 1.23 | |

Notes: Highlighted variables are those important for assessing the productivity and flexibility of wages
*Growth rate of retail prices (RP) is presented until 2006, but for 2006 and following periods in the table is presented consumer price (CP) growth rate. For RP rates weights used represent FBH and RS shares in BH GDP.
** The unemployment rate based on Labour Force Surveys
Source: Central Bank of Bosnia and Herzegovina annual reports (various issues), Agency for Statistics, Bosnia and Herzegovina, Labour Force Surveys, various issues

Prices in BH have been relatively stable. However, in the context of a fixed exchange rate monetary policy is usually argued to be 'imported' from the anchor currency country (zone) and the movements in the inflation rates in BH should therefore be assessed together with those in the Eurozone. Inflation rates in BH and the Eurozone have had similar trends since 2007, with a difference in sharper peaks and drops in BH (Figure 1.1), perhaps due to lower reserves and capacities in its economy to mitigate the effects of any factor that influences these movements. The high rate in 2006 in BH was recorded due to introduction of the value added tax and in 2008 due to the increase of world prices of oil and food. As a result of the crisis inflation rates dropped in 2009 in both BH and the Eurozone, recovered in 2011 and then fell again in 2012 and 2013.

Figure 1.1: Inflation rates in BH and the Eurozone




Source: Author's illustration based on data from the CBBH website (www.cbbh.ba) and the Eurostat (www.epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/) (last accessed: 24/09/2014)

The government's budget has recorded a deficit since 2008. The problem is not the deficit itself, since BH is a developing country undergoing a process of transition and it can be expected that during this process its expenditure needs exceed its ability to collect funds from its citizens. The problem is how these funds are being spent and how (in)effective the government is in stimulating economic activity and mitigating the effects of shocks to the real economy.

*Fiscal policy soundness and effectiveness*

The fiscal revenues are significantly lower than their potential due to underdeveloped production and economic activity in the country and the high level of the grey economy. Schneider et al. (2010) estimated that the average size of the grey economy in BH (over 1999 to 2007) was 33.6 percent of GDP[10]. On the expenditure side, there is a high share of ‘unproductive’ expenditures in total government expenditures (with the highest share of employees in public administration, defence and compulsory social security in the region: 10.8 percent in FBH and 9.5 percent in RS in 2011, see Kreso and Lazović, 2013). Moreover, the quality of government institutions is very low and BH is among the worst performers in South Eastern Europe according to the World Development Indicators. It is in the last place according to voice and accountability, political stability, one before the last if we observe the government effectiveness and ranked lowly when assessing the control of corruption, rule of law and regulatory quality (see Appendix 1.1). According to the Global Competitiveness Reports 2008-2009 and 2009-2010, government instability, policy instability and inefficient government bureaucracy were ranked as the biggest obstacle to doing business. These are still rated among the first four obstacles for doing business (even though, as noted above, in the last three reports access to finance was rated as the biggest obstacle). This assessment is important for setting the framework in which a CBA functions. Moreover, it is important for assessing the flexibility and effectiveness of fiscal policy, since, in order to assess the need for the CBA the viability of complementary and alternative policies have to be evaluated. As noted in Hardouvelis and Monokrousos (2009, p.7) “a CBA can facilitate stabilization programs in economies lacking credible institutions and when policy discretion is ineffective for monetary stabilization”, which is still the case in BH. Moreover, it is an effective tool for keeping the government spending “under control” since it imposes a hard budget constraint on the government. The effectiveness of fiscal policy is especially relevant in a period of crisis, since economic growth cannot be boosted through monetary policy. However, according to the United Nations Development Programme (UNDP)’s Early Warning System the BH government did

[10] To our knowledge there is no more recent estimate available. However, there are also some other estimates available which differ quite significantly: Tomas (2010) estimated the grey economy in BH in 2008 to be 23 percent of GDP, while Vladušić and Pantić (2008) estimated it to be 16 percent in 2006.

not prove to be effective in mitigating the effects of the Global Financial Crisis. As they note: “This was a consequence of the absolute absence of institutional mechanisms which might be used to remove or at least mitigate the negative impact on institutional performance” (UNDP, 2009, p. 31). Moreover, Kreso and Lazović (2013) show that the level of average gross wages increased in BH during the crisis, while it was decreasing in Bulgaria, Slovakia and Croatia (EU countries that they included in their analysis). Moreover, “while GDP in BH grew from 2006-2011 by 1.3 times, compensation for employees in the public administration and beneficiaries of budget funds increased by 1.5 times, and social benefits by 1.8 times” (Kreso and Lazović, 2013, p.8). Since government expenditures exceed revenues the resulting deficit was financed though foreign debt, which has been increasing from 2008 (Table 1.2). According to the currency structure of public debt on 31/12/2013, debt denominated in the euro makes up 52.24 percent of the total public debt of BH and 33.24 percent in special drawing rights (SDR), though the effective payments are again in euros (Ministry of Finance and Treasury, 2014, p.10). This is important when considering the potential future changes in the nominal exchange rate, since the burden of debt would be increased if the local currency is devalued against the euro.

Since the currency is fixed to the euro the question about the potential currency over/under-valuation is frequently posed. According to the data on real effective exchange rate (REER), which takes into account the changes in the exchange rates with the trading partners (and weights it with the level of trade with each partner) from 2005 the REER has appreciated in all years except 2007 and 2013 (Table 1.2). In the annual report of CBBH the depreciation trend in 2013 is explained as a consequence of “favourable developments in the real sector and improved competitiveness” (CBBH, 2013, p. 27). However, the deviations in the REER can be considered not to be too large (compared to, for example Bulgarian lev, which appreciated 22.4 percent cumulatively for the period 2005-2008, see Hardouvelis and Monokrousos, 2009). Another indicator of the overall situation in the country, which is especially relevant for assessing the level of interest rates and the attractiveness of the country for foreign investors is a country’s sovereign credit rating. The long-term rating is B3/stable (according to Moody's Investors Service rating) which is a category of speculative credit rating with high credit risk, which is the lowest rating in the region. The rating improved to B2 in 2006, but decreased again in 2012.

Given the economic and political situation in BH described above, the perhaps inevitable step after the war was to impose strict rules designed to eliminate potential abuse of discretionary monetary policy. These rules were imposed by the introduction of the CBA for the first six years after the war, a period which was extended mainly due to the persistence of political instability in the country. Reasons for the introduction of the CBA in BH and its main characteristics, as well as the main trends in financial sector under the CBA, will be presented in the next section.

## 1.3 The monetary and financial sectors in BH

The main characteristics of the reforms in the monetary and financial sector after the war were explained in Section 1.2.2 and the overview of the macroeconomic situation in which the CBA functions in BH was appraised in Section 1.2.4. Next, more details about the characteristics and functioning of the CBA in BH will be presented and the main characteristics of financial sector and its functioning critically assessed.

### 1.3.1 Origins and the reasons for the introduction of the CBA in BH

In June 1997, in accordance with the Law adopted by the Parliament of Bosnia and Herzegovina, within the framework determined by the Dayton Peace Agreement, the Central Bank of Bosnia and Herzegovina, the monetary institution for the whole country, was established. The Dayton Peace Agreement specified that the Central Bank will operate a currency board, without the possibility of extending credit by creating money. A new currency, konvertibilna marka, was introduced as the only legal tender in the whole country. It was pegged to the deutsche mark at the fixed exchange rate 1 DM = 1 BAM, as it was the most widely used currency prior to the introduction of the national currency. After the introduction of the euro, the konvertibilna marka became pegged to the euro at the fixed exchange rate 1 € = 1.955830 BAM.

Beside the need for stability in a small, open, underdeveloped and unstable economy the CBA was also introduced in BH for political reasons (Kreso, 1997; Kovačević, 2003) related to a country which was, as explained above:

- exiting a war with severe traumas, divisions and mutual distrust, whose economy had been destroyed, and which was bounded by a state constitution with two entities with significant economic independence;
- undergoing transition from being a part of a larger nation to being an independent, small country which lacked a monetary policy track record;
- in a transition process from a socialist command economy dominated by the state to a market-oriented private sector economy.

These characteristics indicate that in such a country it would be very difficult to establish credible, discretionary monetary policy whilst ensuring the stability of the domestic currency. Therefore, a currency board arrangement, which imposes discipline on the domestic monetary authorities, was introduced and embedded in law in order to assure its full implementation and to produce greater credibility and macroeconomic stability.

### 1.3.2 Characteristics and the institutional framework of the CBA in BH

The CBA in BH does not deviate much from the orthodox currency board rules. The Central Bank keeps more than 100% coverage of monetary base in foreign reserves (see Table 1.3); the national currency is pegged to the reserve currency in a fixed proportion; full convertibility of domestic currency into the reserve currency and vice versa is guaranteed. The Central Bank cannot act as a lender of last resort, and it is unable to finance government or commercial banks. The only deviation from the orthodox rules is reserving the right to use one monetary instrument, specifically reserve requirements. All of these rules are embedded in the Law on the Central Bank of Bosnia and Herzegovina (articles 31-37 of the Law on the CBBH). Beside those rules the Law also regulates the independence of the Central Bank from “the Federation of Bosnia and Herzegovina, the Republika Srpska, any public agency and any other authority in the pursuit of its objective and the performance of its tasks” (article 3 of the Law on the CBBH).

The major goals and objectives of the CBBH are also determined by the Law on CBBH. This Law defines CBBH as the "independent and sole authority in charge of establishing and supervision of monetary policy and monetary policy instruments, all according to the powers given to the Board by the Law". The Central Bank "supports and maintains appropriate payment and settlement systems and coordinates the activities of BH's Entity Banking Agencies which are in charge of bank licensing and supervision"[11]. Embedding the currency board and the Central Bank's objectives, responsibilities and political independence in the Law, were considered to provide the grounds for the establishment of Central Bank's credibility. The latter will be empirically investigated in Chapter 4. Within the boundaries set to the Central Bank by the Law, the Bank manages its assets and liabilities, acts as a banking agent for the entities Banking Agencies and has the power to change the reserve requirement rate.

### 1.3.3 Operation of the CBA in BH

Seventeen years after the introduction of the CBA in BH there have not been any major changes to the original regime. Reserve requirements are still the only monetary policy instrument available to the Central Bank of BH, though changes to the deposit basis on which the reserve ratios are calculated and reserve rate limitations[12] have been made and will be addressed later in this section. The structure of the CBBH's balance sheet has remained in accordance with the Law, with slight changes over time.

*The Central Bank's balance sheet*

According to the rule of issuing currency (article 31 of the Law on CBBH) the balance sheet of the currency board may not contain domestic assets and the monetary liabilities should not exceed the net foreign exchange reserves. The asset side of the CBBH' balance sheet consists of foreign exchange assets which include

[11] http://cbbh.ba/index.php?id=13&lang=en (last accessed; 18/12/2014)

[12] The assets that are included in the base on which reserves are calculated has been changing over time. The limitis within which the reserve requirement rate had to be set were defined by law as well, but these limits have also been changed, by revisions to the Law (more details are provided below).

foreign currency in cash, deposits with foreign banks, SDR’s at the IMF, gold reserves (since March 2009) and selected securities denominated in euros (since July 2006). Those securities are high quality instruments with a high degree of tradability and liquidity, with the credit rating of AAA (Standard & Poor, Fitch and Moody's). As indicated in the note to Table 1.3, since 2010 investments into securities with the credit rating BBB+ were also allowed, due to sharp decrease of earnings on AAA securities. The portfolio includes short-term and long-term debt securities with a fixed interest rate, which are issued by the governments of foreign countries (CBBH, 2010a). The liability side consists of monetary liabilities (which include currency in circulation, deposits of resident banks and deposits of other residents), liabilities to non-residents, other liabilities and capital and reserves. The CBBH’s liabilities to non-residents are comprised of short-term liabilities towards non-residents, deposits of non-residents and other short-term liabilities towards non-residents and Accounts 1 and 2 of transactions with the IMF (CBBH, 2010b). Foreign currency assets have been continuously increasing since 1998 (when they were 283 million BAM) until 2007 (when they were 6,698 million BAM). In 2008, as a consequence of the financial turmoil, foreign exchange reserves fell to 6,296 million BAM and continued falling in 2009 (when they were 6,212 million BAM). After 2009 they were relatively stagnant until 2013 (Table 1.3).

Table 1.3: Monthly Balance Sheet (final) of the CBBH as of 31st December of each year

(Amounts in millions BAM)

| **Assets** | **2005** | **2006** | **2007** | **2008** | **2009** | **2010** | **2011** | **2012** | **2013** |
|---|---|---|---|---|---|---|---|---|---|
| Foreign Exchange Assets | 4196 | 5452 | 6698 | 6296 | 6212 | 6457.27 | 6423 | 6507.5 | 7067.7 |
| Foreign currency in cash | 40 | 55 | 40 | 212 | 107 | 102 | 94 | 133 | 92 |
| Deposit with foreign banks | 4155 | 5003 | 6052 | 4778 | 3300 | 3003 | 4385 | 2334 | 2217 |
| SDR in the IMF | 0.5 | 0.5 | 0.3 | 0.4 | 5 | 0.27 | 1 | 4.5 | 2.7 |
| Monetary Gold | | | | | 63 | 67 | 151 | 159 | 164 |
| Security investments/financial assets available for sale* | | 393 | 606 | 1305 | 2735 | 2904 | 1753 | 3770 | 4486 |
| Held-to-maturity investments* | | | | | | 381 | 39 | 107 | 106 |
| Other Assets | 85 | 57 | 56 | 54 | 57 | 68 | 70 | 79 | 80 |
| Total assets (1+2) | 4281 | 5509 | 6755 | 6350 | 6269 | 6526 | 6493 | 6587 | 7148 |
| **Liabilities** | **2005** | **2006** | **2007** | **2008** | **2009** | **2010** | **2011** | **2012** | **2013** |
| Monetary Liabilities | 4008 | 5183 | 6304 | 5727 | 5705 | 4968 | 5915 | 5987 | 6659 |
| Currency in Circulation | 1907 | 2154 | 2440 | 2552 | 2268 | 2497 | 2645 | 2747 | 2910 |
| Deposits of Resident Banks | 2060 | 2892 | 3777 | 3144 | 3375 | 2393 | 3193 | 3041 | 3475 |
| Deposits of Other Residents | 40 | 137 | 87 | 31 | 63 | 78 | 77 | 199 | 274 |
| Liabilities to Non Residents | 1 | 1 | 0.9 | 1 | 0.9 | | | | |
| Other Liabilities | 27 | 24 | 63 | 122 | 59 | 22 | 30 | 23 | 22 |
| Capital And Reserves | 245 | 301 | 386 | 499 | 503 | 533 | 547 | 575 | 466 |
| Total liabilities (3+4+5+6) | 4281 | 5509 | 6755 | 6350 | 6269 | 6526 | 6493 | 6587 | 7148 |

*Note: From 2010 security investments have been reclassified as financial assets available for sale which include quality instruments with a high degree of marketability and liquidity, with a credit rating from AAA to BBB+ (Fitch) and held-to-maturity investments all of which are with a credit rating of AAA (Fitch) and are denominated in EUR.

Source: CBBH annual reports and financial statements for the end of the periods, as of 31 December of each year (from 2005 until 2013)

Deposits held with non-residential banks have been falling since 2008, while the investments in foreign securities have been growing (with an exception in 2011). These changes in the structure of foreign assets held by the Central Bank were part of the reaction of the CBBH to financial crisis. Namely, as all types of deposits in commercial banks started decreasing in 2008 the CBBH was obliged to provide more foreign currency in order to be prepared to answer to the cash requirements of commercial banks. Thus, the deposits with non-residential banks in 2009 fell again by 1.5 billion BAM (30.2%), while investment in securities rose by 1.4 billion (109.6%). The holding of foreign currency fell by 104.8 million BAM or 49.4%, which was a result of fewer tensions in the banking sector in BH in 2009. On the liability side currency in circulation grew by 171.4 million BAM in 2008, as a consequence of demand deposits reduction by 374.4 million BAM, which was a result of deposit withdrawals by depositors and their conversion into cash, as a reaction on global financial crisis (CBBH, 2008, 2009a).

The CBBH also maintains certain accounts in foreign currencies related to agreements concluded between the governments of B H and foreign governments and financial organizations. As these accounts do not represent either assets or liabilities of the CBBH, and because their recording in the Bank's balance sheet would violate CBA matching requirements, they are recorded as off-balance sheet items. As its ”fiscal agent, the Bank acts on behalf of the Government in dealing with the IMF but does not have any responsibility for assets and liabilities related to the membership” (CBBH, 2010a, p.13). Therefore, the total gross position of Government with the IMF is recorded as an off-balance sheet item. However, the increase in the position of Government with the IMF[13] eventually affects the foreign assets when tranches from the stand-by-arrangement are being reimbursed. The key trends in BH's monetary aggregates will next be examined.

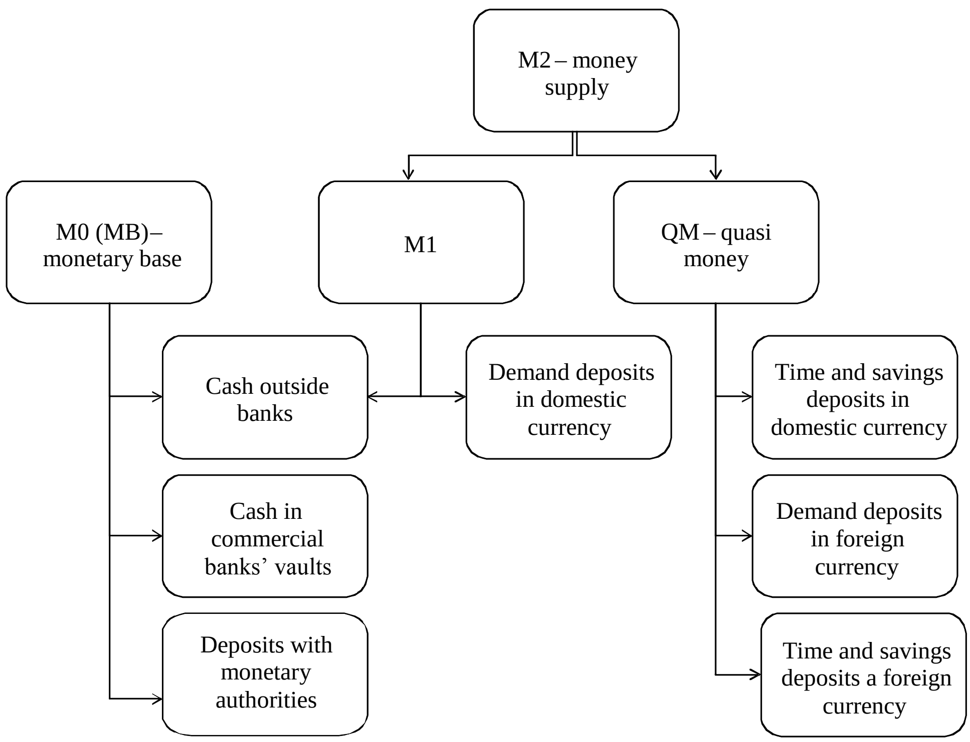
*Monetary aggregates and the process of the money supply creation*

Due to the limitations that the CBA imposes on the role and operations of the CBBH and the absence of a money market the broadest monetary aggregate in BH is M2. As

[13] The latest stand-by-arrangement was agreed on August 2012 when 558.03 mil SDR (1264.80 mil BAM) was approved; up to September 2014 422.75 mil SDR (958.18 mil BAM) has been drawn.

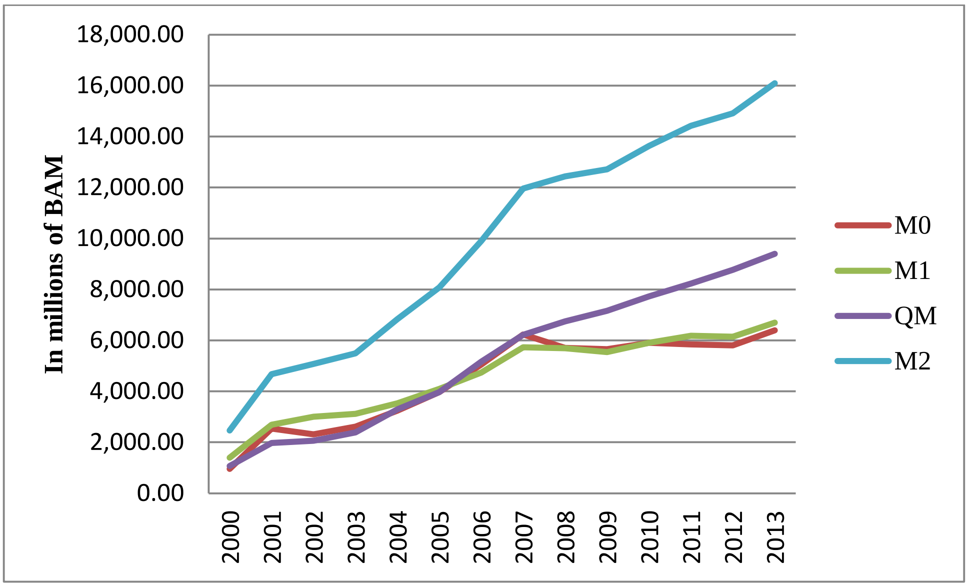
defined by CBBH, the monetary base M0 (primary money or reserve money) consists of cash outside the monetary authorities, deposits of commercial banks and deposits of other domestic sectors (except for deposits of the central government) with the monetary authorities. The monetary aggregate M1 comprises cash outside banks and demand deposits in domestic currency of all domestic institutional sectors (except for deposits of the central government). The monetary aggregate QM (quasi money) consists of time and savings deposits in domestic currency, demand deposits in a foreign currency and time and savings deposits in a foreign currency of all domestic institutional sectors (except for deposits of the central government). Finally, money supply M2 comprises monetary aggregates, M1 and QM. These aggregates are presented schematically in Figure 1.2.

Figure 1.2: Monetary aggregates in BH – schematic illustration




As a CBA functions similarly to the gold standard, changes in the balance of payments have a strong influence on the money supply through changes to the monetary base (*ΔFR (foreign reserves) → ΔMB (monetary base) → ΔM (money supply)*) (this will be elaborated in more detail in Chapter 2). M0 has been increasing since the introduction of the CBA until 2008 when it started falling and only in 2013 did it reach its pre-crisis level (Figure 1.3).

Figure 1.3: Monetary aggregates in BH (2000-2013)




Source: Author's illustration based on data from the CBBH website, www.cbbh.ba (last accessed: 24/09/2014)

The data presented in Table 1.3 implies that there has been a persistent deficit in the current account, which is usually described as one of the major threats to currency board sustainability and desirability. The observed positive trend in the monetary base until 2008 was achieved thanks to the positive trends in the capital and financial account (see Table 1.4). However, capital and financial net inflows have decreased since 2009 (with the exception of 2011 when it increased), as financial aid and foreign direct investments fell, which affected the growth of monetary base. However, the broad money supply (M2) increased even in this period, though at a slower pace than before the crisis (see Figure 1.3).

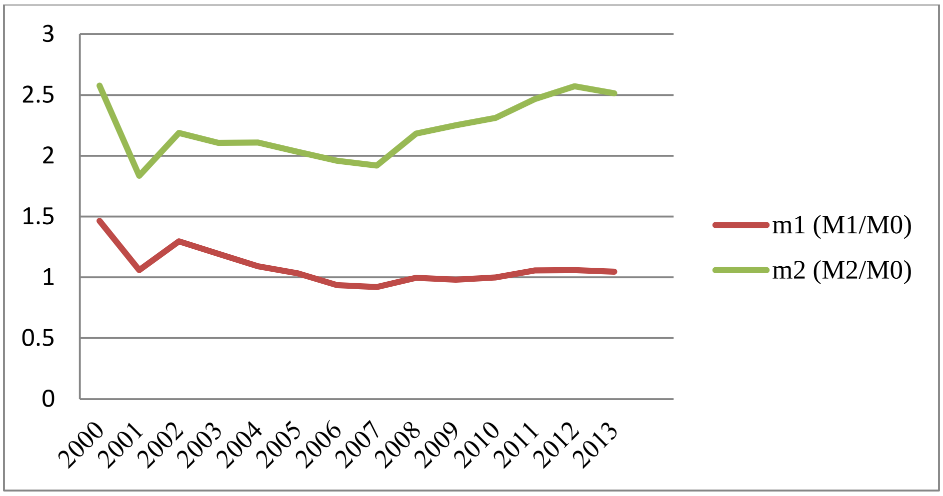
Table 1.4: BH's balance of payments (2000-2013)

| Year | Goods | Services | (Primary) Income | Current transfers (secondary income) | Current account | Capital account | Direct investments | Portfolio investments | Other investments | Reserve assets | Financial account | Net errors and omissions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5= 1+2+3+4 | 6 | 7 | 8 | 9 | 10 | 11= 7+8+9+10 | 12 |
| 2000 | -5868 | 397 | 1253 | 3379 | -840 | 116 | 310 | | -134 | -165 | 11 | -331 |
| 2001 | -6471 | 498 | 1163 | 318 | -163 | 875 | 260 | | 1925 | -1665 | 519 | 236 |
| 2002 | -6891 | 454 | 1055 | 2933 | -2449 | 849 | 551 | | 584 | 245 | 138 | 221 |
| 2003 | -718 | 581 | 925 | 286 | -2814 | 805 | 660 | | 1142 | -316 | 1486 | 523 |
| 2004 | -7193 | 679 | 760 | 2932 | -2822 | 680 | 1042 | | 1136 | -677 | 1502 | 641 |
| 2005 | -7835 | 773 | 712 | 2991 | -3358 | 646 | 821 | | 1943 | -738 | 2026 | 687 |
| 2006 | -6661 | 950 | 720 | 2949 | -2041 | 532 | 661 | | 1259 | -1205 | 715 | 794 |
| 2007 | -8935 | 2318 | 670 | 3901 | -2047 | 415 | 2506 | -4 | 422 | -1242 | 1682 | 50 |
| 2008 | -10665 | 2385 | 943 | 3827 | -3510 | 383 | 1315 | -29 | 1543 | 462 | 3291 | 164 |
| 2009 | -7786 | 1903 | 955 | 3341 | -1587 | 350 | 344 | -274 | 939 | 104 | 1113 | -124 |
| 2010 | -7629 | 2159 | 413 | 3529 | -1528 | 389 | 532 | -173 | 875 | -258 | 976 | -163 |
| 2011 | -8346 | 2116 | 215 | 3504 | -2511 | 357 | 669 | -46 | 1383 | 33 | 2039 | -116 |
| 2012 | -8445 | 2187 | 232 | 3643 | -2383 | 336 | 534 | -18 | 137 | -73 | 580 | -1467 |
| 2013 | -7802 | 2255 | 513 | 3599 | -1435 | 337 | 507 | -132 | 1167 | -709 | 833 | -265 |

Source: CBBH website, www. cbbh.ba (last accessed: 24/09/2014)

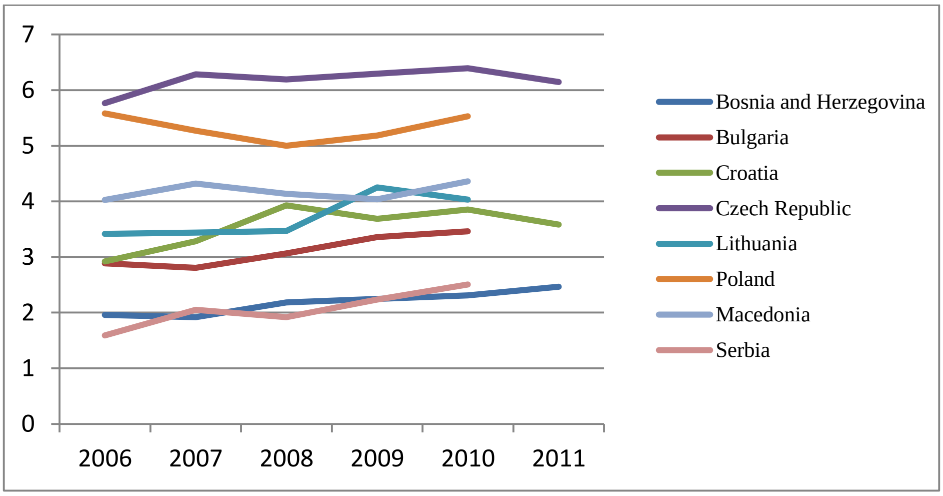
Money supply may also be increased through a process of money multiplication ($\Delta M2=m*\Delta M0$, where m is a money multiplier). As the backing rule applies only to the currency issued by the CBA, and not to that created by the banks, commercial banks retain their power to create money of credit "ex nihilo" (Ponsot, 2006, p.36). By observing the data on monetary aggregates we can perceive a process of secondary money creation through deposit expansion and credit multiplication. Monetary multipliers for BH (m1 and m2), calculated as the ratio between the monetary aggregates (M1 and M2, respectively) and the monetary base (M0), are presented in Figure 1.4a.

Figure 1.4a: Monetary multipliers for BH (2000-2013)




Source: Author's illustration based on data from the CBBH website, www.cbbh.ba (last accessed: 24/09/2014)

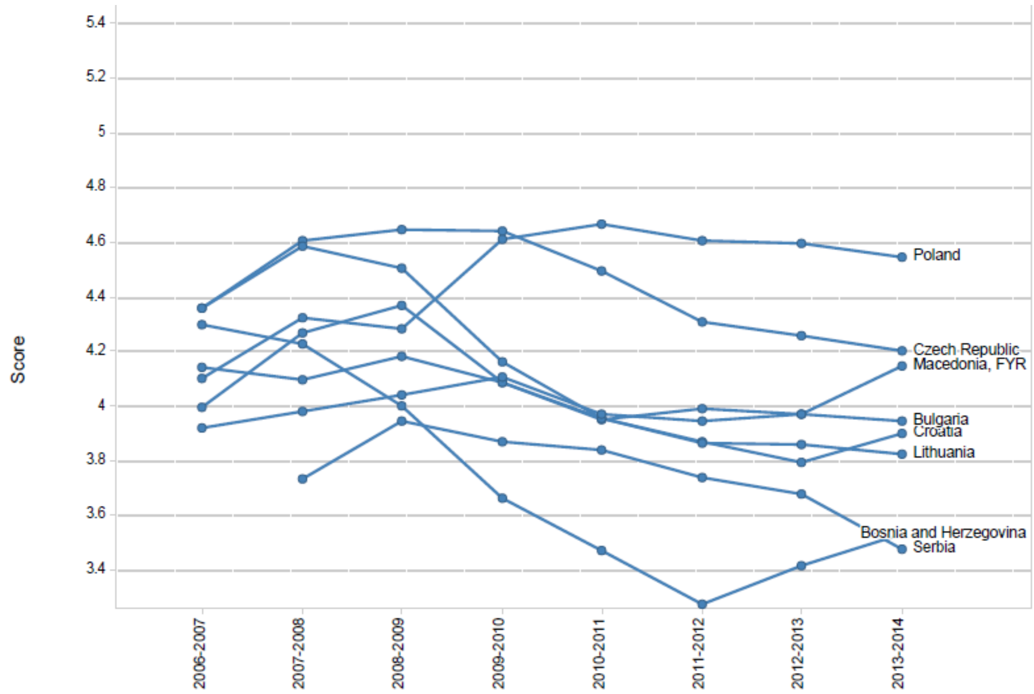
Figure 1.4b: Money multipliers (calculated as a ratio between the broad money and the monetary base) for selected Central and South Eastern European countries




Source: Author's illustration based on data from websites of central banks of respective countries

Figures 1.4a and 1.4b indicate that the money multiplier m2 has been relatively low in BH compared to the monetary multiplier in the other countries from Central and South Eastern Europe. The main reason for such a low money multiplier is likely to be the undeveloped financial market in BH. If we observe the level of financial market development (proxied by the World Economic Forum's financial market development indicator, FMDI[14]) (Figure 1.5), we notice that it is positively correlated with the level of the money multiplier (Figure 1.4b). Besides the influence of the underdeveloped financial market and slow reforms in BH, Kreso and Begović (2013) identified the high asset share of foreign-owned banks (which is the highest in the region) and the dependence of money multiplication process on foreign financial markets as the additional constraints. Namely, due to strict banking regulations (which will be investigated in the next section) and underdeveloped local financial markets the problem of maturity mismatch has to be solved through foreign markets.

Figure 1.5: Financial market development indicators (1-7 best) for the selected countries




Source: http://www.weforum.org/issues/competitiveness-0/gci2012-data-platform/ (last accessed. 24/09/2014)

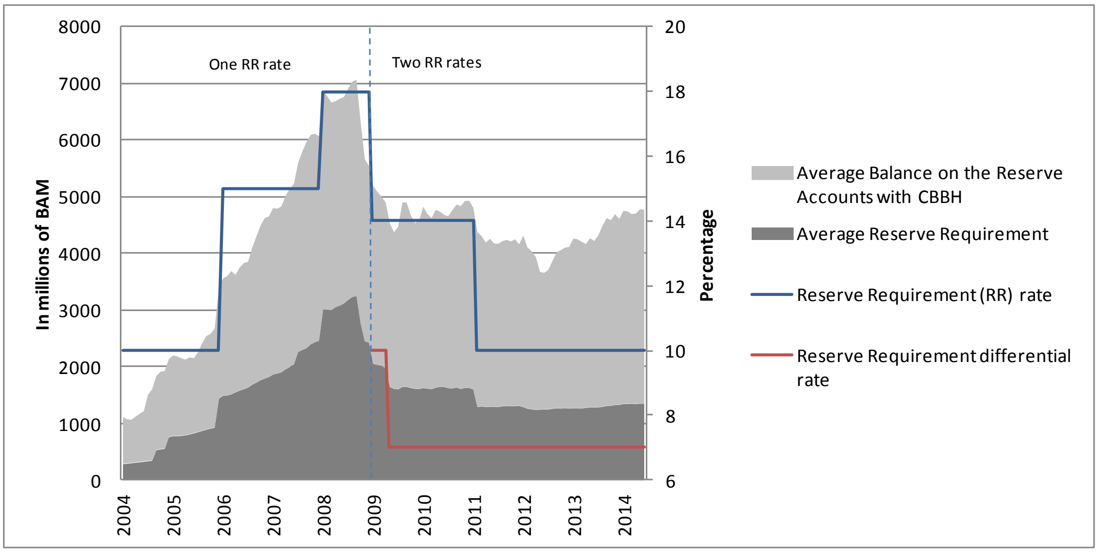
[14] The FMDI assesses the following factors: availability of financial services, affordability of financial services, financing through local equity market, ease of access to loans, venture capital availability, soundness of banks, regulation of securities exchanges and legal rights index based on a executive opinion survey. http://www.weforum.org/issues/competitiveness-0/gci2012-data-platform/

As noted above, CBBH cannot affect money supply by lending to government or banks. The only way the CBBH can potentially influence the money supply in current conditions is through changes in the banking sector's reserve requirements; by lowering the rate of required reserves commercial banks are left with more assets available for credit creation and therefore they can increase money supply through increase in credits, and vice versa. Whether they react to the reserve requirements changes as expected depends on specific conditions, which will be addressed next.

*Reserve requirements and excess reserves*

The Law on the CBBH (article 36) sets the rules for the use of the sole monetary instrument available. The original article 36 determined the limits for reserve requirements to between 10 percent and 15 percent of deposits and borrowed funds denominated in BAM and set the penalties for contravention of the rule. The article has been changed several times through amendments and supplements to the Law. The major changes were the expansion of the base for reserve requirements to include both BAM and foreign currency deposits as well as borrowed funds and the abolition of the limits on the range for the rate of required reserves, as it is considered that the CBBH should have freedom to determine the rate according to the financial conditions (for changes in the reserve requirement rate see Figure 1.6). For example, in order to mitigate the negative (liquidity) effects of the financial turmoil, the CBBH decreased the reserve requirement rate from 18 percent to 14 percent in October 2008 and to 10 percent in February 2011. In January 2009 the CBBH introduced a second (discounted) rate, which has been applied to deposits and borrowed assets with a contracted term of maturity over one year. It was initially set to 10 percent and then lowered to 7 percent in May 2009. In order to stimulate the inflow of capital from foreign countries into the local banking sector, additionally, from November 2008 all new parent banks' credits were freed from the required reserve calculation. Furthermore, since 2010 the "government deposits earmarked for development programs and new foreign borrowing (deposits and loans) were excluded from the basis for calculation of the required reserves" (CBBH, 2012a, p.52).

Figure 1.6: Changes in the reserve requirement rate and the total reserves held by banks in CBBH




Source: The author's illustration based on data from the CBBH website, www.cbbh.ba (last accessed: 24/09/2014)

However, these changes may not have the expected effect on banks' willingness to provide credits. Beside those required reserves commercial banks have generally also been holding a large amount of excess reserves (see Figure 1.6 and Table 1.5). It can be noticed that the reduction in the amount of the average reserve requirements in a period of financial turmoil was followed by an increase in the amount of excess reserves that banks kept (which can be noticed by the difference between the average reserves in the CBBH and the average reserve requirements in Figure 1.6). One of the reasons behind this is the absence of the lender of last resort function of the CBBH since banks want to assure higher liquidity as they know that liquidity cannot be provided by the central bank. Additionally, as the money and capital markets in BH are not developed, banks cannot invest the excess liquidity in less-risky securities in the domestic market or lend money to other banks under more favourable conditions. As noted in the CBBH's annual report for 2009 "...in the shortage of adequate borrowers and sound investment projects, the banks preferred to hold their free funds in reserve accounts than to incur risks through lending to clients" (CBBH, 2009a, p. 59). There are also rigid rules regarding liquidity managing and maturity matching between deposits and credits posed by entities' banking agencies on commercial banks (which will be discussed in the next section). Moreover, from the beginning of the global financial crisis interest rates on the euro market have been falling (even negative in 2014), while the remuneration rate on excess reserves was always positive[15]. All of this can lead us to the conclusion that the reserve requirement instrument is not very effective in periods of financial downturns, as the lower requirement reserve rate did not lower the average balance of the reserve accounts with CBBH.

Table 1.5: Average reserve requirements (2005-2013)

Period average (in millions of BAM)

| Year | Deposit Base for Required Reserve Calculation | Average Reserve Requirement | Average Balance on the Reserve Accounts with CBBH | Balance (excess reserves) |
|---|---|---|---|---|
| 2005 | 8456.6 | 885.5 | 1516.2 | 630.7 |
| 2006 | 10905.9 | 1635.9 | 2372.9 | 737.0 |
| 2007 | 14328.5 | 2149.3 | 3309.6 | 1160.3 |
| 2008 | 17320.1 | 2961.9 | 3630.6 | 668.7 |
| 2009 | 15721.2 | 1605.8 | 2968.7 | 1362.9 |
| 2010 | 15617.8 | 1624.9 | 3154.8 | 1529.9 |
| 2011 | 15227.4 | 1323.9 | 2959.3 | 1635.4 |
| 2012 | 14755.6 | 1257.9 | 2711 | 1453.2 |
| 2013 | 15162.2 | 1290.8 | 3103.9 | 1813.1 |

Source: CBBH website, www.cbbh.ba (last accessed: 26/09/2014)

### 1.3.4 Commercial banks as the major “players” in BH’s financial sector

As noted in Section 1.2.2, since the introduction of the CBA the financial sector in BH has undergone major, mainly positive, transformations. The financial sector has been liberalised, which resulted in the removal of all controls over interest rates, reform of the system of internal payments has been undertaken, and most of the barriers to current and capital account transactions have been removed. The system of bank supervision has been improved in the direction of accepting the international (Basle) standards, and in 2002 a deposit insurance agency was created at the state

[15] From April 1st, 2009 the remuneration rate was calculated as: On the amount of required reserves is 0,5%; on the amount of excess reserves on the rate calculated as an average of interest rates, which were earned by the Central bank on deposits invested up to a month. From July 1st, 2010 the remuneration rate on the amount of required reserves was changed and calculated as an average of interest rates, which were earned by the Central bank on overnight deposits in the same period, while the remuneration rate on the amount of excess reserves was not changed. From August 1st 2011 the remuneration rate was calculated by the weighted average interest rate which were earned by the Bank on deposits invested up to a month in the same period; 70% of this rate is calculated on the amount of required reserves while 90% of the same rate is calculated on the amount of excess reserves (CBBH, website, www.cbbh.ba, last accessed: 24/09/2014).

level. Insurance and leasing companies, investment funds, brokerage houses and micro-credit organizations have been opened, although they still have a minor role in the financial sector, while the banks remain the major “players”, as they hold 86.3% of total financial assets (CBBH, 2012a). The banking system in BH has been strengthened and the number of commercial banks has decreased from 76 in 1997 to 30 at the end of 2008 (CBBH, 2009a, p.79), mostly as a result of the process of banking privatisation during the period 1998 - 2002. The number of state-owned banks has decreased and foreign banks now dominate the banking system, as the foreign banks hold the majority of the banking assets (this issue will be addressed next). This is not surprising as in the countries with a CBA foreign banks usually play an important role in providing liquidity, especially because of the potential problem of time-inconsistency between deposits and loans (the maturity mismatch problem, which will also be addressed further in the text). These banks are considered to be able to respond faster to changes in reserve requirements than the domestic ones in the CBA countries and to better cope with the demands of developing markets, since they have access to foreign markets. Banks in BH can be described as well-capitalized and liquid, with a capital adequacy ratio of 17 percent and a liquid assets to short-term liabilities ratio of 44.1 percent in 2012, which was slightly weaker than in 2011 (when it was 46.7) (CBBH, 2012b). Although not high, the ratio of non-performing to total loans increased from 11.8 in 2011 to 13.5 percent in 2012 (CBBH, 2012b).

Since the introduction of the CBA in BH both outstanding deposits and loans have been increasing, with the exception of 2009 when they fell as a result of financial crisis (Table 1.6). Deposits have been growing, indicating an increased confidence in the banking system until 2008, when a bank run started in BH as a result of adverse conditions in world financial markets.

Table 1.6: Consolidated balance of commercial banks in BH: Selected items

| Year | Total reserves of banks | Foreign assets | Long term loans to non-financial private enterprises | Long term loans to households | Short term Loans to non-financial private enterprises | Short term Loans to households | Total assets | Foreign Liabilities | Transferable Deposits | Other Deposits |
|---|---|---|---|---|---|---|---|---|---|---|
| 2005 | 2233.9 | 2096.6 | 2030.2 | 3057.0 | 1213.8 | 396.4 | 11874.6 | 3559.3 | 3876.1 | 3000.1 |
| 2006 | 3063.6 | 2357.1 | 2592.7 | 3893.0 | 1453.4 | 466.6 | 14749.7 | 4074.8 | 4005.1 | 4758.1 |
| 2007 | 4022.9 | 3558.6 | 3439.2 | 5104.4 | 1819.0 | 564.5 | 19603.2 | 5165.7 | 5106.5 | 6980.7 |
| 2008 | 3393.3 | 3106.1 | 4142.2 | 6051.1 | 2579.8 | 645.7 | 21118.3 | 6361.9 | 4905.1 | 6970.0 |
| 2009 | 3632.0 | 3190.3 | 4186.9 | 5590.8 | 2459.8 | 716.4 | 21009.6 | 5744.1 | 5215.1 | 6877.0 |
| 2010 | 3679.8 | 2814.2 | 4309.5 | 5522.3 | 2624.0 | 801.9 | 21177.7 | 4783.2 | 5557.7 | 6972.4 |
| 2011 | 3469.7 | 2724.5 | 4186.7 | 5846.4 | 2935.2 | 858.4 | 21898.1 | 4176.9 | 5518.1 | 7474.9 |
| 2012 | 3370.4 | 2507.8 | 4248.8 | 5875.2 | 3188.4 | 919.5 | 22324.6 | 3947.0 | 5306.9 | 8019.6 |
| 2013 | 3843.7 | 2637.3 | 4369.0 | 6123.0 | 3152.2 | 942.2 | 23446.3 | 3697.9 | 5771.9 | 8478.0 |

Source: CBBH website, www.cbbh.ba (last accessed: 24/09/2014)

However, deposits started rising again after 2009, but long-term loans to households declined and those to private enterprises have been stagnating or increasing very slowly. On the other hand, short-term loans started increasing from 2009. It is likely that the banks withdrew long-terms funds and substituted more short-term loans in order for previous loans to be repaid by those new short-term ones. This is likely to be very detrimental to economic development, especially when there is no alternative financing. Foreign liabilities have been decreasing since 2008 indicating that funds from the parent banks have been withdrawn from their subsidiaries, making the situation in the country weaker and more fragile. Additionally, the level of excess reserves held in CBBH has been rising since 2009 (Table 1.5). Therefore, it could be concluded that this situation is likely to be driven by events in foreign markets, since foreign banks have a very high share of total financial assets in BH.

*The role of the foreign parent banks in financial (in)stability*

The number of foreign-owned banks has been increasing since 2000 and at the end of 2012, 92 percent of banking assets were in foreign ownership (75 percent of BH's GDP) and they shared 91.6 percent of banking sector profits (CBBH, 2012b). Beside the expected increase in credibility imposed by the introduction of the CBA (which will be empirically investigated in Chapter 4), the adoption of the BH Law on foreign direct investment and reform of the payment system (which was, as noted in Section 1.2.2, transferred to banks in 2001 and insured additional, non-risky, earnings to banks), foreign banks are considered to be attracted by the potential growth of purchasing power of BH residents and by the expected infrastructural projects and foreign investment inflows (Čaušević, 2007). These banks have played a very important role in achieving and maintaining the stability of BH's financial system. On one side, allowing entry of foreign banks promoted competition between foreign and domestic banks by encouraging domestic banks to adopt modern banking practices (Koliadina, 2008) and forcing the local banks to “improve the range and quality of the services they provide in order to survive” (CBBH, 2001, p.16). They also contributed to the reduction in the average lending interest rates. Namely, foreign banks have increased competition in financial markets, and together with a reform of the banking sector, and increase of loans and savings deposits, contributed to the decrease of interest rates, though the rates remain well above those in the eurozone. However, it is hard to make a comparison with the period prior the entrance of the foreign banks as the CBBH only started collecting data on average commercial banks' interest rates since 2002. Gedeon (2010, p.13) emphasises two important roles of the parent banks: “they serve to provide the long-term liabilities against which long-term domestic loans are issued, and they provide the funds to finance domestic consumption and investment demand“. Foreign-owned bank subsidiaries tend to rely on long-term foreign funding, mostly from their parent banks, to finance credit growth, as the short maturity of local deposits limits their role in funding credit growth (IMF, 2006). On the other hand, reliance of the financial sector on foreign parent banks may also pose threats to financial stability as it increases the potential channels for “contagion” from external shocks (IMF, 2006). Namely, in financial depressions foreign parent banks may withdraw capital from subsidiaries creating a liquidity crisis in financial institutions and further bank panics (Andersen, 2009). This happened first in 2008 when parent banks started withdrawing funds from subsidiaries, which could be observed through a decrease in the foreign liabilities (see Table 1.5). This trend continued after 2009 as well, which implies that the banks continued withdrawing money from the country even though the Vienna initiative, in which the parties agreed that parent banks in the EU would not withdraw their funds from BH banks (as well as other banks in the region) and would continue to make loans available to BH’s economy[16]. In April, May and June of 2012 foreign parent banks again started withdrawing money from their subsidiaries (which could also be observed through decrease in banks’ reserves and increase in foreign assets). This coincided with the deadline for fulfilling the new liquidity measures set by Basel III (a rise from 6 to 9 percent of risk weighted assets) of June 30th 2012. We can conclude that this high reliance on foreign banks and funds makes BH’s economy vulnerable to any sudden stop or reversal in net private capital flows. As those banks are the major players in the financial sector of BH that means that economic growth and development of country are highly dependent on the behaviour of those banks. According to the credit portfolio of commercial banks it can be seen that the amounts

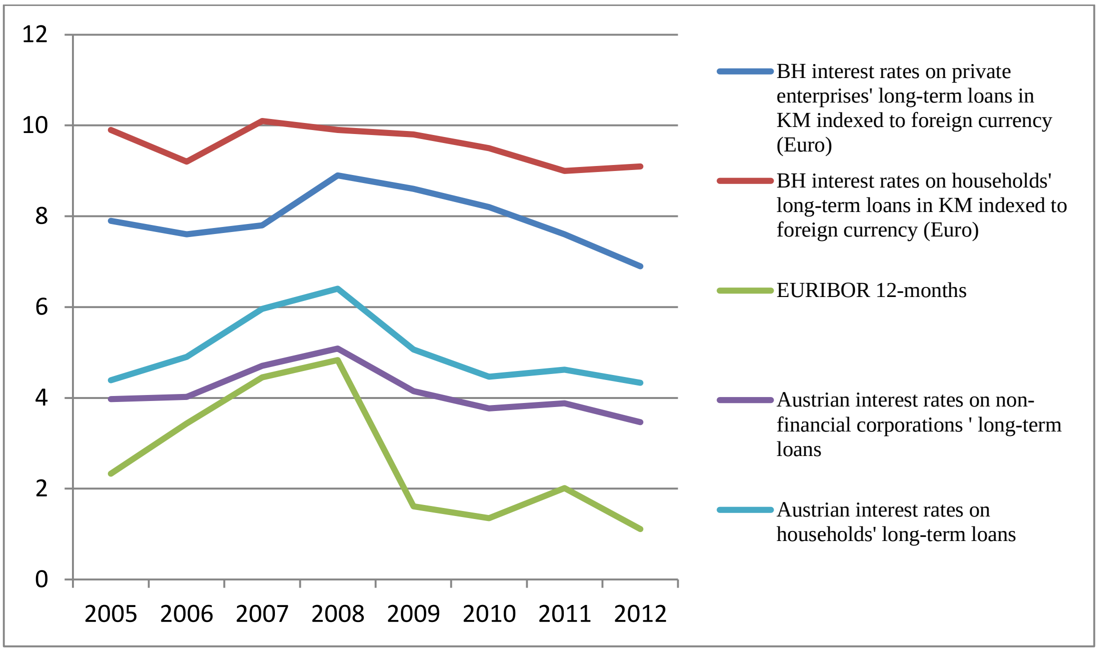
[16] On the 22nd of June 2009 a Memorandum of Understanding entitled the ‘Vienna Initiative’ was signed in Vienna with representatives of six banking groups (Raiffeisen International, Hypo Alpe Adria, UniCredit Bank Austria, Volksbank International, Intesa SanPaolo International, NLB Group) operating in BH. With this agreement, they undertook that the banks in BH would retain their current exposure levels and continue their activities as before the financial crisis. Subsequently, three more banks joined the ‘Vienna Initiative’ (Procredit Group, Sparkasse Bank and Turkish Ziraat Bank) (CBBH, 2009a).

lent to households and enterprises are almost the same (Table 1.5) However, loans to households do not, on average, have the same growth-enhancing effects as do those to the business sector and therefore are likely to produce lower positive social externalities. An additional threat is the heavy exposure of banking sector to a small number of banks, as 61.8% of the loan market and 57.7% of the deposit market are controlled by five largest banks in BH (CBBH, 2009b). This absence of alternative financing led to the creation of an oligopoly of the largest banks in the country setting the interest rates (which will be addressed next). From the above we can conclude that the banking system is not development oriented which is worrying as there is no other mechanism in the BH's financial sector that could provide needed development stimulus.

*Convergence with the anchor currency zone*

As noted in Jeanne and Masson (2000) and Ho and Ho (2009) interest rates between CBA country and anchor currency country (zone) should converge in order to avoid devaluation pressures. Since there is no reference interest rate on domestic financial assets (as there is no money market in BH) there is no interest rate that could be directly compared with the representative euro-zone interest rate – Euribor. Therefore, the lending interest rates in Austria (Austria is taken as an example as it is a country with the highest equity in commercial banks in BH, 63.2%) will be presented, as well as the 12-months Euribor rate, as most of BH's commercial banks have their parent banks in EMU member countries which have access to funds from the European money market. The trends in interest rates were quite similar (as could be seen from Figure 1.7 where interest rates on long-term loans are presented; the trends in the short-term rates were also very similar). As expected, due to higher country risk (which is noted in Section 1.2.4), BH's interest rates are well above the Austrian interest rates and the Euribor. Another reason for the high interest rates in BH may be found in undeveloped money and capital markets which could provide the alternative (and cheaper) source of financing. An additional reason for relatively higher rates (given that the subsidiaries have access to cheaper funds on the euromarkets through their parent banks) is likely to be the "price" that foreign banks "charge" for the maturity matching transformation which is conducted through the foreign markets.

Figure 1.7: Long-term interest rates in BH, Austria and Euribor 12-months

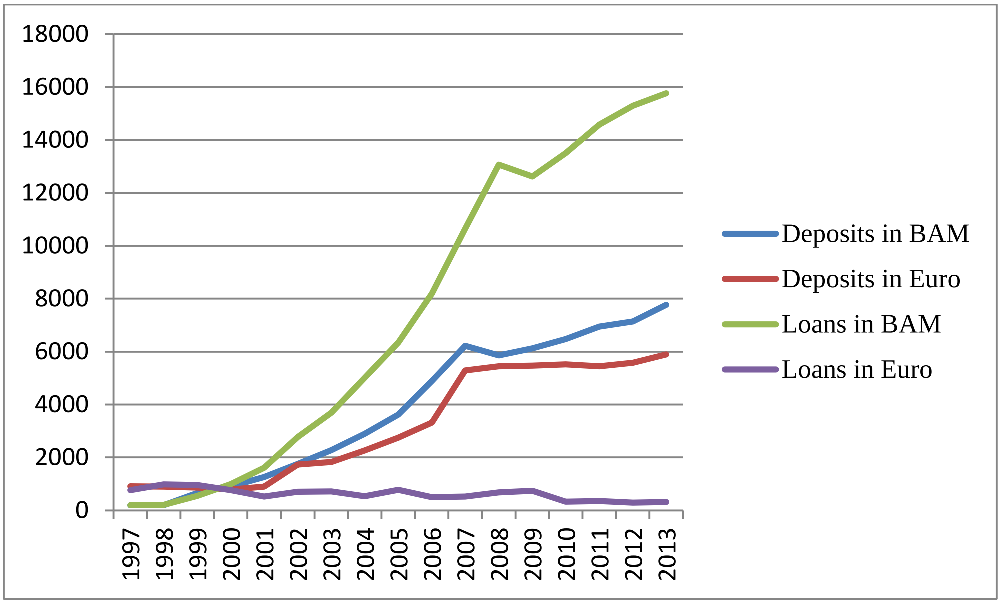



Source: Author's illustration based on data from the CBBH website (www.cbbh.ba), Austrian National Bank website (http://www.oenb.at/) and www.euribor-rates.eu (last accessed: 24/09/2014)

*The risk of maturity and currency mismatch in the banking system*

The risk of maturity mismatch in the banking system of BH can be assessed by looking at the amount of short-term relative to long-term deposits and loans (Table 1.5). In 2009 nearly half of all deposits were held as short-term demand deposits, but three quarters of all loans were long-term loans. There is also a potential currency mismatch problem as approximately 45 percent of resident deposits were euro denominated (Figure 1.8), while nearly 70 percent of all loans were either euro denominated or euro indexed (Gedeon, 2010). The latter cannot be seen from the figure as the euro-indexed loans are treated as BAM loans, since in 2004 the IMF recommended that all credits in BAM which include those with a currency clause (tied to euro), should be classified as credits in BAM (CBBH, 2009c). However, in the 2006 IMF Country Report (IMF, 2006, p. 16) it is stated that indexed loans are treated like euro loans in the currency matching requirement which in June 2005 constituted 70.7 percent of total loans.

Figure 1.8: The structure of commercial banks' loans and deposits by currency




Source: Author's illustration based on data from the CBBH website (www.cbbh.ba)

Additionally, entities' banking agencies pose strict regulations on maturity matching according to which at least "85% of resources with maturity up to 30 days must be used for the loans with maturity up to 30 days, at least 80% of resources with maturity up to 90 days for loans with maturities up to 90 days, and at least 75% of resources with maturity up to 180 days in loans with maturity up to 180 days" (CBBH, 2009b, p.47) (until 2007 those regulations were even more rigid). According to the IMF (2006), this matching requirement results in a segmented bank balance sheet structure: euro-indexed loans are mostly funded through long-term euro deposits and loans from abroad (from parent banks) (since these long-term deposits are not sufficient to cover the long-term loans); local short-term BAM deposits fund banks' excess reserves; and, resident short-term euro denominated deposits fund banks' correspondent euro deposits abroad[17].

Gedeon and Đonlagić (2009, p.32) suggest that the relation between the parent bank and its subsidiaries may satisfy the matching requirement by "recreating the process of independent, private and decentralized open market operations". This is how they describe the process of "quasi central bank intermediation": "the first step for the Bosnian bank is to deposit the foreign assets held against resident demand and time

[17] Kreso and Begović (2012, p. 427, 428) show that „more than 90 percent of the assets sent abroad (foreign assets) are short-term, while approximately 90 percent of the liabilities received from abroad (foreign liabilities) are long-term".

deposits in the parent bank as collateral against a loan that the parent bank will create for the branch bank. The second step is to deposit the process of the loan that the bank has created into the Bosnian branch. It is recorded in Bosnia as a foreign liability, a non-resident deposit, against which required reserves are held. With the new long-term deposit, the Bosnian bank can create long-term foreign exchange loans – or BAM loans, holding the foreign exchange against them – thereby satisfying the matching requirement imposed by the currency board... Essentially, the parent loan is a guarantee against the long-term corporate loan that the bank has issued in BAM. On the liability side, the parent loan increases foreign liabilities, but on the asset side, it increases foreign assets. It may be moved to the parent bank, creating a second liability for the parent bank, as in the multiplier process." This process partly explains how the broad money supply grew over recent years.

This segmentation contributes to the vulnerability of the financial sector by contributing to a tight link between bank lending and capital flows, since the ability of domestic banks to provide long-term loans depends on foreign parent banks' willingness and readiness to supply funds for those loans, as domestic deposits cannot fulfil matching requirements. It also leads banks to transfer euro deposits of residents abroad rather than use them to finance local lending. This has consequently resulted in paradoxical situation of BH becoming an exporter of capital (Dželilović et al., 2004). Namely, by sending short-term assets abroad and receiving long-term liabilities foreign banks takeover the liquidity risk which is "paid" by the surplus/gap between the assets sent abroad (foreign assets + reserves, which are also held abroad) and received liabilities (foreign liabilities) and by paying the interest rate difference (difference between the interest rates charged between the parent banks and their subsidiaries and those charged between subsidiaries and residents[18]). Although this maturity transformation through a foreign market allows an additional increase in the monetary and credit multiplication this approach has proved to be an expensive method of overcoming the maturity mismatch. Kreso and Begović (2012) suggest that the maturity matching requirement could be satisfied less costly by diversification and development of the structure of local financial markets and

[18] Athough there is no data available on the interest rates that parent banks 'charge' their subsidiaries we can assume that those rates are much lower than those that subsidiaries change to residents, since parent banks have access to much cheaper financing (see Figure 1.7).

institutions. Namely, under the condition of liquid markets, companies and households would buy government and corporate bonds, treasury bills and commercial papers, potentially earning more compared to depositing money in the banks. This increase in competition for investing the short-term assets would additionally lower interest rates and provide greater access to financing.

### 1.4 Conclusion

The introduction of the CBA in BH was justified by the specific country circumstances before and after its adoption. It was argued to be justified as a means of ensuring increased credibility and macroeconomic stability, which were disturbed during the war period. Although it was introduced as a transitional solution it is still in operation nineteen years after the war finished. Therefore, the question should be raised about its sustainability and desirability in the medium-to-long run under the changed economic conditions. The task of the analysis presented in the following chapters is to address that question.

While some argue that the CBA should be kept in BH until EMU accession, others argue that further retention of the regime may inhibit the growth process and pose a threat to financial sustainability. The persistent current account deficit is perceived to be the major threat because, as remittances and financial aid have been decreasing, it is becoming harder to finance. Exposure to external shocks and dependence on foreign parent banks, discussed in Section 1.3.4 make the financial sector vulnerable even though financial institutions function according to strict rules and do not engage in excessively risky operations. Moreover, too strict rules may lead to insufficient liquidity for financing business, as some firms (especially small and medium enterprises) willing to incur debt to finance the production are not able to obtain the needed funds. As money and capital markets remain under-developed, and since the Central Bank cannot pursue an expansionary policy the development of the business sector depends primarily on the commercial banks. These are currently not development-oriented, but rather prefer to invest in financing less risky clients (households) and business activities with rapid turnover and high short-term profits (Čaušević, 2001). This raises a question about the desirability of the CBA and its strict form that has been retained since its introduction. To address that question all of the circumstances addressed in this chapter have to be considered and the gains from the rigidity of the regime (which is expected to result in increased monetary authority's credibility and consequently lower inflation) have to be empirically assessed prior to drawing any conclusion about the CBA's sustainability and desirability. Before doing that, the main characteristics of a CBA regime and the concepts of its sustainability and desirability will be examined in the following chapter.

# CHAPTER 2: THE CURRENCY BOARD ARRANGEMENT AS A MONETARY FRAMEWORK: A LITERATURE REVIEW



## 2.1 Introduction

A currency board is usually defined as an arrangement under which a country fixes its nominal exchange rate to some foreign currency and maintains 100 percent backing of its monetary base with foreign exchange. It is usually introduced in countries which need to achieve macroeconomic stability and credibility and which are in the process of transition to market economy and/or have desire to further integrate with a country to which they are pegging their currencies. Although it is known for its success in achieving these desired goals a currency board also imposes some constraints and threats that may obstruct economic development. The main characteristics of the regime, its historical evolution and different forms will be presented in Section 2.2. Section 2.3 presents and evaluates previous research on the strengths and weaknesses of currency board arrangement (CBA) and specifies the criteria for its successful implementation. Since many of the CBAs which are currently in use deviate significantly from the traditional ('orthodox') CBA and among themselves these differences are examined and evaluated in the context of the European transition countries of interest in Section 2.4. Moreover, since these countries of interest are in the process of European Monetary Union (EMU) accession (except BH which is in the process of European Union (EU) accession) this section introduces general arguments for and against retaining a regime prior to accession to EMU. Finally, Section 2.5 concludes.

## 2.2 The main characteristics of a CBA and its evolution

### 2.2.1 The main characteristics of a CBA

Under a CBA a country has its own *currency* which is *pegged* to some other country's (usually stable and widely used) currency. Under the traditional (so called 'orthodox') CBA a country is obliged to hold *100 percent coverage of its monetary base in foreign reserves*. Adoption of an 'orthodox' currency board means that the country has *no discretion in monetary policy*. Unlike the traditional central bank, in a currency board the bank is unable to directly control its own assets and therefore the *monetary base is beyond its control* (Gedeon, 2010). Hence it *imposes discipline on the domestic monetary authorities* regarding their management of domestic money and credit, which is likely to result in an *increase in the credibility of* announced policies and greater confidence that the target(s) of the monetary authority will be achieved. Another characteristic of this regime which makes it even stricter and potentially more credible than a fixed exchange regime is its *embeddedness in the legal framework*. Namely, as countries that are adopting CBA are usually those with low credibility, a commitment to the CBA rules is usually made through the law, although the extent to which the institutional framework of the CBA is implemented in the legal and regulatory system differs across countries[19] (Anastassova, 1999; Ho, 2002; Camillieri, 2004). An additional difference between a CBA and discretionary monetary policy can be seen in the structure of a central bank's balance sheets. The balance sheet in a currency board regime *contains only foreign assets against its*

[19] "The currency boards of the early 1990s (Argentina, Estonia, Lithuania) had separate "currency board laws" in addition to their respective central bank laws. The later currency boards (Bulgaria, Bosnia and Herzegovina), which were externally imposed by multilateral agencies, had the relevant details directly incorporated into the central bank laws. Hong Kong, with neither a separate law nor incorporated provisions of comparable form and detail, is in a class of its own. However, it should be noted that Hong Kong's currency board is no less lawful than the others, as it is fully consistent with, albeit not literally dictated by, the Exchange Fund Ordinance, which governs the establishment, objective and management of the Exchange Fund and the powers of the Financial Secretary over monetary matters." Moreover, CBA rules (full backing, guarantee of convertibility, official parity and specification of anchor currency) which are embedded in the laws differ within those countries as well. (Ho, 2002, p.18).

*liabilities of base money* while the balance sheet of a ‘typical’ non-CBA central bank will contain both foreign and domestic-currency-denominated assets (Hanke and Schuler, 1991; Hanke, 2002), as under a CBA the central bank cannot finance government or commercial banks.

Hanke and Schuler (1991) emphasised that the determinacy of money supply through the “automatic adjustment process” is the main difference between a CBA and ‘typical’ central bank. Nenovsky et al. (2001, p. i.) defined this mechanism as “the presence of a positive cointegration relationship between the balance of payments and the reserve money (or money supply) and absence of discretionary variables in the model.” (this issue will be assessed in more detail later in this chapter). The most widely cited distinctions between a ‘typical’ CBA and non-CBA central bank are those presented in Hanke and Schuler (2000). Table 2.1 is adapted from this study with the difference that some characteristics from the original table that we argue are questionable are excluded and some other distinctions are added. The characteristics listed in the table are those of a ‘typical’ central bank, not those of a theoretically ideal one. However, CBAs have evolved through history and its form has changed and deviated from those orthodox CBA rules.

Table 2.1: Differences in the role of a central bank in a CBA regime

| 'Typical' ('orthodox') currency board | 'Typical' central bank |
|---|---|
| Usually supplies notes and coins only | Supplies notes, coins, and deposits |
| Fixed exchange rate with reserve currency | Pegged or floating exchange rate |
| Foreign reserves of 100 percent of monetary base | Variable foreign reserves |
| Full convertibility | Limited convertibility |
| Rule-bound monetary policy | Discretionary monetary policy |
| Not a lender of last resort | Lender of last resort |
| Does not regulate commercial banks | Often regulates commercial banks |
| Earns seigniorage only from interest | Earns seigniorage from interest and inflation |
| Cannot create inflation | Can create inflation |
| Cannot finance spending by domestic government | Can finance spending by domestic government |
| May only hold foreign currency assets against its liabilities of base money | Holds foreign as well as domestic assets against monetary base |
| Monetary base is beyond its control – market forces determine the monetary base | Affect monetary base through open market operations and discount rate policy |

Source: Adapted from Hanke and Schuler (2000)

As noted above, modern CBAs deviate, to different extents, from these orthodox rules. These deviations and different reasons for adopting a CBA will be investigated next.

### 2.2.2 Evolution of currency board arrangements

*Different forms taken and reasons for their adoption*

Currency board arrangements were first established in some British colonies to facilitate monetary relationships between the colonies and their metropolis. A reason for introducing CBAs in British colonies instead of allowing them to use pound sterling was “to provide the colonies with a stable currency without the associated difficulty of issuing sterling notes and coins that were costly to replace if lost or destroyed” (Frankel, 1999, p.18). The first CBA was established in the British Indian Ocean colony of Mauritius in 1849. Other countries followed and by the late 1940s the number of CBAs reached its peak when about 50 were in operation. This number declined in early 1960s as most of the colonies replaced currency boards with ‘typical’ central banking after gaining independence[20]. In the 1980s CBAs returned not to mediate between a mother country and its colonies but to confront a set of specific economic challenges (Gustavo, 2001), such as: to facilitate transition of former state planned economies (Estonia, 1992 and Lithuania, 1994), to fight speculative attacks and hyperinflation after economic crises and regain credibility for domestic economic policies (Argentina, 1991 and Bulgaria, 1997), to restore confidence after a political crisis or a bank panic (Hong Kong, 1983), or to provide a stable post-war institutional environment (Bosnia and Herzegovina, 1997). In general, the main reason behind implementation of a CBA in those countries was the perceived need to achieve credibility and stability (Jakubiak, 2000), as these countries were economically and/or politically very unstable at the moment of CBA adoption. Another set of countries which also use CBA, primarily because they are small, open economies that had little experience in implementing monetary policy (Santiprabhob, 1997) are: Brunei (1967), Djibouti (1949), Bermuda (1915), the

[20] Although currency board existed in independent countries as well (Argentina, Ireland, Yemen, Libya, Philippines, North Russia) most of the 'early' currency boards countries were British colonies.

Cayman Islands (1972), the Falkland Islands (1899), Faroe Islands (1940), Gibraltar (1927) and Saint Helena (1976).

Those CBAs adopted in the 1980s and 1990s have more flexibility compared to the 19th century's traditional ('orthodox') CBAs and therefore Hanke (2002) argued that those regimes cannot rightfully be termed currency board but rather "central banks that mimic currency boards" or "currency board-like regimes" (term that was afterwards usually used for those 'new' CBAs). This flexibility is associated with deviations from the 100 percent backing rule (Argentina) and usage of some monetary instruments. Namely, all new CBAs, except the one in Hong Kong, use a minimum reserve requirements instrument and all new CBAs, except the one in BH, perform the lender of last resort function, to some extent. All modern CBAs require a floor (minimum), but have no ceiling (maximum) on the foreign reserve coverage for monetary liabilities. The main deviations of modern currency board regimes from the 'orthodox' CBA rules and between these modern CBAs will be examined in Section 2.4.

*Reasons for the abandonment of the CBAs*

There are various reasons for the abandonment of CBAs such as changes in the external environment or occurrence of external and internal shocks which require more discretion in the implementation of monetary policy (Pautola and Backe, 1998). However, Hanke (2002) argued that the abandonments of CBAs in the late 1950s and early 1960s were mainly the result of political rather than economic reasons. Shuler (1992) also emphasised some reasons which have no economic justification such as nationalist sentiment for an independent national currency and perception of currency boards as vestiges of colonialism. However, it can also be argued that economic growth was obstructed by strict rules imposed on the monetary authority through the backing rule and restraints on the implementation of discretionary monetary policy. Another reason for the abandonment of 'old' CBAs was the volatility of sterling, which was the principal reserve currency for currency boards at the time.

Although some of these reasons might be justified, Schuler (1992) argued that the performance of most central banks has been worse than the performance of the currency boards they replaced. Schuler (1992) also argued that no currency board ever failed. He argued that fall of CBA in North Russia and Argentina was because their CBAs deviated from the 'orthodox' – the North Russian Board held 25 percent of its reserves in worthless North Russia government bonds and the Argentine Board held 33.4% of monetary base in domestic assets. However, as noted above, there are different types of CBAs. In order to better understand differences between different types of CBA their operation will be addressed next.

### 2.2.3 Operation of CBAs

*CBA versus gold standard*

In most CBA studies the functioning of a currency board is usually compared to the gold exchange standard and explained as an automatic-adjustment process (Williamson, 1995a; Eichengreen and Flandreau, 1997; Berensmann, 2003). This automatic mechanism implies money supply adjustments to balance of payments imbalances or as Hanke (2008, p.277) described it: under a CBA the "money supply is on autopilot". Hanke and Schuler are among the most cited economists who tried to explain the self-adjustment process under a CBA (Hanke and Schuler, 1991, 2000). According to their schematic illustration, re-establishment of balance in the current account[21] occurs through changes in money supply, interest rates and prices. The self-adjustment mechanism (which is based on gold standard adjustment mechanism) is described as follows: a trade deficit (surplus), through fall (rise) in bank reserves creates a contraction (expansion) in bank credit (the money supply). This causes interest rates to rise (fall), income to fall (rise), which result in lower (higher) domestic aggregate demand. This should lead to a fall (rise) in prices thus lowering (rising) imports and increasing (lowering) exports, consequently restoring the current account balance. Hence, the endogeneity of money supply growth through market forces.

[21] Although they used the term 'balance-of-payments' they only considered changes in the current account assuming that capital and financial accounts do not change.

However, Hanke and Schuler (1991) compared a currency board to a 'classical' gold standard and their simplified model of self-adjustment process under a CBA is based on a few assumptions, some of which are not appropriate for the modern CBAs which are currently in use and for current conditions in the financial markets. First, they assume that there is no international branch banking between the CBA country and the reserve country, while in modern CBA countries, especially in the small ones, foreign banks frequently play an important role in providing liquidity for their subsidiaries (Williamson, 1997; Nenovsky and Dimitrova, 2002), especially because of the potential maturity mismatch problem between deposits and loans, which was described in Chapter 1. The latter is common in modern CBA countries as most of the deposits in those countries are short-term deposits while most of the loans are long-term (Andersen, 2009; Gedeon and Đonlagić, 2009). Therefore, parent banks are sometimes argued to have *a role of lender of last resort which cannot be provided by the monetary authorit*y in CBA countries (Williamson, 1997; Gustavo, 2001; Gedeon and Đonlagić, 2009). Therefore, money supply growth has endogenous sources, which are linked to the liquidity needs of banks, rather than to the outcome of external trade (Gedeon, 2010). Second, they assume that the capital and financial accounts do not change. However, in an environment of free capital movement those changes considerably alter the amount of foreign reserves and subsequently money supply. Moreover, in most currency board countries a growth in the monetary base even in the presence of persistent trade deficit is observed (Hanke and Schuler, 1991; Gedeon, 2010). This can partly be explained through the presence of workers' remittances and net foreign investment inflows which bring additional reserves into the country (Gedeon and Đonlagić, 2009). Therefore, it is more appropriate to argue that the monetary base is determined by the balance of payments than by the current account in the CBA countries. Third, they assume no binding minimum reserve ratio while reserve requirements exist in all modern CBA countries (with the exception of Hong Kong).

Although gold standard regimes and CBAs have some similarities, as both types of monetary regimes pose restrictions on the monetary authorities regarding the issue of money and are considered to increase credibility and confidence due to fixed exchange rate and 100% backing of money (by gold and anchor foreign currency, respectively), there are some differences between two regimes. Desquilbet and Nenovsky (2007) pointed out that a comparison of the two regimes is difficult due to different institutional forms within each regime, observed through time and across different countries in which they were in use. However, Desquilbet and Nenovsky emphasised a few distinctions that hold in all varieties of regimes. First, confidence in the gold standard regimes was determined by hundreds of years of its good performance, while in CBAs it is mostly a result of confidence in a foreign monetary institution to whose currency a CBA currency is fixed. Moreover, these authors also note that the gold standard emerged spontaneously while CBAs are usually enforced (or deliberately created) by some foreign institution (with the exception of Hong Kong and Estonia). Second, the automatic mechanism which is described above nowadays is much more complex and vulnerable. A current account deficit may be compensated by capital and financial account surpluses rather than automatically restored. Additionally, although CBAs should not use sterilization, Hanke (2002) argued that most of the modern CBAs do engage in sterilization and therefore violate the automatic correcting mechanism. The absence of this automatism is also empirically confirmed in some countries with modern CBAs (Bulgaria, Lithuania) which have some discretion in their monetary policies (Nenovsky et al., 2001). However, Nenovsky et al. emphasised that the automatic mechanism is theoretically not completely consistent and is empirically unproven even in the gold standard regimes. Third, the money supply is determined differently in those two regimes: while in the (full-fledged) gold standard regime the coverage exists for all money in circulation in the CBAs the coverage exists only for monetary base which is, in modern financial systems, just a part of total money supply (due to the credit multiplication process).

*Money supply under the ‘modern’ currency board arrangements*

Under an ‘orthodox’ CBA the domestic monetary authority had no direct control over the money supply. According to orthodox currency board rules in a central bank’s balance sheet there should be only cash and notes on the liability side and foreign reserves on the asset side (Hanke and Schuler, 2000). As in ‘modern’ CBAs commercial banks hold their reserves in a central bank account the liability side (the monetary base (MB)) consists of currency board notes – currency in circulation (C), which contains currency outside central bank (currency held by banks, $C_b$, and currency held by public, $C_p$), and banks' reserves held in a central bank (R).

$$MB = C_p + C_b + R \tag{2.1}$$

As noted previously, under a CBA the central bank must have 100 percentage coverage of the monetary base in foreign reserves (FX). A central bank's balance sheet under CBA may be represented by the following identity:

$$FX = C_p + C_b + R \tag{2.2}$$

with FX on the asset side of the central bank's balance sheet and C and R on the liabilities side. Under the CBA the commercial banks' balance sheet contains reserves (R) and loans (L) on the asset side and deposits on liabilities side (D).

$$R + C_b + L = D \tag{2.3}$$

From the above equations it can be noted that there are no borrowings from the central bank to commercial banks on the asset (liability) side of the central bank's (commercial banks') balance sheets. Moreover, there are no other domestic assets in the central bank's balance sheet, since it cannot lend to the government either. This is also evident from the balance sheet of the Central Bank of BH (Table 1.3) and the consolidated balance sheet of commercial banks in BH (Table 1.6) in Chapter 1.

A common money supply equation (M) is given below:

$$M = C_p + D \tag{2.4}$$

As reserves (R) are equal to r·D, where r is reserve ratio and D deposits and c is a ratio of cash (C) to deposits (D) Equation 2.1 can be written as:

$$MB = r \cdot D + c_p \cdot D + c_b \cdot D = D \cdot (r + c_p + c_b) \tag{2.5}$$

From the above it follows that:

$$D = \frac{1}{r+c_p+c_b} \cdot MB \tag{2.6}$$

$$C_p = \frac{c_p}{r+c_p+c_b} \cdot MB \tag{2.7}$$

$$C_b = \frac{c_b}{r+c_p+c_b} \cdot MB \tag{2.8}$$

By integrating 2.6 and 2.7 into 2.4 we get:

$$M = \frac{1+c_p}{r+c_p+c_b} \cdot B \tag{2.9}$$

where $\frac{1+c_p}{r+c_p+c_b}$ represents the money multiplier, m, so the above equation could be written as:

$$M = m \cdot MB \tag{2.10}$$

The money supply can therefore be altered by changes in the monetary base and money multiplier. As noted above, under a CBA, the monetary base can be altered only when the foreign reserves are altered (Equation 2.2). The money multiplier is altered by changes in cash, reserves and deposits. Finally, based on Equations 2.2 and 2.3 the money supply equation (based on a consolidated balance of banking sector and central bank) under a CBA can be written as follows:

$$FX + L = C_p + D \tag{2.11}$$

Furthermore, as all modern CBAs deviate from the ‘pure’ (‘orthodox’) CBA rules (see Table 2.2 below) the money supply may also be altered by the use of available monetary instruments. First, all the new currency boards, except the one in Hong Kong, use a reserve requirement instrument. Berensmann (2003, p.9) emphasised five main functions of reserve requirements which makes them relevant for countries in transition[22]: ”they provide a monetary tool for which the central bank does not need to create central bank money; they can limit the expansionary effects of capital inflows on domestic credit; they assume the role of a buffer and stabiliser of money market interest rates; they serve to control the liquidity of commercial banks; and they serve to avoid crises of confidence”. However, this monetary tool is usually argued not to be a very effective monetary policy instrument given its uncertain influence on money supply (Gedeon, 2010). Kanda (2006) argued that under conditions of open capital account and predominance of foreign-owned banks which are supported by their parent banks (which is, as argued above, often the case in small CBA countries), the effectiveness of a rate of required reserves is very limited as the presence of foreign banks is likely to make the subsidiaries less dependent on the local policy. Thus it may be argued that this instrument is not effective in countries with high participation of foreign banks, as parent banks can provide extra liquidity for loans to their subsidiaries, so that they do not have to lower their credit growth when reserve requirements are increased and they can withdraw money from their subsidiaries or subsidiaries may hold excess reserves (instead of increasing credit growth) when reserve requirements are lowered.

Moreover, the asset side of modern CBAs’ balance sheets consists not just of foreign assets (as in ‘orthodox’ CBAs) but of domestic assets as well (Joksas, 2004). This implies that the ‘new’ CBA countries can use open market instruments and engage in sterilization[23] to some extent. Sterilization, which is not possible under ‘orthodox’ currency board, is argued to be important in some new currency board countries. Hanke (2002) argued that all recent currency board-like systems, except the one in BH, have engaged in sterilization, behaving much like countries with a ‘typical’ central bank. He calculated sterilization coefficients which significantly deviate from zero[24] in all countries except BH, implying that the link between the changes in the

[22] When new CBAs are discussed (especially those in Europe) one has to keep in mind that those countries were at the beginning of transition process at the moment of adoption of CBA and therefore characterised by a high degree of overall economic instability.

[23] Sterilization means usage of open market operations to offset the effect of changes in net foreign assets on domestic money supply; “when the monetary authority tries to influence the money supply, it *sterilizes* the amount of base money which it sells (buys) for foreign exchange by buying (selling) domestic assets through open market operations“ (Joksas, 2004, p.8).

[24] Hanke (2002, p.208) “decomposed changes in the monetary base into domestic and foreign components to calculate the“ sterilization coefficient. “If a monetary authority is operating as an orthodox currency board, changes in the monetary base only contain a foreign component and the

net foreign assets and base money in those counties has been broken. Nenovsky et al. (2001) also argued that the inclusion of discretionary variables breaks the automatic link between the balance of payments and the money supply and results in “combined adjustment through automation and discretion” (p.18). Their empirical analysis also confirmed the absence of automatic adjustments in two (Bulgaria and Lithuania) out of three analysed (the third one is Estonia) modern CBA countries.

*Price and interest rate determination under a CBA*

In theory, if capital movements are liberalised and taxes are similar to those in anchor currency countries, as a result of a fixed exchange rate and asset arbitrage, there will be convergence tendency between prices and interest rates in CBA and anchor currency countries (Hanke and Schuler, 2000; Imam, 2010). However, in practice, prices and interest rates in CBA countries do diverge from the prices and interest rates in anchor countries. To understand these differences it should be noted that CBA countries are usually developing countries, while anchor currency countries are developed (and usually one of the worlds' strongest) economies. Differences in prices between those two types of countries are usually explained by productivity differences arising from different levels of development between the CBA and the anchor country (Imam, 2010, p.19). This phenomenon is known as the Balassa-Samuelson effect which Duisenberg (2001) described as a source of “potential inflationary pressure arising from higher productivity growth in catching-up economies, which has also been held responsible for higher inflation in accession countries“. Namely, production capacity levels in developing countries are much lower than in developed countries and rates of these capacities tend to increase faster in developing countries which may be one of the sources of differences in inflation between those two types of countries (thus, the general price level is expected to grow considerably faster in developing than in developed countries). Furthermore, Nenovsky and Dimitrova (2002) emphasised differences in a number of microeconomic and structural factors as sources of inflation differentials, such as: the difference in the degree of development of the economies, in the economic and

sterilization coefficient is zero (or close to zero). Non-zero values signal that a monetary authority is deviating from currency board orthodoxy because the monetary base contains both foreign and domestic components.“

industrial structure, in the rates of growth, the structure of corporate governance, government tax policy, customs duties and expenditures, the structure of goods and labour market etc. There is also a danger of real exchange rate misalignments (and overvaluation of a CBA's currency) when the CBA country's inflation rate differs (is higher than) from that of the anchor currency country (Jakubiak, 2000, Silajdžić, 2005). As a government cannot change the exchange rate in order to help the economy to adjust to outside shocks (such as fall in export prices or sharp shift in capital flows), domestic prices and wages have to adjust. Furthermore, in order to adjust for monetary supply changes caused by changes in balance of payments, prices, wages, labour market and interest rates should be flexible in CBA countries (Santiprabhob, 1997). However, prices and wages in those countries tend to be sticky and rigid, which may cause additional imbalances in the economy, in particular high rates of unemployment.

### 2.2.4 The economics of monetary and exchange rate regimes: where does the currency board fit in?

The ability to pursue an independent monetary policy is closely related to the degree of flexibility of the exchange rate (Jakubiak, 2000). According to the Mundell-Fleming in a world of high capital mobility, it is impossible to attain both exchange rate stability and monetary independence - the so called "Impossible Holy Trinity". However, even though higher monetary independence (discretion) is related to higher exchange rate flexibility it does not necessarily mean that discretionary central banks do not control their exchange rates. Calvo and Reinhart (2000) noted that in countries with floating exchange rate regimes monetary policy is not completely independent from exchange rate policy. They assign this behaviour to the so called "fear of floating" and the need of a central bank to intervene in particular circumstances (during booms and crises). On the other hand, in the world of imperfect markets a fixed exchange rate may not lead to a complete loss of control of monetary policy (Imam, 2010). Kim and Yang (2009) showed that countries in East Asia with pegged exchange rate regimes enjoy a higher degree of monetary autonomy, presumably with a help of capital account restrictions. Therefore, a strict classification of countries' monetary and exchange rate policies, such as the one made by the

International Monetary Fund (see Table 2.2. below) which is frequently used in empirical analyses, is not fully accurate as it takes at face value that countries actually do what they say they do (Calvo and Reinhart, 2000).

In classifications of exchange rate regimes (monetary policy frameworks) a CBA can be allocated between a monetary union (and full dollarization) and other conventional fixed arrangements (see Table 2.2). A CBA is less rigid than a monetary union and dollarization, as the country keeps its own domestic currency and it can abandon the regime (by changing the convertibility law) and transform the exchange rate regime into a more flexible one. On the other hand, it is more rigid than other fixed parity regimes as there is a 100 percent reserve requirement and the fixed exchange rate commitment is embedded in law, and therefore is less vulnerable to speculative shocks than a central-bank administered peg (Selgin, 2005; Santiprabhob, 1997). Moreover, a change in the fixed rate is much harder under a CBA than under other fixed regimes, as the fixed rate in CBA countries is enshrined by law so it cannot be abandoned at short notice (Feuerstein and Grimm, 2006). Furthermore, under a CBA there is less discretion, more rules-based set-up, stronger legal barriers, and no ability to monetise fiscal deficit, even in the short run (Sepp and Randveer, 2002b).

Table 2.2: IMF's Classification of exchange rate arrangements and compatible monetary policy frameworks

| **Exchange rate regime** | **Characteristics** | **Monetary (in)dependence** | **Compatible Monetary Policy Framework** |
|---|---|---|---|
| Monetary union and dollarization/ euroisation | Exchange arrangements with no separate legal tender. | Complete 'surrender' of the monetary authorities' independent control over domestic monetary policy. | Exchange Rate Anchor |
| Currency Board Arrangements | A monetary regime based on an explicit legislative commitment to exchange domestic currency (which is fully backed by foreign assets) for a specified foreign currency at a fixed exchange rate. | Elimination of the traditional central bank functions with little or no discretionary monetary policy. | |
| Other Conventional Fixed Peg Arrangements | The country (formally or de facto) pegs its currency at a fixed rate to another currency or a basket of currencies within a band of at most ±1 percent around a central rate. No particular reserve requirements | Flexibility of monetary policy, though limited, is greater than in the case of exchange arrangements with no separate legal tender and currency | |
| Pegged Exchange Rates within Horizontal Bands | Pegs with bands larger than ±1 percent | Limited degree of monetary policy discretion, depending on the band width | |
| Crawling (adjustable) Pegs | The currency is adjusted periodically in small amounts at a fixed rate or in response to changes in selective quantitative indicators | There are constraints on monetary policy in a manner similar to a fixed peg system | |
| Exchange Rates within Crawling Bands | Allows for interventions when the exchange rate hits a band of either side of parity | Constraints on monetary policy, with the degree of policy independence being a function of the band width | |
| Managed Floating with No Predetermined Path for the Exchange Rate | The monetary authority attempts to influence the exchange rate without having a specific exchange rate path or target | Discretionary monetary policy | Monetary Aggregate Anchor or Inflation Targeting Framework |
| Independently (Free) Floating | There are no interventions on the foreign exchange market, but private supply and demand for currency clear the market | Discretionary monetary policy | |

Source: Table is based on IMF Classification of Exchange Rate Arrangements and Monetary Policy Frameworks, http://www.imf.org/external/np/mfd/er/2004/eng/0604.htm, (last accessed: 03/09/10)

Because of the strong fix of domestic currency to the anchor currency and because of the resulting loss of monetary discretion, the CBA and full dollarization are quite similar, but still there are some differences between the two. What makes the CBA different from dollarization/euroisation, apart from satisfaction of national sentiment, is that it yields seigniorage to the issuer (which is equal to the interest generated by its foreign currency assets). Under dollarization there are no foreign exchange reserves (Fabris and Kalezić, 2008; Imam 2010) and the foreign currency has the exclusive status as the full legal tender. Therefore, it relies upon a foreign central bank to satisfy the local demand for paper currency which generates a risk of a foreign embargo on currency shipments (Selgin, 2005). On the other hand, dollarization is a stronger guarantee against any risk of devaluation and therefore is considered a more credible regime. Furthermore, any local-currency denominated assets in modern currency board systems tend to bear a risk premium relative to similar dollar-denominated assets, as under a currency board there is still a potential risk of devaluation if the statutory law changes, while dollarization eliminates any risk of a devaluation of the monetary base relative to the dollar (Selgin, 2005). As emphasised by Frankel (1999), an interest rate differential[25] which can undermine the sustainability of a CBA is less likely with dollarization as the currency premium vanishes and the country premium should diminish over time due to the more stable currency. Alternative exchange rate regimes and their main characteristics alongside their monetary policy framework are presented in the Table 2.2. In the table it can be noticed that adoption of an exchange rate anchor is identified as a monetary framework and a CBA as a type of exchange rate regime. In the next section, it is argued that a CBA should be classified as an exchange rate-monetary regime (framework) combination, since the regime defines not only the type of the exchange rate, but also the set of rules imposed on the monetary authority, as emphasised in the previous sections.

[25] The interest rate differential consists primarily of a country premium, supplemented by a small currency premium. The country premium is compensation for the perceived risk of default, and the currency premium is compensation for perceived risk of a change in exchange rate policy (Frankel, 1999, p. 23).

### 2.2.5 A CBA as a monetary framework

Previous studies which aimed to estimate the effect of a CBA on macroeconomic performance treated a CBA only as an exchange rate regime (ERR) and compared it with the other ERRs. Most of the early studies which estimate the effect of different ERRs on macroeconomic performance used the IMF's 'de jure' classification of ERRs. As noted above, this classification is based on the ERRs which countries report they are utilising, which is not necessarily the ERR which they employ in practice. In order to facilitate the assessment of the ERR, Levy-Yeyati and Sturzenegger (2005) and Reinhart and Rogoff (2004) developed their own classifications which are based on consideration of the actual behaviour of nominal exchange rates. Although widely used, both classifications were criticized for not capturing all relevant features that represent the actual ERR[26]. Moreover, Domac et al. (2004, p.5) argued that 'de facto' classifications fail "to capture the distinction between stable nominal exchange rates resulting from the absence of shocks, and stability that stems from policy actions offsetting shocks" and "to reflect the commitment of the central bank to intervene in the foreign exchange market", which is reflected in the 'de jure' classification. Kuttner and Posen (2001) argued that 'de facto' classifications do not account for the differences in the (inflationary) expectations which are usually affected by announced/declared policies. They argued that "whether the implications of different declared regimes for central bank behaviour and relevant macroeconomic outcomes indeed differ is an empirical question requiring investigation" (p.16), the results of which should indicate whether the announced fixed ERR is actually credible and what are the relevant macroeconomic outcomes. Ghosh et al. (2011) argue that there is a significant difference between 'de jure' and 'de facto' ERR classifications and there is also a difference in the effect of 'de jure' and 'de facto' pegged ERRs on inflation performance since "de facto pegs that are not supported by a formal commitment may not deliver the full disinflationary benefits of pegs" (p.16). Clearly, both

[26] Levy-Yeyati and Sturzenegger's (2005) classification includes measures of exchange rate volatility, volatility of exchange rate changes and volatility of reserves to capture the actual behaviour of exchange rate. However, this classification is criticised for not accounting for capital controls and for classifying ERR in countries which do not exert much volatility in these variables as inconclusive (Petreski, 2011). On the other hand, Reinhart and Rogoff (2004) incorporated data on parallel and dual exchange rate markets and data on exchange controls and currency reforms. However, this classification is criticised for not accounting for foreign exchange reserves which may signal a government's commitment to maintain peg (Petreski, 2011).

classifications have some disadvantages and are likely to result in relatively different inferences. However, neither classification separates a CBA from pre-announced pegs and regimes with no separate legal tender and none of the classifications takes into account the combination of ERR and monetary regime, which are interrelated and jointly determined.

Beside the adoption of a rigid ERR there are other methods used by the monetary authorities to anchor inflationary expectations, such as an announced monetary target and (increased) central bank independence. Assessing whether the effects of these policies (additional to rigid ERR) will be supplementary, negligible or counterproductive in increasing the credibility of monetary authority is not straightforward[27]. Kuttner and Posen (2001) argued that in order to answer this dilemma one should take all three elements of the monetary framework (namely, the type of ERR, announced domestic target and the degree of central bank independence) into account. They argued that "… the partial view taking exchange rates alone is misleading" (p.9). Although monetary and exchange rate regimes are likely to be highly correlated and interdependent, the same ERR may not have the same effect on macroeconomic performance due to different domestic targets and rules and rules and different level of central bank independence in compared countries. Sepp and Randveer (2002b), who estimated the effect of alternative (combined) regimes on macroeconomic performance in Estonia, specified the monetary regime as a "combination of a specific exchange rate regime with the concrete monetary rule" and monetary rule as "a specific monetary instrument setting designed to keep a target variable close to its specified target path" (p.369). Kuttner and Posen (2001) called this augmented (combined ER-monetary) regime *the monetary framework*. Beside the monetary rule (or as Kuttner and Posen called it the domestic target) and ERR, Kuttner and Posen also considered the degree of central bank independence when defining the monetary framework. In their analysis they included 41 countries from the OECD, Latin America and East Asia. Their results

[27] As Kuttner and Posen (2001, p.12) argued: "One could argue that the effect would be nil, because the exchange rate commitment already credibly limited the central banker's discretion. One could instead argue the effect would be still greater credibility, albeit perhaps with diminishing returns, because inflationary government officials are escape artists, and the more restraints the better. Or one could argue that the additional restraints are counterproductive, because just handcuffs in the form of inflation targeting leave a necessary limited amount of discretion as well as a clear release method, while the excessively tight duct tape of exchange rate targets, let alone multiple constraints, interferes. Theory gives no single answer to this empirical question."

implied that the combination of inflation target plus exchange rate float and high central bank autonomy would appear to be a full substitute for a hard exchange rate commitment in terms of the resulting inflation level. Souza (2002) obtained the same results for the 10 European Union countries prior their accession in 2004. Therefore, taking into account only the effect of ERR, without its interactions with the domestic target/monetary rule, might be misleading. Rose (2011, p.7) also notes that ”the academic profession should move away from considering 'Exchange Rate Regimes' and instead classify countries by 'Monetary Policy Frameworks'”.

In the case of CBA the choice of monetary and ER regimes are jointly determined since beside the commitment to keep the domestic currency fixed to the anchor currency a CBA sets rules which restrain the discretion of the monetary authority. In Kuttner and Posen’s (2001) (ERR-domestic target) combined classification a CBA is set as both a domestic target and ERR.

CBAs are usually introduced as a means of restraining the monetary authority from stimulating output or financing government debt. The strict rules imposed on the monetary authority aim to increase credibility of announced monetary policies, anchor inflationary expectations and promote market discipline. On the other hand, constraining discretionary monetary policy prevents the monetary authority from stabilising output in response to shocks and from mitigating the effects of liquidity crises. As a CBA can be both beneficial and costly for a country which operates it in order for benefits to prevail certain conditions have to be fulfilled.

## 2.3 Strengths and weaknesses of a CBA

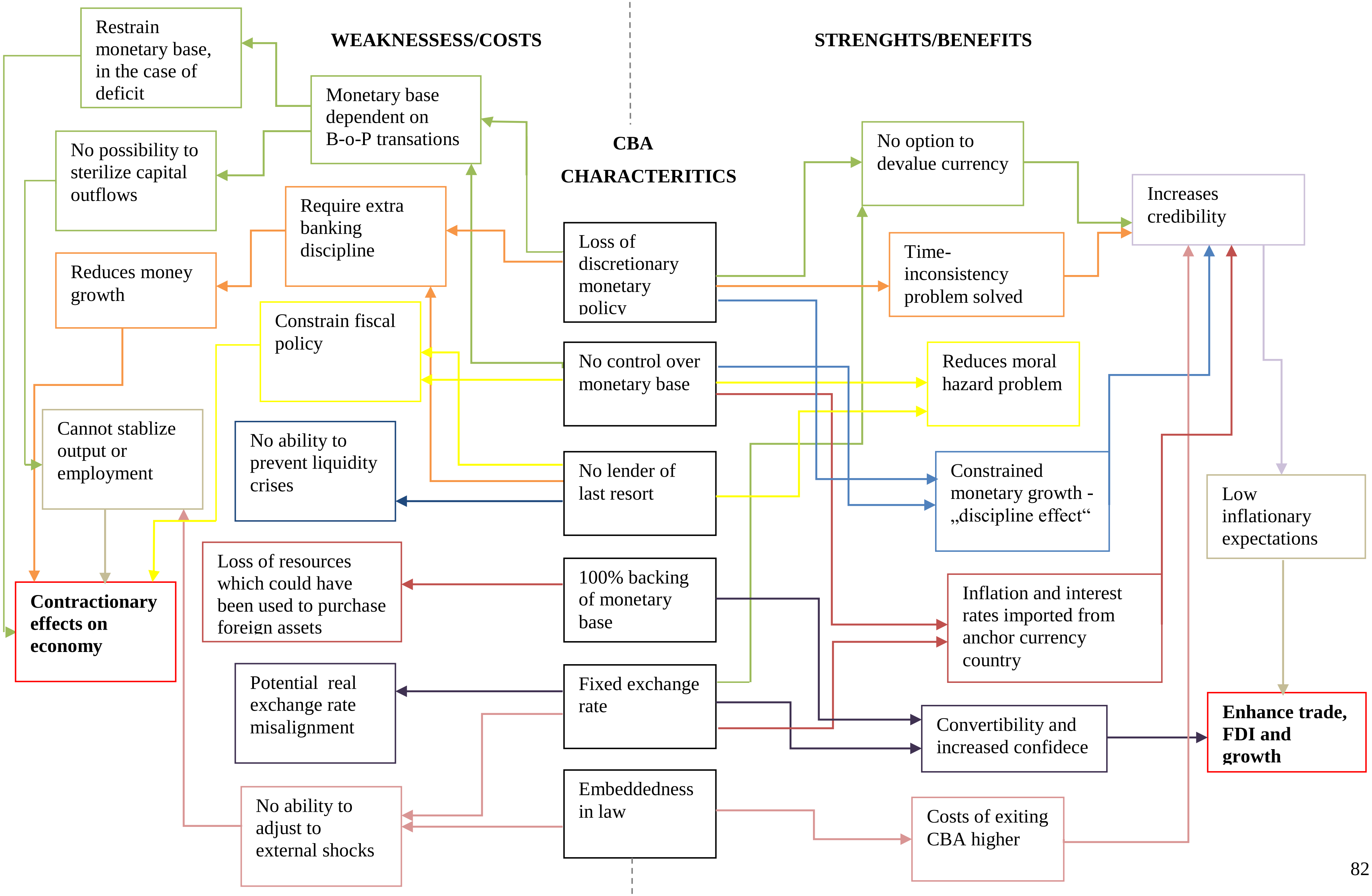
*Strengths of a CBA*

The *level of credibility* of a monetary authority, which is expected to be increased after the introduction of CBA, is usually emphasised as the main advantage of CBA. It can be argued that the main sources of increased credibility are the strict rules imposed on the monetary authority, as there is *no option to devalue a currency* given that it is fixed to another country’s currency (Batiz and Sy, 2000) and the *time-inconsistency problem is resolved*, as monetary authorities cannot create surprise inflation (Feuerstein and Grimm, 2006). Furthermore, as CBA is enshrined by law it *cannot be abolished at short notice* (Feuerstein and Grimm, 2006) and the *costs of exiting such a regime are high* (Ghosh et al., 2000), which should make it more credible than other fixed exchange rate regimes. Keefer and Stasavage (2000) argued that the independence of the central bank and the legal status of the currency board are the sources of policy commitment and not the peg itself. One more benefit for a country which is likely to result from adoption of a CBA is the *increase in confidence in the domestic currency*. Desquilbet and Nenovsky (2007) identified this increase in confidence as the main strength of CBA as they consider it to be essential for achieving macroeconomic stability. Desquilbet and Nenovsky emphasised that this increased confidence is a result of *convertibility* which affects confidence through the adoption of two anchors, namely the fixed exchange rate and coverage of monetary base by foreign reserves. They further argued that this increased confidence is imported as it is derived from the confidence in the (future stability of) foreign currency (assuming that countries with a CBA peg their currencies to currencies which are strong and internationally recognized). Moreover, *currency risk*, although not removed, is *lower* in CBA countries than in countries with more flexible monetary and exchange rate regimes thanks to the fixed exchange rate, backing rule and the embeddedness of both in law (Imam, 2010).

Wolf et al. (2008) distinguished one more beneficial effect of CBA besides the 'confidence' effect and that is the 'discipline effect'. This effect occurs as a result of *constraints* posed on a monetary authority *regarding money growth* as the central bank under an orthodox CBA has no control over the monetary base and cannot use most monetary policy instruments (although, as noted in previous sections, in many modern CBAs reserve requirements have been used as an instrument). However, it can be noted that the 'discipline' effect is strongly related to the 'confidence' effect and that it is also likely to contribute to an increase in credibility. Moreover, the absence of a lender of last resort function is usually argued to *increase (financial) market discipline* and to *reduce moral hazard* in the banking system, as commercial banks are less likely to engage in extremely risky operations knowing that there is no monetary authority which could support them if they face liquidity problems (Pautola and Backe, 1998). Frankel (2010) argues that this issue is even more important for developing markets whose banking systems tend to be more prone to problems of asymmetric information, illiquidity and moral hazard than developed markets. Moreover, the fixed parity and backing rule tend to keep *inflation and interest rates closely aligned to those in the anchor currency country* (Imam, 2010), which is also likely to induce credibility (as explained in Section 2.2.3). In modern CBA countries, especially in the small ones, foreign banks frequently play a dominant role in providing liquidity for their subsidiaries (Williamson, 1997; Nenovsky and Dimitrova, 2002). Their presence may partially be explained by existence of CBA as these banks may be attracted by the expected increased monetary credibility. The presence (and prevalence) of foreign banks in CBA countries might be assessed as desirable since parent banks usually resolve the potential problem of maturity mismatching between short-term deposits and long-term loans that subsidiaries in CBA countries are usually facing, as showed to be the case in BH (see Chapter 1).

It is argued that a CBA *promotes sound fiscal policy* and overall *macroeconomic stability* of country as it places a constraint on fiscal policy and should encourage more responsible government planning (Osband and Villanueva, 1993), since under a CBA the central bank cannot finance a government deficit. Although some may argue that limited fiscal policy could be costly as it cannot provide a stimulus for demand it has also been argued that deficit financing "has been abused far more often than it has been used constructively" (Williamson, 1995a, p.15). The potential strengths that can arise from a specific CBA characteristic are presented in Figure 2.1. However, as emphasised above, all CBA characteristics may also represent weaknesses for a country. These are also shown in Figure 2.1 and will be assessed next.

Figure 2.1: CBA's strengths/benefits and weaknesses/costs diagram



*Weaknesses of a CBA*

The rigidity of the CBA regime and its features described above, may have some beneficial effects but may also bring costs to a country. In the previous section the convertibility of domestic currency is stressed as the main cause of the increase in confidence in the domestic currency. However, there are two groups of critics with the opposite views regarding the 100 percent backing of monetary liabilities. The first group of critics emphasises that retaining 100 percent of foreign reserves represents a clear *loss of resources*, as a portion of those reserves could instead be safely used for the purchase of foreign assets (Hazlewood 1952, as cited in Schuler, 1992; Ghosh et al, 2000). The second group of critics emphasise that convertibility only refers to the monetary base not to the entire money in circulation (the entire stock of liquid monetary assets is usually a large multiple of the monetary base) hence *financial panics can still occur* if the public try to convert domestic currency into the anchor currency (Williamson, 1995a; Ponsot, 2001).

Although the strict rules imposed on the monetary authority are expected to increase credibility they are usually criticised for *preventing the monetary authority from offsetting contractionary shocks and stabilising output* (Schuler, 1992). As the domestic currency is fixed to the anchor currency there is a danger that *external shocks may cause an economic slowdown and high unemployment*, if prices and wages are not flexible, as those shocks cannot be absorbed through changes in the exchange rate (Pautola and Backe, 1998, Silajdžić 2005; Gedeon, 2010). Regarding the fixed exchange rate there is also *a threat of real exchange rate misalignments* when the CBA country's inflation rate differs from the inflation rate of the anchor currency country (Jakubiak, 2000, Silajdžić, 2005).

Given that the backing rule and inability of monetary authority to influence the monetary base limit the monetary authorities from sterilizing capital flows, a current account deficit or rapid capital outflows will automatically be translated into domestic liquidity tightening and higher relative interest rates (Santiprabhob, 1997; Ponsot, 2001). Moreover, due to the exclusion of domestic assets from CBA's balance sheet *monetary expansion is limited* compared to expansion under discretionary monetary authority that can create money backed by domestic assets.

As there is no lender of last resort and the monetary authority cannot use most monetary policy instruments to offset liquidity crises, banks have to be more cautious and therefore they usually keep excess reserves which additionally restrain monetary growth. One more disadvantage is *the loss of the portion of seigniorage* which could have been derived from the creation of new monetary base backed by domestic assets (Pagano, in Ghosh et al., 2000). Seigniorage in CBA countries may only be obtained from interest revenue on central bank's reserves (invested in foreign securities). Furthermore, the exclusion of domestic assets from CBA's balance sheet imposes a *financing constraint on the government* as it prevents the central bank from financing a government deficit by purchasing government securities (Camilleri, 2002). Hence, the constraints imposed on fiscal policy together with the constraints imposed on monetary policy are argued to *impart a deflationary bias* (Treadgold, 2006) and to have net *contractionary effects on the economy* (Ponsot, 2001). However, Williamson (1995b)[28] argued that "the ability of a currency board to discipline fiscal policy is critically dependent upon the political willingness of the government to be disciplined", especially when it has access to international financial markets where it can finance additional debt (Jakubiak, 2000). This may also be argued for financial restraints imposed by a CBA, which cannot finance financial institutions, because in CBA countries, as elsewhere, foreign banks have access to international financial markets. Although they may provide needed liquidity for their subsidiaries, the high dependence of financial stability on foreign banks may also pose a threat to money market stability in the periods of both financial upturns and downturns. Potential threats may arise in a period of financial development when foreign parent banks inject extra liquidity into a currency board country's banking sector. This is likely to affect money supply and if the currency board does not use any monetary instrument, and does not impose any capital controls, this may eventually lead to a credit boom. Another threat may arise in a financial depression if foreign parent banks withdraw capital from their subsidiaries, creating a liquidity crisis in financial institutions and further bank panics, which may lead to an unsustainable current account deficit and hence a balance of payment crisis (Andersen, 2009). As argued in Chapter 1, this happened in BH during the GFC. Although argued to have a lender of last resort role, foreign parent banks are primarily led by profits and their needs, and not by a

[28] News Release: Currency Boardsare not the answer, at: http://www.iie.com/publications/newsreleases/newsrelease.cfm?id=20 (last accessed: july 2014)

willingness to help in emergences (which is the main purpose of the lender of last resort function). As illustrated in Figure 2.1 the characteristics of a CBA can be both beneficial and at the same time costly for a country. The overall net effects of a CBA regime on a country's macroeconomic performance depend on a country's specific circumstances and fulfilment of particular pre-conditions. These conditions will be examined in the next section.

*Evaluating the conditions under which a CBA will be beneficial*

Whether the adoption and retention of a CBA will be beneficial for a country depends on the specific circumstances in a country and the fulfilment of certain conditions before and after its introduction. Those circumstances and conditions are similar to those for an optimum currency area[29] (OCA), as the country adopts a fixed exchange rate regime and loses its monetary policy discretion. In this context, among other conditions, Frankel (1999) emphasised that benefits from the fixed exchange rate will be higher the stronger the need to import monetary stability in a country (due to either a history of hyperinflation or an absence of credible public institutions) and the higher the desire for further integration with a particular neighbour or trading partner. Moreover, when choosing an anchor currency a country should consider whether:

- the economy to which the currency is to be pegged is actually or potentially an important trading partner (in order to benefit from lower transaction costs),
- the currency to which domestic currency is to be pegged should already be widely used in the country,
- the country has an access to an adequate level of reserves,
- the central bank of the country to which the domestic currency is to be pegged is independent and the anchor currency is strong and widely used.

The traditional OCA conditions emphasised by Mundell (1961), McKinnon (1963) and Kenen (1969) refer to price, wages and labour mobility, openness and product diversification (respectively), which are argued to be preconditions for benefiting

[29] A currency area is traditionally defined as area that adopts an irrevocably fixed exchange rate regime or a signle currency within its area, and maintains a flexible exchange rate regime with the rest of the world.

from the fixed exchange rate and/or monetary union. Furthermore, it is emphasised that in order to fully benefit from pegging exchange rate or joining a monetary union the domestic and anchor currency countries should be exposed to similar (symmetric) shocks and relative importance of these shocks should be similar as well (Mundell, 1961; Kenen, 1969). Furthermore, if countries are frequently affected by country-specific (idiosyncratic) shocks, they need to be able to adjust quickly, through fiscal policy or other mechanism (such as rapid changes/adjustments in prices, wages and interest rates). All of these conditions can be applied to the CBA countries. Since the domestic currency is fixed to the anchor currency and the domestic monetary authority cannot engage in sterilization, there is a danger that external contractionary shocks may cause an economic slowdown and high unemployment, if prices and wages are not flexible (Camilleri, 2002).

It is usually argued that in modern economies wages are sticky due to labour market rigidities (Gedeon, 2010). If prices and wages are sticky there is a danger of the nominal fixed exchange rate becoming overvalued in real terms (Camilleri, 2002). However, in subsequent studies of OCA and CBA it is argued that the type of shocks that a particular economy is facing is of great importance. Namely, in the case of real or external shocks floating exchange rates are likely to provide better insulation while fixed exchange rates are likely to perform better in the case of nominal or financial shocks (Buiter, 1995; Tavlas, 2009; Wolf et al., 2008). Furthermore, Chang and Valesco (2000) showed that in CBA countries banking crises are more likely to occur than balance-of-payments crises (the risk of currency devaluation diminishes while the risk of bank failure increases). Moreover, it is argued that the effects of external shocks might be mitigated (in the short-term) if a country has a strong foreign asset position (Santiprabhob, 1997) and high capital mobility (Ingram, 1962; as cited in Tavlas, 2009). As the currency is pegged to another country’s currency real convergence between those countries is of a great importance as well. Unsynchronised business cycles in those countries may destabilise the macroeconomic performance, as the anchor currency country’s monetary policy is transferred to the pegging country (Seep and Randveer, 2002b). Furthermore, if a country’s inflation remains higher than inflation in the anchor country it may lead to real misalignment, and the currency will become overvalued, which may weaken its export performance. This is an important issue as, under a CBA, money growth is largely determined by the balance of payments, as explained in Section 2.2.3. Additionally, overvaluation of a currency may be caused by different productivity growth rates between those countries. In this context, Haan et al. (2001) also argued that the higher correlation between CBA and anchor currency country's output shocks the more attractive is a currency board (since foreign monetary policy is likely to be more in line with the needs of the home country). However, in the subsequent studies on the OCA conditions regarding convergence and synchronisation between countries it has been argued that these may be more likely to occur after rather than before entering a monetary union: after joining business cycles are likely to converge (Frankel and Rose, 1997) and shocks become symmetric (De Grauwe and Monegelli, 2005). Holub (2003) emphasised that in the context of adjusting OCA criteria to CBA besides the convergence of a real factors which should exist between the CBA and the anchor currency country the importance of gaining monetary credibility through the commitment to strict rules has to be accounted for as well. The factors addressed next are those which are specific to those CBA countries that are the focus of this research programme, given that these are transition countries that introduced a CBA in specific conditions.

A CBA is usually introduced in countries with high political instability and low quality of other state institutions in order to avoid the abuse and political pressures on the primary issue function. Galic (2012) concludes that CBAs are usually introduced in small, open economies facing macroeconomic instability and whose monetary policymakers possess a low level of trust. Hardouvelis and Monokrousos (2009, p.7) emphasised that a "CBA can facilitate stabilization programs in economies lacking credible institutions and when policy discretion is ineffective for monetary stabilization." Until conditions in the country are improved there is still a strong argument for retaining a CBA, since high political instability and low trust in government institutions can lead to a decrease in trust in the local currency if the CBA is abandoned and more discretion allowed.

Furthermore, the determinants of the money supply and the level of development of the financial sector have to be considered as well. Namely, as a monetary authority cannot induce money growth by using monetary policy instruments, it is argued that CBA induces a deflationary bias. However, Treadgold (2006) argued that this bias could be resolved through an increase in the monetary base (which is determined by balance-of-payments transitions) or the domestic money multiplier. This implies that a CBA country needs to achieve a surplus in its balance-of-payments in order to increase its monetary base or support increased lending activities in order to increase the money multiplier. However, these conditions are hard to meet especially in developing countries. Firstly, most of the countries which introduce CBA are transition economies which usually have a persistent current account deficit, though in many of these countries this has been financed by net inflows of remittances and foreign direct investments (FDI). Secondly, as commercial banks in CBA countries are required to be more disciplined since there is no lender of last resort, they usually keep excess reserves in order to be always ready to assure depositories' demands for funds, which additionally restrains monetary growth (by lowering the money multiplier). As the extra liquidity cannot be provided by the monetary authority one more precondition emerges, and that is existence of developed financial markets and financial innovations and access to global financial markets, as an alternative source of financing. Again, speaking in the context of transition economies it can be said that this source of finance is frequently limited in scope (Chang and Velasco, 2000; Ponsot, 2006). As there is no lender of last resort banking crises can have serious consequences. Therefore to assure additional liquidity, capital restrictions should be removed and international banking encouraged (foreign banks attracted). One additional condition is fiscal policy soundness and flexibility, as it should support local economic activity, especially in a period of crisis, as monetary policy is constrained. Therefore, a weak fiscal position in a country with a CBA may inhibit its economic development and make economic stagnation and a banking crisis more likely to occur (Goodhart, 2004). However, countries which are heading towards E(M)U accession (and this is the case for all European transition countries with a CBA, which will be examined in our empirical analyses) have strict rules imposed by the Maastricht criteria regarding the limits on budget deficits and public debt.

Since a country loses its monetary policy and ability to change the exchange rate by introducing a CBA, when deciding to adopt it one should consider the effectiveness of the two prior the introduction of CBA. If a country is unable to use effectively its monetary policy the loss of monetary independence will not have a significant cost (Calvo and Reinhart, 2000). It is argued that discretionary monetary policy is less effective under conditions of high capital mobility and globalised financial markets (Schwartz, 1992, as cited in Camilleri, 2004) as developed financial markets are more likely to provide liquidity to banks without the need for central bank's (inter)actions (Stockman, 2001). Tavlas (1993) argued that the loss of the exchange rate adjustment mechanism is less costly than presented by the traditional theory of OCA because changes in the nominal exchange rate may only have temporary effect on the country's competitiveness, as any devaluation of the currency will in the long run result in inflation without real effects on output and unemployment, while the external deficit will remain. Moreover, Goldberg (1999) argued that for transition economies a loss of flexibility in exchange rates is not so costly as these countries tend to have a price-inelastic demand and supply of tradable goods and services and are not able to effectively perform short-term stabilisation. McKinnon (1963) argued that nominal exchange rate changes in a relatively open economy are not likely to result in increased competitiveness as this positive effect is likely to be offset by changes in costs and subsequently in domestic wages and prices. This may also be especially relevant for countries with relatively high imports and which import primarily intermediate products and raw materials. Therefore, the country specifics and the convergence between CBA and anchor country have to be assessed when examining whether potential benefits of CBA prevail over its potential costs.

There are no simple or universal conditions which can be examined in order to determine whether a country should adopt and keep a CBA. As Frankel (1999) noted for the OCA, these conditions are different for different countries and times and what is optimal for one country is changing over time, as fundamental policies and exogenous factors of the country are changing. Therefore, the criteria should be assessed on a case-by-case basis. Most of these criteria are investigated for BH in Chapter 1 and will be assessed in Chapter 7.

## 2.4 The CBA in the context of transition

As mentioned in the first part of this chapter, CBAs which are currently in use (modern or 'new' CBAs) differ from those introduced in the 19$^{th}$ century as they were adopted for different reasons and are characterised by higher flexibility in the rules imposed on the monetary authority (the main deviations of modern CBAs from orthodox currency board rules are listed in Table 2.3). Moreover, these modern CBAs differ amongst themselves regarding their degree of flexibility, institutional design and operational framework, as well as in their legal, political and overall macroeconomic characteristics. These differences, together with rationale for flexibility of the regime in transition countries which currently use CBA, are examined in this section.

*'Orthodox' and 'modern' currency board regimes*

Studies investigating modern CBAs provide two opposing views regarding the desirability of deviations from orthodox CBA rules. According to one stream (presented by Hanke and Schuler) modern currency boards should operate as an 'orthodox' CBA (without any deviations), as allowing greater discretion of monetary policy while holding exchange rate fixed presents "invitations for abuse" (Hanke, 2002, p.206). This consequently leads to a higher possibility of balance of payments crises (Hanke, 2008) as the most elementary principle of economics is violated (i.e. monetary and exchange rate policies conflict with one another). Hanke (2002) further argued that deviations from orthodoxy were a source of economic instability which resulted in the collapse of Argentina's CBA.

The other stream (presented by Ho, Wu, Nenovsky and others) argues that modern CBAs should deviate from orthodox rules as the conditions under which modern CBAs operate differ from conditions under which 'pure' CBAs had operated (due to changes in the political and economic landscape, country's independence, increased capital mobility and international banking). Ho (2002, p.3) argued that "Given their wider responsibilities and the more complex environment, currency boards cannot plausibly accomplish their 21$^{st}$ century duties efficiently relying only on 19$^{th}$ century mechanics". Proponents of this stream argue that deviations from orthodox rules in each observed economy should depend on domestic circumstances of individual economies (Ho, 2002; Wu, 2005). This stream also argued that too strict rules increase the possibility of a liquidity crunch and systematic crises in the banking sector (Joksas, 2004) and identified this rigidity as a reason for a collapse of Argentina's CBA (Wu, 2005).

*Similarities and differences between the 'new' CBAs in European transition countries*

All CBAs currently in use in the European transition countries (Estonia[30], Lithuania, Bulgaria and Bosnia and Herzegovina) deviate from the 'orthodox' CBA. The form and extent of their deviation from 'orthodox' rules differ between countries. Regimes in those countries differ due to country-specifics, different circumstances before and after the CBA introduction and different legal systems and traditions. These differences might be regarded through different designs of their CBAs, different features of their CBA embedded in a law (Ho, 2002), different institutional designs, and different overall macroeconomic frameworks (Nenovsky et al., 2002). Camillieri (2004) calculated an index of statutory pre-commitment which includes (and assesses) seven different criteria regarding CBA features which are associated with institutional, legal and political commitment. The index assesses: clarity of legal basis; quality of reserve backing in terms of denomination and liquidity; coverage of the monetary rule; vulnerability to alternative claims on reserves; operational autonomy; transparency and accountability provisions and regime revocation arrangements. According to this index the CBA in BH is characterised as the strictest (index value of 0.93) and Lithuania as the least strict (index value of 0.39). In Table 2.3 the main characteristics of modern CBAs are presented (but our focus will be on CBAs in transition countries).

[30] Estonia entered EMU on January 2011. However, it will be included in the anaylsis since it operated under a CBA for 18 years until its accession to EMU and therefore might serve as a potentially good example for other countries.

Table 2.3: The main deviations of modern CBAs from orthodox currency board rules

| | **Orthodox CBA** | **Bulgaria** | **Estonia** | **Lithuania** | **BH** | **Argentina** | **Hong Kong** |
|---|---|---|---|---|---|---|---|
| Date established | | July 1997 | June 1992* | April 1994 | July 1997 | March 1991* | October 1983 |
| Reserve currency | | Deutsche mark – euro (1999) | Deutsche mark – euro (1999) | US dollar – euro (2002) | Deutsche mark – euro (1999) | US dollar | US dollar |
| Backing rule (lower bound) | 100% of monetary base | 100% of monetary base | 100% of monetary base | 100% of monetary base | 100% of monetary base | 66.6% of monetary base** | 100% of monetary base |
| Minimum reserve requirements | no | 12% | 15% | 4% but not on all liabilities | 10% (maturity up to one year) and 7% (maturity over one year) | Replaced by liquidity requireme-nts in 1995 | no |
| Lender of last resort | no | Central bank*** | Central bank*** | Central bank*** | no | Central bank*** | HKMA* ** |
| Deposit certificates issued by the central bank | no | no | Introduce d in 1993 abolished 2000 | no | no | no | Excha-nge funds and notes |
| Repurchase agreements | no | no | no | yes, for fine tuning | no | yes | yes |
| Government s deposits in Central bank | no | yes | no | yes | no | no | yes |

* Argentina abandoned the CBA in 2001 and Estonia abandoned CBA in January 2011 when it entered EMU
** Since 1995 one third may be held in government bonds
*** Only for system risk and in emergencies; limited by the excess of the foreign reserves

Sources: Table based on information provided in Jakubiak (2000) and Kovačević (2004) and national central banks' statistics for the updates

What is common to all 'new' CBAs in these countries is the backing rule (which is embedded in law in all countries) which ensures convertibility of domestic currency. Another similarity is the use of a reserve requirement tool. Moreover, all countries have been changing the rate of required reserves to try to affect the liquidity of the banking system. Another deviation which is, to a limited extent, present in all observed countries, except in BH, is the lender of last resort. Deviations from the orthodox rules in 'new' CBAs may also be observed in the presence of atypical items in the CBAs' central bank's balance sheet. This deviation is the largest in Lithuania's and Bulgaria's balance sheets which contain governments' holdings which influence reserve money. This also violates the operation of automatic adjustment mechanism.

The econometric investigation conducted by Nenovsky et al. (2001) indicated that an automatic adjustment mechanism exists in Estonia (although in a weak form), while Bulgaria and Lithuania are characterised by “adjustment through discretion”[31]. Nenovsky et al. (2001) described 'new' CBAs as a “unity of rules and discretion” emphasising that central banks and CBAs cannot be found in their pure form today. However, given the changed circumstances under which the modern CBAs operate, compared to those when orthodox CBAs were used, this might be justified.

*Need for flexibility of CBA compared to the need for credibility and discipline in transition countries*

CBAs introduced in the 20th century differ from the colonial CBAs from the 19th century since conditions and circumstances in which they were introduced differ. First of all, all countries which introduced a CBA in the 20th century were and still are independent countries and they initiated its introduction themselves (though following an initiative from multinational organisations in the case of BH) unlike the 19th century CBAs which were imposed on colonies by their mother country. Moreover, the policy alternatives were not the same: alternatives to 'old' CBAs were the adoption of the metropolitan currency or use of silver, while the alternative to 'new' CBAs might be a central bank with discretionary monetary policy (Ho, 2002). Second, modern CBAs have to deal with issues which were absent or insignificant in the period of 'old' CBAs (Ho, 2002). These refer to the increasing complexity of the financial environment, development of interbank activities and non-cash means of payment (Ho, 2002), the existence of sophisticated financial markets and liberalised capital flows which affect domestic money markets (Hawkins, 2004). Finally, as presented in the previous section, ‘modern' CBAs are much more complex and diverse among themselves as they are adjusted to country-specific characteristics. All of these imply that 'new' CBAs should differ from the 'old' strict-ruled CBAs by conducting some monetary discretion. Berensmann (2003) argued that the use of monetary policy instruments in the 'new' CBA countries are not aimed to manage

[31] Nenovsky et al. (2001) estimated the effect of changes in government deposits on interest rates and concluded that fiscal policy can impact interest rates not only directly (through securities issue) but also indirectly - through its presence in the currency board’s liabilities.

bank liquidity or to pursue active interest rate policy but to cushion economic shocks and stabilise fixed exchange rate based monetary policy system.

Furthermore, since all the 'new' CBA countries discussed above are in a process of transition towards the market-oriented economy this flexibility is argued to be even more important as those counties are characterised by a high degree of overall economic instability (especially during the initial phase of transition process) (Ho, 2002; Berensmann, 2003). Those countries are argued to be often hit by macroeconomic shocks: losses in real GDP, volatile capital flows or interest rates and banking crises (Berensmann, 2003; Salater, 2004) and to have weaker adjustment mechanisms that could compensate for the monetary policy inflexibility. Salater (2004) argued that a lender of last resort is an important function which should be available for dealing with banking crises especially for transition countries which still have unsound and vulnerable banking systems. On the other hand, these countries are unstable and CBAs were introduced in order to impose discipline and credibility on the monetary authority and any deviations from the strict rules may negatively influence this process. However, Berensmann (2003) and Salater (2004) argued that deviations from the orthodox rules in transition countries did not undermine their credibility and price stability or jeopardize the stability of the monetary and exchange rate systems. Wu (2005, p. 355) argued that a middle way approach (so called 'modified' CBA) provided “an answer to the general issue of rule versus discretion: confined flexibility in credit and exchange rate adjustments bounded by the policy discipline tends to achieve macroeconomic stability in a more credible way than a pure stereotype of currency board system”. Wu (2005, p. 355) further argued that: “The main advantage for a limited extent of exchange rate flexibility and monetary liquidity is to avoid the structural rigidity that a pure currency board faces in the presence of large current account deficits and pressures of capital flight. Its drawbacks are, however, adverse impacts on credibility of the currency board and thus increased risk of currency attacks. Indeed, it is often a country-specific issue how far a currency board should go toward relaxing its discretionary power over exchange rates and domestic credit.“

The reserve requirements instrument, which is in use in all ‘new’ transition CBA countries affects the liquidity stance of banks which is especially important in transition countries where banking supervision is difficult (Abazorius, 1996, as cited in Berensmann, 2003). Moreover, they are argued to have a role as a buffer and stabiliser of money market interest rates (Berensmann, 2003). Besides, use of this instrument does not require the central bank to create money. Finally, Berensmann (2003) noted that the relatively high risk of confidence crises is also a good reason to introduce reserve requirements in transition economies, although, as noted previously, this may not be very effective instrument.

As all European countries with a CBA are heading towards accession to EMU[32] an important issue for these transition countries is the question of retention/abolition of the CBA (and potential introduction of more discretionary monetary policy, such as inflation targeting) prior to their accession to EMU.

*'New' CBAs in a context of EMU accession*

There are several arguments for retaining a CBA prior to EMU accession. First of all, in the case of abandonment of a CBA there is a potential threat of a loss of monetary authority credibility. Moreover, a CBA is argued to impose macroeconomic stability and discipline which are important in the pre-accession period and therefore abandonment of CBA may violate the established stability and discipline. It could also be “perceived as a failure of the state and would likely undermine popular backing for any supporting policies” according to Purfield and Rosenberg (2010, p.12), though they provide no explanation for their latter claim. Second, by retaining a CBA, the costs of introducing new institutions and policies that would only be used during Exchange Rate Mechanism II (ERMII[33]) participation are avoided (Begg et al., 2001). Third, retaining a CBA is considered as a way to cope with the risk of speculative attacks, since the accession country’s currency is pegged to a currency of area to which it is accessing (Katsimi, 2008). Finally, “If there is a risk that

[32] Lithuania and Bulgaria became members of EU in 2004 but are still not members of EMU, while BH is still not an EU member, although it is progressing towards the accession. Estonia entered EMU in January 2011, Lithuania 2015.

[33] “The Exchange Rate Mechanism II (ERM II) was set up on 1 January 1999 as a successor to the ERM to ensure that exchange rate fluctuations between the euro and other EU currencies did not disrupt economic stability within the single market, and to help non euro-area countries prepare themselves for participation in the euro area. The convergence criterion for exchange rate stability requires participation in ERM II.“ (http://ec.europa.eu/economy_finance/euro/adoption/erm2/index_en.htm, last accessed: 4/10/2014).

abandoning the CBA will bring back the problems responsible for its establishment in the first place, then retaining the arrangement is clearly optimal“ (Katsimi, 2008, p. 1061).

On the other hand, Katsimi (2008) pointed out arguments for abandoning a CBA prior the introduction of the euro. He argued that the retention of CBA during the ERMII period will not allow for testing the appropriateness of the central rate. Any "inappropriateness of the exchange rate will prohibit interest rate convergence in an environment of free capital mobility, since long term interest rates will contain a risk premium for the lack of readiness for EMU" (Begg et al., 2001, as cited in Katsimi, 2008, p.1047). Katsimi (2008) further emphasised that allowing the exchange rate to fluctuate within the bands of ERMII could restrict the inflationary consequences of capital inflows in the period before joining the euro-area. Finally, Katsimi (2008) argued that abandoning a CBA will signal to markets the sustainability of nominal convergence and, hence, improve the prospects of joining the euro-area by reducing market uncertainty. These signals are argued to be important since a country's success will crucially depend on markets' expectations about future economic performance. However, the accession of Estonia to EMU implies that the convergence criteria could be fulfilled without abandoning a CBA. Nevertheless, its desirability should be investigated on a case-by-case basis and by examining the potential alternatives.

If a country aims to abandon a CBA prior to the introduction of the euro the question of which alternative regime to adopt is raised. Since other European countries which are in a process of accession to EMU adopted inflation targeting regime (IT), the desirability of CBA should be examined in comparison with this regime. IT involves the public announcement of medium-term numerical targets for inflation with an institutional commitment by the monetary authority to achieve these targets (as noted in the IMF classification of monetary and ER regimes). Apostoaie (2010) and Kemme and Lyakir (2011) argue that the co-existence of IT with an explicit exchange rate objective is problematic, which implies that countries that participate in ERMII should opt for the other monetary regime. On the other hand, CBAs are argued to be appealing exchange rate regimes even for potential EMU entry countries currently without CBAs (Sinn, 1999). One more advantage of a CBA over the IT is credibility of monetary authority which is harder to achieve under the IT regime. However, both regimes target price stability, although in exchange rate targeting countries it is achieved through exchange rate channel while in IT countries it is achieved by usage of monetary policy instruments. Finally, "the exchange rate target might inflict output volatility under increased international capital mobility. Conversely, IT pre-emptively includes output departures from its potential level in the objective function and again delivers an optimal inflation outcome, while reducing the sacrifice ratio together with exchange-rate volatility" (Petreski, 2011, p.181).

By observing fulfilment of the Maastricht convergence criteria in countries which are currently in the EU but not yet EMU members it could be concluded that there is not much difference between countries which operate under a CBA and those with IT (Table 2.4). However, introduction of a CBA did help those countries to get closer to fulfilment of these criteria, through macroeconomic stabilisation and increase of confidence in domestic currency and monetary authority (inflation and interest rates dropped significantly in Estonia, Bulgaria and Lithuania after their introduction of a CBA).

Table 2.4: Fulfilment of Maastricht criteria in EU but not yet EMU countries

| Country | Monetary policy framework | Price stability criterion | Government budgetary position criterion | Exchange rate criterion | The long-term interest rate criterion | Legislation compatibility |
|---|---|---|---|---|---|---|
| Bulgaria | CBA | yes | yes | no | yes | no |
| Czech Republic | Inflation targeting | yes | yes* | no | yes | no |
| Lithuania | CBA | yes | yes | yes | yes | yes |
| Hungary | Inflation targeting | yes | yes | no | yes | no |
| Poland | Inflation targeting | yes | no | no | yes | no |
| Romania | Inflation targeting | no | yes | no | yes | no |

Note: *If the Council decides to abrogate its excessive deficit procedure, the Czech Republic will fulfil the criterion on public finances.
Source: European Commission (2014)

These countries also had similar trends in macroeconomic variables and we cannot distinguish the CBA countries from other European transition countries on grounds other than their operation of a CBA (see Appendix 2.1), though currently we cannot conclude whether and how a specific regime affected these trends. Therefore, in order to draw any conclusions about which monetary regime is more appropriate and desirable an empirical investigation of the effects of regime on macroeconomic performance should be conducted. This requirement will be addressed on Chapters 5 and 6.

### 2.5 Conclusion

A CBA is usually introduced as a means to induce monetary discipline and overall macroeconomic stability since it imposes strict rules on a monetary authority. However, the CBA's characteristics which aim to increase economic growth through inducing international trade and investment, which are expected to result from increased monetary credibility and macroeconomic stability, may also have a net contractionary effect on the economy due to the inability to stimulate the economy through expansionary monetary policy, as well as inability to buffer shocks by using monetary policy instrument. In order for CBA's characteristics to be beneficial certain criteria should be met. In this chapter the optimum currency area criteria, augmented by some other criteria specific for a CBA in transition economies, were assessed. Namely, the specific conditions under which a CBA was introduced, together with any improvements in these conditions through time, have to be considered. Moreover, the existence and strength of other stabilising mechanisms have to be assessed. Hence an overall assessment on the desirability of introducing and/or retaining a CBA should be based on specific country circumstances.

In BH the introduction of the CBA was justified by the specific country circumstances: as a means of contributing to macroeconomic stability which had been disturbed during the war. On the other hand, justification for its retention is provided by the weaknesses of other stabilising mechanisms in BH also discussed in Chapter 1. Overall, the sustainability and desirability of the CBA in BH depends upon the benefits and costs of the CBA and these will be assessed in the next chapter.

# CHAPTER 3: THE SUSTAINABILITY AND DESIRABILITY OF A CURRENCY BOARD ARRANGEMNET WITH REFLECTIONS ON BOSNIA AND HERZEGOVINA'S CURRENCY BOARD



## 3.1 Introduction

Based on the strengths and weaknesses of a CBA investigated in the previous chapter, the issue of its sustainability and desirability will be introduced in this chapter. This discussion will provide the framework for the empirical investigation presented in the later chapters. The analysis presented in this chapter is organised as follows. In Section 3.2 the term sustainability of a monetary regime is defined and its main features in the context of a CBA as a specific monetary regime determined. In Section 3.3 studies which investigate the sustainability of a CBA are critically assessed. Section 3.4 investigates some of the features of sustainability of the CBA in BH, while Section 3.5 elaborates the importance of confidence in and credibility of monetary regime as the main sources of CBA sustainability. Section 3.6 explains how the effect of CBA will be captured in the empirical analyses presented in the following chapters. Section 3.7 concludes.

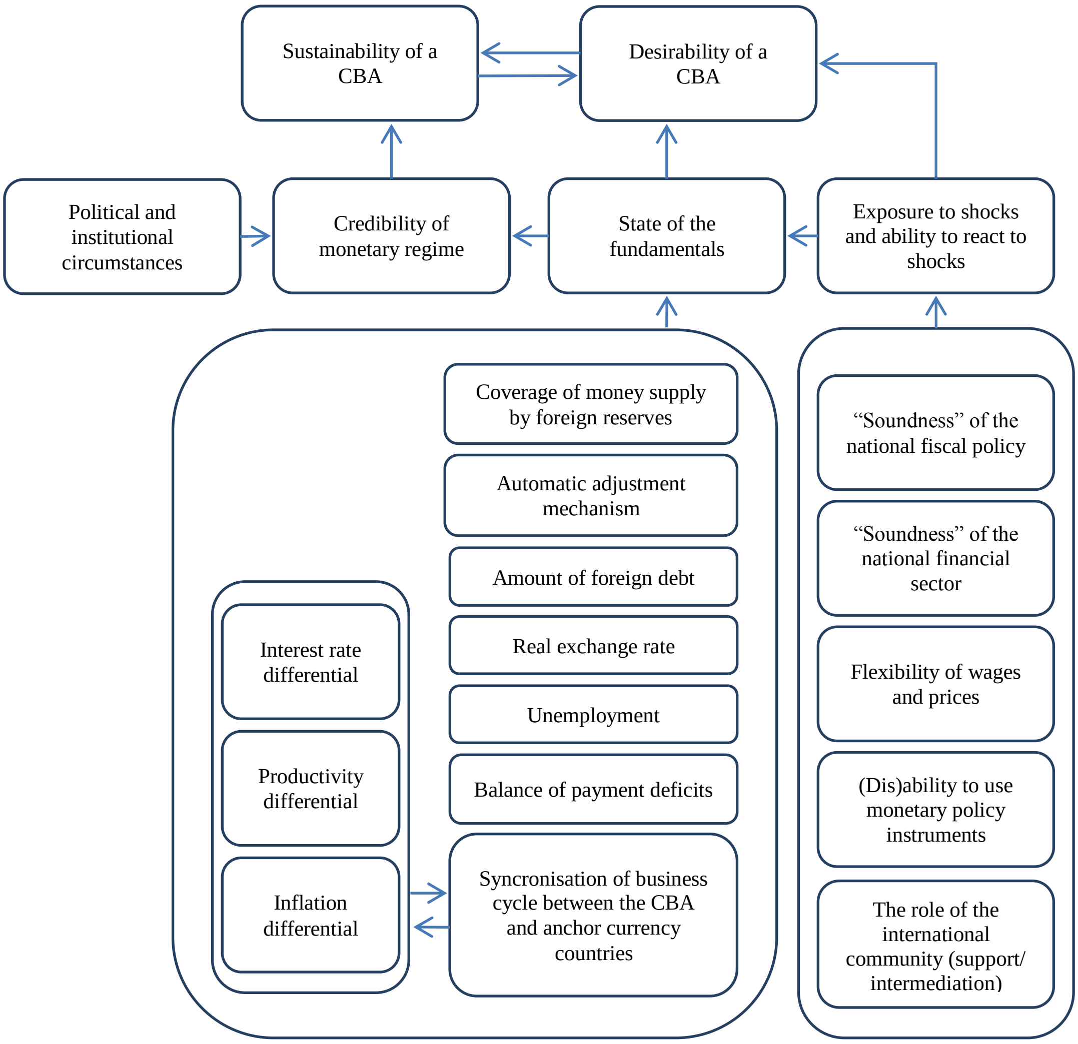
## 3.2 The sustainability and desirability of a monetary regime/policy

The term sustainability is usually related to a concern for the future and the ability to adjust to shocks (Hlivnjak, 2011). However, there are many explanations of the term and the preferred definition depends on the topic being investigated. In this thesis the term will be defined in the context of monetary policy and then related specifically to a CBA in the context of the country of interest. Only a few studies examine the sustainability of a monetary regime and most of these investigate only one or two features of sustainability. Although it is difficult to integrate all of the features into one model, these should at least be identified and separately assessed. According to previous analyses, there are three categories of factors that are likely to affect the sustainability of a monetary regime: market perceptions/expectations about the maintenance of a specific monetary regime and its target(s) (the monetary authority's credibility) (Ferderer, 1998; Mulino, 2002; Feuerstein and Grimm, 2006); performance of economic fundamentals (Sepp and Randveer, 2002b; Ho and Ho, 2009, Belke et al., 2012) and exposure to shocks and ability to react to shocks (Sepp and Randveer, 2002a; Minea and Rault, 2011). These categories are interrelated and interdependent (see Figure 3.1 below). Thus, the sustainability of a monetary policy (and a CBA specifically) may be defined as the capability of the monetary authority to maintain their announced policy (which under a CBA is the maintenance of a fixed exchange rate) in the medium-to-long run[34], while sustaining economic stability in the country. The latter is especially important in the case of limited monetary discretion, such as under a CBA, since such a regime is not likely to be desirable, and consequently sustainable, if macroeconomic performance is unfavourable or the economy is exposed to large and/or frequent shocks and there are no effective tools/mechanisms in the economy which could help adjustment. There is no universally accepted definition of desirability either. One can argue that a monetary regime is desirable when: utilization of a specific monetary regime generates a better effect on macroeconomic stability and performance compared to other monetary regimes, taking into consideration the specific circumstances in the country. Desirability of CBA is especially related to the existence of 'other tools' which could be used as buffers and stimulators in the economy. Since monetary policy under a CBA is restricted, flexibility and economic 'soundness' are needed, namely flexibility of prices and wages together with 'soundness' of the financial sector and fiscal policy. Beside these, under a CBA, the automatic adjustment mechanism between the balance of payments and monetary base (or, more broadly, the money supply) should restore balance in the economy after a shock. However,

[34] For European transition countries this 'medium-to-long run' period can be argued to be the period until EMU accession.

the existence of this mechanism in modern CBA countries is, as noted by Desquilibet and Nenovsky (2007, p.20), "disputable: theoretically not completely consistent and empirically unproved" (see Section 2.2.3). One more important 'tool', in the context of transition countries, is the support and intermediation of the international community, which 'comes to the rescue' when all other buffers within the economy are inefficient. From the above it could be perceived that the concepts of desirability and sustainability intertwine and it is difficult to separate the two (see Figure 3.1).

Figure 3.1 Sustainability and desirability of a CBA




As noted by Sepp and Randveer (2002a, p.21), a CBA's sustainability "also depends on the ability of the real economy to function reasonably well under such exchange rate regime". This is an important issue since, it is still commonly accepted that monetary policy is the macroeconomic policy that should ultimately be responsible for macroeconomic stability and growth, even when that is not its primary goal. If it focuses on fulfilling only its primary goal(s) this may undermine economic growth if, for example, the nominal exchange rate is overvalued, current account deficits persist and business cycles are not synchronised between the domestic and anchor currency countries. Moreover, it is usually argued that persistent (and high) unemployment may undermine the sustainability of the CBA, since a central bank or government is more likely to come under pressure to abandon the CBA in favour of an expansionary policy to stimulate growth and lower the unemployment rate. The interconnection between desirability and sustainability of a CBA exists in another direction as well: a CBA should provide high credibility for the monetary authority, which is usually argued to be the main pre-condition for its sustainability and consequently it may increase stability that then increases its desirability. The issue of stability, which should be increased by CBA, is especially important for transition countries, with political problems (as discussed in Chapter 1). It is a combination of all of the above factors that will ultimately determine the CBA's sustainability. To our knowledge, none of the existing studies considers all these factors in assessing a CBA's sustainability and desirability. Accordingly, after assessing previous studies that investigate some of the sustainability/desirability features a more comprehensive analysis is developed for the case of BH and the approach applied in this thesis is then presented.

### 3.3 A critical assessment of studies investigating the sustainability of a CBA

The common approach to estimating a CBA's sustainability is by observing differences in the interest rates in the CBA and anchor-currency countries. Those differences are likely to place devaluation/appreciation pressures on the domestic currency and are argued to be direct estimates of the probability of a devaluation/appreciation and thus thought to be good proxies of a regime's credibility (Jeanne and Masson, 2000). The size of these pressures is usually estimated by using a Markov-switching model (Alvarez and Schrooten, 2003; Boinet et al., 2005; Ho and Ho, 2009) which can detect switches in devaluation probabilities. Alternatively, the sustainability of a CBA can be assessed through examining the "reaction" of the macroeconomic performance of the country to external shocks, especially those from the anchor currency country (Sepp and

Randveer, 2002a; Minea and Rault, 2008, 2011). Studies that have estimated or analysed the sustainability of a CBA are appraised below. However, only a few studies conducted empirical research, with most studies assessing a CBA's sustainability in a specific country by observing the performance (flexibility) of other policies in that country. For an outline of the main characteristics of these studies see Table 3.1. First, the studies that investigated CBA's sustainability in countries other than BH will be presented and assessed (in chronological order). Two studies that focused on the sustainability of CBA in BH will be appraised at the end of this section as an introduction for Section 3.4 in which the main features of BH's CBA's sustainability will be briefly addressed. The purpose of the assessment of studies in this section is to examine the different definitions and features of CBA's sustainability considered, as well as the different measures applied.

Table 3.1: Summary of the studies investigating the CBA's sustainability (in chronological order)

| Study | Country | Period and frequency | Dependent variable | Controls | Technique |
|---|---|---|---|---|---|
| | | | Variables analysed | | |
| Sepp and Randver (2002a) | Estonia | 1996-2000 monthly and annual data | Shocks: nominal exchange rate (the kron against USD) shock, shock of foreign interest rate change, fall in money supply, shock in import prices and export shock, measured by the GDP of EU15, the Finnish GDP, the CPI of EU15, the Russian CPI; economic fundamentals: GDP growth, output gap, trade balance, inflation and real exchange rate | | Simulations |
| | | | Growth of money supply and credit, interest rates of forward transactions, dynamics of economic growth and fiscal deficit, current account deficit, real wage and productivity growth (in trade and public sectors), real effective exchange rate, export and import growth | | Descriptive analysis |
| Alavez-Plata and Schrooten (2003) | Argentina | 1994-2001 monthly data | Devaluation probability measured by an index of speculative pressure constructed as a weighted average of monthly exchange rate changes, interest differential changes and international reserve changes | Capital account, current account, financial sector and the real sector indicators | Markov-switching model |
| Hardouvelis and Monokrousos (2009) | Bulgaria | 2003/2004 - 2008/2009 monthly data | Coverage of the monetary base and the lev-dominated portion of M2 by FX reserves, 1-month interbank rate spreads vs. EUR, real effective exchange rate, savings-investment imbalances, change in the export-to-GDP ratio, MFI credits to domestic sector, private sector credit, FDI/CA deficit, CA balance, gross external debt, government fiscal balance, reserve assets | | Descriptive analysis |
| Ho and Ho (2009) | Argentina and Hong Kong | 1991-2001 Argentina 1984-2005 Hong Kong quarterly data | The expected rate of depreciation measured as the interest rate differential between the domestic economy and the anchor currency country | The economic fundamentals: fiscal balance, trade, real exchange rate, unemployment, inflation, real growth | Markov-switching model |
| Hayo and Neuenkirch (2010) | Argentina | 1998-2006 daily data | Daily changes of the three-month, six-month, and one-year Buenos Aires Interbank Offered Rate | Dollar- and peso-denominated asset returns, macroeconomic announcements, the Federal Funds Target Rate movements and communication dummies | GARCH |
| Minea and Rault (2011) | Bulgaria | Q3:1999-Q4:2010 quarterly data | Interest rate shock in the anchor-currency country/zone (LIBOR EUR 3-months interest rate), FED interest rate, lev/USD exchange rate, domestic "money market rate" with three months maturity, growth rate of real activity, consumer prices, growth rate of nominal M3 | | VAR (GITFs) |
| Kristić (2007) | BH | 2000-2005 annual data | Government budget balance, current account balance, level and growth of wages and productivity in different sectors, coverage of monetary aggregates by FX reserves, changes in savings and exports, Gross foreign reserves | | Descriptive analysis |
| Kahmi and Deheija (2006) | BH | 1999-2004 annual data | Gross and net foreign reserves, real GDP growth rate, inflation, government budget, external debt, broad money, current account balance, trade balance | | Descriptive analysis |

As noted in the previous section there are different definitions and aspects of a monetary regime's sustainability. There are also different approaches to assessing the regime's sustainability. The ones that consider many potential features that may affect regime's sustainability are usually those that lack any empirical analysis and therefore fail to provide the evidence for their inferences. There are two studies that assess sustainability of BH's CBA and both are descriptive. Kahmi and Deheija (2006) analysed trends in the main macroeconomic variables in BH after the introduction of the CBA and based on these trends concluded that the introduction and maintenance of BH was justified. However, since this was the period of recovery after the war these trends cannot be assigned to the implementation of the CBA. They further identified a lack of solid legal and regulatory infrastructures and the lack of political cohesion as the major potential threats to its sustainability. Kristić (2007) identified some other potential threats, such as the persistent current account deficit and more rapid growth of wages than productivity, mainly driven by the high rise of wages in the public sector.  Despite this conclusion, she argued that fiscal policy was prudent. The same conclusion was drawn by Kahmi and Deheija (2006). They based this conclusion only on an observation of the trend in the fiscal balance. However, the degree of prudence of fiscal policy should be assessed based by its ability to efficiently react to shocks and readjust the imbalances in an economy (as analysed in Sepp and Randveer, 2002a), not just by the level of a government's budget deficit. Moreover, since the war a very small portion of government expenditures has been directed towards capital and infrastructure investments (as elaborated in Section 1.2.4), which also places in question the prudency of fiscal policy. Moreover, both studies fail to identify some other potential threats to CBA's sustainability, such as high unemployment persistence, potential overvaluation of the local currency and lack of funds for development. Kristić (2007) also emphasised the importance of 'a sound' financial sector, but did not conduct any analysis to investigate this determinant. Hardouvelis and Monokrousos (2009) considered all of the above in their assessment of sustainability of the Bulgarian CBA. They argued that the Bulgarian CBA was sustainable, despite the global financial crisis and instabilities in the region, since it "enjoys strong public and constitutional support... large pool of foreign exchange reserves  and a strong fiscal position... the banking sector is well-capitalised and has limited exposure to single-lender contagion risks , while its central bank has the flexibility to undertake 'strictly limited' lender-of-last resort (LLR) operations, which can diffuse events that cause domestic financial stress" (p. 2). However, the authors did not explain what data or factors led to their conclusion of the strong public support for the Bulgarian CBA, which is an important drawback of this study since they state that public support is an important feature of a CBA's sustainability, but do not test for this. In addition, the 1-month interest rate differential between the Bulgarian and the anchor country's interest rate was observed and compared with the differentials of Baltic countries against their respective reserve country's interest rate. Since it is argued that this differential is an estimate of devaluation probability they concluded that the probability of devaluation of the Bulgarian currency is lower than for the Baltic countries. However, this might not been the case if other variables were taken into account, such as risk and inflation differences between the observed countries. As noted above, none of these studies conducted any empirical analysis to support their inferences.

The common approach to empirically investigating a CBA's sustainability is by analysing the differences in the interest rates in the CBA and anchor-currency countries. Those differences are likely to place devaluation/appreciation pressures on the domestic currency and are argued to be direct estimates of the probability of a devaluation/appreciation and thus thought to be good proxies of a regime's credibility (Jeanne and Masson, 2000). The size and source of these pressures is usually estimated by using a Markov-switching model (Alvarez and Schrooten, 2003; Ho and Ho, 2009) which can detect switches in devaluation probabilities. As emphasised by the Alvarez and Schrooten (2003, p.9): "In this class of models it is assumed that the parameters of the underlying data generating process of the observed time series depend on an unobservable state variable." Usage of the Markov-switching model enabled them to detect "jumps" from a "low" to a "high" devaluation probability, which depends on the shifts in expectations of private investors. Therefore, by using a Markov-switching model they assessed the relative importance of fundamentals and expectations. Those expectations in their models are not observed but assumed to be the source of switch which is not "caught by" observable, macroeconomic variables, which are included in the model. The results of Alvarez and Schrooten's (2003) analysis indicated that, beside the weak and deteriorating fundamentals, shifts in agents' beliefs also played a crucial role in the Argentinean crisis. The results of the estimations in Ho and Ho (2009, p.3), which investigated sustainability of the CBAs in both Argentina and Hong Kong, suggested that "market expectations play a more important role in maintaining the currency board in Argentina than in Hong Kong. Economic fundamentals, including the trade surplus, real exchange rate and inflation rate are more important for the sustainability of the Hong Kong currency board".

As the pressure on maintaining a CBA observed through the probability of currency devaluation is not directly measurable, Ho and Ho (2009) used the expected rate of depreciation as an indicator of devaluation pressure, which they also proxied by the interest rate differential between the domestic countries and the anchor currency country. Alvarez and Schrooten (2003) used a somewhat broader measure of devaluation probability. They assume it to be a function of the pressure in the exchange market, and measured it by an index of speculative pressure constructed as a weighted average of monthly exchange rate changes, interest differential changes and international reserve changes. However, one may argue that the devaluation pressure may also come from differences in productivity growth or inflation rates between the CBA and the anchor currency country, as well as from a high variation in the exchange rate between the CBA country's currency and currencies of trading partners other than that/those to whose currency the CBA's currency is pegged. As relevant macroeconomic variables both studies included a number of economic fundamentals, though they differ in most of the variables included (for the list of variables see Table 3.1). However, the variables included are not observed relative to those in the anchor currency country, which would be more informative given that the dependent variable is constructed based on the differential between interest rates in the CBA and anchor currency country. Moreover, none of the models account for differences (and changes) in the country risk premiums that are also likely to affect interest rate differentials. Changes in the money supply that are likely to influence the interest rate differentials are also not considered (Frommel et al., 2005). Finally, both studies fail to report diagnostic tests and therefore the reliability of their results is questionable.

Another empirical approach to assessing the sustainability of a CBA is through examining the "reaction" of the macroeconomic performance of the country to external shocks, especially those from the anchor currency country (Sepp and

Randveer, 2002a; Hayo and Neuenkirch, 2010; Minea and Rault, 2008, 2011). Hayo and Neuenkirch (2010) examine the effect of U.S. news on the Argentinean financial market and compare the reactions during and after the CBA and before, during and after the financial crisis. The authors start from the assumption that U.S. economic news (central bank communications and macroeconomic announcements) have a great impact not only on the U.S. financial market, but also on other economies' financial markets (here, on Argentina's specifically), as the United States is the world's largest economy. They assume that this transmission may happen through several channels. The first channel is based on real economic integration via international trade. The second channel is financial market integration based on high capital mobility. This channel carries the risk of contagion arising from shocks in other markets. The third channel is driven by monetary policy: Argentina pegged its exchange rate against the U.S. dollar (until 2002) and, therefore, had to follow U.S. monetary policy very closely. This should also imply a greater sensitivity to U.S. news and a co-movement of short-term interest rates. They used the GARCH (Generalised AutoRegressive Conditional Heteroscedasticity) specification of daily financial returns to capture the autoregressive conditional heteroscedasticity that characterises many financial series. The daily changes of the three-month, six-month, and one-year Buenos Aires Interbank Offered Rate for a period 1998-2006 are used as dependent variables and controls include macroeconomic announcements, the Federal Funds Target Rate movements and communication dummies. First, the authors found that U.S. monetary policy and U.S. macroeconomic announcements have a significant impact on Argentina's financial market returns: money, equity, and foreign exchange markets. Second, they also found that Argentina's financial markets were more dependent on U.S. news under the currency board than after its abandonment. In particular, neither the U.S. central bank's actions and communications, nor U.S. price indicators exert a significant influence in the post-crisis subsample. Thus, the degree of financial integration between these countries has decreased, which suggests that the currency board lead to a higher degree of financial integration in the first place. Third, they found that U.S. dollar-denominated assets in Argentina react less to U.S. news than peso-denominated assets, which further suggest that dollar-denominated assets are seen as safer than peso-denominated assets implying that the currency board was not completely credible to markets participants. Finally, they obtain a significantly larger economic reaction of

Argentina's financial markets to U.S. news during Argentina's financial crisis for both dollar- and peso-denominated assets. However, as noted in the studies assessed above there are many other important factors, beside those included in this study that can influence changes in the interest rate. Minea and Rault (2008, 2011) investigate whether and how the anchor currency country's central bank (ECB) and FED interest rate shocks (which are considered the main sources of monetary volatility in Bulgaria) translate to the Bulgarian real economy. The authors argue that an interest rate shock in the anchor-currency country/zone (LIBOR EUR 3-months interest rate) will first affect the domestic interest rate (the "money market rate" with three months maturity). Changes in the domestic interest rate are further supposed to affect the growth rate of real activity (output), followed by changes in consumer prices and finally domestic nominal money growth (growth rate of nominal M3). In addition to estimating the effect of the ECB interest rate, the effect of the FED interest rate is also estimated in the 2011 study, since Bulgaria still has important trade relations with countries like Turkey and Russia that are/were heavily linked to the USD (United States dollar). They conduct the same estimation with the FED interest rate, with the difference of inclusion of the lev (Bulgarian currency) to USD exchange rate. Quarterly data for the period 1999 – 2010 is used. "Generalised" impulse response functions (GITFs), which are insensitive to the ordering of variables in the VAR (Vector autoregression), are utilised. The results suggest that Bulgarian interest rates follow the ECB interest rate dynamics, with a short lag (about 1-2 quarters), while they follow the FED interest rate dynamics with a longer delay (which is not specified in the study). Output growth, prices and money exhibit smaller persistence and become non-significant earlier in time following an ECB interest rate shock, compared to a FED interest rate shock. The authors argued that: "This result could suggest that the CB[A] may have worked as a good convergence device between Bulgaria and the EMU, with respect to other foreign partners." (p.16). However, this argument should be treated cautiously given that differences in some key variables, such as productivity and inflation between the domestic and anchor countries, are not observed. Moreover, the possibility that (foreign) banking sector's liquidity might be altered by the parent banks, which may affect Bulgarian interest rates and money supply is not considered. Additionally, a source of monetary shocks may be also found in changes in, for example, the inflation rate in the euro-market or ECB macroeconomic announcements. These potential channels that may affect interest rates and money supply are not considered in the paper. A similar analysis was conducted for Estonia and Lithuania in the European Forecasting Network Report (EFN, 2004). This analysis implied that the reaction of GDP and prices to a monetary shock is very fast in Estonia, though there is no clear evidence of the presence of a well-defined interest rate or exchange rate channel. For Lithuania there are clear effects of ECB's monetary policy on domestic output, but not on prices. Regarding the transmission channels, it is indicated that the "direct" interest rate channel seems to have been effective in Lithuania during the considered period.

Finally, the most comprehensive approach is applied by Sepp and Randver (2002a). They analysed aspects of the sustainability of the Estonian CBA using two methods: looking at the outcomes of shock-simulations and then at how the economy had actually "coped with shocks" through observing how the Estonian economy reacted to the adverse effects caused by the Asian (in 1997) and Russian (in 1998) crises. Their simulation analysis suggested that external shocks did not cause a divergence of the Estonian economy from its 'long-run' path. Both the Asian and Russian crises were accompanied by difficulties in obtaining foreign financing. They argued that observations of the real (and financial) sectors in Estonia during and after the crises are a good test of the sustainability of the CBA (especially from the perspective of the viability of the financial sector). According to their analysis, the financial sector proved its efficiency during and after the crises, since the capitalisation and liquidity of banks increased and the credibility of domestic banks increased. However, they did not provide the data or arguments on which they reached the latter conclusion. They further observed changes in the money supply, forward market, interest rates and credit growth during and after the Russian crisis. Even though the state of these variables deteriorated in the short-term, they stabilised shortly after the crisis was over. Utilising simulations, they observed the effect of this exogenous shock on the price level and real variables. These suggested that the negative impact is temporary and GDP growth converges on its 'long-run' path (the impact on prices and exports was small). The need for 'soundness' and flexibility of fiscal policy, flexibility of prices and wages and 'soundness' of banking system were emphasised as highly important conditions for the stability/sustainability of the CBA. The condition for the 'soundness' of fiscal policy was argued to be fulfilled in Estonia, since fiscal policy has been used for stabilisation purposes, such as the reduction of current account deficit, through the introduction of tight fiscal policy and setting targets for fiscal deficits. By observing trends in productivity and wages they concluded that wages in Estonia were quite flexible in the period 1996-1999, especially in the tradable sector. Moreover, deviations of the actual real effective exchange rate (REER) from the equilibrium level were observed. Although the REER appreciated significantly as a consequence of the Russian crisis, it returned to its equilibrium after six months. Since the investigated adjustment mechanisms appeared to function well in Estonia the authors concluded that its CBA might be sustainable. One aspect missing from this 'comprehensive' study is the neglect of the importance of public beliefs and expectations regarding the credibility of the monetary authority, which can threaten the sustainability of the CBA even when the fundamentals are "sound". Moreover, they did not discuss the effect of unemployment on the sustainability of the CBA which, if persistent, is argued to be potential reason for decreased credibility of the monetary authority (Drazen and Masson, 1994; Mulino, 2002; Castren et al., 2010) and may consequently undermine a CBA's sustainability.

The purpose of the assessment of studies in this section is to examine the different definitions and features of CBA's sustainability considered, as well as the different measures applied. These sustainability features identified in Sections 3.2 and 3.3 will be initially investigated in the context of BH in the next section.

## 3.4 A short discussion of sustainability/desirability features of the CBA in BH

Since the macroeconomic situation in BH under which a CBA had been introduced and maintained was already investigated in the first chapter we will only investigate this here in the context of CBA's desirability and sustainability and refer frequently back to the specific section in the first chapter. This section therefore summarises trends in BH economy which may undermine or support the maintenance of its CBA.

The level and trends in the key *macroeconomic variables* which may undermine the CBA's sustainability in BH (real exchange rate, current account balance, external debt, inflation and interest rate convergence with anchor currency country, level and persistence of unemployment) were explored in Chapter 1. According to these fundamentals, it should be emphasised that the persistent deficit of the current account and high and persistent level of unemployment could potentially undermine BH's CBA's sustainability. A persistent current account deficit puts pressure on the domestic currency, potentially signalling an overvalued exchange rate and uncompetitive export goods. This, together with decreasing foreign investment and aid, as well as the persistent and high unemployment and the inflexibility of BH's labour market, also raises the question of the CBA's desirability and sustainability, since in this regime monetary policy cannot be used to stimulate economic growth. The *'soundness' of the financial sector* can be assessed by its stability, ability to stimulate the economy, and to absorb shocks. These are investigated for the BH financial sector in the second part of Chapter 1. The financial sector in BH can be considered as stable, but it is not stimulating the economy, since it is under-developed and credit growth is slow. The ability to absorb shocks depends largely on 'mother' banks' actions, which are driven by their own interests, not those of the country in which they have subsidiaries. This might be very dangerous under a CBA, especially because foreign-owned banks dominate the domestic banking system as in BH. As elaborated in Chapter 1, *fiscal policy* in BH is heavily constrained, which poses a question about its ability to fulfil a role as both a stimulator and buffer in the economy. Firstly, since 2008 there has been a continuous government budget deficit, since, on one side, public revenues are low due to high percentage of 'grey' economic activities, while, on the other side, requirements for public expenditures are high. Secondly, the high proportion of social benefits and extensive public administration expenditures do not provide a foundation for a sustainable fiscal policy. Third, international institutions, such as the IMF, impose strict rules on fiscal policy, but, international institutions also provide some of the additional funds necessary for growth in an economy with low domestic public revenues and savings. Finally, the political situation in BH is very complex and people have low trust in government and its ability to react to shocks. A further role *of the international community* is as a buffer, which could be observed through its initiative at the beginning of the financial crisis in 2008. Namely, when 'mother' banks started withdrawing funds from their subsidiaries in BH action orchestrated by the IMF (see Chapter 1) mitigated this process that would have put downward pressure on the financial sector and the whole economy. This would most likely have lead to a decrease in trust in the financial sector and people would start withdrawing money from banks, and potentially converting their domestic into foreign currency, which would ultimately undermine confidence in the local currency and consequently the CBA's sustainability. Therefore, confidence in the local currency can be considered one of the major determinants of the CBA's sustainability. In the following section the importance of confidence in and the credibility of CBA will be emphasised and the theoretical rationale and methodologies for estimations in Chapter 4 established. Desirability will be assessed by the estimation of the effects of a CBA on the economic performance of a country, measured through official statistics and subjective assessment of the situation in Chapters 5 and 6. Chapter 7 will consider the results of these empirical analyses and situation in BH assessed in Chapter 1, prior giving the final conclusion regarding the sustainability and desirability of BH's CBA.

### 3.5 The credibility of a CBA as a source of its stability and sustainability

As elaborated in Chapter 2, an increase in confidence in the monetary authority and credibility of the monetary authority and policy is the most emphasised advantage of a CBA and the main source of its stability and sustainability. This section explains the importance of confidence and credibility for a regime's stability and sustainability and the alternative methods of empirically investigating these particular features.

First, differences and similarities between 'confidence' and 'credibility' need to be examined and these terms defined in the context of CBA. Le Heron and Carre (2005) argued that confidence and credibility (of the monetary authority and policy) are different concepts, defining credibility as a belief that the monetary authority will be consistent in following the announced policy and confidence as a belief that the monetary authority reacts to the market (economic agents') 'needs'. Confidence defined like this implies that the monetary authority has the discretion and ability to adjust to shocks, which cannot be applied to countries with a CBA or other counties with a fixed exchange rate and free capital movements if central bank wants to maintain the fixed exchange rate. Monetary policy under a CBA is not allowed to 'react to market needs' and it may induce confidence only if it implements its announced policy and holds the national currency stable (against the anchor currency) and trustworthy. Therefore, in the context of a CBA, the difference between confidence and credibility is only in the period observed. Confidence in the monetary authority is a result of perceptions about the *current* (and past) monetary policy, while expectations about the *future* monetary policy indicate the monetary policy's credibility, and consequently the monetary regime's sustainability. Confidence in the monetary regime may be observed as an indicator of the regime's past credibility and current stability, since current perceptions are likely to be based on the previous behaviour of the central bank. It can be argued that credibility is also based on perceptions about the current and past monetary policy. Therefore, both perceptions and expectations about the stability of local currency will be used as a measure of the monetary authority's credibility and observed as a system in the empirical analysis in Section 4.6.3.

The credibility of a monetary authority is usually identified as an important feature, since there is a "prevailing opinion that economic policies are more effective if they are credible to private economic agents" (Blackburn and Christensen, 1989, p.1). As discussed in Chapter 2, high credibility of a monetary authority is expected not only to provide lower inflation expectations and consequently a lower inflation rate, but also to lessen speculative attacks, contribute to macroeconomic stability and attract foreign investments. Mulino (2002) and Ledesma et al. (2004) also argued that low credibility may be a destabilising element in the economy and a source of future currency crises. Credibility is usually defined as a belief that the monetary authority's announced policy will be implemented. Since a fixed exchange rate is an announced policy rule in CBA countries it should result in increased expectations of a currency's stability[35] compared to the countries with other policies. As argued in Section 2.3 these expectations are likely to be firmer in countries with a CBA than in countries with fixed exchange rate regimes since, under a CBA, it is harder to deviate from a fixed rate since the rule of a fixed rate is embedded in law and the costs of changing legislation are argued to be high. However, assessing the level of credibility of the monetary authority under a CBA is not straightforward, since sustaining credibility depends on the frequency and type of shocks (Feurenstein and Grimm, 2006), the state of the economy (Drazen and Masson, 1994) and the specific

[35] This primarily refers to stability against the anchor currency, but since one of the criteria when choosing the anchor currency is its stability against other major world's currencies, it may be argued to refer to overall currency stability.

(political and institutional) circumstances in the country (Blackburn and Christensen, 1989; Desquilbet and Nenovsky, 2007). Desquilbet and Nenovsky (2007, p.1) noted that: “the lack of credibility is typical for peripheral countries and cannot be overcome completely even by ‘hard’ monetary regimes”, an argument that is elaborated in more detail in Section 4.3. Therefore, we may question whether ‘tougher’ regimes will automatically result in higher credibility of the monetary authority and this issue ultimately needs to be answered by empirical analysis.

As noted in Section 3.3 studies which investigated the credibility of monetary regimes usually used interest rate differentials relative to the anchor (or some credible) monetary policy (Arestis and Mouratidis, 2005; Ho and Ho, 2009), as a “good proxy for expected devaluation and hence for the lack of credibility of fixed parities” (Drazen and Masson, 1994, p. 744) [36]. However, this cannot be conducted for BH since it has no money market. One alternative might be to use the difference between interest rates on loans in domestic currency and those indexed to a foreign currency. However, the difference between these is small in BH (significantly smaller than in other countries, e.g. Estonia, Croatia, Latvia) and is not varying much over time (see Appendix 3.1). Moreover, only a very small portion of total loans in BH are indexed to the euro, according to the official statistics data (see Figure 1.8 in Chapter 1). Finally, data on interest rates has only been recorded separately for domestic currency loans and those indexed to the euro from 2007 and for a time-series analysis a longer period is required. Ferderer (1998), Mulino (2002) and Feuerstein and Grimm (2006) emphasised that the gain in credibility should be represented by the extent to which the announced policies influence expectations about future policy. In the next chapter credibility will be measured by the subjective residents' attitudes (regarding their currency’s stability) and an empirical analysis of the effect of CBA on these attitudes conducted. This approach can be considered advantageous compared to previous approaches since it directly reflects perceptions and expectations without the need to use any proxies for expected exchange rate changes. Bursian and Furth (2012) emphasise the importance of the subjective

[36] Some authors created a credibility index for their measure of monetary authority’s credibility. For example, Mackiewicz (2009) created a credibility index that consists of central bank’s transparency, independence, accountability, a history of honesty (measured as a deviations from the announced (inflation) target and past inflation performance), public debt and quality of institutions in a given country (proxied by country risk).

component when estimating citizens' perceptions. Moreover, they explain that having a 'tough' policy is not enough, people have to trust that the policy will be implemented and maintained in order for the policy to have the expected effect. Therefore, when estimating the credibility of monetary regime one should prefer subjective attitudes to observing changes in some variables that are considered to be "good proxies". Specifically, since the announced policy under a CBA is a fixed exchange rate (stable currency against the anchor currency) the citizens' perceptions and expectations regarding their currency's stability should be used as indicators of the confidence of monetary regime.

There is only one study (Valev and Carlson, 2007) which has used public expectations (measured by national surveys from 2000 to 2004) regarding a currency's stability to empirically assess the sustainability of a CBA. However, this study focused only on Bulgaria and did not compare the effect of the CBA and other regimes on credibility, but sought to assess the possibility of a collapse of the Bulgarian CBA. The question they used to derive their dependent variable was: "In your opinion what is the likelihood that the currency board will collapse with a sharp devaluation of the local currency in the next 6 months/12 months/5 years?" According to the responses, at the time of the 2004 survey, the last survey available for their analysis, a large majority of the Bulgarians believed that a collapse of the currency board was unlikely. According to responses from all surveys, a non-negligible minority believed that devaluation was likely and only a quarter of the respondents to the survey were willing to rule out completely the possibility of devaluation. Answers revealed that concerns over international shocks and pressure from international organisations were singled out as major factors. Furthermore, the limitations imposed by the currency board on output stabilisation policies, as stated by the authors, generated additional doubts about its sustainability. Empirical analysis was conducted to estimate the effect of different respondents' characteristics on their perceptions of the probability and the changes of probability of Bulgarian CBA's collapse through time. According to their findings older respondents, more educated respondents, and political supporters of the party that introduced the currency board had greater confidence in it. However, a few limitations of this study should be emphasised. The construction of the question asked requires respondents to be familiar with the CBA, its characteristics, as well as the term 'devaluation', which might be assumed not always to be the case in the wider population. In the empirical analysis the authors fail to control for the expectations about the economic situation, as well as political and institutional circumstances in the country, which are likely to significantly influence the monetary policy's credibility. Finally, the authors did not conduct any robustness checks to support their findings.

In the empirical analysis presented in the next chapter the effect of a CBA on perceptions and expectations about the local currency's stability is examined, after controlling for other relevant factors. Since a CBA is usually argued to establish credibility by reducing inflation expectations (see for example Carlson and Valev, 2001) credibility may also be examined by comparing inflation expectations in countries with and countries without CBA from the sample. However, Weber et al. (1991, p. 62) argued that in order to achieve credibility "the authorities must precommit themselves to a particular policy rule". Although under a CBA inflation is typically maintained at low levels, the "precommitment rule" is more explicit for maintaining a fixed exchange rate against the anchor currency than low inflation. Weber et al. (1991, p. 72) further argued that credible exchange rate pegging is likely to increase the "counter-inflation reputation" of the monetary authority. Hence, lower inflation expectations are likely to be the result of a credible exchange rate regime and therefore we will first focus on the credibility of the pre-commitment to maintain a stable local currency (fixed exchange rates against the anchor currency). Next, the approach utilised in our empirical analyses to capture the effect of a CBA will be elaborated.

### 3.6 Capturing the effects of a CBA

In all the empirical analyses conducted in this research programme the effect of a CBA, on the monetary authority's credibility and economic situation in a country, will be captured by a dummy variable. As this could be considered a possible limitation, additional explanations are needed in order to justify that the variable is capturing the effect of the specific monetary framework. Namely, the use of a simple indicator variable raises the possibility that the results could be driven by some other common characteristics of countries with CBA, other than the CBA itself. However, the descriptive statistics on trends in main macroeconomic variables presented in

Section 2.4 (Appendix 2.1) do not suggest that the CBA countries in our analyses (BH, Bulgaria, Estonia and Lithuania) have common economic characteristics that distinguish them as a group. Moreover, the main economic characteristics are controlled for in the regression analyses. To investigate the possibility of political and institutional characteristics as alternative common set of characteristics defining the CBA countries we consider the World Governance Indicator indices. Comparing these indicators (see Appendix 1.1) we can again conclude that there is no suggestion that there is something similar between CBA countries and distinct from other transition countries. Indicators of voice and accountability, political stability, government effectiveness and regulatory quality differ between the CBA countries. On the other hand, measures of the rule of law, control of corruption are similar between CBA countries (confidence intervals overlap), but are also similar to those of the other transition countries and no distinctiveness could be identified for CBA countries. Moreover, these countries also differ in their progress in transition. The aggregate EBRD index on progress in transition averaged for 1998-2012 for BH was 2.72; for Bulgaria 3.55; for Estonia 3.94 and Lithuania 3.75. Finally, with respect to recent history, ethnic composition and relationship to the European Union there are substantial differences between BH and the other European transition countries with a CBA: BH had a war, while the other CBA countries have not in the recent past; BH is a multi-ethnic country, while this ethnic diversity is not so pronounced in the other CBA countries; BH is not an EU member, whereas the other CBA countries are. To our knowledge, there is no set of economic, political or historical characteristics that define these countries as a distinct group. Therefore, it is a reasonable presumption to believe that the CBA dummy variable is capturing the effect of CBA rather than some other set of common characteristics.

By including a CBA dummy variable in our empirical analyses in Chapters 4, 5 and 6, we are comparing the effect of a CBA with those of all other monetary-ER regime combinations. As argued in Section 2.2.5, the CBA variable compares the effect of the regime not only with the other ERRs, as done in previous studies (these studies will be assessed in Chapter 5), but with all other monetary-ER regime combinations. The advantage of this is that we do not have to choose between the 'de facto' and 'de jure' classifications of ERRs, both of which, as discussed in Section 2.2.5, have some limitations. Additionally, the inclusion of only a CBA dummy variable instead of a full set of ERR dummies simplifies the model and saves degrees of freedom therefore gaining efficiency given the small sample properties. Finally, the CBA variable is also capturing some institutional characteristics which are different from the other regimes, such as the inability to finance government, full coverage of monetary base and inability of central bank to act as a lender of last resort.

## 3.7 Conclusion

Sustainability of a CBA may be defined as the capability of the monetary authority to maintain its announced policy (monetary credibility) while sustaining economic stability in the country. The latter is also related to the desirability of the regime, since it is neither sustainable nor desirable when economic stability cannot be sustained in the medium-to-long term. A CBA, as a restrictive monetary regime, is likely to increase monetary and consequently overall macroeconomic stability in country. However, it has a limited ability to stimulate growth and to mitigate the effect of shocks on the real economy. The features that may affect CBA’s desirability and sustainability have been identified in this chapter through a critical assessment of studies that address this issue. These features have also been briefly elaborated for BH’s CBA. However, to address these issues appropriately a more detailed analysis is required and will be conducted in the following chapters. The credibility of the monetary authority, which is usually emphasised as the main source of CBA sustainability, will be empirically analysed in Chapter 4. As noted in Section 3.3, there are other methods that could be applied to assess CBA’s sustainability. However, the absence of a reliable macroeconomic model of the BH economy prevents us from conducting simulations in order to observe how external shocks would have affected the real economy. In Chapters 5 and 6 the effect of CBA on economic performance will be compared to that of other monetary regimes, in order to observe whether there is an effect of CBA on the real economy. Since the period included in our analysis contains both the global financial and euro-zone crises we will be able to assess CBA’s desirability and sustainability during ‘turbulent times’.

# CHAPTER 4: AN ASSESSMENT OF THE CREDIBILITY OF CURRENCY BOARD ARRANGEMENTS IN BOSNIA AND HERZEGOVINA AND BULGARIA



## 4.1 Introduction

In the previous chapter, the relatively high degree of confidence in and credibility of a CBA were identified as sources of its stability and sustainability. In this chapter the hypothesised increased confidence in the monetary authority and the credibility of its announced policy under a CBA will be empirically investigated. These features, as explained in Chapter 3, have been argued to affect the CBA's stability and sustainability, since the absence of confidence and credibility is likely to lead to a large-scale conversion of domestic currency into other currencies, which is likely to result in a currency crisis.

In Section 4.2 the rationale for using residents' trust/confidence in the local currency (from the Austrian National Bank surveys) as an indicator of confidence in and the credibility of monetary policy is explained. The data used in this research has not been previously used outside the Austrian National Bank or for this kind of research. The questions from these surveys that will be used in estimations are introduced and explained in the context of the stability and sustainability of a CBA. The potential determinants of the confidence and credibility of the monetary authority/regime are appraised in Section 4.3. After presenting the descriptive statistics of the survey data in Section 4.4, the estimation results are presented in Section 4.5. The main conclusions from the empirical analysis are appraised in Section 4.6.

## 4.2 Indicators of confidence in and credibility of a CBA

As suggested by Ho (2001) (as cited in Desquilbet and Nenovsky, 2007, p.9) “both credibility and confidence are subjective categories, related to a promise given”. Therefore, as indicators of confidence and credibility respondents' perceptions and expectations about the announced policy are used in this research. In order to capture these subjective attitudes the answers to questions from the surveys conducted by the Austrian National Bank are used as indicators of confidence in and credibility of monetary policy. Surveys were conducted in ten European transition countries (Albania, Bulgaria, Bosnia and Herzegovina, Croatia, Czech Republic, Hungary, Macedonia, Poland, Romania, and Serbia), two of which, namely Bosnia and Herzegovina and Bulgaria, operate under a CBA. The rationale for using subjective attitudes regarding the local currency’s stability as indicators of confidence and credibility of the monetary authority is next elaborated and the precise questions that will be used are specified.

Gjedrem (2001) and Krugman (2012) argue that confidence in the monetary authority is highly correlated with the nominal anchor[37]. Krugman argues that a country that wants to stabilise its currency “must either peg its currency, or manage it strongly”. Schuler (1992) argued that the choice of monetary regime in developing markets should be restricted to a currency board, full dollarization or monetary union in order to provide currency stability. This is especially relevant for a small open economy, which does not have experience in monetary policy implementation or strong institutions that would be able to attain economic agents’ confidence in the short-to-medium run. With the fixed exchange rate as a nominal anchor under a CBA, confidence in the monetary authority is likely to be reflected in the

[37] Krugman (2012) defines confidence as “the ability to protect exchange rates from destabilizing speculation, including currency crises.” (available at: http://web.mit.edu/Krugman/www/triangle.html)

respondents' attitudes/perceptions about the stability of their local currency. The precise question from the Austrian National Bank dataset used as an indicator of confidence elicits responses to the following statement: "*Currently, the [local currency] is a very stable and trustworthy currency*".

Blackburn and Christensen (1989, p.2) provided the most general interpretation of credibility: "the extent to which *beliefs* about the current and future course of economic policy are consistent with the program originally announced by policy makers" (emphasis added). In the context of CBA we may argue that credibility refers to the public's perceptions and expectations with respect to commitment to maintain a fixed exchange rate (stable national currency against the anchor currency), since that is the announced policy under a CBA. Therefore, in the analysis undertaken below we estimate the credibility of the monetary authority under a CBA by comparing the public's expectations about the national currency's future stability in countries with and without a CBA. These expectations about the stability of the national currency can be considered an indicator of the monetary authority's credibility, especially in the CBA countries[38]. This can be argued to apply to the other countries in this sample as well, given that all countries effectively peg against the euro and since most of the trading partners either already use the euro or are heading toward its adoption (and therefore keeping their national currencies stable against the euro). The precise question from the Austrian National Bank dataset used as an indicator of credibility is based on the following statement: "*Over the next five years, the [local currency] will be very stable and trustworthy*". A question about expectations about the future exchange rate between the euro and the local currency is also available in the dataset: "*How do you think will the exchange rate of the [local currency] against the euro develop over the next five years?*" and could also be used as a credibility indicator. However, we do not exercise this option for the following reasons. The expectations about the local currency's stability and the stability of the exchange rate between the euro and the local currency are expected to have similar responses in countries in which the euro is used as a reserve currency. Residents of a small open transition economy cannot be expected to have confidence in their

[38] In CBA countries confidence in the local currency might be argued to be the main determinant of confidence/credibility of monetary authority since the currency's stability is its primary target and this is specified in the central bank laws in all European transition countries that implement a CBA.

monetary authority without a nominal anchor. Therefore if the nominal anchor is abandoned (which is a fixed exchange rate against the euro in the case of CBA countries) it is likely that the confidence in the local currency will be abandoned as well (as emphasised by Krugman, 2012). Therefore, responses to the question on confidence in the future stability of their local currency would be expected to be similar to those for their confidence in future euro exchange rate stability. However, based on descriptive statistics (Section 4.4), we observe that the answers between the two questions do differ: the correlation coefficient is not very high. We prefer the question about the local currency stability to that about maintenance of the fixed euro exchange rate due to the following reasons. First, there is a potentially misleading framing effect given the way the latter question is constructed. As argued by Kahneman (2002, p.456) “different descriptions of the same problem [that] highlight different aspects of the outcomes” may result in different answers to (mainly) the same questions. The framing effect in the question about the expectations about the local currency’s stability is to direct the attention of the respondent towards the local currency, while in the question about the expectations about the exchange rate between the local currency and euro the attention is directed to the stability of the euro. Second, it might be assumed that people are more confident to talk about their confidence in the local currency, with which they operate every day, than about the euro exchange rate, with which they may or may not be familiar. This is confirmed by the high proportion of ‘do not know’ answers to the euro question (around 20%, while around 13% respondents gave this answer to the questions about future local currency stability), which indicates that many respondents may not be in a position to judge this issue. Descriptive statistics indicate that 59 percent of those who answered ‘do not know’ to this question were those with a medium level of education and 27 percent those with a low education (see Table 4.1 and Appendix 4.2). Overall, 63 percent of respondents are those with medium level of education and 17 percent of those with low level of education. Third, trust (confidence) in the local currency might be more relevant for residents’ actions (decisions in which currency to spend and save) than their expectations about the euro exchange rate. Finally, Belke et al. (2012, p.6) emphasise that credibility of a policy is “only given if the public has *trust* in the respective legislation” (emphasis added). Therefore, the former question is preferred since it contains information about trust. Bursian and Furth (2012, p2.) emphasise that “credibility and trust are closely related” and that “it is difficult to disentangle them" and in the following discussion these terms will be used interchangeably.

Table 4.1: Percentage of 'do not know' answers and the level of education of those respondents

| | Currently, the [LOCAL CURRENCY] is a very stable and trustworthy currency | Over the next five years, the [LOCAL CURRENCY] will be very stable and trustworthy | How do you think will the exchange rate of the [LOCAL CURRENCY (against the euro)] develop over the next five years? |
|---|---|---|---|
| Percentage of 'do not know' answers | 5.1 | 12.8 | 19.7 |
| Level of education of those who answered 'do not know': | | | |
| High level of education | 9.4 | 16.0 | 14.3 |
| Medium level of education | 53.3 | 56.0 | 59.0 |
| Low level of education | 37.4 | 28.0 | 26.8 |

Since the beginning of the recent global crisis a few studies have analysed levels of trust in the European Central Bank (ECB) (Fisher and Hahn, 2008; Gros and Roth, 2010; Bursian and Furth, 2012; Walti, 2012). Although in these studies trust in the ECB is used as a proxy for its credibility, it is emphasised that "people appear to evaluate performance of the ECB on the basis of its success in achieving its primary goal" (Fisher and Hahn, 2008, p.1). Since a question about trust in the central bank is not available in the Austrian National Bank surveys, the perceptions/expectations about the achieving primary goal/announced policy (namely, currency stability) is used as a confidence/credibility indicator. The question related to trust in a currency can be argued to reflect trust in the respective central bank. A question about trust in their currency is 'closer' to respondents than a question about the monetary authority, with whose actions and policies they may or may not be familiar. As noted by Bursian and Furth (2012, p. 7) "agents are bounded rationally and do not fully understand the mandate of the ECB". Trust in a currency might be considered more relevant since, as noted above, based on this, residents make their decisions about using local currency as a medium of exchange and store of value, which then affect the stability and sustainability of their national monetary and financial system as a whole. Given the use of answers to questions about the confidence in local currency's (current and future) stability as indicators of confidence and credibility of the CBA, potentially relevant determinants are next investigated and the initial model specification determined.

### 4.3 Determinants of the confidence and credibility of a monetary authority/regime

Beside a CBA dummy variable, which captures the difference between the responses in countries with a CBA and those with other monetary- regime frameworks, it is necessary to control for other potentially relevant variables. However, there is no substantive theoretical or empirical research on the choice of determinants of trust/confidence/credibility, and, as pointed out by Blackburn and Christensen (1989, p.1): “one may speculate upon a number of factors that are likely to influence the credibility of policy announcements”. In order to assess what additional independent variables should be included in the model, studies of a monetary regimes’ credibility are appraised.

The degree of credibility of the monetary authority has been addressed in many studies starting with Barro and Gordon (1983) in which they developed a model of the incentives for a monetary authority to deceive. This model was subsequently developed to include other determinants of the monetary authority’s credibility apart from time-inconsistency considerations. As argued in the previous chapter (Section 3.5), the credibility of the monetary authority does not depend only on the ‘toughness’ of policy maker(s) and a CBA may not necessarily result in greater trust in the local currency. Therefore, other factors, such as the state of the economy, political and institutional circumstances and the effect of external shocks have to be taken into account when estimating the credibility of a monetary/ER regime.

Drazen and Masson (1994) presented a model in which a policymaker maintains a fixed parity in good times, but devalues if the unemployment rate gets too high, implying that credibility depends on the state of the economy. They argued: “if tough policies constrain the room to manoeuvre in the future, then following a tough policy may actually harm rather than enhance credibility” (p.736). Drazen and Masson (1994, p. 735) concluded that “if there is persistence in unemployment, observing a tough policy in a given period may lower rather than raise the credibility of a no-devaluation pledge in subsequent periods.” Castren et al. (2010, p. 85) also argue that high “unemployment persistence makes a currency peg more fragile and undermines the credibility of the monetary authority”. Following Drazen and Masson, Mulino (2002) argued that the credibility of the CBA depends on the state of fundamentals such as persistent unemployment, since persistent unemployment is likely to affect future expectations and undermine the CBA’s credibility, “eventually inducing a self-fulfilling (currency) crisis” (p.381). Here, it can be argued that the way people perceive and expect the economic situation to be in their country might be more relevant than what the situation really is, since their confidence and further actions depend on their perceptions/expectations rather than the actual situation (this proposition will be discussed in more detail later in this section). Mulino (2002, p.382) further emphasised that external shocks and/or speculative attacks may also reduce the CBA’s credibility and result in recession, since the inability to adjust to shocks “may entail large output and employment losses, which could in turn undermine the confidence in the sustainability of the peg”. Feuerstein and Grimm (2006) noted that the credibility of the CBA itself is transient since “it can be abolished if the costs of maintaining it—for example, in case of a recession, a debt crisis, or problems within the banking sector—exceed its advantages” (p.819). Hence, they concluded that “its capability of solving the time-inconsistency problem makes the currency board credible, but only as long as this advantage is not outweighed by the need for stabilization of shocks occurring with a high volatility” (p.829).

Studies that estimated the determinants of the trust in the ECB conducted empirical analyses to test for changes in this trust during a period of financial crisis. Besides controlling for the socio-demographic characteristics of respondents, they also emphasised the importance of controlling for macroeconomic conditions and country specifics. Bursian and Furth (2012) emphasise the importance of macroeconomic conditions, country specifics, as well as the political views of respondents, in the trust-building process. Ehrmann et al. (2010) argue that public trust in the ECB during the crisis can be explained by the economic situation, trust in the overall European project and financial and banking sector (in)stability. In their empirical analysis they also control for political orientation and trust in the European Commission, implying the importance of controlling for political circumstances.

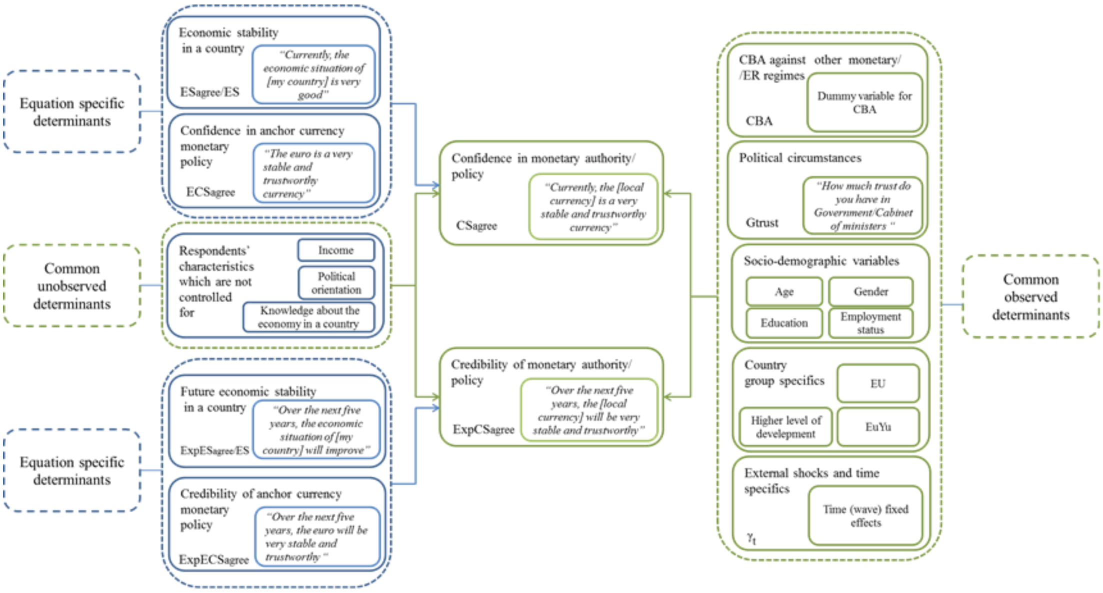
Valev and Carlson (2007) also argued that the political affiliation of respondents should be taken into account. Walti (2012, p.594) emphasise the importance of controlling for trust in economic institutions, especially in a period of crisis, “when uncertainty increases markedly”. Walti also underlines the importance of controlling for social loss functions in macroeconomics (proxied by movements in inflation and unemployment), as well as other country-specific developments and time specifics. Country and time fixed effects are also included in the empirical analysis conducted by Gros and Roth (2010) and Bursian and Furth (2012), although the latter include time dummies only for the years of crisis. Based on suggestions from these studies and on the characteristics of the countries in our sample and the specific questions used as indicators of confidence/credibility of CBA, the preferred specifications of the models are now addressed.

*Using subjective attitudes as confidence/credibility determinants*

As explained above, two models are considered and estimated. In the first one (the ‘confidence’ model), the effect of CBA on confidence and trust in the local currency (*perceptions* about the current stability of the local currency) is analysed. In the second (the ‘credibility’ model) the effect of CBA on the *expectations* about the future stability and trust in the local currency is investigated. However, it can be argued that views of current trustworthiness are influenced by expectations of trustworthiness in the future. Conversely, views of future trustworthiness most likely extrapolate, at least to some extent, from current experience and perceptions. From this it is reasonable to argue that both are the outcome of similar underlying determinants, both observed and unobserved. Current views and views about the future are correlated because of their joint determination within a wider system. However, they cannot so convincingly be held to determine one another. In this case, it is more appropriate to estimate the two models as seemingly unrelated regressions (SUR). Since subjective attitudes are used as dependent variables it is important to control for respondents’ socio-demographic characteristics. In this analysis age, gender, level of education completed and employment status are used as controls.

Following the above discussion of the determinants of a regime’s credibility, beside socio-demographic variables and type of monetary regime, control for the subjective attitudes regarding the economic (and financial) situation and political circumstances in a country, as well as other country and time specifics. Both perceptions (used in the 'confidence' model) and expectations (used in the 'credibility' model) about the local currency stability are assumed to be determined by some common determinants. Some of these determinants can be observed and are available in the dataset, such as the respondents' characteristics, the type of monetary regime and political circumstance in the country the respondents are coming from, which are included in both models. However, there are some common unobserved determinants, such as the political orientation of respondents and the level of their knowledge and awareness of the economic situation. However, there are some determinants which might be argued to be related to only one model in the system. In the 'confidence' model these specific determinants are the perceptions about the current economic situation in a country and perceptions regarding the euro's current stability. In the 'credibility' model expectations regarding the future economic situation and the euro's future stability are used as the specific model determinants. These determinants are listed in Figure 4.1.

Figure 4.1: Determinants of the confidence and credibility in a monetary authority/policy




In the preferred specifications, we use subjective attitudes of respondents (the reasons for preferring subjective attitudes over macroeconomic data from official statistics are discussed at the end of this section) for the independent variables. The precise question from the surveys used as an indicator of economic situation/stability (in the 'credibility' model) is: "*Over the next five years, the economic situation of [my country] will improve*". The question about the financial system stability is: "*Currently, banks and the financial system are stable in [my country]*". We may assume that this perception about the financial system is already integrated into their answer to the question about the economic situation in their country. Walti (2012) also argued that some part of banking sector (in)stability is likely to be captured by the economic situation in a country. Only perceptions, not expectations about the financial sector stability are available in this dataset and the question is not included in all available survey waves and therefore will not be included in the preferred specification. However, this variable will be included in the robustness checking. The survey question regarding political circumstances in a country from the surveys is: "*How much trust do you have in Government/Cabinet of ministers*". It is likely to be important to control for the political circumstances in this sample, since BH and Bulgaria have had a relatively high degree of political uncertainty during the period under consideration, as well as in the period prior to the one observed (this is elaborated in more detail for BH in Chapter 1). It might be expected that the better the perceptions/expectations about the economic situation/stability, the financial system's stability and the higher the level of trust in government are then the more the local currency is likely to be perceived as/expected to be stable and trustworthy.

From the review of previous studies we may conclude that besides including the economic situation and level of trust as independent variables these should also be interacted with the CBA variable in order to estimate/observe the effect of CBA conditional on different economic situations and different levels of trust in government. Indeed, Blackburn and Christensen (1989, p.4) argued that: "In general, credibility of monetary policy will depend not just upon monetary policy alone but rather upon the perceived coherence of the overall macroeconomic program, together with the intellectual and political consensus on the economic theory being used and the objectives and conduct of economic policy." As elaborated in Chapter 2, a CBA is typically introduced in countries where the (perceptions/expectations about) economic stability and the level of trust in government are low and is expected to increase monetary (and overall macroeconomic) stability in otherwise unstable economies. In order to estimate this, we introduce interaction terms between the

CBA variable and the economic situation, on the one hand, and the CBA and trust in government variables on the other.

Desquilbet and Nenovsky (2007) argued that in CBA countries confidence in the local currency is 'imported' from "confidence in the power of fiat currency" (p.11), meaning that the source of trust in the local currency is trust in the anchor currency (in this case the euro). Therefore, we control for the effect of trust in the anchor currency by using answers to another question from the survey *"(Over the next five years) the euro is (will be) a very stable and trustworthy currency*". Since the local currencies in both CBA countries were pegged to the euro in the observed period, it might be expected that confidence in the local currency is highly determined by the degree of trust in the euro. Although closely related, confidence in the stability of the local currency and the euro are not likely to be jointly determined, since the stability of the euro depends on its exchange rate with other currencies such as the dollar, pound etc. but not significantly on the national currencies of BH and Bulgaria. Confidence in the local currency is likely to depend on factors such as the economic situation and political circumstances in the CBA country that have no effect on the level of confidence in the euro. We further include time (wave) fixed effects to control for any "unobserved aggregate shocks in the data", which may be especially important given that the period observed is a period of global crisis (Walti, 2012, p.595). Since whether a country operates a CBA is represented/captured by a dummy variable which is 1 for BH and Bulgaria and 0 otherwise we cannot include country dummies, since we would have perfect collinearity. However, as explained in the following sub-section, group country dummies are included, namely dummy variables for EU membership, Ex-Yugoslav country and high(er) level of development, in order to avoid potentially biased estimates.

*CBA and country dummies*

BH and Bulgaria country dummies and a CBA dummy cannot be included in the same regressions, since the first two sum to the second (perfect collinearity). In order to observe the effect of a CBA we need a CBA dummy, without country dummies, that will compare the joint effect of Bulgaria and BH to all other countries. The CBA variable captures what is unique to BH and Bulgaria compared to all the other countries (i.e. what distinguishes them from the other countries). Based on the comparison of macroeconomic variables and world development indicators we can conclude that the only outstanding similarity between BH and Bulgaria is a CBA and there are no other such characteristics common to those two but different from those in the other countries (this is investigated and elaborated in Section 3.6).

By not including country dummies we are neglecting time-invariant country specifics and so run the risk that their influence may be picked up by other variables in the model including the CBA dummy. The model could be estimated with country dummies but in that case the comparison group would not be the same. In order to partially control for country specifics we include the perceptions/expectations about the economic situation in a country and trust in government. Moreover, although we cannot include individual county dummies, we can control for country-group effects. Accordingly, three group dummies are included: for EU membership; for Ex-Yugoslav member countries; and for the level of development. Inclusion of the EU dummy variable (which is 1 for Bulgaria, Czech Republic, Hungary, Poland, and Romania for the whole sample period) is based on the assumption that those who entered the EU have more rigid rules regarding their inflation rate, exchange rate etc., which may (positively) affect perceptions/expectations about both the local currency and the economic situation in a country. The inclusion of the Ex-Yugoslav dummy (which is set to 1 for BH, Croatia, Macedonia and Serbia) is based on a geographical and historical rationale. Namely, these countries have different experiences from other countries in the sample. These ex-Yugoslav countries share the same experience of loss of monetary unity and specific political disturbances after the break-up of Yugoslavia (in the early 1990s), which can still affect the credibility of their individual/national monetary authorities (formed after the break-up). Finally, the level of development is controlled for by identifying the group of countries with a GDP per capita higher than $10,000 (Croatia, Czech Republic, Hungary and Poland). This group of countries also has the highest scores for the world development indicators (rule of law, control of corruption, regulatory quality, political stability, voice and accountability) (see Appendix 1.3). People in countries with a higher level of development might be expected to perceive/expect the situation in their countries, and therefore their local currencies, as more stable than those in less developed countries. Fisher (2010) argued for the inclusion of geographic region dummies for groups of countries "sufficiently similar to share common socio-economic traits, possible caused by imitation effects, exchange of population and other types of spill-over across neighbouring countries" (p.16,17) and that estimates will not be biased by the omission of country fixed effects if regional/country-group effects are controlled for.

*Preferring subjective attitudes about economic performance over the official macroeconomic variables*

Since economic theory is based on the proposition that economic agents respond to reality as they experience and perceive it, we prefer a model utilising microeconomic (individual) perceptions/expectations about the economic situation in a country to a model estimated with official macroeconomic data. The subjective measure of economic performance will be used as an independent variable in this chapter and as the dependent variable in Section 6.4 where the effect of CBA on macroeconomic performance will be estimated. One of the reasons for preferring subjective measures of the economic performance over the official macroeconomic data is that the official statistics, especially in the less developed countries, are usually argued to be limited and unreliable. Official statistics are widely used because they are comparable across time and location (although far from perfectly), but mainly because usually there is no alternative. However, in this database the same questions about the economic situation were posed in ten different countries which enable us to use answers to these questions as a measure of the economic performance in these countries. If we define the objective of the economy as maximisation of its residents' well-being then the preferred measure will be subjective beliefs of these residents about the performance of the economy or specific institutions over aggregate measures of actual performance. The individuals' perceptions, which are based on their experiences, are more likely to dominate in determining their well-being than some arbitrary measure of aggregate output or movement of aggregate price indices. Thus when we have data available on individual's beliefs, perceptions and expectations regarding economic performance we should use it in preference to indicators that attempt to measure objectively 'real' outcomes.

In this chapter these subjective measure of macroeconomic performance are used as independent variables and respondents' perceptions and expectations about their currency as the dependent variables. Therefore, it is consistent to use respondents' perceptions/expectations about the macroeconomic performance as controls; since it is more likely that people base their perceptions/expectations about a currency on their own perceptions/expectations about the economic situation rather than the actual economic situation, which may or may not be 'correctly' perceived or experienced by a respondent. As emphasised by Uslaner (2010, p.112) "trust depends on information and experience". Moreover, using one variable for the economic situation enables us to estimate the effect of CBA on confidence/credibility conditional on the economic situation. Using a set of macroeconomic variables would be likely to be more complex, both for estimation and interpretation. Moreover, a collinearity issue is likely to be more pronounced in a model with actual macroeconomic variables, since the same value for the same macroeconomic variable would have to be attached to all respondents that come from the same country and are interviewed in the same year. Accordingly, using the real macroeconomic variables would dictate a small sample (10 countries, 3 years), while the number of observations from the survey is much larger (10 countries, approximately 1,000 respondents per country per survey, 6 survey waves). This is a difference in potential sample sizes of three orders of magnitude. Therefore, even where relationships are present in the data, the model using official macroeconomic variables is not likely to yield precise estimates, while the preferred model where all the variables used are derived from survey data can give more precise estimates. Finally, as argued by Ho (2001) (as cited in Desquilbet and Nenovsky, 2007, p.9) "human behaviour is an immediate source of a possible crisis" and we may assume that any such behaviour is reflected in residents' perceptions/expectations, and consequently actions. As noted by Jacobe (2002, p.2): "In economics, like politics, perceptions are often reality." He argued that investors' confidence will be reflected in investment, consumers' and employees' confidence and, hence, will result in changes in the real economy. Therefore, our preferred models are those in which subjective responses are used. Some additional reasons, related to empirical issues, for preferring the subjective attitudes about economic performance are explained in Section 4.5.

### 4.4 Descriptive analysis of the survey data

As noted in Section 4.3, the surveys from the Austrian National Bank contain questions related to the assessments of stability of the local currency and the euro, as well as the general economic sentiment. The surveys were conducted in ten countries, namely Albania, Bulgaria, Bosnia and Herzegovina, Croatia, Czech Republic, Hungary, Macedonia, Poland, Romania, and Serbia[39]. None of these countries is yet an EMU member and all are still using their local currencies. However, these countries are current or likely future EU members and are expected to adopt the euro at some point in the future. Eight survey waves are available, from fall 2007 to spring 2011[40]. Most of these surveys were conducted in April and May for the spring waves and October, November or December for the fall wave (months in which surveys were conducted are only indicated in the dataset from the 2008 fall wave, see Table A.4.1a in Appendix 4.1). For each survey, face-to-face interviews were conducted with approximately 1,000 respondents (which are different in each survey wave) per country, which makes a total of 80,000 observations. All regions were represented in all countries, except in Poland where the population of only the ten largest cities was sampled (regions and percentage of respondents per regions in countries are listed in Appendix 4.1d)[41]. In all countries the number of males and females interviewed is almost the same (see Table A.4.1b in Appendix 4.1). In all countries almost half of respondents are employed, with the rest being unemployed, retired or students. The respondents are broadly 'representative' of different countries' regions, genders, ages, level of education and employment status (see Table A.4.1a and Table A.4.1b in Appendix 4.1).

In the sample selection process the sampling weights[42] were not taken into account, but weight variables were created on a country-wave basis, by the data provider, by

[39] Changes in variables related to the economic sentiment, trust in currency, level of euroization and other survey questions between different countries and waves are regularly examined in different OeNB publications (descriptive statistics mostly).
[40] Surveys were conducted also in subsequent years. However, the latest survey made available by the Austrian National Bank for this research is the 2011 spring survey.
[41] Technical details are taken from the official Austrian National Bank website: http://www.oenb.at/en/geldp_volksw/zentral_osteuropa/Eurosurvey/Survey/survey.jsp (last accessed: 6/08/2012).
[42] Controlling for the sampling weights is needed in order to equalize the percentages of different age groups, gender, level of education, region and other relevant characteristics between the sample and population.

using various socio-demographic variables (Table A.4.1c in Appendix 4.1). Although the authorities usually provide information about the sampling weights, there is a debate in the literature on how and whether to use weights in econometric analysis. Minot (2009, p.36) argued that: "… virtually all random-sample surveys must use weights to make estimates that are valid for the whole population." Purdon and Pickering (2001, p.9) suggested that: "… weighted estimates, even with their increased standard errors, are *almost always* preferable to the unweighted estimates. There are, obviously, exceptions, but we would recommend that the weights are used by default." By applying weights, the bias is likely to be minimised, but the standard error of the estimator is likely to be increased (Purdon and Pickering, 2001). However, according to Cameron and Trivedi (2005) (as cited in Gashi, 2007, p.430), weighting is unnecessary "if interest lies in regressing (y) on (x), provided the conditional model for (y) given (x) is correctly specified and stratification is not on the dependent variable". In our model in this chapter the dependent variable is associated with a currency's stability and that, as well as monetary policy, is a national-level variable and should not depend on the region in which the surveys were conducted. However, since we are not sure about the model specification, both weighted and unweighted results will be presented in the empirical analysis. Moreover, as noted in Wooldridge (2002) and Cameron and Trivedi (2005) (as cited in Gashi, 2007, p.109), applying the sampling weights for descriptive statistics enables us to make inference about the population from the sample.

Two countries from the sample, Bosnia and Herzegovina and Bulgaria, have a CBA, which is thus an institutional arrangement affecting all the individuals from those two countries. One fifth of the respondents, 16,073 from all survey waves (8,073 from BH and 8,000 from Bulgaria), are from the countries with a CBA.

In order to generate initial insights about any differences, the responses related to the confidence and credibility of the monetary policy of respondents in the CBA countries and those in non-CBA countries are compared. Since the preferred specification contains a variable (trust in government) which is not available for the first three survey waves the number of observations is smaller (compared to the available sample), between 40,000 and 50,000, depending on the specification[43]. The descriptive statistics will therefore be based on this (smaller) sample. According to the descriptive statistics which are presented in Table 4.2 (printouts from Stata12 in Appendix 4.2a) answers to questions related to the assessment of the current and future stability of (and trust in) the local currency indicate higher trustworthiness in CBA compared to non-CBA countries. Moreover, almost double the percentage of respondents in a CBA compared to those from non-CBA countries expect their local currency to be stable against the euro in the next five years. This is as expected given the fixed exchange rate of the local currency against the euro under the CBA. According to the chi-squared distribution (chi2) test[44] these differences are statistically significant at all conventional levels of significance and we may conclude that it is likely that there is some relationship between the perceptions/expectations and the presence of a CBA (Appendix 4.2b).

Table 4.2: Answers to the questions of interest in CBA and non-CBA countries (in percentages of total respondents in particular group) (controlled for weights)

| Answers (in percent of Total/Non-CBA/CBA); weights included | **Currently, the [LOCAL CURRENCY] is a very stable and trustworthy currency** | | | **Over the next five years, the [LOCAL CURRENCY] will be very stable and trustworthy** | | | | **How do you think will the exchange rate of the [LOCAL CURRENCY (against the euro)] develop** | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Non-CBA | CBA | Total | Non-CBA | CBA | | Total | Non-CBA | CBA |
| Strongly agree | 3.9 | 3.0 | 7.9 | 3.0 | 2.4 | 5.7 | Lose value | 36.6 | 39.2 | 25.8 |
| Agree | 11.5 | 10.3 | 16.5 | 10.9 | 9.4 | 13.0 | Will stay the same | 34.0 | 28.9 | 55.4 |
| Somewhat agree | 23.2 | 22.9 | 24.1 | 23.0 | 23.3 | 21.9 | Gain value | 7.7 | 8.8 | 3.0 |
| Somewhat disagree | 20.9 | 22.0 | 16.3 | 20.5 | 21.3 | 17.2 | | | | |
| Disagree | 18.9 | 20.3 | 12.8 | 17.4 | 18.1 | 14.3 | | | | |
| Strongly disagree | 15.6 | 15.5 | 16.2 | 11.8 | 10.9 | 15.5 | | | | |
| Do not know | 5.1 | 5.0 | 5.4 | 12.7 | 13.1 | 11.2 | Do not know | 19.7 | 21.1 | 14.2 |
| No answer | 1.0 | 1.0 | 0.8 | 1.5 | 1.6 | 1.2 | No answer | 1.9 | 2.0 | 1.7 |

Since these are the answers to the questions which will be used as dependent variables and we are interested in the distribution of the responses, then the answers to these questions are further analysed (separately for non-CBA and CBA countries) in Figures 4.2 (a, b and c).

[43] The number of observations varies since different variables used contain different number of 'no answers' which are excluded from the estimation. However, this number is not large for any of independent variables (not larger than 3%) and therefore we assume that the exclusion of these answers will not bias the results.

[44] Beside the 'chi2' test, 'gamma' and 'taub' tests (whcih are test for statistical significance of differences) are also performed, since these have been suggested as more appropriate for testing association between ordinal variables (Torres, 2007). These tests generated the same results as the 'chi2' test.

Figure 4.2a: Perceptions about the local currency's stability in CBA and non-CBA countries

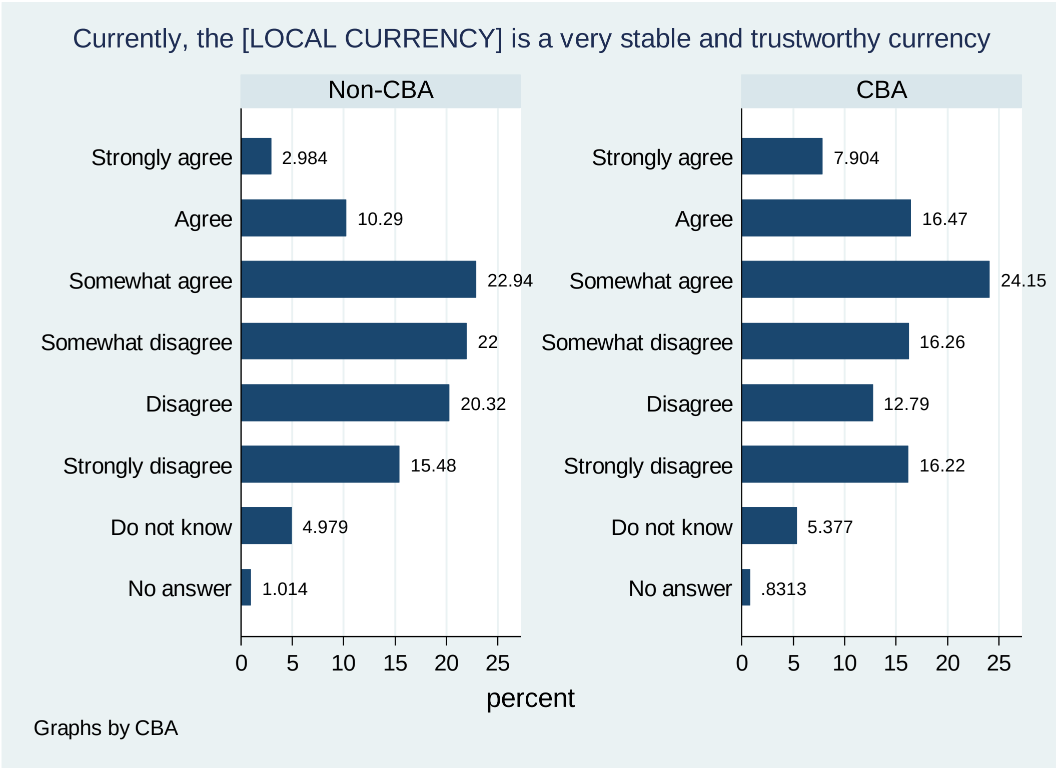



Figure 4.2b: Expectations about the local currency's stability in CBA and non-CBA countries

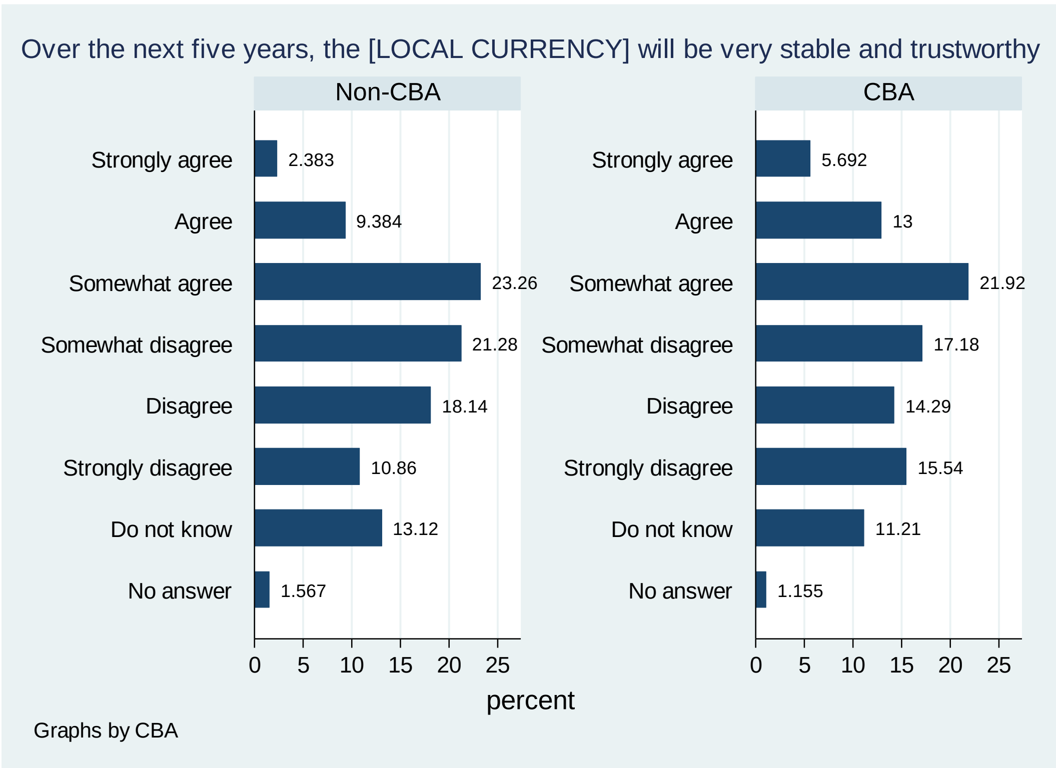
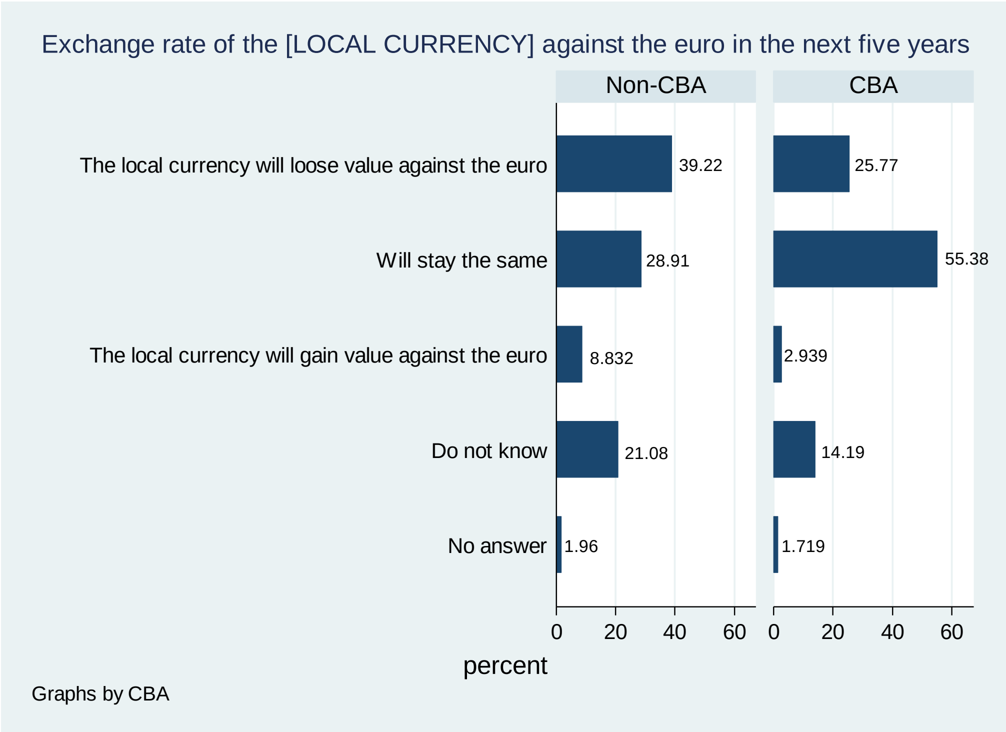


Figure 4.2c: Expectations about the exchange rate between the euro and local currency in CBA and non-CBA countries




Additionally, the answers about the perceptions and expectations of the stability of the local currency are compared with those for the question on the stability of the euro. Answers to the latter question are expected to be similar, since all sample countries' currencies are explicitly or implicitly related to the euro. Moreover, the answers to the questions about the local currency's stability and the euro stability are expected to be more similar in CBA countries since the local currency is fixed to the euro. According to the descriptive statistics presented in Table 4.3 (also see Appendix 4.2a) more people, in both groups of countries, trust in the stability of the euro than in the stability of their local currency. However, it does not appear to be consistent, especially in the CBA countries, that people expect both the euro to be more stable than their local currency and that the exchange rate between the local currency and the euro will stay the same. This might be explained by difference in the countries' 'brands'. Namely, in the context of the South Eastern European (SEE) countries, especially those with political and institutional weaknesses trust and confidence in anything domestic is by default lower than trust and confidence in something foreign. Consequently, even though many people are aware that the exchange rate between the local currency and the euro is fixed (and expect it to be fixed in the future) in the CBA countries they still may not have much confidence in their local currency.

Table 4.3: Perceptions and expectations about the stability of the local currency vs. the stability of the euro (controlled for weights)

| Answers (in percent of Total/Non-CBA/CBA); weights included | **Currently, the [LOCAL CURRENCY] is a very stable and trustworthy currency** | | | **The euro is a very stable and trustworthy currency** | | | **Over the next five years, the [LOCAL CURRENCY] will be very stable and trustworthy** | | | **Over the next five years, the euro will be very stable and trustworthy** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Non-CBA | CBA | Total | Non-CBA | CBA | Total | Non-CBA | CBA | Total | Non-CBA | CBA |
| Strongly agree | 4.0 | 3.3 | 6.8 | 12.0 | 10.4 | 18.7 | 3.1 | 2.6 | 5.0 | 10.9 | 9.2 | 18.0 |
| Agree | 12.4 | 11.4 | 16.6 | 23.4 | 22.8 | 26.2 | 10.8 | 10.4 | 12.8 | 22.7 | 22.2 | 25.1 |
| Somewhat agree | 24.3 | 24.4 | 24.0 | 29.0 | 30.5 | 22.5 | 23.7 | 24.0 | 22.2 | 27.3 | 28.6 | 21.8 |
| Somewhat disagree | 20.3 | 21.5 | 15.6 | 14.1 | 14.8 | 11.5 | 20.0 | 20.8 | 16.7 | 12.6 | 13.0 | 11.3 |
| Disagree | 18.5 | 19.3 | 14.8 | 8.5 | 8.5 | 7.0 | 16.9 | 17.1 | 15.8 | 7.4 | 7.5 | 6.6 |
| Strongly disagree | 14.4 | 14.0 | 16.0 | 4.7 | 4.3 | 6.3 | 11.0 | 10.1 | 14.9 | 4.0 | 3.6 | 5.4 |
| Do not know | 5.2 | 5.1 | 5.3 | 7.4 | 7.4 | 6.5 | 13.0 | 13.4 | 11.5 | 13.5 | 14.3 | 10.4 |
| No answer | 1.1 | 1.1 | 0.9 | 1.3 | 1.3 | 1.3 | 1.5 | 1.6 | 1.1 | 1.5 | 1.6 | 1.2 |

Although questions about the stability of the local currency and the euro are expected to be highly correlated, the correlation matrix does not indicate a high correlation between any of variables, except for the answers to questions about the current and future euro stability (correlation 0.67), which is to be expected (see Appendix 4.3). If we observe changes in the answers through waves it can be noticed that there has not been any significant change in the answers to question about the stability of the local currency over time (Appendix 4.2c).

Regarding economic sentiments, most people (82% in non-CBA and 87% in CBA countries) do not agree with the statement that the economic situation in their country is good. The percentages are lower (approximately 53% in non-CBA and 62% in CBA countries) when the expectations about the future economic situation in the country are observed (Figures 4.4a and 4.4b and Appendix 4.4). Regarding the trust in government/cabinet of ministers question, approximately 50% of respondents answered that they do not trust government and the answers are quite similar between CBA and non-CBA countries (Figure 4.4c). However, beside “do not know” answers there are also “neither trust nor distrust” answers with high percentage of respondents (approximately 20%) answering this in both groups of countries. Since the perception about the economic situation in a country and trust in government variables will be included as control variables, the distribution of these answers are presented in Figures 4.3a – 4.3c.

Figure 4.3a: Perceptions about the economic situation in CBA and non-CBA countries

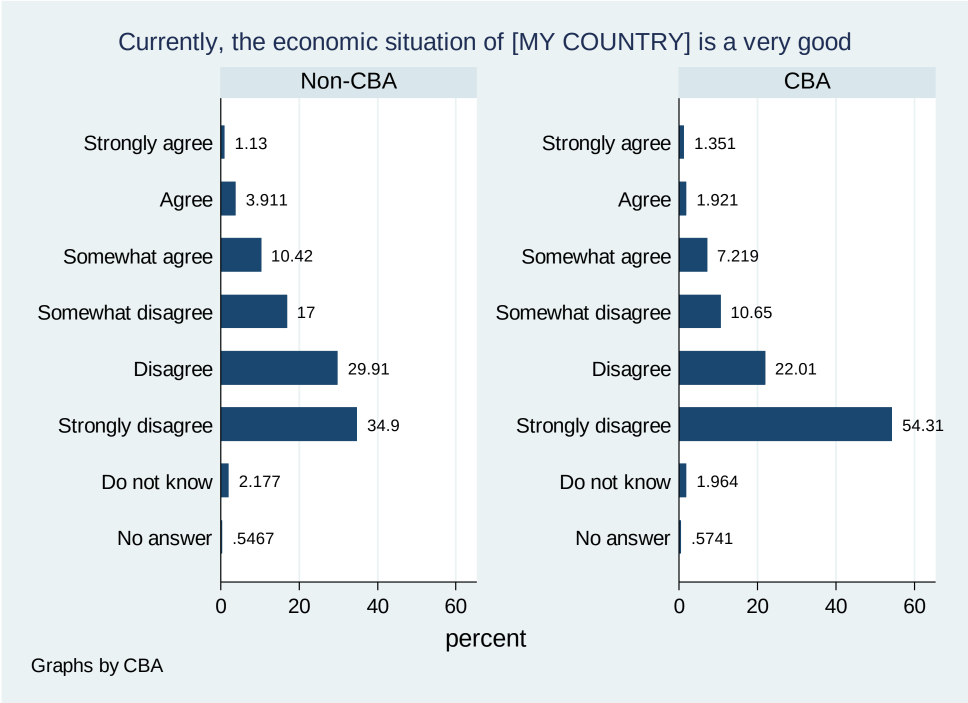



Figure 4.3b: Expectations about the economic situation in CBA and non-CBA countries

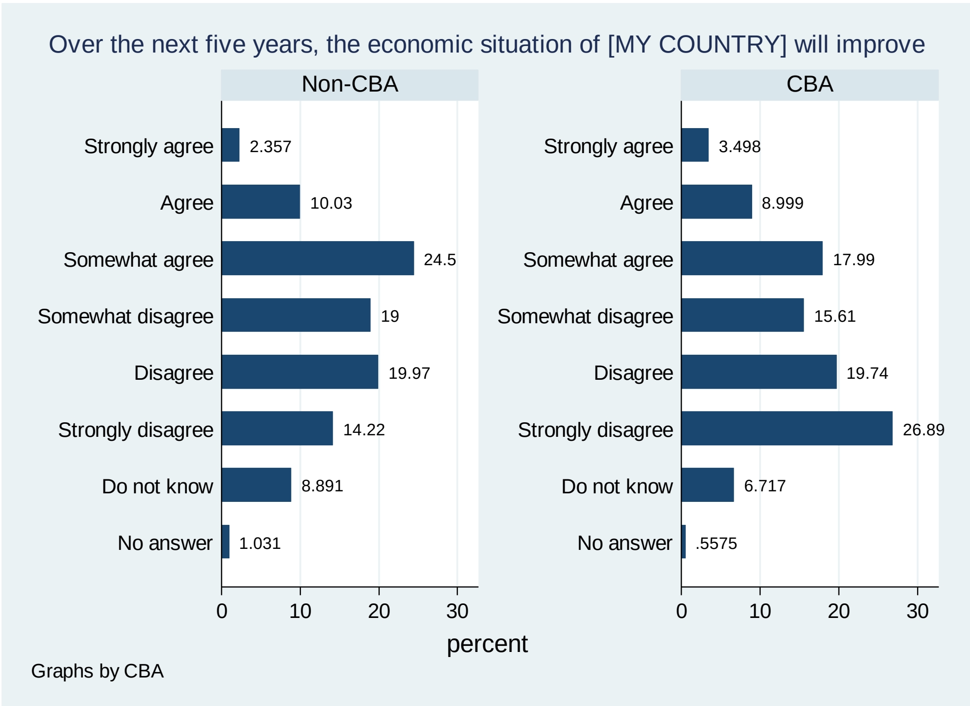
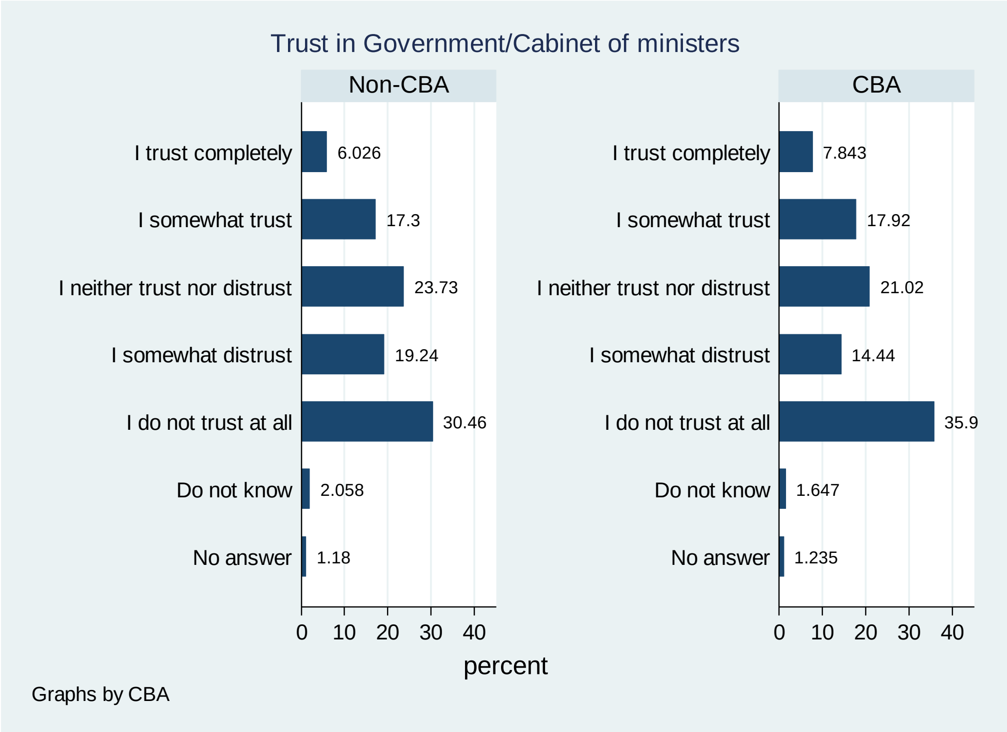


Figure 4.3c: Trust in government in CBA and non-CBA countries




There are a number of "do not know" answers to all questions in the surveys. Since these answers for the dependent variable cannot be rated/ordered and it is difficult to include them in the empirical analysis (this will be explained in Section 4.5.4) and in the main estimations these answers are excluded. It might be argued that by excluding these answers additional information is lost, though there are no more than 13 percent of these answers and the number of remaining observations is high. However, in the robustness check we will create a separate category for "do not know" answers and estimate a simplified model by multinomial probit in order to test for the potential bias.

The above descriptive statistics indicate that the perceptions and expectations about the local currency's stability are somewhat higher in CBA than in non-CBA countries and that the current and future economic situation are perceived/expected to be worse in CBA than non-CBA countries. This initial analysis provides useful insights into the data and identifies some initial trends and relations. However, to be able to give more precise inference a more formal empirical analysis needs to be conducted. Therefore, the effect of CBA on confidence/credibility (measured by the specified questions above) will be estimated, taking into account all the controls specified in Section 4.3.

### 4.5 Econometric analysis

The survey data available for this research includes surveys from fall wave 2007 to spring wave 2011. Since the respondents are different in different waves, we cannot use panel estimation. Therefore, in order to get as many observations as possible we utilise a pooled cross-section. This strategy is preferred over cross-section analysis as it produces higher variability in the data, since it has an ability to capture variation in both time and space dimensions simultaneously (Podesta, 2002). On the other hand, in pooled cross-sections there is a potential problem of errors being correlated across time (serial correlation) and countries (for additional advantages and disadvantages of using a pooled cross-section see Podesta, 2002). In our analysis we address these issues by the inclusion of time ($\gamma_t$) and country-group ($\lambda_{cd}$) dummy variables, since country-group dummies should remove any country-group specific, time invariant characteristics from the error term and wave dummies should remove all time-specific country(-group) invariant characteristics. Additionally, we report the equivalent of cluster-robust standard errors, which are inflated to take account of loss of information associated with error correlation[45] (this is discussed in more detail in Section 4.5.2).

Since we assume that the effect of CBA is also conditional on the level of trust in government (see Section 4.3) we use the smaller dataset, which includes the observations from spring 2009 to spring 2011 (in this dataset we lost 40 percent of all possible observations, since the question about the trust in government was not included in the first three survey waves). However, this variable is excluded and a model without it is estimated with the large dataset in a sensitivity analysis.

[45] As noted in UCLA notes: “Stata's survey routine calls the same routine used to create clustered robust standard errors.” http://statistics.ats.ucla.edu/stat/stata/library/cpsu.htm

### 4.5.1 The endogeneity issue

Since it can be argued that the perceptions/expectations about the local currency's stability and the economic situation in a country might be jointly determined then potential endogeneity, caused by simultaneity between those two variables, might be assumed. However, it can be argued that the expected effect of the local currency's stability on the economic situation is weaker than the expected effect of the economic situation on a local currency's stability, since the effect of currency stability on the economic situation is inconclusive (both on theoretical and empirical grounds, as elaborated in Chapter 5). In spite of the large number of studies investigating the effect of a currency's stability on real economy variables, such as trade, investment and output, there is no clear evidence of any systematic effect (for more details see Rose, 2011). Finally, it may be argued that simultaneity is not likely to be an issue between the perceptions/expectations of currency stability and the CBA, since there is no rationale for assuming that *current* perceptions/expectations about currency stability affects the likelihood of a CBA *being in operation/having a CBA* (in both BH and Bulgaria the decision concerning the introduction of a CBA was taken and implemented long before our sample period).

### 4.5.2 Survey design characteristics

In several recent studies the importance of controlling for survey design characteristics when using survey data in estimations has been emphasised (Chromy and Abeyasekera, 2005; Kreuter and Valliant, 2007; Pitblado, 2009). These studies argue the need to control for four features usually involved in sample surveys, which may have "potentially significant consequences for estimations" (Kreuter and Valliant, 2007, p.2). These features are: weights; stratification (stratum/strata); clustering (primary sampling units (PSUs)); and finite sample population (FSP). These can be controlled for by defining these features in the 'svyset' (available in Stata12) and specifying a 'svy' option before the estimation command. These details should be provided together with the dataset by the data provider, since these should be determined before the data is collected. However, due to differences in the sampling frames and approaches to sampling between the countries[46] it is not

[46] This became evident from the descriptions of sampling sent by the data provider.

possible to control for survey design (by using the 'svy' option). Moreover, the survey database only contains full data on weights. It does not contain data for the 'strata' variable and contains a primary sampling unit (PSU) variable that is incomplete and therefore cannot be used to control for the clustering effect, i.e. common unobservable features between individuals in the same PSU, which are not shared (at least, not to the same extent) with individuals in other PSUs – which would correspondingly adjusts standard errors. However, standard errors that control for clustering should be obtained, if clustering is present (Cameron and Trivedi, 2010). Alternatively, as suggested by Cameron and Trivedi (2010, p.175), "a conservative approach is to use non-survey methods and obtain standard errors that cluster on a variable that subsumes the PSUs, for example, a geographic regions such as a state". Therefore, we conduct inference using robust SEs clustered on country, as a locational variable, since in this analysis we are interested in the questions about the local currency stability and the answers are not expected to depend on regions or other location smaller than a country, since the same currency is used in a whole country and monetary policy is conducted at the state level. Pepper (2002), as explained in Cameron (2011), argued that the highest level at which correlation between respondents can be assumed should be chosen as the cluster. However, the question about the perceptions/expectations concerning the economic situation (which is used as the independent variable) might depend on the region of the respondent. Namely, those coming from less developed regions of the country are more likely to perceive/expect the economic situation as/to be worse than those who live in the capital city region where production and industry are more developed and the level of employment is usually higher. Therefore, we also estimated the specifications using a robust SEs clustered on region. Moreover, Nicholas and Schaffer (2007) argued that the cluster-robust standard error estimator converges to the true standard error as the number of clusters, not the number of observations, approaches infinity and that "at higher levels the number of clusters will be smaller, so the asymptotic results for the estimator are less likely to hold". Therefore, we will use both country and region as locational variable and present both results. Since quota sampling[47], in which the sample is chosen to be representative of the

[47] As noted in Saunders et al. (2009, p.235): "Quota sampling is entirely non-random and is normally used for interview surveys. It is based on the idea that your sample will represent the population, as the variability in your sample for various quota variables is the same as that in the population".

population, is applied only in Bulgaria, the *weights* are taken into account, since it enables us to apply estimates not only to a sample but also to the full population (Kreuter and Valliant, 2007, p.2). The main characteristics on which this variable is formed for each country and wave is noted in Appendix 4.1 (these details were provided by the data provider). However, since there is a debate in the literature on how and whether to use weights in econometric analysis, as noted in Section 4.4, both weighted and unweighted results are reported. As noted in Kreuter and Valliant (2007), we may expect an increase in standard errors after weighting.

Since the probit estimator will be used for all specifications, in order to discuss the results marginal effects have to be calculated. In Stata 11 (and later versions) a new command for calculating marginal effects, 'margins', has been introduced and this will next be discussed in more detail.

### 4.5.3 Marginal effects computed using the 'margins' command

*The difference between the marginal effects at the means and the average marginal effects*

The marginal effect of CBA is computed by using the 'margins' command, introduced in Stata11. Using this command, marginal effects can be estimated at the means of other variables (<u>m</u>arginal <u>e</u>ffect at the <u>m</u>eans, MEMs). Alternatively, with other variables kept as observed, the predicted probabilities for each individual are calculated: first as if subject to a specific state and, second, as if not subject to a specific state, with the mean difference being the <u>a</u>verage <u>m</u>arginal <u>e</u>ffect (AME). The former could be produced by both old 'mfx'[48] and new 'margins'[49] command, while the latter is only possible within the 'margins' command. However, since the MEMs are usually argued to be inappropriate for some variables (for example, there

[48] The "mfx' command "numerically calculates the marginal effects or the elasticities after estimation". However, "mfx has been superseded by margins. mfx does not support factor variables and will often fail if you do not run your estimation command under version control, with the version set to less than 11." (Stata11, help file)

[49] "Margins are statistics calculated from predictions of a previously fit model at fixed values of some covariates and averaging or otherwise integrating over the remaining covariates. The margins command estimates margins of responses for specified values of covariates and presents the results as a table." (Stata 12, help file)

is nobody who is 52.5% female) the AME will be used. Using the AME we are estimating the marginal effect of a CBA by creating two hypothetical populations: one in which everybody in the sample are assumed to come from a country with a CBA (CBA=1) and another in which nobody in the sample is assumed to come from a country with a CBA (CBA=0), having the exact same values for the other independent variables in the model. As elaborated by Williams (2012), the AME could be explained as follows.

- Go to the first case and treat the person as though his/her country had a CBA (i.e. the CBA dummy variable is set to one and multiplied by its estimated effect), regardless of the actual regime used in a country from which the person comes. The predicted probability that this person (if his/her country had a CBA) would perceive the local currency as stable and trustworthy is computed;
- Calculate the predicted probability that this person would perceive the local currency as stable and trustworthy treating this person as though (s)he was coming from the country without a CBA (i.e. the CBA dummy variable is set to zero);
- The difference in the two probabilities is the marginal effect for that case;
- The process is repeated for every case/person in the sample;
- The average of all the marginal effects is computed and this is called the average marginal effect (AME).

Marginal effects at the means, on the other hand, are showing us the probability of perceiving the local currency as stable and trustworthy if we had two otherwise average (values of all other variables set at average) individuals, one from country with a CBA and another from non-CBA country. Besides the critique that MEMs use impossible values for some variables, as noted above, it is also criticised for using a set of values that (probably) no real person actually has (Williams, 2012). As noted in the Stata base reference manual 2012 (p.1036), the prediction at the average of the covariates, given by the margins specified at the mean, is the expected probability of a person with average characteristics. On the other hand, the average of the predictions, given by the average margins (or the 'as observed' option of marginal effect), is the average of the probability among actual persons in the data, in two counterfactuals. Choice between MEMs and AME is not a matter of right or wrong. With MEMs we are dealing with imaginary people (a person with average characteristics is unlikely to exist in the real world) in actual states and with AME we are dealing with actual people in imaginary (counterfactual) states.

*Marginal effects of the interaction terms in a non-linear model*

In recent studies it has been emphasised that the marginal effects calculated with the standard ‘mfx’ command, after using a non-linear estimator in which the interaction terms are included, are likely to be incorrect. This refers not only to their magnitude but also to the sign and significance of the coefficients on variables that are part of the interaction terms as well. The recently introduced command ‘margins’ does not even report the marginal effects of the interaction terms in non-linear models, since, as stated in Williams (2012, p.329): “The value of the interaction term cannot change independently of the values of the component terms, so you cannot estimate a separate effect for the interaction”. Since we are not interested in the marginal effects of the interaction terms, but rather on the effect of CBA conditional on the perceptions/expectations about the economic situation and the level of trust in government, we estimate the effect of CBA at different perceptions/expectations of economic performance and levels of trust in government. The ‘margins’ command takes into account that a CBA is also part of the interaction terms when these are included in the regression. Therefore, we prefer models with the interaction terms and rely on the average marginal effect of the CBA variable. However, usage of the average marginal effect is also argued to “obscure differences in effects across cases” (Williams, 2012, p. 326). Therefore, we are using a marginal effect at representative values (MER), as Williams (2012, p.330) suggests: “Presenting MERs can make results easier to interpret and provide a better feel for how the effects of variables differ across cases.”, since it allows us to observe the marginal effect of one variable at different levels of the other variable(s). By providing a visual display of results, the ‘marginsplot’ command (introduced in Stata12) makes it easier to observe the effect of one variable conditional on the change of the other variable(s). However, different values/categories are only chosen for the variables of greatest interest (perceptions/expectations about the economic situation and trust in government), not for all variables, since this would be time and space consuming and since these are not of primary interest for this study.

Ai and Norton (2003) suggested the usage of the 'inteff' command[50], which enables the estimation of marginal effects of the interaction term for each observation. As noted in Ai and Norton (2003, p.129) "the interaction effect requires computing the cross derivative or cross difference" since "the magnitude of the interaction effect depends on all the covariates in the model". Consequently, it can have different signs for different observations "making simple summary measures of the interaction effect difficult". Therefore, Ai and Norton suggested estimation of the marginal effects of interaction term for each observation separately by using the 'inteff' command after estimating the non-linear model with an interaction term. However, this approach is not applied here, since no more than one interaction term can be estimated by 'inteff', while there are more interaction terms in our specification. Moreover, Greene (2010) suggests usage of graphical devices that can be more informative than the test statistics suggested by Ai and Norton (2003). In private correspondence, Williams also suggests that the 'margins' approach (now integrated in Stata) is much easier and more sensible. Finally, it is not possible and makes no sense to represent/summarise the marginal effect of interaction term with one number, since "they are just too variable" (Buis, 2011), which also complicates comparisons between different models.

### 4.5.4 Estimation of the 'confidence' and 'credibility' models as seemingly unrelated regressions

As argued in Section 4.3, the two models can be observed as a part of a wider system. These two models have some common observed factors (CBA, trust in government, and socio-demographic variables) and we may assume that there are some common unobserved determinants as well, such as some other respondents' characteristics which are not controlled for (e.g. income, political orientation). We therefore estimate the two models as a system by using a seemingly unrelated regression (SUR). SUR allows inclusion of the equation-specific variables as well, which are in our models perceptions/expectations about the local currency's stability, the euro and economic situation. By using a SUR the unobserved factors are allowed

[50] 'inteff' is a command for „computing interaction effects and standard errors in logit and probit models" (Stata12, help file).

to be correlated. This correlation is indicated in the SUR results as the 'rho' (ρ)[51] (see Equations 4.1). The motivation behind using a SUR is to gain efficiency in estimation by combining information from different equations (which is one of the reasons for using SUR emphasised in Moon and Perron, 2006).

Answers to the questions "*Currently, the [local currency] is a very stable and trustworthy currency*" and "*Over the next five years, the [local currency] will be very stable and trustworthy currency*" are used as the dependent variables ($CSagree_i$, $ExpCSagree_i$, respectively). There are eight answers offered, as noted in Table 4.1. Since the interpretation of the results when the dependent variable includes many scales is complicated (see Long and Freese, 2001; Wooldridge, 2002), especially when interaction terms are included in the regression (Williams, 2012), the answers are aggregated into two groups: "agree" (which combines the answers "strongly agree", "agree", "somewhat agree"), and "disagree" (which combines the answers "somewhat disagree", "disagree", "strongly disagree"), the latter being the base category. In the analysis there is the problem of treating "do not know" and no answers, since those cannot be rated or aggregated with other answers. One common practice is to drop these observations. Wang (1997, p.220) argued that "there is a potentially serious cost in terms of lost information" and that "sample selection bias may be introduced if DK [do not know] respondents are systematically different from the rest of the respondents". Wooldridge (2002, p.557) argued that dropping the observations with no answers may result in biased estimators. However, in the preferred estimation we will exclude these answers since their inclusion would require usage of a multinomial probit, and 'margins' command which has to be used in order to interpret the results of models with interaction terms (as noted in Section 4.5.3) is more difficult to use with multiple-outcome commands (see Williams, 2012). Moreover, we prefer the seemingly unrelated regression estimator which cannot be used with multiple-outcome command. In order to test for the potential bias we will create a separate category for "do now know" answers and estimate multinomial probit for the separate equations (4.1a and 4.1b), but without the interaction term. Additionally, separate probit models without the interaction terms will also be estimated and the results compared with those from the multinomial

[51] 'Rho' is the showing the (significance and the sign of) correlation between unobservable factors in the equations.

probits. In all specifications the dummy variable which is 1 for countries with a CBA and 0 otherwise (CBA) and the variable for current and future trust in the euro ($ECSagree_i$ and $ExpECSagree_i$), for which the answers are aggregated in "agree" and "disagree" groups (the same way as for the dependent variable), are included. We control for the macroeconomic performance of country by including the answers to questions regarding the current and future economic situation in a country ($ES_i$, $ExpES_i$). Seven answers are possible, rated from "strongly agree" to "strongly disagree", plus "do not know" answers, ("strongly agree" is used as the base category). Moreover, we assume that the effect of CBA is also conditional on different perceptions and expectations about the economic situation. Accordingly, interaction terms between those two variables (in the first model between perceptions and CBA and in the second between expectations and CBA) are included in the models to be estimated. As elaborated in Section 4.3, we consider trust in government to be a potentially important determinant of the perceptions about the local currency's stability, especially in European transition countries where political issues are more likely to influence peoples' perceptions and expectations. Moreover, trust in economic institutions has been argued to be "particularly important" at times of crisis (Walti, 2012, p.594). Hence, we include the 'trust in government' variable in the analysis ($Gtrust_i$). Moreover, we assume that the effect of CBA is also conditional on the level of trust in government and, therefore, the interaction term between those two variables are included in the models estimated. The trust in government variable has five categories of answers (from 1 to 5, respectively: "I trust completely", "I somewhat trust", "I neither trust nor distrust", "I somewhat distrust" and "I do not trust at all", plus "do know answers" (the first category is used as a base). In all estimations we control for the respondents' socio-demographic characteristics, namely age ($h\_age1_i$, $h\_age2_i$), gender (h_female), level of education ($h\_edu\_high_i$, $\alpha_{12}edu\_medium_i$) and employment status ($h\_retired_i$, $h\_student_i$, $h\_unemployed_i$), as well as for the time ($\gamma_t$) and country-group dummy ($\lambda_{cd}$) variables. These variables are not reported in the tables with results due to space limitations, but are reported in Appendices. There are four categories of age: 1-18; 19-34; 35-54 (h_age1); and 55+ (h_age2)). We argue that respondents younger than 19 are unlikely to have much knowledge about their currency and these respondents are excluded from the analysis. The base category for age is thus the group of respondents from age 19 to 34; for gender the base category is 'male'; for education there are three categories (‘low’, ‘medium’ and ‘high’ education) and the ‘low’ education category is used as the base category; for employment status there are four categories (‘retired’, ‘student’, ‘unemployed’ and ‘employee’) and ‘employee’ is used as the base. The SUR specification is given below (Equations 4.1a, 4.1b and 4.1c).

$$CSagree_i = \alpha_0{}^{52} + \alpha_1 CBA_c + \alpha_3 ECSagree_i + \alpha_4 ES_i + \alpha_5 CBA_c \cdot ES_i + \alpha_6 Gtrust_i + \alpha_7 CBA_c \cdot Gtrust_i + \alpha_8 h\_age1_i + \alpha_9 h\_age2_i + \alpha_{10} h\ \_female_i + \alpha_{11} h\_edu\_high_i + \alpha_{12} h\_edu\_medium_i + \alpha_{13} h\_retired_i + \alpha_{14} h\_student_i + \alpha_{15} h\_unemployed_i + \gamma_t + \lambda_{cd} + \varepsilon_{1i} \quad (4.1a)$$

$$ExpCSagree_i = \beta_0 + \beta_1 CBA_c + \beta_2 ExpECSagree_i + \beta_3 ExpES_i + \alpha_4 CBA_c \cdot ExpES_i + \alpha_5 Gtrust_i + \alpha_6 CBA_c \cdot Gtrust_i + \beta_7 h\_age1_i + \beta_8 h\_age2_i + \beta_9 h\ \_female_i + \beta_{10} h\_edu\_high_i + \beta_{11} h\_edu\_medium_i + \beta_{12} h\_retired_i + \beta_{13} h\_student_i + \beta_{14} h\_unemployed_i + \gamma_t + \lambda_{cd} + \varepsilon_{2i} \quad (4.1b)$$

$$\rho = Cov(\varepsilon_{1i,}\ \varepsilon_{2i}) \quad (4.1c)$$

The estimator used is biprobit, which fits maximum-likelihood two-equation probit models. We use robust SEs clustered on country and region and present both sets of results. Additionally, weighted and unweighted results are also presented. Since the results from the biprobit estimation are not indicative when interaction terms are included in the model (see Section 4.5.3) the marginal effects are calculated and reported. Marginal effects are given for the probability of both perceptions and expectations being equal to 1, which is a high confidence/trust category in both cases (Table 4.3, Appendix 4.5 and Appendix 4.7). Marginal effects take into account the correlation between the models and are consequently slightly different for all variables, compared to the results of the separately estimated models, since we are observing the effects on the combined probability of having a high current and future confidence in the local currency’s stability. The SUR results indicate that the unobserved factors are significantly and positively correlated and moving both perceptions and expectations about the local currency’s stability in the same direction

[52] In all equations coefficients (α, β, γ etc.) are the estimates.

(this is indicated by the positive ‘rho’ coefficient and the small standard error on ‘rho’, see Appendix 4.5 and 4.7). This means that if unobservable factors are increasing the probability of the currency being perceived as currently stable, they are also increasing the probability of the local currency being expected to be stable in the future. The highly significant correlation between the unobserved factors supports the usage of SUR and, therefore, this is the preferred estimator. Although the interpretation of these combined marginal effects is complicated, some general findings, can be provided:

-The effect of the CBA on the combined probability of high current and future confidence in the local currency is significant and positive. The average marginal effect for CBA is 0.142, meaning that, on average, if the individuals are coming from is a CBA country then they are 14.2 percentage points more likely to perceive/expect local currency to be stable than are individuals coming from a countries with some other regime. As noted in Section 4.5.3 these implications are based on the comparison of two hypothetical populations calculated on the whole sample (all countries from the sample are considered in the counterfactuals). It should be noted that the period observed is a period of crisis (2009-2011), which is implying that the credibility of CBA in the ‘bad times’ is not undermined (as suggested by some authors, for example Drazen and Masson, 1994; Feuerstein and Grimm, 2006; Castren et al., 2010; see Section 4.3). In order to assess the impact of a CBA separately for CBA and non-CBA subsamples the marginal effects are calculated separately for these subsamples. According to these results, the effect of CBA is positive and significant in both subsamples (Appendix 4.5f). The effect is somewhat higher in CBA countries indicating that the countries that actually had a CBA benefited from it more than the countries with other regimes would have benefited if they had had a CBA.

- The weaker the perceptions/expectations about the economic situation in a country the lower the probability of high current and future confidence in the local currency. Those that somewhat disagree, disagree and strongly disagree that the economic situation is good are respectively 9.6, 12.9 and 16.7 percentage points less likely to perceive/expect the local currency as/to be stable than those who strongly agree that the economic situation in a country is good. Similarly, those that somewhat disagree, disagree and strongly disagree that the economic situation in a country will improve are respectively 11.5, 16.2 and 19.1 percentage points less likely to perceive/expect the local currency as/to be stable than those who strongly agree that the economic situation in a country will improve.

- High current and future confidence in the euro (compared to having low confidence) positively affects the probability of high current and future confidence in the local currency. Those that trust in the current and future stability of the euro are, respectively, 6.9 and 5.8 percentage points more likely to perceive and expect their local currency to be stable than those who do not perceive/expect the euro to be stable. This is expected, since all countries from the sample are current or likely future EU members and their currencies are directly or indirectly connected to the euro.

- Regarding the effect of the trust in government variable, the results imply that, as expected, the lower is trust the larger is the negative effect it has on the favourable perceptions and expectations about the local currency's stability. Namely, those who somewhat distrust and totally distrust government are 11.5 and 13.8 percent less likely to perceive/expect current and future stability of the local currency than those who highly trust their government.

These results are highly significant and consistent over the different specifications estimated[53].

In order to investigate conditionality between CBA, trust in government and CBA and the economic situation the marginal effects of CBA conditional on level of trust and economic state are estimated by calculating the marginal effects at representative values (MER) (Appendices 4.5 c, 4.5d and 4.5e). Nagler (1991) and Brambor et al. (2006) argued that "Any finding of interaction from a model without a product term... is an 'artefact of the methodology'" and "is substantively meaningless" (as cited in Berry et al., 2010, p.249). However, the effect of the interaction terms cannot be seen separately from the estimates of the variables included in the interaction terms in the marginal effect results (as explained in Section 4.5.3). This conditionality will be presented by using 'marginsplot' in Figures 4.4a, 4.4b and 4.4c. The marginal effects, calculated after the estimation of the system by using the 'biprobit' estimator, are presented in Table 4.4.

[53] The significance of the difference between the effect of different groups/levels of trust in government and perceptions/expectations about the economic situation in a country is also tested by using the 'contrast' command and differences between all the groups, except between the first and the second one is significant (see Appendix 4.1g).

Table 4.4: SUR results - Estimation of the 'credibility' model (as specified in Equation 4.1 (number of observations: 37,908)

| **Questions used for the dependent variable: "Currently, the local currency is very stable and trustworthy?" and "Over the next five years, the [LOCAL CURRENCY] will be very stable and trustworthy"** Dependent variable: probability of both questions being equal to 1 (answers: "Strongly agree", "Agree" and "Somewhat agree") as opposed to 0 (answers: "Strongly disagree", "Disagree" and "Somewhat disagree") | **Marginal effects; clustered on country** unweighted | weighted | **Marginal effects; clustered on region** unweighted | weighted |
|---|---|---|---|---|
| **CBA** 1=CBA is implemented *Base category: CBA not implemented* | 0.137* (0.0792) | 0.142* (0.0768) | 0.137*** (0.0454) | 0.142*** (0.0440) |
| **Gtrust2** Trust in Government: "I somewhat trust" | -0.0184 (0.0160) | -0.0131 (0.0160) | -0.0184 (0.0162) | -0.0131 (0.0168) |
| **Gtrust3** Trust in Government: "I neither trust nor distrust" | -0.0807*** (0.0261) | -0.0759*** (0.0248) | -0.0807*** (0.0187) | -0.0759*** (0.0185) |
| **Gtrust4** Trust in Government: "I somewhat distrust" | -0.119*** (0.0315) | -0.115*** (0.0307) | -0.119*** (0.0205) | -0.115*** (0.0206) |
| **Gtrust5** Trust in Government: "I do not trust at all" | -0.142*** (0.0289) | -0.138*** (0.0278) | -0.142*** (0.0179) | -0.138*** (0.0175) |
| **Gtrustdnk** Trust in Government: "Do not know" *Base category:Trust in Government:"I trust completely"* | -0.152*** (0.0356) | -0.152*** (0.0381) | -0.152*** (0.0278) | -0.152*** (0.0271) |
| **ECSagree** Euro currently stable; 1="Strongly agree", "Agree" and "Somewhat agree" *Base category: "Strongly disagree", "Disagree" and "Somewhat disagree"* | 0.0689*** (0.0135) | 0.0695*** (0.0146) | 0.0689*** (0.00750) | 0.0695*** (0.00793) |
| Current economic situation in a country is very good: | | | | |
| **ES2** "Agree" | -0.0101 (0.00712) | -0.00983 (0.00636) | -0.0101 (0.00817) | -0.00983 (0.00789) |
| **ES3** "Somewhat agree" | -0.0410*** (0.0103) | -0.0421*** (0.0102) | -0.0410*** (0.00798) | -0.0421*** (0.00782) |
| **ES4** "Somewhat disagree" | -0.0953*** (0.0123) | -0.0966*** (0.0114) | -0.0953*** (0.00835) | -0.0966*** (0.00826) |
| **ES5** "Disagree" | -0.126*** (0.0161) | -0.129*** (0.0151) | -0.126*** (0.00910) | -0.129*** (0.00882) |
| **ES6** "Strongly disagree" | -0.164*** (0.0168) | -0.167*** (0.0154) | -0.164*** (0.00978) | -0.167*** (0.00941) |
| **Esdnk** "Do not know" *Base category: "Strongly Agree"* | -0.115*** (0.0176) | -0.118*** (0.0192) | -0.115*** (0.0182) | -0.118*** (0.0191) |
| **ExpECSagree** Future euro stability; 1="Strongly agree", "Agree" and "Somewhat agree" *Base category: "Strongly disagree", "Disagree" and "Somewhat disagree"* | 0.0596*** (0.00979) | 0.0581*** (0.00958) | 0.0596*** (0.00604) | 0.0581*** (0.00592) |
| Future economic situation in a country is very good: | | | | |
| **ExpES2** "Agree" | -0.0170*** (0.00517) | -0.0151*** (0.00525) | -0.0170*** (0.00509) | -0.0151*** (0.00505) |
| **ExpES3** "Somewhat agree" | -0.0424*** (0.00692) | -0.0398*** (0.00698) | -0.0424*** (0.00621) | -0.0398*** (0.00637) |
| **ExpES4** "Somewhat disagree" | -0.116*** (0.00670) | -0.115*** (0.00664) | -0.116*** (0.00656) | -0.115*** (0.00657) |
| **ExpES5** "Disagree" | -0.166*** (0.00848) | -0.162*** (0.00816) | -0.166*** (0.00660) | -0.162*** (0.00653) |
| **ExpES6** "Strongly disagree" | -0.193*** (0.00887) | -0.191*** (0.00812) | -0.193*** (0.00718) | -0.191*** (0.00734) |
| **ExpEsdnk** "Do not know" *Base category: "Strongly Agree"* | -0.116*** (0.00595) | -0.116*** (0.00587) | -0.116*** (0.0114) | -0.116*** (0.0118) |

Robust standard errors (clustered on country and region) in parentheses; *** p<0.01, ** p<0.05, * p<0.1
Note: The results presented in this table are only an extract from the full results reported in Appendices
Note: The marginal effects calculated after the biprobit SUR estimation are reported

As noted in Section 4.5.3, the effect of the interaction term cannot be seen from the 'margins' results. Therefore, the marginal effect of CBA at different levels of variables used in interaction terms will be separately assessed and presented in figures produced by the 'marginsplot' in Stata12. Figures 4.4a - 4.4c indicate the effect of CBA conditional on the level of trust in government and perceptions/expectations about the economic situation.

Figure 4.4a: The average marginal effect of CBA on the probability of high current confidence and expectations about local currency stability conditional on the level of trust in government

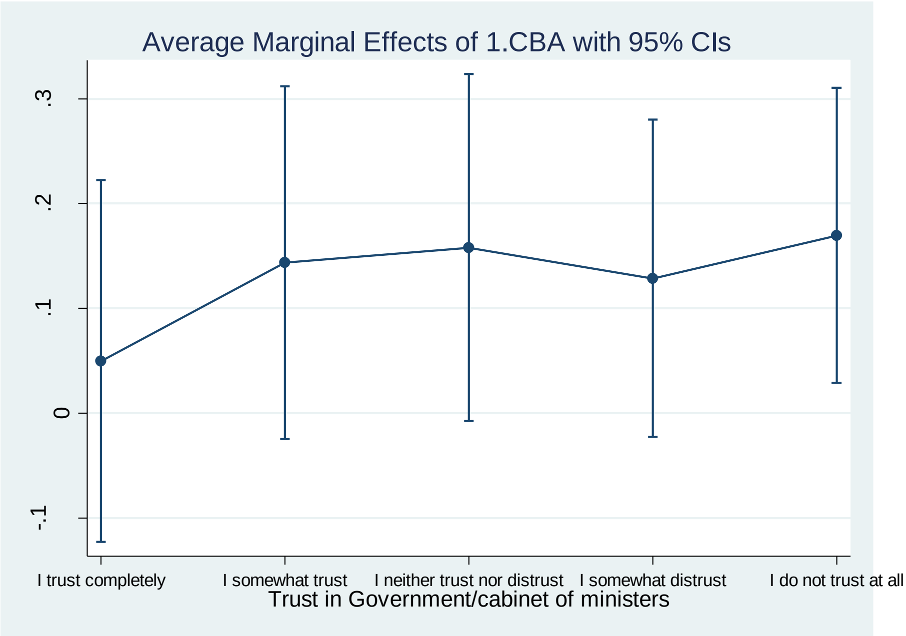


Figure 4.4b: The average marginal effect of CBA on the probability of high current confidence and expectations about local currency stability conditional on perceptions about current economic situation

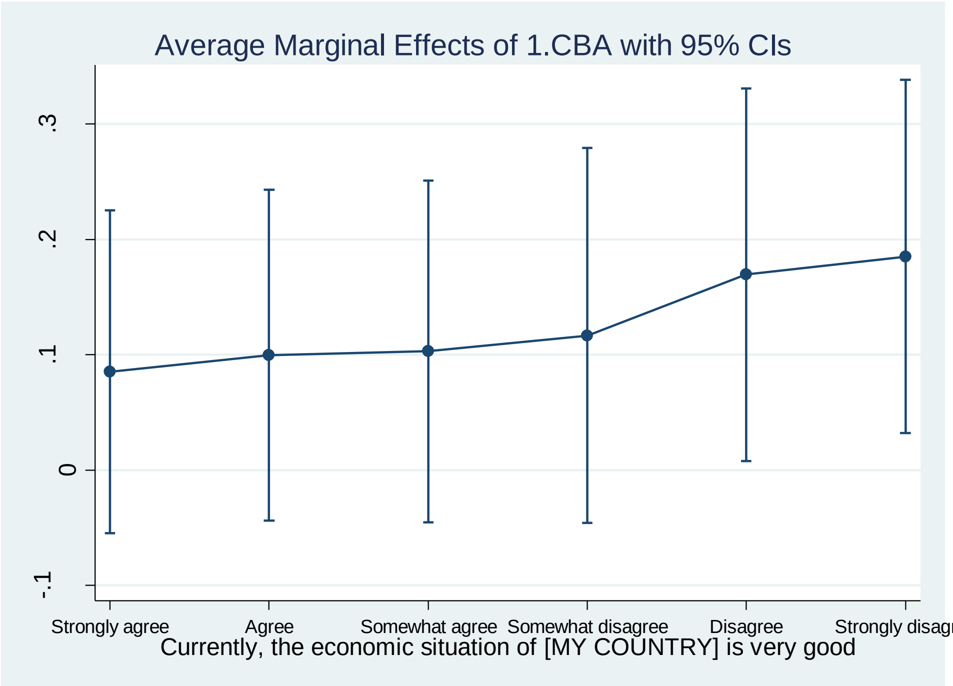
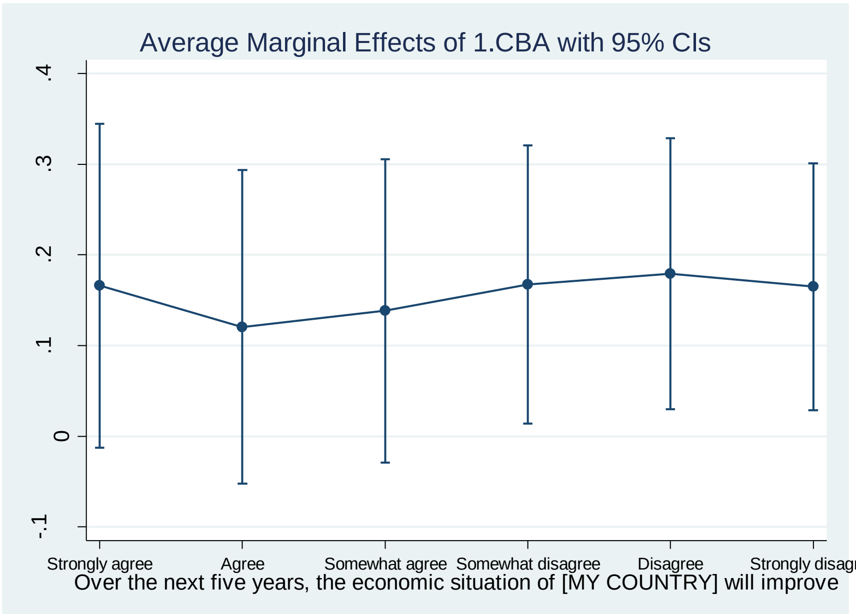



Figure 4.4c: The average marginal effect of CBA on the probability of high current confidence and expectations about local currency stability conditional on expectations about future economic improvement




Before interpreting these figures the significance of differences in the CBA effect between different levels of other variables (from the interaction terms) should be tested (Table 4.5). Mitchell (2012, p.204) notes that "overlap (or lack of overlap) of confidence intervals between groups cannot be used to draw conclusions about the significance of the difference between groups" the 'contrast' command (which is calculating the difference between the marginal effects of one variable at different levels of the other variable) is used to test for the significance of the difference in the effect of CBA at different levels of the other variable (economic situation and trust in government).

Table 4.5: The effect of having a CBA compared to not having a CBA on perceptions/expectations about the local currency stability at different levels of trust in government, perceptions and expectations about the economic situation

| **Trust in government:** | Contrast |
|---|---|
| 'Somewhat trust' compared to 'trust completely' | 0.094*** |
| 'Neither trust nor distrust' compared to 'trust completely' | 0.108*** |
| 'Somewhat distrust' compared to 'trust completely' | 0.079* |
| 'Do not trust at all' compared to 'trust completely' | 0.12*** |

| **Perceptions about the current economic situation good:** | Contrast |
|---|---|
| 'Agree' compared to 'strongly agree' | 0.014 |
| 'Somewhat agree' compared to 'strongly agree' | 0.018 |
| 'Somewhat disagree' compared to 'strongly agree' | 0.14 |
| 'Disagree' compared to 'strongly agree' | 0.084*** |
| 'Strongly disagree' compared to 'strongly agree' | 0.099*** |

| **Future economic situation will improve:** | Contrast |
|---|---|
| 'Agree' compared to 'strongly agree' | -0.045*** |
| 'Somewhat agree' compared to 'strongly agree' | -0.027* |
| 'Somewhat disagree' compared to 'strongly agree' | 0.001 |
| 'Disagree' compared to 'strongly agree' | 0.013 |
| 'Strongly disagree' compared to 'strongly agree' | -0.001 |

The test for the significance of the differences in the size of effect of CBA between different levels of trust in government indicates that differences between every group and the base category are significant. The effect is increasing as we move from high trust to high distrust (with an exception of 'somewhat agree' category, although the effect for this difference is significant only at 10 percent level) (Appendix 4.5g). The results suggest that the effect of a CBA on perceptions/expectations about the local currency is 12 percentage points higher for those who do not trust at all compared to those who trust government completely. The test for the significance of the differences in the size of the effect of CBA between different perceptions about the economic situation indicates the significance between the effect at all 'bad' (categories of) perceptions about the economic situation in a country compared with 'the best' (category of) perceptions (Appendix 4.5g) . According to comparison of the marginal effects (which are calculated by 'contrast' command) of a CBA for the 'disagree' and 'strongly disagree' compared to 'strongly agree' answers to the question about the economic situation in a country indicate that the effect is 8.4 (for 'disagree') and 9.9 (for 'strongly disagree') percentage points higher (compared to 'strongly agree'). Finally, the effect of a CBA is calculated at different levels of expectations about the economic situation. Only the differences between the 'agree' and 'somewhat agree' category (at the 10% level of significance for the latter) compared to strongly agree category are significant and negative. However, the differences of the effect of a CBA between 'disagree' and 'agree' categories are not significant and therefore we can conclude that the effect of a CBA does not differ between those with pessimistic (compared to those with optimistic) expectations about the future economic situation, when estimated as seemingly unrelated regression (together with perceptions).

According to the Wald and likelihood-ratio tests the variables included in the model are jointly significant at all conventional confidence levels (Appendix 4.6). According to the correlation matrix there is no indication of a high correlation between the variables used (Appendix 4.3).

The results from the preferred model specification indicate that none of the socio-demographic variables proved significant. Only the high education variable is significant and positive when the unweighted, clustered on country, results are observed. Due to space limitations these results are not presented here but are available in the Appendices. All time dummy variables are significant (except the one for the wave fall 2009, when country is used as cluster) and indicate that the perceptions/expectations about the local currency became more stable after spring 2009 (which is the first year in the preferred dataset and the omitted category). This is consistent with gradual increase in stability after the beginning of the global financial crisis. Moreover, in the larger dataset (which is used as a robustness check) where spring 2007 is used as the base period (Appendix 4.11) the only significant time dummy, after controlling for survey design, is for spring 2009, which is negative. This also suggests that the two sets of results are consistent in indicating that early 2009 was a particularly unstable period.

*Sensitivity analyses*

Since in some studies it is emphasised that the financial situation in a country may also affect the perceptions about the local currency's stability, a variable for perceptions about banks' and financial stability is included in the preferred model, for the robustness check. The results for the variables included both in this and in the preferred specification are very similar. The estimates on the financial stability variable indicate that, as expected, the worse the perceptions about the financial stability in a country the more pessimistic are perceptions and expectations about the current and future stability of the currency (result column 1 in Table 4.6a and 4.6b, Appendix 4.8). The CBA effect is again positive and highly significant. However, these results are not preferred, since: there is an issue of endogeneity (simultaneity) between the perceptions about the local currency's stability and the local financial stability and there is no strong/clear theory suggesting the inclusion of a financial stability control. Next, perceptions and one-year expectations regarding the financial situation of a household are controlled for (results column 2 in Table 4.6a and 4.4b, Appendix 4.9). The results again suggest a significant and positive effect of a CBA. Other results are also very similar to the preferred results in Table 4.4. Additionally, the results suggest that the lower the perceptions/expectations about the financial situation of a household the higher the negative effect on perceptions/expectations about the local currency stability will be.

Since we had to exclude all observations from the first three survey waves, as one of the questions of interest, namely, trust in government, was not included in these waves, we now estimate the model without this variable for the large dataset (respondents from all survey waves are included in the estimation) (column 3 in Table 4.6a, Appendix 4.10). The results again suggest positive and significant effects of the CBA and the other results do not change a lot.

Next, we estimate the model without using interaction terms. Here, even biprobit estimates are somewhat indicative (and they also suggest a positive effect of a CBA, although the level of significance somewhat differ[54]), although we again present marginal effects for the comparison (column 4 in Table 4.6a and Appendix 4.11). The results are very similar to those from the preferred specification. However, the inference from the effect of CBA conditional on other variable differs. Namely, there is no indication of a different effect of the CBA at different levels of trust in government, perceptions and expectations of economic situation in a country when interaction terms between these variables with the CBA dummy are not included. However, we cannot rely on these findings since, as argued above, interaction terms should be included if we want to observe this conditionality.

[54] From the SUR results the significance of the effects of a CBA on perceptions is higher but on expectations it is lower. However, the marginal effects show the combined effect (and which is comparable to previous results) is somewhat higher. The latter are shown in the table; the former are only mentioned as a check of the consistency of the results.

Table 4.6a: SUR results (the first part) - robustness checks for the ‘credibility’ model (the results for the first two columns continue in Table 4.6b)

| **Questions used for the dependent variable: "Currently, the local currency is very stable and trustworthy?" and "Over the next five years, the [LOCAL CURRENCY] will be very stable and trustworthy"** .<br>Dependent variable: probability of both questions being equal to 1 (answers: "Strongly agree", "Agree" and "Somewhat agree”) as opposed to 0 (answers: "Strongly disagree", "Disagree" and "Somewhat disagree") | Controlling for perceptions about the financial stability in a country | Controlling for perceptions about the financial situation in a country and financial situation of a household | Using large dataset (trust in government variable excluded); no. of observations: 59,351 | No interaction terms used |
|---|---|---|---|---|
| **CBA**<br>1=CBA is implemented<br>*Base category: CBA not implemented* | 0.139**<br>(0.0663) | 0.134**<br>(0.0625) | 0.116**<br>(0.0589) | 0.149**<br>(0.0788) |
| **Gtrust2**<br>Trust in Government: "I somewhat trust" | -0.00198<br>(0.0114) | -0.000670<br>(0.0107) | | -0.0166<br>(0.0218) |
| **Gtrust3**<br>Trust in Government: "I neither trust nor distrust" | -0.0512***<br>(0.0174) | -0.0460***<br>(0.0161) | | -0.0802**<br>(0.0312) |
| **Gtrust4**<br>Trust in Government: "I somewhat distrust" | -0.0852***<br>(0.0220) | -0.0776***<br>(0.0205) | | -0.1193***<br>(0.0347) |
| **Gtrust5**<br>Trust in Government: "I do not trust at all" | -0.0986***<br>(0.0198) | -0.0882***<br>(0.0191) | | -0.1427***<br>(0.0338) |
| **Gtrustdnk**<br>Trust in Government: "Do not know"<br>*Base category: Trust in Government: "I trust completely"* | -0.110***<br>(0.0302) | -0.100***<br>(0.0298) | | -0.1478***<br>(0.0359) |
| **ECSagree**<br>Euro currently stable; 1="Strongly agree", "Agree" and "Somewhat agree"<br>*Base category: "Strongly disagree", "Disagree" and "Somewhat disagree"* | 0.0538***<br>(0.0139) | 0.0518***<br>(0.0137) | 0.0709***<br>(0.0159) | 0.0699***<br>(0.0142) |
| Current economic situation in a country is very good:<br>**ES2**<br>"Agree" | -0.0121<br>(0.00785) | -0.0146*<br>(0.00862) | -0.00120<br>(0.00306) | -0.0073<br>(0.0076) |
| **ES3**<br>"Somewhat agree" | -0.0437***<br>(0.0119) | -0.0463***<br>(0.0125) | -0.0354***<br>(0.00567) | -0.0387***<br>(0.0109) |
| **ES4**<br>"Somewhat disagree" | -0.0919***<br>(0.0117) | -0.0918***<br>(0.0118) | -0.0977***<br>(0.00513) | -0.0927***<br>(0.0124) |
| **ES5**<br>"Disagree" | -0.124***<br>(0.0152) | -0.119***<br>(0.0146) | -0.146***<br>(0.0109) | -0.1243***<br>(0.0178) |
| **ES6**<br>"Strongly disagree" | -0.156***<br>(0.0158) | -0.147***<br>(0.0149) | -0.191***<br>(0.0112) | -0.1594***<br>(0.0197) |
| **Esdnk**<br>"Do not know"<br>*Base category: "Strongly Agree"* | -0.108***<br>(0.0202) | -0.102***<br>(0.0194) | -0.110***<br>(0.0180) | -0.1142***<br>(0.0186) |

Table 4.6a: SUR results (the first part - continuing) - robustness checks for the ‘credibility’ model (the results for the first two columns continue in Table 4.6b)

| **Questions used for the dependent variable: "Currently, the local currency is very stable and trustworthy?" and "Over the next five years, the [LOCAL CURRENCY] will be very stable and trustworthy"** .<br>Dependent variable: probability of both questions being equal to 1 (answers: "Strongly agree", "Agree" and "Somewhat agree”) as opposed to 0 (answers: "Strongly disagree", "Disagree" and "Somewhat disagree") | Controlling for perceptions about the financial stability in a country | Controlling for perceptions about the financial situation in a country and financial situation of a household | Using large dataset (trust in government variable excluded); no. of observations: 59,351 | No interaction terms used |
|---|---|---|---|---|
| **ExpECSagree**<br>Future euro stability; 1="Strongly agree", "Agree" and "Somewhat agree"<br>*Base category:"Strongly disagree", "Disagree" and "Somewhat disagree"* | 0.0501***<br>(0.00830) | 0.0477***<br>(0.00821) | 0.0620***<br>(0.0118) | 0.0604***<br>(0.0103) |
| Future economic situation in a country is very good: | | | | |
| **ExpES2**<br>"Agree" | -0.0146***<br>(0.00557) | -0.0155***<br>(0.00570) | -0.0108***<br>(0.00300) | -0.0120**<br>(0.006) |
| **ExpES3**<br>"Somewhat agree" | -0.0356***<br>(0.00729) | -0.0356***<br>(0.00739) | -0.0407***<br>(0.00462) | -0.0394***<br>(0.00814) |
| **ExpES4**<br>"Somewhat disagree" | -0.110***<br>(0.00590) | -0.106***<br>(0.00581) | -0.124***<br>(0.00478) | -0.1169***<br>(0.0096) |
| **ExpES5**<br>"Disagree" | -0.154***<br>(0.00673) | -0.144***<br>(0.00723) | -0.184***<br>(0.00862) | -0.1664***<br>(0.0136) |
| **ExpES6**<br>"Strongly disagree" | -0.181***<br>(0.00602) | -0.167***<br>(0.00696) | -0.222***<br>(0.00769) | -0.1889***<br>(0.0143) |
| **ExpEsdnk**<br>"Do not know" | -0.110***<br>(0.00710) | -0.104***<br>(0.00671) | -0.127***<br>(0.00743) | -0.1087***<br>(0.0064) |
| *Base category: "Strongly Agree"* | | | | |

Table 4.6b: SUR results (the second part) - robustness checks for the 'credibility' model (the results of the first two columns from Table 4.6a continuing)

| **Questions used for the dependent variable: "Currently, the local currency is very stable and trustworthy?" and "Over the next five years, the [LOCAL CURRENCY] will be very stable and trustworthy"** Dependent variable: probability of both questions being equal to 1 (answers: "Strongly agree", "Agree" and "Somewhat agree") as opposed to 0 (answers: "Strongly disagree", "Disagree" and "Somewhat disagree") | Controlling for perceptions about the financial stability in a country | Controlling for perceptions about the financial situation in a country and financial situation of a household |
|---|---|---|
| Currently, banks and the financial system in a country are stable: | | |
| **FS2** | -0.0600*** | -0.0544*** |
| "Agree" | (0.0144) | (0.0130) |
| **FS3** | -0.138*** | -0.126*** |
| "Somewhat agree" | (0.0144) | (0.0141) |
| **FS4** | -0.250*** | -0.233*** |
| "Somewhat disagree" | (0.0235) | (0.0238) |
| **FS5** | -0.268*** | -0.248*** |
| "Disagree" | (0.0193) | (0.0189) |
| **FS6** | -0.270*** | -0.248*** |
| "Strongly disagree" | (0.0314) | (0.0303) |
| **FSdnk** | -0.234*** | -0.214*** |
| "Do not know" | (0.0241) | (0.0233) |
| *Base category: "Strongly Agree"* | | |
| Currently, the financial situation of my household is good | | |
| **FSH2** | | 0.00783 |
| "Agree" | | (0.00662) |
| **FSH3** | | -0.00750 |
| "Somewhat agree" | | (0.00516) |
| **FSH4** | | -0.0349*** |
| "Somewhat disagree" | | (0.00547) |
| **FSH5** | | -0.0425*** |
| "Disagree" | | (0.00992) |
| **FSH6** | | -0.0556*** |
| "Strongly disagree" | | (0.0102) |
| **FSHdnk** | | -0.0495*** |
| "Do not know" | | (0.0153) |
| *Base category: "Strongly Agree"* | | |
| Over the last 12 months, the financial situation of my household has got better | | |
| **ExpFSH2** | | -0.00186 |
| "Agree" | | (0.00698) |
| **ExpFSH3** | | -0.00590 |
| "Somewhat agree" | | (0.00882) |
| **ExpFSH4** | | -0.0333*** |
| "Somewhat disagree" | | (0.0101) |
| **ExpFSH5** | | -0.0497*** |
| "Disagree" | | (0.00848) |
| **ExpFSH6** | | -0.0584*** |
| "Strongly disagree" | | (0.00957) |
| **FSdnk** | | -0.0320*** |
| "Do not know" | | (0.00898) |
| *Base category: "Strongly Agree"* | | |

Robust standard errors (clustered on country and region) in parentheses;***p<0.01,** p<0.05,* p<0.1
Note: The results presented in this table are only an extract from the full results reported in Appendices
Note: The marginal effects calculated after the biprobit SUR estimation are reported
Note: Results presented are weighted results with country used as cluster

Additionally, single equation models are also estimated using a probit estimator. Even though unobserved factors are positively correlated, as suggested by SUR estimation, the single-equation estimations are consistent with those from the SUR, which also suggest that the single-equation results are not being driven systematically by the unobserved factors (Appendix 4.12 and 4.13). The estimated effects of the observed variables in both models separately are very similar to those when models are estimated as a system. In particular, the results imply that a CBA is likely to increase perceptions and expectations about the local currency's stability by 19.5 and 10 percentage points, respectively, while the combined effect from the SUR estimation was 14.2 percentage points. The other results have similar implications and the 'marginsplots' again indicate an increasing positive effect of the CBA with lower trust in government and worse perceptions. The only difference is that the effect of a CBA conditional on different levels of expectations about the economic situation in a country is significant for the 'strongly disagree' compared to 'strongly agree' category, indicating that the effect of a CBA is higher at the most pessimistic level of expectations about the economic situation (compared to the most optimistic level) (Appendix 4.13). Finally, in order to test for potential bias caused by exclusion of "do not know" answers (see Section 4.5.4) the separate models are estimated without the interaction terms by using probit (where 'do not know' answers are excluded) and multinomial probit estimator (where a separate category of the dependent variable is created for 'do not know' answers) (see Appendix 4.14). The results of this robustness check imply that the preferred results are unlikely to be biased since the effect of the variable of interest in "do not know" category is insignificant, while it is still significant and positive when the 'agree' ('trust in the local currency') category is compared to the 'disagree' ('distrust') category.

### 4.6 Conclusion

Since enhanced confidence/credibility of the monetary authority is usually emphasised as the main feature of a CBA's sustainability, in this chapter it is empirically investigated. Since confidence and credibility are defined as the public's beliefs about the announced policy, and under a CBA the announced policy is maintenance of a stable local currency (against the anchor currency), perceptions and expectations about local currency stability and trustworthiness from the Austrian National Bank survey dataset are used as indicators of confidence in and credibility of the CBA. The data used in this research has not been previously used outside the Austrian National Bank or for this kind of research. Using survey data from ten European transition countries, two of which have a CBA, enabled us to estimate the effect of a CBA on perceptions/expectations about the local currency stability and trustworthiness. One of the major contributions to knowledge of this chapter is in providing an empirical comparison between the confidence in/credibility of the CBA and the confidence in/credibility of other monetary regimes that, to our knowledge, has not previously been undertaken.

Since the dependent variable is based on respondents' perceptions and expectations, we controlled for the economic situation and political circumstances in the countries under investigation by also using respondents' perceptions/expectations. Comparable studies that investigated the credibility of the ECB included actual macroeconomic data, but we prefer controls based on respondents' subjective attitudes, since economic theory is based on the proposition that economic agents respond to reality as they perceive and experience it. This is an additional novelty of this research, since other studies that investigated the credibility of a particular monetary regime relied upon different proxies for these perceptions/expectations.

A further contribution is that, not only is the monetary authority's credibility under a CBA investigated but also the circumstances under which the CBA is more important for the credibility of monetary policy. Namely, the model is specified to control for the effect of CBA conditional on the economic situation and trust in government (by including the interaction terms between CBA and perceptions/expectations regarding the economic situation and CBA and trust in government).

The results of the empirical analysis suggest that the effect of a CBA on perceptions/expectations about the local currency stability and trustworthiness is positive and significant. Since the marginal effects are comparing the counterfactual states, the positive effect implies that if all countries from the sample had had a CBA then perceptions/expectations about the local currency's stability would have been 14 percentage points higher compared to perceptions/expectations if those countries did not have a CBA. Estimation of the effect in CBA and non-CBA subsamples suggests that this effect is higher for CBA than non-CBA countries, suggesting that countries that had a CBA benefited from it more than other countries would have benefited from it if they had had a CBA. These are important findings, which may partially justify the maintenance of CBAs in Bosnia and Herzegovina and Bulgaria as a stabilisation tool.

The marginal effects of the interaction terms suggest that the positive effect of a CBA on perceptions and expectations about the local currency stability and trustworthiness is greater the worse the perceptions about the economic situation in a country and the lower the trust in government. Even though we observed only the period during the financial and euro crises (2009-2011), the effect of the CBA was significant and positive, when the unemployment rate was increasing (compared to the pre-crisis period). This suggests that the maintenance of CBAs in BH and Bulgaria has been justified in the period of crisis and even when the anchor currency (the euro) was less stable. These results contradict the suggestions of some authors that the credibility is likely to be undermined in the 'bad times' (Drazen and Masson, 1994; Mulino, 2002; Feuerstein and Grimm, 2006).

Several robustness checks were conducted and the findings were very similar across all estimations. Therefore, we may conclude that these findings are robust. Hence, one may conclude that CBAs in European transition economies have the advantage of increasing the monetary authority's credibility and increasing monetary stability in otherwise unstable economies and in periods of maximum stress. Increased credibility of the monetary authority should lower inflation expectations and hence inflation. However, since inflation rates are also influenced by other factors causation is ambiguous. Therefore, in order to investigate whether a CBA also contributed to better inflation performance, the next chapter addresses this question directly.

# CHAPTER 5: ESTIMATION OF THE EFFECT OF CURRENCY BOARD ARRANGEMENTS ON INFLATION PERFORMANCE



## 5.1 Introduction

The results of the empirical analysis conducted in Chapter 4 suggest that a CBA is increasing the credibility of the monetary authority. This is expected to decrease inflationary expectations and consequently to lower inflation. However, this effect is not straightforward and should be empirically assessed. Studies that have investigated the effect of CBA on inflation performance also estimated the effect on other macroeconomic variables, such as GDP growth and volatility. The effect on the latter will be empirically analysed in Chapter 6, while this chapter will focus on the empirical investigation of the effect of a CBA on inflation performance. Section 5.2 will assess studies that investigated the effect of a CBA on macroeconomic variables. Section 5.3 analyses the specifics and main trends in the transition countries that will be included in the empirical analyses in this chapter and Sections 6.2 and 6.3 of the next chapter. Section 5.4 will investigate the effect of CBA on inflation performance. Subsequently, the CBA variable will be divided into ‘strong’ and ‘weak’, according to its strictness, in order to estimate whether the effect on inflation differs with the strictness of the CBA. Conclusions of the empirical analyses presented in this chapter will be drawn in Section 5.5.

## 5.2 Theoretical rationale and critical analysis of the empirical evidence

The prediction of orthodox economic theory, outlined in Section 2.3, is that countries with a fixed exchange rate regime will have a better inflation performance than countries with a flexible exchange rate regime, since pegs are likely to lower inflationary expectations ("confidence effect") and the rate of money growth ("discipline effect"). This is confirmed by empirical research in many studies (e.g. Levy- Yeyati and Sturzenegger, 2001; De Grauwe and Schnable, 2004a; Domac et al., 2004), although the size of the effect usually differs depending on the level of development of the countries observed and exchange rate regime (hereafter ERR) classification used. As a type of pegged ERR (usually classified as a "hard" peg) CBAs are expected to reduce inflation by more than other pegged ERRs, due to the greater increase in credibility of the monetary authority (Wolf et al., 2008). Namely, in a world of free capital movements, other fixed exchange rate regimes can alter the exchange rate parity, while the institutional arrangements of CBA do not allow a central bank to alter the exchange rate or money supply. Moreover, the abolition of a CBA is more difficult than abolition of other pegged ERRs and the time-inconsistency problem is reduced in the CBA countries. Consequently, the inflation rate is expected to be lower and more stable in the CBA countries than in countries with other pegged ERRs. However, the opposite result may emerge as a consequence of the so called "catch-up" process in transition countries. As argued by De Grauwe and Schnabl (2004b), high productivity growth in transition countries (due to the low starting point) with a tight peg to the euro is likely to result in an increase in inflation rates in those countries, while in the countries with a flexible exchange rates high productivity rates are likely to alter the exchange rate. This phenomenon is known as the Balassa-Samuelson effect, which is found to be present in many transition countries (e.g. Halpern and Wyplosz 2001, Mihaljek and Klau, 2008).

There are manyof studies estimating the effects of different ERRs on macroeconomic performance (usually inflation and output growth and volatility) some of which include the CBA together with dollarization (and in some cases a conventional pegged arrangement) as a type of a “hard” peg (De Grauwe and Schnabl, 2004a; Bleaney and Francisco, 2007a; Ghosh et al., 2011). However, there are only a few studies which focus exclusively on the CBA and its effect on macroeconomic performance. Those studies which focus on a CBA estimate its effect by comparing different countries with different ERRs (‘comparison’ approach) or by observing one country during the periods before and during the CBA (‘experimental’ approach). The ‘comparison’ approach allows comparison of macroeconomic performance between countries with a CBA and countries with other fixed ERR and flexible ERR, after controlling for other factors. The potential limitation of this approach might emerge when the sample is large and relatively few observations are related to countries with a CBA, which is the case for most of the studies which estimate the effect of CBA on macroeconomic performance. On the other hand, the ‘experimental’ approach allows comparison of macroeconomic performance within the country prior to and after the introduction of CBA[55], which might be beneficial since there are fewer factors to control for. Moreover, this approach might be more reliable for policy-makers, since it is focused only on the country of interest. However, this approach requires data for a long time period. Moreover, Kwan and Lui (1999, p.407) argued that “sufficiently rich data variation is necessary for statistical purposes”, since “if the economic conditions of the two periods had remained perfectly stable, the data would hardly contain enough information for inferring the macroeconomic performance of the two systems”. Since our focus is on transition countries for which there is not enough data for the estimation of latter approach, the former method will be used and studies which use this approach will be discussed in more detail.

Among the few studies which estimate the effect of CBA on macroeconomic performance the most cited ones are Ghosh et al. (1998) and Kwan and Lui (1999). Those two papers have different approaches in estimating the effect of CBA on macroeconomic performance; while the former uses the “comparison approach”, the latter uses the “experimental approach”. The “comparison” approach is also used by

[55] Strictly speaking, this is before and after comparison only, even thouth Kwan and Lui (1999) call it the 'experimental approach'. The identification strategy of a natural experiment requires comparison between treatment and control groups before and after some change.

Anasstasova (1999), Ghosh et al. (2000) and Wolf et al. (2008) while the 'experimental' approach is used by Sepp and Randveer (2002b). Sepp and Randveer's (2002b) and Kwan and Lui's (1999) studies will next be briefly presented and those studies which use the "comparison" approach will be analysed in more detail (a summary of the studies is given in Table 5.1). Even though in this chapter only the effect of CBA on inflation performance will be empirically analysed, this section assesses studies in which its effect on other macroeconomic variables was investigated as well.

Table 5.1: Summary of the empirical research of the currency board effect on inflation and growth

| **Study** | **Data and sample** | **Dependent variable(s)** | **The effect of CBA on dependent variable compared to other regimes**[†] | **Controls** | **Technique** | **Endogeneity** | **Robustness checking** |
|---|---|---|---|---|---|---|---|
| **Ghosh et al. (1998)** | 1970-1996, all IMF members | Inflation [$\pi/(1+\pi)$] [††] | - ** | money supply; openness; GDP growth, Central bank governor turnover | OLS | Addressed through the simultaneous equation model | No |
| **Kwan and Lui (1999)** | 1973-1995, Hong Kong | Inflation | - | | structural vector autoregressive model | Not addressed | |
| | | Output growth volatility | - | | | | |
| **Anastassova (1999)** | 1984-1997, 22 countries | Inflation (CPI) | - *** | money growth, openness | Panel data analysis | Not addressed | No |
| | | Nominal interest rates | - *** | money growth | | | No |
| | | Real interest rates | - * | money growth | | | No |
| | | Growth per capita | + *** | money growth, openness and inflation | | | No |
| | | Growth | + * | The initial level of per capita income, relative to US, investment/GDP, human capital, terms of trade volatility, population growth, drought and war | | | No |
| **Ghosh et al. (2000)** | 1975-1996, all IMF members | inflation [$\pi/(1+\pi)$] | -*** | the growth rate of money and output, openness, and annual dummies | Panel data analysis | Addressed through the simultaneous equation model | No |
| | | Per capita GDP growth | +* compared to flexible ERR; + **compared to other ERRs | the investment/GDP ratio, a convergence term, trade openness, population growth, a dummy for droughts and annual dummies + lagged values of GDP and money supply | | | Yes - not robust |
| | | Output volatility | + | Convergence term, openness, drought, population growth, investment ratio volatility, a dummy for droughts | | | No |
| | | Export performance | + | the investment/GDP ratio, a convergence term, trade openness, population growth, a dummy for droughts | | | No |

Table 5.1 (continuing): Summary of the empirical research of the currency board effect on inflation and growth

| Study | Data and sample | Dependent variable(s) | The effect of CBA on dependent variable compared to other regimes† | Controls | Technique | Endogeneity | Robustness checking |
|---|---|---|---|---|---|---|---|
| **Wolf et al. (2008)** | 1972-2002, 99 countries | Inflation | -*** | Money supply growth, GDP growth, openness, CB turnover, terms of trade, fiscal balance | Panel data analysis | Addressed | Yes - results robust |
| | | Per capita real GDP growth | - for lower income countries (insignificant for upper income countries) | Investment ratio, openness, terms of trade, years of schooling, tax ratio, fiscal balance, convergence ratio, population growth, log (pop) | | | Yes - results not robust |
| | | Output volatility | +*** for upper income countries, -*** for ———lower income countries | Investment volatility, openness, terms of trade volatility, schooling, government balance, population size | | | No |
| | | Export growth | -* for lower income countries, + insignificant for upper income countries) | Real exchange rate growth, lagged terms of trade, output growth | | | Yes - results robust |

Note: ***, **, * donates that variables are statistically significant at the 1%, 5% and 10%, respectively

† Different studies have different comparison group (s)

†† Ghost et al. call this measure of inflation "scaled inflation" and they note that this measure is introduced to check for the influence of hyperinflation outliers

Sepp and Randveer (2002b) conducted counterfactual simulations for estimating the effects of alternative monetary regimes on Estonia's macroeconomic performance. As alternative regimes they consider combined exchange rate and monetary regimes: 1) pegged exchange rate arrangement with inflation or output gap targeting; 2) floating exchange rate arrangement with inflation or output gap targeting and 3) floating exchange rate regime excluding any monetary policy target. Through simulations these authors examined how successful were different regimes in achieving their objectives and how volatile the key indicators were (output gap, inflation, interest rate and nominal exchange rate) under various combinations of monetary and exchange rate regimes. A comparison of the effect of shocks on the variability of the key macroeconomic indicators under different regimes suggested that the CBA outperforms all other regimes under every type of shock (at least as it functioned during the period under consideration). Additionally, the authors argue "an exit from the CBA could, at least in the short-term, increase uncertainty in the market and also reduce policy transparency and discipline" (p.415). Therefore, the authors conclude that the CBA was still the best policy option. Kwan and Lui (1999) compared macroeconomic performance in Hong Kong before and during the operation of CBA. By using a structural vector autoregressive model they estimated that the volatility of inflation and output growth in Hong Kong was lower during the currency board period than under the free float regime. Based on simulations, they further concluded that demand shocks led to greater output volatility under CBA, while output was less sensitive to supply shocks under CBA compared to a free-floating regime. However, Kwan and Lui (1999) warned that increased output stability was likely to be the result of Hong Kong's increased fiscal discipline, though they failed to include a measure of fiscal discipline in their model.

In the empirical studies using the "comparison" approach the effect of a CBA on inflation, growth and other macroeconomic variables is captured by inclusion of a dummy variable in an appropriate equation. Anastassova (1999) used panel data analysis of 22 countries for the period 1984-1997 and estimated the effect of CBA on inflation, GDP growth per capita and nominal and real interest rates. Anastassova (1999) divided the sample into three groups: the first consists of CBA countries, the second of countries with a similar-to-CBA regime and the third of countries with pegged ERR or crawling band. Beside addressing the possible difference in the effect of a CBA and other pegged ERRs on macroeconomic indicators Anastassova also addressed the effect of “strong” and “weak” CBAs on macroeconomic indicators since the institutional arrangements of CBAs adopted in the 1990s differ significantly among themselves (this issue is addressed in Section 2.4). According to the results, the CBA countries have lower inflation, nominal and real interest rates and higher growth than do other pegged ERRs countries (and countries with regimes similar to CBA). When the CBA dummy is split between “strong” and “weak” CBAs the results indicate that “adopting strict institutional arrangements will have much stronger impact on the main economic variables” (p.19). However, there are some limitations in the analysis presented in this paper. First, it is not clear what the comparison group for the “strong” and “weak” CBA dummies is (all other countries from the sample, countries with regimes similar to CBA or other pegged ERRs). It is also likely that GDP growth is not just determined by exchange rate/monetary regime, openness of economy and money growth, but by other determinants as well which should be controlled for. For example, Ghosh et al. (1998) also included: human capital accumulation, the initial level of per capita income, terms of trade variability, population growth and indicators for cataclysmic events such as wars and droughts. Additionally, GDP in the base year in currency board countries is likely to be low relative to potential output (as the period observed is a period just after a CBA introduction which was in all these countries a period of recovery) which may be one explanation for the higher ‘growth’ in this group of countries. Furthermore, capital controls should also be considered, since countries with a similar ERR may have different impact on growth if they have different capital controls. Moreover, a control for some other variables in the inflation regression is suggested in the literature. Ghosh et al. (1998) included the degree of central bank independence, as well GDP growth and controls for global inflation shocks. A further important limitation is that the potential endogeneity of regime choice is not controlled for, since according to Ghosh et al. (1998, p.3) “countries with a greater proclivity towards low inflation may be more likely to adopt a currency board”. Moreover, the observed period after the adoption of CBA is quite short (being only a year for some countries, such as Bulgaria). Additionally, as noted in our literature review in Chapter 3, when estimating interest rates differentials differences in country risks should be accounted for.

Although, as noted above, Ghosh et al. (1998) addressed some of the drawbacks of Anastassova's (1999) study there are a few limitations emphasised by the authors. Firstly, they argued that "it is difficult to determine whether the observed differences in performance between existing currency board arrangements and other pegged exchange rate regimes result from the regime itself or from some peculiarity specific to the countries, since many of the currency board countries in the sample are small, island economies, subject to specific shocks, and with particular economic structures which makes their experience perhaps less relevant to other countries" (p. 18). However, these country' specifics could have been controlled by including the country's fixed effects or, at least, dummy variables for country-group effects (such as small island economies and EU member countries). Secondly, since CBAs are usually argued to adjust slowly to shocks the authors argue that "currency board arrangements may appear better for economic growth than they really are" if the sample, as here, does not include periods of economic disruptions (Ghosh et al., 1998, p. 18). Indeed, their sample contains a relatively small number of CBA countries and only a short period after the introduction of most CBAs. Hence, a more satisfactory sample would include a period such as the recent financial crisis and a longer period under a CBA. Finally, these authors do not report model diagnostics. However, a similar group of authors made some improvements and additions in their later published paper Ghosh et al. (2000). Here, in the growth function the authors controlled for the potential endogeneity of GDP and the money supply by using their lagged values as instruments.. However, the results of both studies are similar and imply a negative effect of a CBA on inflation and a positive effect on growth, compared to other ERR. Since an introduction of a CBA is usually associated with a potential real appreciation, Ghosh et al. (2000) additionally estimated the effect of a CBA on export growth performance, but did not find a significant effect. Again, the short period observed after the CBA introduction puts constraints on a "fuller assessment, especially of the [unspecified] downsize risks" (p. 294). Diagnostics are not reported in any of assessed papers. Both Ghosh et al. (1998) and Ghosh et al. (2000) estimated all regressions for the full sample, and for upper and upper middle income and lower and lower middle income groups and compared the macroeconomic performance of CBA to other ERRs. The estimated effects of CBA on macroeconomic performance are similar across all groups. However, it is peculiar that some CBA countries in the sample are identified as belonging to the upper income group of countries. The authors do not specify which countries are included in this group and how many countries with a CBA are in this group.

Wolf et al. (2008) conducted a similar, but more comprehensive, analysis to that undertaken by Ghosh et al. (2000). Their inflation equation is augmented by a 'central bank's governor turnover' variable, which is their proxy for the central bank's independence, terms of trade shocks and fiscal balance. GDP growth, money growth rate and fiscal balance are instrumented by their lagged values to control for their potential endogeneity. The results again indicate that, on average, the CBA countries had lower inflation than countries with other pegged or flexible ERRs. Besides dividing the sample into upper and lower income countries, they also divided their sample into countries without current account restrictions, countries without capital account restrictions, low inflation observations, countries with a low turnover rate of central bank governor and very open economies. The same effect of CBA on inflation is observed across all subsamples, even among countries with low inflation, indicating that "the superior performance of currency boards is not a case of simple reverse causality" (p. 85). The results are robust after excluding the first few years following the adoption (to control for the potential "contamination"), inclusion of fixed effects and accounting for the possible endogeneity of the regime choice (addressed the same way as in the above studies). Additionally, Wolf et al. (2008) tested the success (defined as the ability to maintain inflation below its pre-stabilisation period after three years) and durability (defined as the ability to maintain inflation below its initial post-stabilisation period after three years) of positive effects of CBA on inflation performance compared to other ERRs. They found that the levels of "success" and "durability" were considerably higher for CBA countries than countries with other ERRs. They also estimated that CBAs have been more successful in lowering inflation in countries that started with high inflation. Additional to the growth regression model estimated by Ghosh et al. (2000), Wolf et al. included the budget balance/GDP ratio and terms of trade shocks "to allow for shorter-term shocks" (p. 102), the average number of years of schooling of the population, population size as a scale variable and a proxy for the size of government, the tax/GDP ratio. However, the coefficients on the ERR variables are significant only for lower income countries. Their robustness checking consists of dropping the first three years following the adoption of a new ERRs to control for "legacy effect across regimes" (p.103), including the level of a country's income in the year prior to the adoption of a new ERR to control for the "rebound effect of countries having adopted boards during a period of macroeconomic turbulence" (p.150), including country fixed effects and controlling for simultaneity bias. However, the first two inclusions passed the robustness checking, while the results after including fixed effects and controlling for simultaneity bias are economically small and statistically insignificant. Wolf et al. also estimated the effect of ERRs on output volatility (measured as a centred, three-year standard deviation of the log of real GDP relative to its Hodrick-Prescott trend). It is expected that the relation between CBA and output volatility will be positive since under a CBA the central bank cannot mitigate the effect of shocks. Consistent with this classic Mundell-Fleming prediction, the authors found that "among upper-income countries — where nominal wages are more likely to be sticky — countries with currency boards indeed experienced more volatile output. Conversely, in lower-income countries, where labor markets tend to be more informal, nominal wages are less downwardly rigid, and policy itself may be a significant source of shocks, currency boards are not associated with greater volatility" (p.115). However, robustness checks were not conducted for this regression and diagnostic tests are not reported for any empirical analysis. Finally, since there is a common concern that the real exchange rate will appreciate in CBA countries[56] and consequently export performance be undermined, these authors also estimated the effect of a CBA (compared to other ERRs) on export performance. For upper-income countries, the regime does not seem to be robustly related to export performance, while lower-income countries with currency boards or other pegged regimes experienced weaker export growth performance[57] (p.115).

All the above studies divided countries into three groups according to their exchange rate regime, with one group being the group of countries with a CBA. They estimated the effect of a CBA by including dummy variables for two groups of

[56] The authors emphasise two reason for this concern: "First, currency boards have often been adopted in the midst of high or hyperinflations, periods in which the real exchange rate is typically grossly undervalued, providing considerable room for a post-stabilization appreciation. Second, the growth and productivity recovery may itself raise the equilibrium real exchange rate, again providing some room for an appreciation without serious adverse effects on competitiveness" (p. 133).

[57] These results apply both before and after controlling for the possibility of the "bounce-back" effect which represents the possibility that exports might be undermined in CBA countries in times of economic crisis, by augmenting the regression with the export-to-GDP ratio relative to its predicted value based on a standard cross-country openness regression.

exchange rate regimes while omitting the third one. However, none of these explained what type of classification they used for allocating the countries (exchange rate regimes) into specific group. Moreover, none of the above studies control for differences in monetary policy regimes (e.g. inflation targeting) which may affect macroeconomic performance, additional to the ERR. Moreover, they treat a CBA only as an ERR. Although it is defined as an ERR in the IMF classification it is usually stated that a CBA is a monetary regime as well, and therefore it might be useful to compare it with other monetary regimes beside treating it only as ERR (this issue is discussed in more detail in Section 3.4.1). The approach utilised in the research programme reported in this thesis is superior as inclusion of an only CBA variable (instead of a full set of different ER regimes variables) simplifies the model, saves degrees of freedom and avoids the need to choose between ERR classifications, all of which have some limitations (as discussed in Section 2.2.5). Finally, none of the above studies control for potential inflation hysteresis by using a dynamic estimator(s) and none of the studies report diagnostic tests, which undermined the reliability of their results. Moreover, these studies examine both developed and developing countries together and it has been argued that developing countries (especially those going through a transition process) have specific features and should therefore be examined separately from developed countries. This point is elaborated in more details in the next section where the main characteristics of transition countries, which will be focus of our empirical analyses, are analysed.

## 5.3 Characteristics of selected transition countries

### 5.3.1 Choice of sample and sample specifics

To estimate the effect of a CBA on macroeconomic performance (in this Chapter and Section 6.2 of the next chapter) panel data from a sample comprising 25 transition countries from the Central, South-Eastern Europe and former Soviet Union for the period 1998-2009 is used. The main reason for not including the period prior 1998 is a data constraint. However, the first years of transition (at the beginning of 1990s) were very volatile in terms of trends in the major macroeconomic variables and, if included, might have biased the estimates. Since Serbia and Montenegro separated in 2006 there is a lack of data for Montenegro and therefore it is excluded from the sample. Moreover, due to a lack of data Turkmenistan and Uzbekistan are also excluded from the sample. Since data on the EBRD indicator for Czech Republic for the years 2008 and 2009 is missing[58] and data on the general government balance for Serbia in 1998 and 1999 and on openness for Hungary and Lithuania for 2009 are missing, the panel is unbalanced. Data for all countries and all years for certain variables are not always available from the same source. For most of the countries the data used are those from international databases, such as the IMF's and the World Bank's databases, but for some countries national statistics had to be consulted. Data sources for the variables used in each regression will be discussed and analysed within the appropriate sub-sections.

Some authors emphasise that transition (and developing) countries should be treated separately from developed countries since they have specific features (such as lack of policy makers' credibility, limited access to international markets, high default risk, weak and underdeveloped institutions) and are going through the process of transition towards a market-oriented economy, which is likely to affect macroeconomic variables significantly (Domac et al., 2004; Barlow, 2010; Frankel, 2010). Moreover, most of the counties in this sample changed their monetary and/or ERRs as a part of the transition process (Domac et al., 2004). Typically a CBA was introduced as a means of establishing stability, which was disturbed at the beginning of the transition process in all countries. Therefore, it is important to estimate the difference that those different regimes had on macroeconomic performance. Moreover, when estimating this effect it is important to control for the effect of progress in transition, since that process is characterised by liberalisation, privatisation and tighter monetary and fiscal policies, which are likely to influence macroeconomic performance. Barlow (2010) controls for this by using the EBRD transition indices for liberalisation, privatisation and credit reform. Since our focus is not on the effect of the progress of transition on macroeconomic performance and in order to save degrees of freedom, the aggregate transition indicator which reflects the general progress made in transition is used. It is calculated as an average of eight transition indicators related to liberalisation, privatisation and credit reform reported in the EBRD transition reports. These indicators are available for the whole sample except for the Czech Republic for 2008 and 2009. Furthermore, macroeconomic

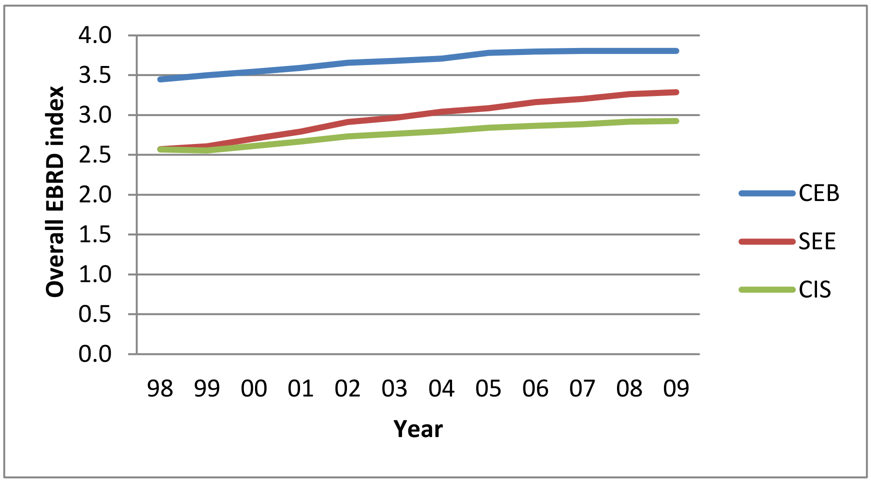
[58] EBRD Transition Reports do not include the Czech Republic after 2008.

performance is likely to be affected by the EU accession process of some countries in this sample, first informally (through stabilisation programmes before EU accession) and then formally (through an endeavour to fulfil the Maastricht criteria after EU accession, before EMU accession). According to their EU orientation the countries from the sample might be divided into two groups: Commonwealth of Independent States (CIS), which are not EU oriented, and EU oriented countries: Central-Eastern Europe and Baltic countries (CEB) and South-Eastern European countries (SEE). Nine countries from the second group are already EU members, four of them EMU members (Slovenia, from 2007, Slovakia, from 2009, Estonia from 2011 and Latvia from 2014), while other countries from this group are heading towards accession. Furthermore, BH (from 1997), Bulgaria (from 1997), Estonia (from 1992 until EMU accession), and Lithuania (switched from the dollar peg to the euro in 2002) pegged their currencies to the euro through a CBA, while Latvia (since 2005 until EMU accession) and Macedonia (since 1997) fixed their currencies against the euro. This convergence towards the EU/EMU may lower the effect of monetary-ERRs on macroeconomic performance, since countries in the process of accession endeavour to converge towards the economic trends in EU countries. Since, after the EU accession, countries are highly influenced by EU trends, this convergence process should be controlled for.

### 5.3.2 Major trends in selected transition countries

Economic reform in transition countries has been achieved through stabilisation, liberalisation and privatisation processes (Barlow, 2010). Although the transition process in all countries started at the beginning of the 1990s, it did not progress at the same pace in all countries. Moreover, different countries had different pre-transition conditions and therefore their progress in transition would have been expected to differ. Therefore, countries are typically divided into three groups, as noted in the previous section, following the grouping suggested in the EBRD transition reports. The first group consists of CEB countries, which includes the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia. The second group is SEE countries, which includes: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, Romania and Serbia. The third group is the group of CIS countries which includes: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan and Ukraine[59]. According to the overall EBRD index (which accounts for the progress in liberalisation, privatisation and credit reform) the greatest progress was accomplished by the first group of countries, which might be argued to be result of EU accession since all countries from this group entered the EU in 2004. Countries from the SEE group are argued to have made quite good progress, but are still below the levels of CEB countries, while the CIS countries progressed at the slowest pace (see Figure 5.1).

Figure 5.1: Regional patterns of progress in transition (according to the EBRD aggregate index) for CEB, SEE and CIS countries



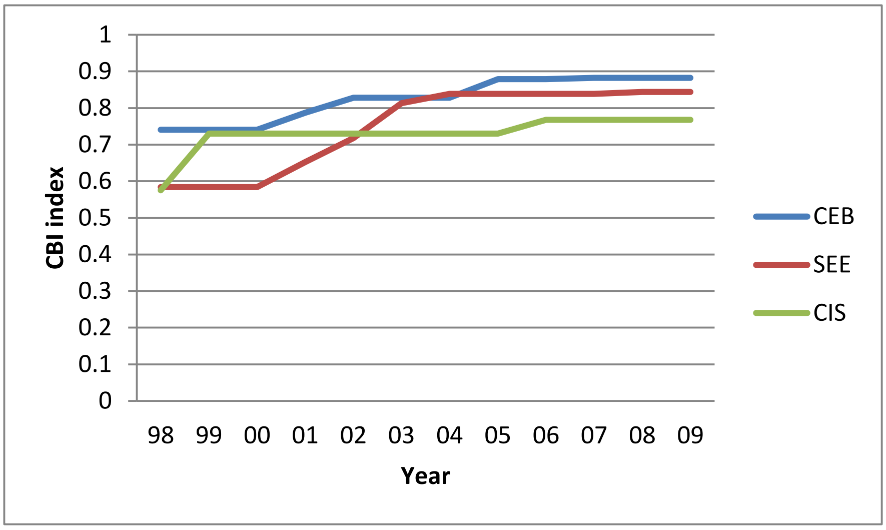

Source: Based upon the various issues of EBRD transition reports

Beside the liberalisation, privatisation and credit reforms captured by the EBRD index, the reform process also included institutional changes, most notably central bank independence; experiments with intermediate targets such as exchange rate anchors and monetary targeting; and more recently inflation targeting (Barlow, 2010). By observing Cukierman's index for central bank independence (CCBI), similar trends to those of the EBRD index between country groups can be observed (see Figure 5.2). However, data for CIS countries is not reliable since it includes the index for only two countries (Moldova and Ukraine) as data is not available for the rest of the countries in this group[60].

[59] Only countries which are included in our sample are noted here.

[60] The Cukierman's central bank independence index (CCBI) is updated for all countries in the sample except for eight CIS countries by Bogoev et al. (2012). We did not update the index for missing obervations since it is not our main focus of research and none of the countries for which the index is not calculated/updated implemented a CBA.

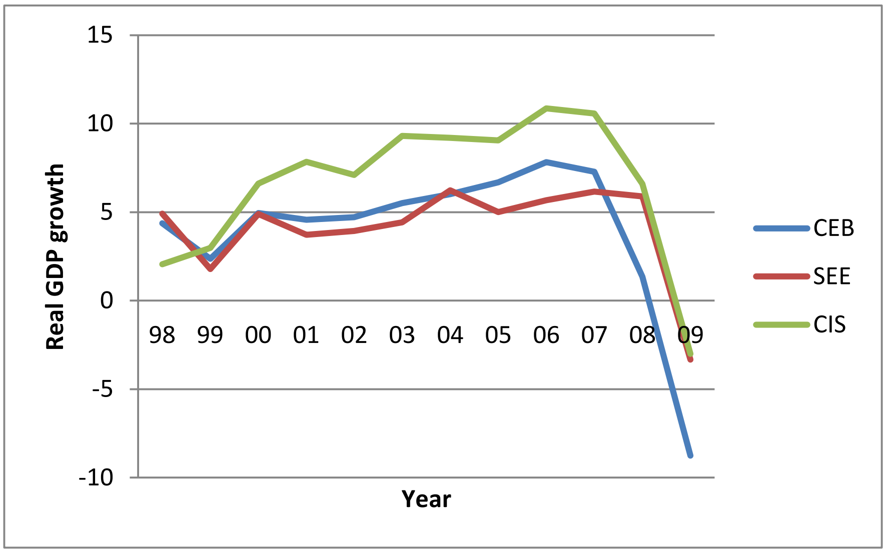
Figure 5.2: Average Cukierman's central bank independence index (updated) for CEB, SEE and CIS countries




Source: Based upon the updated Cukierman's index calculated by Bogoev et al. (2012)

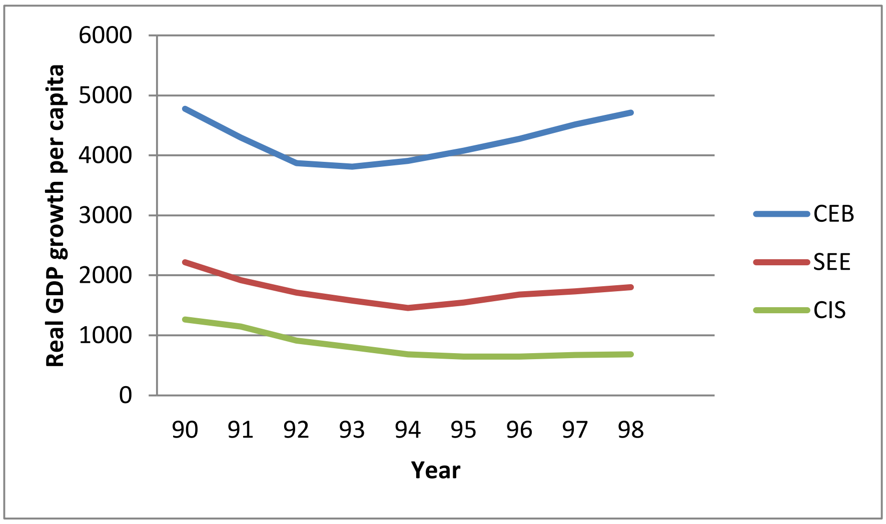
During the first years of the transition process most of the transition countries experienced negative macroeconomic trends, namely, low growth rates and high inflation rates. Through their stabilisation programmes most of the countries succeeded in successfully reversing these negative macroeconomic trends by the middle 1990s. As observed in Figure 5.3, at the beginning of the observed period all groups of countries had positive growth rates which were increasing until the end of 2007 when they started falling sharply, even being negative in late 2008 and in 2009, due to financial crisis which "hit" all countries in the sample. The highest growth rates can be observed in the CIS countries, possibly due to their initial growth being low relative to the CEB and SEE countries (Figure 5.4).

Figure 5.3: Real GDP growth (in percentage changes) in CEB, SEE and CIS counties




Source: Based upon the World Bank Indicator database

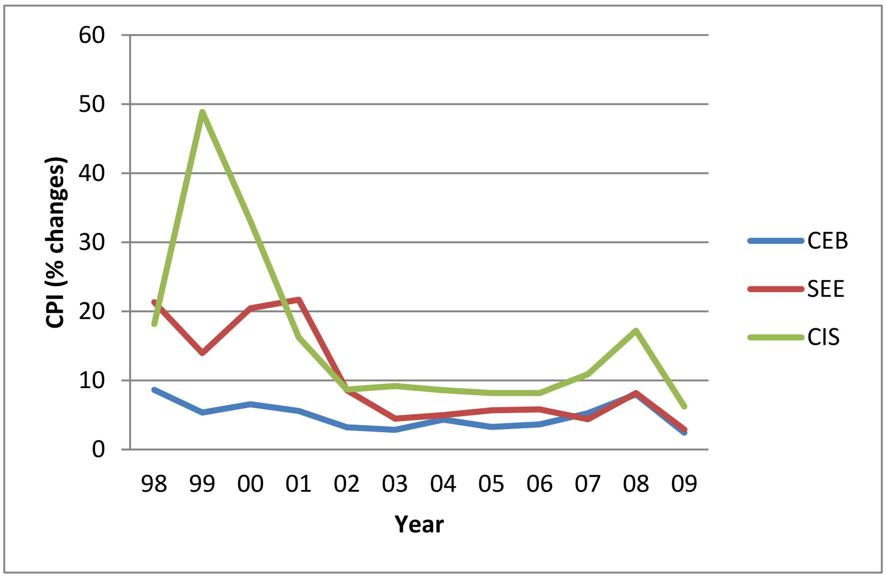
Figure 5.4: Real GDP per capita (in constant 2000 US$) in CEB, SEE and CIS countries prior to the sample period (1990-1998)




Source: Based upon the World Bank Indicator database

Most of the countries also experienced high inflation rates at the beginning of the transition process. Most of the transition countries managed to lower their inflation rates by the middle 1990s.This period is not included in the sample. However, it may be observed that there were some high inflation rates in the late 1990s in the CIS countries, which are likely to be the result of the Russian financial crisis in 1998. The high average inflation rate for CIS countries in the 1999 was mainly driven by the extremely high inflation rates in Belarus (293%) and Russia (85%). The inflation shock in 2001 in SEE countries was mainly driven by the high inflation rate in Serbia (95%) which is likely to be the result of the Kosovo war in 1998-1999. However, the inflation rates stabilised after 2003 in most of the transition countries. Inflation rates increased in late 2007 as a result of the financial crisis, but returned to their pre-crisis levels at the beginning of 2009. For a comparison of inflation rates between CEB, SEE and CIS countries see Figure 5.5.

Figure 5.5: Inflation rates (measured as percentage changes in consumer price index) in CEB, SEE and CIS countries




Source: Based upon the World Bank Indicator database

As noted above, some of the transition countries adopted stricter monetary and ERR regimes during the first years of transition, such as a CBA, as a part of their stabilisation programmes (Inoue, 2005). Some authors (Domac et al., 2004; Botrić and Cota, 2006) argued that these regimes played an important role in stabilising macroeconomic performance.

## 5.4 Estimation of the effect of CBA on inflation

### 5.4.1 Inflation determinants

At the beginning of the transition process all countries from the sample experienced periods of high inflation. However, the inflation rates decreased significantly over time in all countries in the sample (Figure 5.5). As noted earlier, some of the countries switched from one regime to another during the first years of transition as a part of their stabilisation process. The aim of this chapter is to estimate whether the countries which adopted a CBA in the early stage of transition had better inflation performances than countries with other monetary-ER regimes. In this section the potential determinants of the inflation performance in transition countries will be identified and assessed.

The actual and anticipated behaviour of the monetary authorities plays a crucial role in modern theories of inflation Under more discretionary policy there is a higher possibility of time-inconsistency which affects inflationary expectations and therefore inflation is expected to be higher. Under rule-based monetary policy, and a CBA is one of the most rigid rule-based policies, the time-inconsistency problem is reduced significantly. Wolf et al (2008) noted that the inflation rate is determined by the rate of money growth (Δm) and any monetary shock:

$$\pi = \Delta m + \nu\pi^{e} + \varepsilon \tag{5.1}$$

where ε has mean zero, has variance $\sigma_{\varepsilon}^{2}$, and ν is the elasticity of the growth of velocity with respect to expected inflation, reflecting forward-looking elements in household money demand and $\pi^{e}$ is the private sector's expectations of the inflation rate.

Under a CBA (and other fixed exchange rate regimes) domestic monetary policy cannot affect either inflation or the level of output and the central bank has no ability to expand the money supply. Starting from the formal models which are based on the assumption of rational expectations, inflationary expectations would be eliminated under such a regime and inflation (π) equal the anchor-currency country's inflation rate (π*) (Wolf et al., 2008, p.35)

$$\pi = \pi^* \tag{5.2}$$

Under a floating exchange rate regime inflation is expected to be higher since the central bank can pursue an activist monetary policy and create surprise inflation and therefore inflationary expectations are higher. Therefore, the inflation rate will be:

$$\pi = \frac{-A\theta\eta + A\theta y + A\theta^2(1-\nu)\pi^e - \nu\pi^e}{1 + A\theta} \tag{5.3}$$

where, y is the log of output, θ is a positive constant, A is the marginal benefit from the surprise inflation from any source and η is a random productivity shock. As noted in Wolf et al. (2008, p.35): "Actual inflation is increasing in the central bank's incentive to create surprise inflation, A$\bar{y}$ > 0 ($\bar{y}$ is desired level of output), and in the private sector's expectation of inflation, $\pi^e$. Under rational expectations, the latter is given by the mathematical expectation of actual inflation.

$$\pi^e = A\theta\bar{y} > 0 \tag{5.4}$$

In particular this implies that the central bank cannot systematically surprise the private sector" (p.36). However, in Wolf et al. (2008) the banking system is ignored and therefore another source of money supply growth is ignored. If we observe broader money supply inflation can still be induced under any regime through the credit multiplication process and a high pressure of demand induced by a rise in output growth, which is not followed by a rise in productivity. Therefore, we will start with the baseline model in which inflation (INF) is determined by the *broad* money supply growth (MSG) and GDP growth (GDPG).

$$\text{lnINF} = \text{MSG} + \text{GDPG} \tag{5.5}$$

In determining the inflation regression we start from this baseline model to which variables of interest and control variables, which are likely to influence inflation in transition countries, are added. For the *inflation variable* the logarithm of the percentage changes in consumer price index[61] (logs are used in order to reduce the effect of outliers) are used (this approach was also applied by Staehr, 2003 and Barlow, 2006). As suggested by monetary theory, a higher *growth in money supply* is likely to increase inflation, holding other factors constant. The positive effect of money supply growth on inflation is found in many studies (Wolf et al., 2008; Ghosh et al., 2011). In developing countries money supply growth and inflation might be considered endogenous, since higher nominal price of goods and services increases money demand which may put pressure on the authorities to increase money supply (Sargent and Wallace, 1981). This is not likely to be the case in many transition countries, which established more independent central banks during the first years of the stabilisation process (Figure 5.2). Moreover, since we are using the broadest monetary aggregate, the increase in money demand is likely to result in increases in broad money supply, even when the central bank is not increasing the monetary base (so called endogenous money supply), through the credit multiplication process. Since there is usually a time gap until the old situation adjusts to the new one and since consumer prices are argued to be sticky, the effect of money supply growth on inflation is likely to be lagged. The usually emphasised reasons are: inventories, forward and future contracts, the time needed for firms to notice higher costs and the time needed for firms to change their prices. Moreover, in order not to lose customers, firms may not change prices until they are sure that increase in costs is not temporary. This lag is usually argued to be 1-2 years,[62] although it is likely to be different in different countries depending on the level of development of country, monetary regime, type of dominant transmission mechanism, (changes in) money velocity and the degree of product market competition. The inclusion of lagged money supply growth is likely to resolve the potential endogeneity between money supply growth and inflation. Moreover, since we are using the growth of the broadest monetary aggregate as the measure of money supply growth (which is determined not only by monetary authority actions, but by the financial sector as well) there is no need for including longer lags of money supply growth in order to avoid endogeneity.

[61] Since 8 observations have negative inflation values in order to calculate logs these are dropped out from the sample.

[62] Chen (2009) emphasised Friedman's findings that approximately 6 - 9 months is needed for changes in monetary supply to change nominal national income and output, and a further 6 - 9 months for changes in nominal national income and output to affect prices. So the time lag is about one or one and a half years from the changes of monetary supply to the changes of price.

On the other hand, *real GDP growth* is expected to be negatively correlated with inflation, ceteris paribus, since faster output growth should raise money demand and consequently decrease inflation for a given expansion of money supply (Wolf et al., 2008). However, in some studies it is argued that this relationship holds only in countries with pegged ERR, since in countries with flexible ERRs output growth is likely to affect the exchange rate rather than inflation (Abbott and De Vita, 2011). The difference between the effect of a CBA, which is the variable of interest, and other regimes on inflation is estimated by using a *dummy variable for the CBA*. The expected effect of CBA on inflation is appraised in Section 5.2 in comparison to other exchange rate regimes. As explained in Section 2.2.5, we may assume that a CBA variable is capturing a "broader" effect (not just the effect of the ERR). Therefore, we expect that CBA countries had lower inflation than countries with other monetary-ER regimes. By including only a CBA variable we may argue that the endogeneity problem between the choice of ERR and inflation, which is usually emphasised in the studies, is likely to be avoided. Namely, simultaneity between a CBA and inflation may occur since it is argued that "countries with a greater proclivity towards low inflation may be more likely to *adopt* a currency board" (Ghosh et al., 1998, p.3, emphasis added). Therefore, periods of high inflation might explain the origins of a CBA, but not its maintenance. Since the sample period does not include a period before CBA introduction in any of our observed countries, we may argue that simultaneity is not likely to be an issue, since the maintenance (and the abandonment) of a CBA is an institutional and political matter rather than determined by a countries' inflation aversion. To determine the model specification and additional variables which should be included, recent studies that examine the effect of ERRs on inflation and studies which examine the sources of inflation in transition countries are next consulted.

Beside the growth of money supply and output growth, the control variables usually included in inflation models are: fiscal balance, openness and terms of trade. A higher *fiscal deficit* is usually argued to increase inflation in developing countries, since in these countries a fiscal deficit is usually financed by an increase in the money supply growth (seigniorage) (Lozano, 2008). However, after early transition a monetisation of fiscal deficit was less likely to occur, since countries increased central bank independence and had more developed financial markets (Catao and

Torrones, 2001; Henry et al., 2004). However, a fiscal deficit may influence inflation through other channels. Specifically, if government increases its net expenditures significantly aggregate demand is likely to increase therefore putting upward pressure on prices (since it is not likely that the aggregate supply will increase to the same extent, as least not in the short-run) (Samimi, 2000). If we expect that the effect of a fiscal deficit on inflation will not be through monetisation of the deficit then the potential endogeneity, which is usually argued to exist between fiscal deficit and inflation, is not an issue. Empirical evidence is inconclusive; some studies indicated a positive relationship between fiscal deficit and inflation in developing countries (Catao and Terrones, 2001; Lozano, 2008), while others did not find any significant relationship (De Haan and Dick, 1990; Mukhtar and Zakaria, 2010). Since we use the fiscal balance (in percentages of GDP) (FB) as a measure, if there is a significant effect, we expect it to be negative, since a fiscal surplus in the context explained above is likely to reduce inflation. A measure of the *openness* (OPEN) of an economy is usually included in the inflation regression “to control for the potential disciplinary effect elicited by international arbitrage” (Levy-Yeyati and Stuzengger, 2001, p.8). Studies which include this variable as a control (Levy-Yeyati and Stuzengger, 2001; Wolf et al., 2008; Ghosh et al., 2011) suggest that the expected effect of openness on inflation is negative. These studies refer to Romer (1993) in their explanation of an expected negative effect. Romer (1993) explained this relationship through the commitment mechanism (and time-inconsistency problem) as a main channel through which openness influences inflation. He argued that higher openness leads to lower inflation since the inflation costs of the “surprise” monetary expansion are higher (and output gains lower) when a country is more open, assuming a floating ERR. As Romer (1993, p. 1) further explained: “because unanticipated monetary expansion causes real exchange rate depreciation, and because the harms of real depreciation are greater in more open economies, the benefits of surprise expansion are a decreasing function of the degree of openness.” Romer (1993) also emphasised that the effect of openness on inflation is likely to be lower when central bank independence is high. Daniels et al. (2005) demonstrated that once one controls for the degree of central bank independence, a positive relationship between openness and inflation emerges. However, studies which deal with issue of openness and inflation causation in more detail note that this link is highly dependent on particular country circumstances and channels through which the openness affects inflation. According to the new growth theory, the channel through which openness may influence inflation is not through affecting the incentive for money expansion but through its “positive influence on output, mainly through increased efficiency, better allocation of resources, improved capacity utilization, and increased foreign investment” (Jin, 2000). The effect of openness on inflation is not likely to occur through a commitment mechanism channel, since most of the countries from the sample already established a high level of independence of their monetary institutions by the beginning of the observed period. However, if inflation is affected by openness in these countries is it likely to be through the channel emphasised by Jin (2000).

Fisher (1993) argued that the changes in *terms of trade* (TOT) are a major source of supply shocks for most developing countries. The commonly used measure for the terms of trade is a ratio of the export unit value index to the import unit value index. Accordingly, it is argued that when a country’s terms of trade are improving (increasing) a country can afford more imports for the exported value, due to increase in earnings from the exports, which may be the result of an increase of export prices and/or increase of export quantity, and/or decrease of import prices relative to export prices. These improvements are likely to increase import quantity (of relatively cheaper import goods), which is considered as a supply-shock, and consequently lead to a decrease in inflation, in the short-run. However, the TOT might have a quite different implications for inflation under a wide range of circumstances, depending on the type of the exchange rate regime, prices within the TOT measure that are changing and whether the changes are seen to be temporary or long-lasting (Archer, 1993). Archer (1993) and Gruen and Dwyer (1996) argued that changes in TOT are expected to affect inflation in the short run, since over the long --run inflation is determined by the stance of domestic monetary policy. Archer (1993) argued that the relative price changes will not affect inflation if the effect is of a one-off nature since inflation is an ongoing process, involving a generalized movement of all prices in the same direction and changes in prices and production are costly. Therefore, the changes in international trade prices will not spill over on to the domestic prices and production if the change is expected to be temporary. However, the TOT changes may affect inflation if the effect is permanent and when these changes are not expected to be reversed in the short period. Gruen and Dwyer (1996) and Desormeaux et al. (2009) argued that the main channel through which changes in TOT affect inflation is the exchange rate response and that the effect of TOT will depend on the exchange rate regime which is in use in a particular country. They argued that under a fixed ERR, the changes in TOT will have higher influence on inflation than under a flexible ERR since the changes in TOT might be offset by changes in the real exchange rate under a flexible ERR. Under fixed ERRs the rise in TOT will increase the real purchasing power of domestic production which is likely to have a positive effect on income, investment, consumption and production and consequently inflation (Archer, 1993; Gruen and Dwyer, 1996; Cunningham, 2010). This is the indirect effect of an increase in TOT on inflation. However, Desormeaux et al. (2009) argued that this link is getting weaker over time due to increased diversification of the export base, enhanced macroeconomic framework, as well as a floating exchange rate regime that usually bears the burden of the adjustment to changes in external conditions. However, if a country is predominantly a price taker rather than a price setter, which is the case for most countries in our sample in both export and import markets, it may be argued that changes in the TOT result virtually entirely from international developments (Archer, 1993). Moreover, as most countries from the sample are small, open economies (with a few exceptions) their price levels are strongly influenced by import prices. Sepp and Randveer (2002b, p.377) argued that in small, open economies import prices are "predominantly relevant in domestic price formation". Therefore, improvements in TOT are usually the result of a decrease in the prices of imported goods, which is consequently expected to lower domestic inflation.

Empirical studies which examine the inflation determinants in transition countries emphasise the importance of accounting for the effects of economic liberalisation, central bank independence and other institutional characteristics (Cukierman et al., 2002; Inoue, 2005; Barlow, 2010). In transition economies, there are many structural and institutional changes, which are expected to influence the inflation generating process. To account for these changes transition indicators are included in the model. Although they have some limitations (see Chapter 1) the *EBRD indices*, as the most widely used transition indices, are used. The aggregate EBRD index (EBRDI) indicates the overall progress in transition, assigning scores from 1 (which indicates little or no progress) to 4 (for the highest progress)[63]. Better progress in transition should result in lower inflation due to trade liberalisation (through increase in competition), privatisation (through increase in enterprises efficiency) and credit reforms (through the increase in monetary policy efficacy via raising the effectiveness of credit allocation) which are included in the aggregate EBRD index (Barlow, 2010).

An increase in a *central bank's independence* (CBI) is also argued to be a characteristic of the transition process and to influence inflation (Frankel, 2010). Therefore it is also important to perceive if and how the changes in the institutional and legal framework of monetary authority affect inflation. As elaborated in Section 2.2.5, in the case of a CBA the choice of monetary and ERR are jointly determined, since beside the commitment to keep the domestic currency fixed to the anchor currency, a CBA sets rules which restrain the discretion of the monetary authority. Therefore a CBA variable is capturing all the features associated with that particular regime, not just the type of the exchange rate (such as the inability to finance government, full coverage of monetary base and inability of the central bank to act as a lender of last resort). Some of these features are also assessed within a central bank independence (CBI) index, which is usually argued to influence inflation in transition countries (Maliszewski, 2000; Cukierman et al., 2002). Cukierman's CBI index (CCBI), which is usually used in similar studies, is constructed for every country by assigning points on certain features/questions which are assumed to affect central bank independence (such as "Who appoints the Governor?", "Limits on the level of CB credit to government" and "Provisions for dismissal of the CB governor") and by assigning certain weights to these features. Since this assessment is based on provisions in central bank laws (and CBA laws in countries with a CBA) it may be argued that the CBA variable is capturing the features assessed in the CCBI. However, although monetary policy is rule-bound under a CBA that does not necessarily mean that all CBA countries have a high CCBI index. For example, Lithuania had 0.78 CCBI from 1998 until 2000, which is lower than the CCBI index for some countries with more flexible ER-monetary regimes (e.g. Poland).

[63] „In 1995 an additional category of 4* was added for equating policies and performance standards with those of an advanced industrial economy, and in 1997 pluses and minuses were introduced to allow for finer distinctions among the different categories (with 4* redefined as 4+)" (EBRD, 2010, p.2).

We may argue that the level of central bank independence is related to the "strictness" of a CBA. Namely, by observing the CCBI indices in the CBA countries it can be noted that it is the highest in the country which had the strictest CBA (Bosnia and Herzegovina), while the country with the lowest level of CCBI index (Lithuania) had a more flexible CBA (the one which deviates most from the orthodox rules)[64] (for more details on deviations from orthodox rules see Chapter 2). The "strictness" of a CBA can be observed through the pre-commitment index calculated by Camilleri[65] (2002 and 2004) which controls for deviations of modern CBAs from the theoretical benchmark (for more details about the composition of this index see Section 2.4). This index partially overlaps with the Cukierman's CBI index. It is also the highest for the country with the most rigid CBA (Bosnia and Herzegovina) and the lowest in the country which has the most flexible CBA (which is again Lithuania).

Since an increase in central bank's independence is associated with a decrease in the time-inconsistency problem it is expected to lower inflationary expectations and therefore to decrease inflation. This relationship is found in many studies (Grilli et al., 1991; Cukierman et al., 1992; Panagiotidis and Triampella, 2006, as cited in Bogoev et al., 2012). What is also of particular interest is how to measure the level of CBI. In this respect there are a few indices calculated which mainly assess the level of autonomy of central banks in determining monetary policy. The most widely used indices in the empirical studies are those designed by Grilli, Masciandaro and Tabellini (1991) and Cukierman et al. (2002) which consider a broad variety of legal provisions assumed to contribute to CBI (as cited in Bogoev et al., 2012). The weighted Cukierman's indices used in this Chapter are updated from the original Cukierman indices, which are considered to be the most comprehensive (Bogoev et al., 2012). The issue recognised by most of the recent studies is that the relationship between inflation and CBI is likely to be endogenous, since countries with a higher CBI are expected to have lower inflation but, on the other hand, the low inflation countries are likely to adopt more independent central banks, causing an inverse

[64] Central bank independence indices calculated as impliedby Cukierman (1992) and Cukierman et al. (1992) suggest that central bank independence in CBA countries is not necessarily (very) high: BH (0.979), Bulgaria (0.859), Estonia (1998–2001: 0.78; 2002–2004: 0.88; 2005-2009: 0.907) and Lithuania (1998-2000:0.78; 2001-2009:0.912).
[65] Camilleri pre-commitment index differs between CBA countries and suggests that CBAs differ institutionally: 0.93 for BH; 0.62 for Bulgaria; 0.86 for Estonia; 0.39 for Lithuania.

relationship between inflation and CBI. Most studies avoided this potential endogeneity by including a lagged CBI variable (Maliszewsky, 2000; Cukierman et al., 2002; Eijffinger and Stadhouders, 2003, as cited in Bogoev et al., 2012). Inclusion of a lagged CBI measure is also justified on theoretical grounds, since there is a time lag between the dates when the central bank law has been imposed and when it is actually implemented in practice. Therefore, we also include this variable lagged one period. However, this variable is assumed to be capturing the level of the central bank's credibility and therefore may lower the influence of a CBA on inflation, which is also thought to be capturing this effect. The same applies to *the dummy variable for fixed exchange rate*. By including the 'defactoFIX' variable, which refers to an actual (de facto) fixed exchange rate, we will observe whether the effect of a CBA on inflation is the result of fixed exchange rates in those countries or whether a CBA reduces inflation over and above the effect of the fixed exchange rate. Therefore, we used Ilzetski, Reinhart and Rogoff's (2010) exchange rate classification (IRR) which is based on actual variations in the exchange rate. This variable includes the CBA countries, except Lithuania for the period 2002-2009, since the IRR classification classifies the Lithuanian ERR as limited-flexible in this period. Inflation in the EU member countries is likely to be influenced by the inflation in the Euro-zone due to the convergence process. In order to capture this effect (for the Euro-oriented countries in the sample) a dummy variable for *EU membership* (EU) is included in the model.

One more potential determinant of short-run increases in inflation in transition countries might be the introduction of *value-added tax* (VAT), which occurred in most of the countries in the sample during the early stages of transition[66]. Bird (2005) argued that the introduction of VAT is one of the most important fiscal issues in transition and developing countries. Bye et al. (2003, p.13) noted that "the general VAT reform increases the share of indirect taxation in the consumer prices, and the aggregate price index of material consumption rises". A general result of all analyses conducted by Viren (2009) is that more than one half of a tax increase shifts to

[66] VAT was introduced in Russia and ex-Soviet Union countries in 1992, after the dissolution of the Soviet Union. In most of the Central Europen countries it was introduced in the early 90's (Czech Republic 1993, Slovak Republik 1993, Poland, 1993) and in South Easter European countries in the late 90's, early 2000 (Croatia in 1998, Slovenia in 1999, Macedonia in 2000, Montenegro in 2003, Serbia in 2005 and BH in 2006).

consumer prices. However, it is sometimes argued that VAT is not inflationary. Tait (1991) conducted the empirical analysis about the effect of VAT on inflation for forty countries and did not find evidence of causality for thirty three countries. Sarili (2000) did not find a significant relationship between introduction of a VAT and inflation in Turkey. None of the studies reviewed in Section 5.2 control for this effect. However, since it is believed that the introduction of VAT affected inflation in transition countries a dummy variable which indicates the year of VAT introduction is included in the model. Finally, *year dummies* are included to control for shocks that are common for all countries such as an increase in oil price or a financial crisis. This control is usually included in previous studies and all the studies reviewed in Section 5.2 include this control. Annual data for all variables is used. All the above specified variables with their measures, labels, and expected signs are presented in Table 5.2 below.

Table 5.2: Inflation regression variables – label, description, expected sign and data source

| Variable name | Label | Description | Expected sign | Data source | Notes |
|---|---|---|---|---|---|
| Inflation | lnINF | Natural log of inflation (which is measured as annual percentage change in consumer price index | Dependent variable | WDI | For BH national statistics is used; inflation in BH is measured by using the retail price index until 2007<br><br>Since 8 observations have negative inflation values in order to calculate logs these are dropped out from the sample. |
| Countries with currency board arrangement | CBA | Dummy variable for countries with a CBA | - | | |
| Real GDP growth | GDPG | Based on the market prices expressed in constant local currency (annual % change) | - | WDI | |
| Broad money supply growth | (L1)MSG | The first lag of the broad money supply growth which is the sum of currency outside banks; demand deposits other than those of the central government; the time, savings, and foreign currency deposits of resident sectors other than the central government; bank and traveller's checks; and other securities such as certificates of deposit and commercial paper (annual % change) | + | WDI | Data on broad money for Slovenia taken from various EBRD transition reports |
| Fiscal balance/GDP | FB | Fiscal balance in % of GDP | - | EBRD | Data for Moldova taken from various EBRD transition reports and EconStat |
| Openness | OPEN | The sum of exports and imports of goods and services measured as a share of gross domestic product (% of GDP) | - | WDI | |

Table 5.2 (continuing): Inflation regression variables – label, description, expected sign and data source

| **Variable name** | **Label** | **Description** | **Expected sign** | **Data source** | **Notes** |
|---|---|---|---|---|---|
| Terms of trade | TOT | Ratio of the export unit value index to the import unit value index (base year 2000) | ? | UNCTAD STAT | Data not available for years 1998 and 1999 and data for Serbia is joint with data for Montenegro, therefore data for 2008 and 2009 missing for this county |
| EBRD progress in transition indicator | EBRDI | Average of eight EBRD transition indicators (for liberalisation, privatisation and credit reform) (index) | - | EBRD | Available for all countries in the sample except for the Czech Republic in years 2008 and 2009, as it is considered to have completed its transition in 2007 |
| Central bank's independence | (L1)CCBI | The first lag of updated Cukierman's index of central bank independence (index) | - | Bogoev et al., 2012 | Data not available for 8 CIS countries (96 missing observations) |
| Fixed exchange rate | defactoFIX | Dummy variable for countries with fixed exchange rate (de facto fixed exchange rate regime) | - | Ilzetski, Reinhart and Rogoff (2010) | |
| EU membership | EU | Dummy variable for EU member countries | - | | |
| Introduction of value added tax | VAT | Dummy variable for the year of VAT introduction | + | Background paper for International Tax Dialogue Conference on the VAT, 2005 | |

### 5.4.2 Descriptive statistics and model specification

In the previous section variables to be included in the inflation model were specified and their expected effect on inflation elaborated. In this section the main trends in these determinants in countries with a CBA will be compared with their trends in countries with other regimes.

Table 5.3: Comparison of average trends in inflation and inflation determinants between countries with a CBA and countries with other regimes

| Variable | CBA | | | | Other regimes | | | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Standard deviation | Min | Max | Mean | Standard deviation | Min | Max |
| INF | 5.03 | 3.90 | 0.28 | 18.67 | 12.64 | 24.65 | 0.05 | 293.68 |
| GDPG | 5.36 | 4.79 | -15.03 | 15.60 | 5.11 | 5.55 | -18.01 | 34.50 |
| MSG | 19.68 | 14.41 | -0.40 | 90.00 | 28.04 | 30.85 | -14.13 | 276.00 |
| FB | -0.47 | 2.77 | -9.20 | 3.40 | -2.69 | 3.99 | -13.10 | 25.50 |
| OPEN | 123.67 | 23.22 | 87.28 | 172.80 | 99.29 | 31.38 | 45.13 | 203.20 |
| TOT | 110.53 | 16.78 | 97.95 | 148.35 | 105.76 | 21.39 | 73.51 | 238.18 |
| EBRDI | 3.29 | 0.55 | 2.10 | 4.00 | 3.07 | 0.54 | 1.40 | 4.00 |
| CCBI | 0.89 | 0.07 | 0.78 | 0.98 | 0.75 | 0.17 | 0.34 | 0.95 |

According to Table 5.3 countries with a CBA recorded, on average, lower inflation, higher GDP growth rates, lower money supply and lower fiscal deficits than countries with other regimes. Furthermore, CBA countries were more open and had more improved (increased exports-to-imports unit value index) terms of trade compared to the countries with other regimes. CBA countries also recorded higher EBRD and CCBI indices than countries with other regimes.

However, these are only unconditional averages of variables. Therefore, before making any inference about the difference in macroeconomic performance in countries with CBA compared to those with other regimes a more formal empirical analysis should be conducted. Therefore, the effect of CBA (compared to other regimes) on inflation performance will be estimated by using the appropriate static and dynamic estimator, taking into account all the above specified controls. The natural logarithm of the consumer price index will be used as a measure of inflation in order to decrease the influence of outliers and to induce a linear relationship among the variables. Since there are only eight observations with negative change in inflation these observations are dropped in order to use logarithms. The first lag of money supply growth and Cukierman's CBI index will be included as discussed in Section 5.4.2. Other variables are included in their current values. The correlation matrix suggests that there are no signs of high correlation between the explanatory variables (Appendix 5.1). As suggested by other studies, time or period dummy variables (period fixed effects - $\gamma_t$) will be included in order to control for price shocks. A test for the significance of the time dummy variables also suggests that time dummies should be included in the regression (Appendix 5.2). Accordingly, the model we want to estimate is:

$$LnINF_{i,t} = \alpha_0 + \alpha_1 CBA_{i,t} (+ \alpha_2 defactoFIX_{i,t} + \alpha_3 CCBI_{i,t-1}) + \alpha_4 GDPG_{i,t} + \alpha_5 MSG_{i,t-1} + \alpha_6 FB_{i,t} + \alpha_7 OPEN_{i,t} + \alpha_8 TOT_{i,t} + \alpha_9 EBRDI_{i,t} + \alpha_{10} EU_{i,t} + \alpha_{11} VAT_{i,t} + \gamma_t + \varepsilon_{i,t} \quad (5.6)$$

'DefactoFIX' and 'CCBI' variables are put in the brackets since in each case (static and dynamic estimations) the model is developed from variables outside the brackets and built up by subsequently including the controls for fixed exchange rate regime and the level of central bank independence.

### 5.4.3 Static panel model estimations

Estimation results of Equation 5.6 by pooled OLS suggest that the CBA variable is highly significant with the expected (negative) sign implying that countries with a CBA have, on average, lower inflation rates than countries with other regimes. GDP growth, money supply and CBI index are also significant with the expected signs (OLS results are presented in Table 5.4). Diagnostic tests indicate that the assumptions of normality, linearity and homoscedasticity cannot be rejected at all conventional levels of significance (Appendix 5.2). However, since we cannot expect to capture all countries' specifics by the exogenous variables we should control for the country effects which is not done within pooled OLS. Botrić and Cota (2006) emphasised that the inflation generating processes in transition economies differs, and that country specifics should be taken into account when analysing inflation in those countries. Therefore, since it ignores the countries' specifics, one may argue that the OLS would result in biased estimates. In order to account for the countries' effects ($\gamma_t$) a fixed effects (FE) model is next utilised (Equation 5.7).

*FE model (Stage 1 in FEVD)*

$$LnINF_{i,t} = \alpha_0 + [\alpha_1 CBA_{i,t}]^{67} + (\alpha_2 defactoFIX_{i,t} + \alpha_3 CCBI_{i,t-1}) + \alpha_4 GDPG_{i,t} + \alpha_5 MSG_{i,t-1} + \alpha_6 FB_{i,t} + \alpha_7 OPEN_{i,t} + \alpha_8 TOT_{i,t} + \alpha_9 EBRDI_{i,t} + \alpha_{10} EU_{i,t} + \alpha_{11} VAT_{i,t} + \gamma_t + u_i + \varepsilon_{i,t} \quad (5.7)$$

The F-test, after estimation of Equation 5.7, suggests that the hypothesis that the unit fixed effects ($u_i$) are equal to zero is rejected at all conventional levels of significance (p-value 0.000) (Appendix 5.3). This implies that the FE should be preferred over the OLS estimator. However, using the FE model disables the estimation of the time-invariant variables since it uses only within-group (time) variation. Therefore, if we are interested in the effects of the time-invariant variables, the FE model will not tell us anything about their effect on the dependent variable (since it disregards additional information contained in the between-group (countries) variation, in effect absorbing all sources of between-group variation into the group fixed effects). This is an important issue for our model, since the variable of interest (CBA) is not changing during the observed period (as discussed in Section 5.4.1). Additionally, Plumper and Troeger (2007) argued that the FE estimator is also unreliable when estimating the effect of slowly changing variables (variables with relatively small within-group variation) which is usually a characteristic of institutional variables. This could be argued for the transition indicator variable (EBRDI) and the central bank independence index (CCBI). However, when interested in the time-invariant and/or slowly changing variables one may use the random effects (RE) model or Hausman-Taylor estimator, though both estimators are argued to give biased and inefficient estimates of the true betas in relatively small samples (Plumper and Troeger, 2004). Moreover, the RE requires the strict exogeneity of regressors and orthogonality between regressors and unit effects, which is a rarely-fulfilled condition. As Plumper and Troeger (2004, p.6) argued: "the real world data rarely satisfied the conditions under which RE estimators are consistent". As a solution, Plumper and Troeger

[67] The CBA variable is put in the square brackets since it drops from the estimation in the first stage since it is time-invariant variable (as explained in the text below).

(2004, 2007) proposed the fixed effects vector decomposition (FEVD) estimator, which allows estimation of time-invariant variables and variables with low within-group variance in the presence of unit effects. Other advantages of FEVD, pointed out by its creators, are that it maintains the small sample properties of fixed effects estimation and it is more reliable in estimating the coefficients of time-varying and time-invariant variables even when these are correlated with the unit effects. It is argued that the FEVD is more efficient than FE, since it uses more information (both within and between variation) but is also argued to be more biased (Plumper and Troeger, 2007). Therefore, the decision about which estimator should be used is based on a trade-off between efficiency and unbiasedness and depends on the sample size and the researcher's interest[68]. Plumper and Troeger (2011) further argue that FEVD estimation has characteristics that combine the FE with the pooled-OLS model[69]. Specifically, it is induced by including the estimated unit effects from the FE model in a pooled OLS regression. The FEVD estimator is described as a three-stage procedure: the first stage estimates the model with the FE estimator (Equation 5.2); the second stage regresses the time-invariant and slowly moving variables on the predicted unit effects $\hat{u}_i$from the first stage (Equation 5.8); the third stage estimates the time-varying, time-invariant and slowly changing variables by OLS and including the estimated residuals from the second stage $h_i$ (Equation 5.9).

*Stage 2 in FEVD*

$$\hat{u}_i = \beta_0 + \beta_1 CBA_{i,t} + \beta_2 EBRDI_{i,t} \, (+ \beta_2 CCBI_{i,t-1}) + h_i \tag{5.8}$$

where:

$\hat{u}_i$ - the estimated unit effects (from 5.2); and

$h_i$ - the error term, i.e. the unobservable, hence unexplained part of the unit effects

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[68] As noted in Plumper and Troeger (2007, p. 130): "If researchers always went for the estimator with the best asymptotic properties (as typically recommended in econometrics textbooks) they would always choose the best estimator for infinitely large samples. Unfortunately, this estimator could perform poorly in estimating the finite sample at hand." Therefore, for the small sample available the consistency issue is already pronounced regardless of the estimator chosen.

[69] "... FEVD analyzes variables that are best analyzed by FE by a de facto FE model and variables that are best analyzed by pooled OLS by a de facto pooled OLS model. As we concluded in our 2007 *Political Analysis* article, FEVD does better than FE in estimating time-invariant (and rarely changing and exogenous time varying) variables and better than pooled OLS and random effects in estimating endogenous time-varying variables" (Plumper and Troeger, 2011, p. 149).

*Stage 3 in FEVD*

$$LnINF_{i,t} = \delta_0 + \delta_1 CBA_{i,t} (+ \alpha_2 defactoFIX_{i,t} + \alpha_3 CCBI_{i,t-1}) + \alpha_4 GDPG_{i,t} + \alpha_5 MSG_{i,t-1} + \alpha_6 FB_{i,t} + \alpha_7 OPEN_{i,t} + \alpha_8 TOT_{i,t} + \delta_2 EBRDI_{i,t} + \alpha_9 EU_{i,t} + \alpha_{10} VAT_{i,t} + \alpha_{10} h_i + \gamma_t + \varepsilon_{i,t} \tag{5.9}$$

Plumper and Troeger (2004, 2007) argued that only the third stage overcomes the potential multicollinearity between time-variant and time-invariant variables, and it is also needed to adjust the degree of freedom to obtain the correct standard errors (SEs). However, the FEVD estimator was criticised as producing inconsistent estimates (Greene, 2011a) and small/incorrect standard errors (Greene, 2011a and Breusch et al., 2011). The SEs were eventually changed in the subsequent FEVD version (xtfevd4.0 which replaced xtfevd2.0) by Plumper and Troeger to account for the additional variance (a more detailed discussion about the SEs is provided below). Therefore, the separate estimation of three stages (stage by stage) will not yield the correct standard errors, since they are not corrected for the extra variance. In his "Reply to Rejoinder" Greene (2011b) argues that "although it produces the right coefficient estimates, it produces the wrong SEs for the estimator of β [the coefficients on time-varying variables] and an ambiguous result for the SEs for the estimator of γ [the coefficients on time-invariant variables]" (p. 171). He argues that the step 3 estimator is incorrect and suggests relying entirely on step 2 plus a side calculation for γ and that "a fair amount of mechanical detail, including the crucial statement about how to compute SEs is simply omitted from PT [Plumper and Troeger]" (Greene, 2011b, p.172). However, Greene, with two other authors, published an empirical paper (Greene et al., 2010) in which they utilise the FEVD method. In their paper they argue that FEVD "becomes a useful tool only when slowly changing variables are included in the second stage" (p.5) and they emphasise the importance of the between to within ratio as a criterion for the inclusion of time-varying variables in the second stage (as suggested by Plumper and Troeger, 2007). Although the ratio cannot be exactly determined, since it depends on the correlation between the variable and the unit heterogeneity, which is unobservable, Plumper and Troeger (2007) suggested the ratio of 2.8 as sufficient to justify the inclusion of the variable in the second stage. However, it is not clear whether Greene et al. (2010)

utilise exactly the same procedure suggested by Plumper and Troeger (2011) or they made some changes, but they note that the accuracy of the SEs cannot be confirmed. However, by using the FEVD himself Greene tacitly approved its usage when both time-invariant and slowly changing variables are included in the second stage.

The model is estimated by using the 'xtfevd4.0' command[70]. We included CBA as a time-invariant variable (since countries with a CBA had this regime during the whole observed period) and EBRDI as a slowly changing variable (since its ratio of between-to-within variance is 2.7). We also treated the CCBI variable as slowly changing, since it changes infrequently during the observed period, even though - since it is not varying much between countries either - it also has a low between variance (and consequently low between to within ratio)[71] (Appendix 5.4). Since the 'xtfevd' does not allow us to do post-estimation tests we run the three stages step-by-step as suggested in Plumper and Troeger (2007), which allows us to do post-estimations (since OLS estimation is used in the last stage). The tests suggest that the standard assumptions on homoscedasticity, normality and linearity cannot be rejected at all conventional levels of significance[72] (Appendix 5.5a). However, although the coefficients from the third stage are the same as the ones provided by the 'xtfevd' estimator the two have different degrees of freedom and in the third stage (when estimating stage by stage) the SEs are not adjusted for the variance from the previous stage (which is done in 'xtfevd', as discussed above)[73]. Therefore we will interpret the results from 'xtfevd' estimation.

As noted above, we implement a sequential approach to estimation of our variables of interest. Since we argue that a CBA is a monetary framework which captures the

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[70] 'xtfevd4.0' is a command introduced by Plumper and Troeger (2007) for estimation of fixed effect vector decomposition in Stata.

[71] DefactoFIX, VAT and EU variables also do not vary much between countries or within a country. We tried estimations in which these variables are treated as slowly changing (added into the second stage) but they were insignificant in the second stage and the results in the third stage, as well as these from 'xtfevd' were very similar to these where these variables are not treated as slowly-moving. Since the variables are insignificant in the second stage the preferred results are those where these variables are not treated as slowly changing.

[72] Although Cameron and Trivedi‟s decomposition of IM-test ('imtest') suggests that the hypothesis of homoscedasticity cannot be rejected, the Breusch–Pagan (1979) and Cook–Weisberg (1983) test for heteroskedasticity ('hettest') suggests a rejection of this hypothesis at all conventional levels of significance.

[73] By comparing the results one may note that most of the variables lose their significance when 'xtfevd' is applied, compared to their significance in the third stage when estimating stage by stage.

effect of fixed ERR, central bank independence and discretion of the monetary authority, the first specification includes only the CBA variable (Appendix 5.5b). In the second specification we control for the fixed exchange rate (defactoFIX) in order to see whether a CBA still has significant effect on inflation or its effect is a result of a fixed ER (Appendix 5.5c). Finally, in the third specification we also include the (lagged) central bank independence variable (L1CCBI) in order to observe whether the CBA effect on inflation is a result of the high central bank independence or whether it has an additional effect on inflation over the effect of central bank independence (Appendix 5.5d).

Table 5.4: Results from the OLS and FEVD - Equations 5.1-5.4

| Estimation technique | OLS | FEVD | | |
|---|---|---|---|---|
| Variables | | CBA | CBA + defactoFIX | CBA + defactoFIX + L1CCBI |
| CBA | -0.631** | -0.704** | -0.601* | -0.614 |
| DefactoFIX | 0.084 | | -0.156 | 0.047 |
| L1CCBI | -1.578** | | | -1.992** |
| GDPG | -0.062** | -0.019 | -0.019 | -0.055 |
| L1MSG | 0.024*** | 0.008** | 0.008** | 0.012** |
| FB | 0.076** | -0.009 | -0.009 | 0.035 |
| OPEN | 0.004 | 0.012** | 0.012** | 0.007 |
| TOT | 0.008 | 0.004 | 0.004 | 0.023 |
| EBRDI | 0.173 | -0.630** | -0.662** | -0.149 |
| VAT | 0.999 | 0.935* | 0.933* | 0.895 |
| EU | 0.011 | -0.163 | -0.166 | -0.284 |
| Period dummies included | Yes | Yes | Yes | Yes |

Note: ***, **, * donates that variables are statistically significant at the 1%, 5% and 10%, respectively

As summarised in Table 5.4, when a CBA variable is included in the model (but dejureFIX and CCBI are not) it is significant at the 5% level in both the OLS and FEVD estimations and has the expected negative sign, holding other factors constant. After introducing the dummy variable for fixed ER the negative effect of a CBA on inflation is still significant, though only at the 10% level, while the variable for the fixed ER is insignificant. After including the CCBI variable the CBA variable loses its significance, while CCBI has a significant negative effect on inflation. These results suggest that a CBA has an additional effect on inflation reduction when a fixed exchange rate is accounted for. However, once the degree of central bank independence is controlled for then neither fixed exchange rates nor a CBA are significant influences; instead, central bank independence is “doing the work” of inflation reduction. The inclusion of the CCBI variable also has the effect that the coefficients on openness, EBRDI and VAT variables become insignificant. Money supply is significant and positive through all specifications suggesting that an increase in the previous period's money supply is likely to increase current inflation.

However, the interpretation of the results from the FEVD is not straightforward, since there are still some unresolved issues about this estimator. Firstly, the appropriateness of the structure (adjustment) of the standard errors is not agreed upon. All the authors engaged in the discussion about the FEVD approach propose similar but somewhat different structures of the standard errors (for the comparison of the variance formula used by Plumper and Troeger, Greene and Breusch et al., see Plumper and Troeger, 2011, p. 160). However, in their paper in which they apply the FEVD Greene et al. (2010, p.14, emphasis added) argue that: "*It is not clear yet whether and how any adjustment should be made to the standard errors in the rarely-changing variable case and this will doubtless be a subject of debate in the future"* and that "gains in precision have arisen from more plausible parameter estimates, not from greatly reduced standard errors". Plumper and Troeger's improved estimator (xtfevd4.0) is adjusting the standard errors in the third stage by taking into account the extra variation from the previous stage which could be seen from its structure (Equation 5.6). In order to see the additionally added part of the SEs, the Plumper and Troeger variance formula provided in 2011[74] (Equation 5.6) is compared with the sampling variance of the linear regression estimator (Equation 5.5):

As noted in Baum (2006, p.134) the sampling variance of the linear regression estimator (independent and identically distributed i.i.d. errors assumed) is a scaling of the variance of the data against the data itself[75]:

$var[\beta \mid x] = (X'X)^{-1}(X'\sum_u X)\ (X'X)^{-1}$, where $\sum_u$ is $\sigma^2 I_{NxT}$ and $\sigma^2$ is a constant variance, X is a data matrix and X' is a transposed data matrix (5.10)

[74] It cannot be compared with the variance formula used in the previous version of FEVD (xtfevd2.0) since it is not provided in the PT's 2007 paper, but they argue in their 2011 paper that "the OLS is overconfident" and that "this was the main reason for why xtfevd2.0beta was overconfident, with computed SEs being much smaller than the sampling distribution" (p.160).

[75] The original formula from Baum (2006) is amended with a time dimension (T) to be better comparable with FEVD variance, which is derived for the panel data

while the xtfevd4.0 variance formula is as follows:

$$X_{FEVD4.0}(\beta,\gamma) = (H'W)^{-1}H'\Omega H(W'H)^{-1}, \text{ where } \Omega = \sigma^2_{\varepsilon}I_{NT} + \sigma^2\eta I_N \otimes l_T l'_T \qquad (5.11)$$

where $I_N$ is an NxN identity matrix, $l_T$ is a Tx1 vector of ones, $\sigma^2\eta$ stands for the variance of the residuals (eta) of the second stage regression of the FEVD procedure, the unexplained part of the unit specific effects.

From the Equations 5.5 and 5.6 we can see that these formulas have similar but different structures. First, the FEVD accounts for two different types of variables, namely time varying (Y) and time-invariant and slowly changing variables (Z). Second, the H matrix is in the demeaned form of Y: H = [$\ddot{Y}$, Z] and the W matrix is W = [Y; Z]. Finally, the middle matrix, Ω, is different; while the default SEs assume constant variance, the FEVD SEs allow for extra variance from the second stage and, therefore, additional information compared to $\sum_u$. In addition, $\sigma^2_{\varepsilon}I_{NT}$ suggests that 5.6 does not yield SEs that are robust to heteroscedasticity (because the variance of the idiosyncratic error term is not allowed to vary with observation i; cluster-robust SEs also take into account variation by group j, as noted below.) However, when Plumper and Troeger's SEs (Equation 5.6) are compared to the SEs which account for heteroscedasticity (Equation 5.7), and for arbitrary correlations within clusters (Equation 5.8), it should be noted that Plumper and Troeger's SEs do not account for potential heteroscedasticy and/or serial correlation in the residuals, since they do not include the group effect (i or j subscript) to indicate that the variance is no longer constant.

The robust estimator of the variance component estimation (VCE), as noted in Baum (2006, p.136) is:

$$\text{var}\,[\hat{\beta}|x] = \frac{N}{N-k}(X'X)^{-1}\left(\sum_{i=1}^{NxT}\hat{u}_i^2 x_i' x_i\right)(X'X)^{-1} \qquad (5.12)$$

where N is the number of observations, k is the number of coefficients estimated, T number of years, $u_i$ is the *i*th regression residual and $x_i$ is the *i*th row of the regressor matrix: a 1 x k vector of sample values.

The cluster-robust VCE estimator, as defined in Baum (2006, p.139), is:

$$\mathrm{var}\ [\hat{\beta}|x] = \frac{N-1}{N-k}\frac{M}{M-1}\ (X'X)^{-1}\ (\textstyle\sum_{j=1}^{MxT} \tilde{u}_j'\ \tilde{u}_j)\ (X'X)^{-1} \qquad (5.13)$$

where M is the number of clusters, $\tilde{u}_j = \sum_{i=1}^{Nj} \hat{u}_i x_i$[76], $N_j$ is the number of observations in the jth cluster, $\hat{u}_i$ is the ith residual from the jth cluster, $x_i$ is the 1xk vector of regressors (sample values) from the ith observation in the jth cluster, where the subscript j indicates that the arbitrary patterns of within group correlation (autocorrelation of various different kinds) is taken into account.

Plumper and Troeger in their 2007 paper (where they introduced 'xtfevd2') noted that FEVD estimation can account for potential heteroscedasticy and/or serial correlation by running a robust Sandwich estimator or a model with panel-corrected SEs and that in the presence of serial correlation the Prais-Winston regression should be used instead of OLS in the first and the third stage. However, in relation to their revised estimator ('xtfevd4.0') they are silent about model diagnostics and corresponding strategies to address diagnostic failures. Indeed, the options for accounting for heteroscedasticity and serial correlation described in the help file are not working within the 'xtfevd4.0' programme and Plumper notes on his website that the help file is not adjusted for the new version of FEVD. Additionally, Plumper and Troeger (2011, p.5) emphasise that the FEVD is consistent only when $\varepsilon_{i,t}$ is an i.i.d. error term, which also suggests that potential diagnostic failures are not accounted for within the FEVD. However, they point out the trade-off between the consistency and efficiency of estimation and that "researchers necessarily face a choice between using as much information as possible and using an unbiased estimator" (Plumper and Troeger 2007, as cited in Plumper and Troeger, 2011, p.150).

Consequently, we may not fully rely on the results from the FEVD as the debate about the SEs is on-going and there is no agreed verdict that they are correct. Further,

[76] In Baum (2006, p. 139) N in the summation is written with a subscript k and afterwards Nj is explained (which is not used anywhere). Therefore, we assume that it should be Nj in the summation as well, since a summation is being done across all the observations within each group (which is what cluster SEs are doing).

Plumper and Troeger (2011) note that i.i.d. is a precondition for FEVD consistency. Additionally, we should not rely on the FEVD results since the time span is shorter than 20, which Plumper and Troeger (2011, p.160) argue to be "problematic". Furthermore, Plumper and Troeger (2011, p.7) note that "FEVD is inconsistent if and only if the time-invariant-variables are correlated with the unit effects", which cannot be tested. Moreover, it is not clear which variables should be treated as slowly moving variables (and therefore included in the second stage) since the relationship between the rarely changing variable and the unobserved unit effects is unobservable. Finally, the FEVD approach does not allow for diagnostic tests or for standard responses to diagnostic failure. Therefore, as suggested in most recent studies, dynamics will be included in our next modelling approach, since it is likely that there is "inflation inertia" in the countries in the sample. Moreover, the serial correlation test, conducted after the 3-stage procedure, suggest that serial correlation may be an issue (the p-value is on the border line of rejection/non-rejection of the null hypothesis of no error serial correlation (Appendix 5.5e). This will also allow us to check the consistency of the results, which, due to the limitations discussed above, may not be fully reliable.

### 5.4.4 Dynamic panel model estimations

As it is likely that the inflation rate from the previous year affects the current inflation rate, a dynamic panel will be estimated. Although none of the studies that estimate the effect of CBA on inflation (reviewed in Section 5.2) addressed this issue, recent studies of inflation emphasise the importance of inclusion of dynamics (Levy-Yeyati and Stuzengger, 2001; Bleaney and Fransisco, 2005; Barlow, 2010). Levy-Yeyati and Stuzengger (2001, p. 8) argued that the lagged dependent variable should be included "to capture the effect of past policies on currency expectations, as well as to control for the possibility of backward-looking indexation". This inflation persistence is captured by inclusion of one lag of inflation (Equation 5.14).

$$LnINF_{i,t} = \alpha_0 + \alpha_1 lnINF_{i,t-1} + \alpha_2 CBA_{i,t} + (\alpha_3 dejureFIX_{i,t} + \alpha_4 CCBI_{i,t}) + \alpha_5 GDPG_{i,t} + \alpha_6 MSG_{i,t} + \alpha_7 FB_{i,t} + \alpha_8 OPEN_{i,t} + \alpha_9 TOT_{i,t} + \alpha_{10} EBRDI_{i,t} + \alpha_{11} EU_{i,t} + \alpha_{12} VAT_{i,t} + \gamma_t + \varepsilon_{i,t} \quad (5.14)$$

Where $\varepsilon_{i,t} = u_i + v_{i,t}$ ($u_i$ is a group-specific effect and $v_{i,t}$ is a white noise)

Lagged values of money supply growth and central bank independence indicator could again be used in a dynamic model instead of the current values. In static estimation lagged values were included to avoid the potential problem of endogeneity. However, we would expect the contemporaneous and lagged values to be highly collinear, so inclusion of the lagged values in the dynamic estimations, in which we can control for the potential endogeneity without the inclusion of lagged values, might be of very limited value. In the dynamic estimation these variables are included in their current values and treated as endogenous and their lags are used as instruments. In order to estimate the dynamic model the General Method of Moments (GMM) is used. All GMM techniques for estimating dynamic panel models are argued to be suitable for panels with wide cross section (N) and short time series (T), which is the case with our sample (25 countries and 12 years of data). Dynamic panel estimators require as few as three periods of data to be usable, although “four or more will be preferable” (Greene, 2007, E11-83, as cited in Pugh, 2009). Other advantages of the GMM are that distributional assumptions, such as normality, are not required and that it enables us to control for unobserved heterogeneity of the same countries over time (Verbeek, 2000, as cited in Pugh, 2009). The Arellano-Bond approach (the so called ‘difference’ GMM), which uses lagged values of the levels as instruments for the equations in first differences, is not conducted since it drops out the variable of interest, which is time-invariant. Therefore, we use only the Arellano-Bover/Blundell-Bond (so called ‘system’ GMM) that builds a system of two equations: a difference equation which is instrumented by levels; and a levels equation instrumented by first differences. Additionally, ‘system’ GMM is more comprehensive than “difference” GMM, since lagged levels (used in ‘difference’ GMM) are argued to be rather poor instruments for first differenced variables, especially for variables that are close to a random walk, which is frequently the case with macroeconomic variables (Baum, 2006, p.234). Although the ‘system’ GMM dynamic model developed by Arellano-Bover/Blundell-Bond can be estimated by using the Stata command 'xtdpdsys', we estimated it by the command 'xtabond2'[77], which was subsequently developed by Roodman (2006). Roodman’s ‘xtabond2’ is preferred over ‘xtdpdsys’ as it offers a much more flexible approach than does

[77] ‘xtdpdsys’ and ‘xtabond2’ are commands for estimation of ‘system’ GMM in Stata.

official Stata's 'xtabond', which does not allow the same flexibility with respect to the specification of instrument sets. Since the variable of interest drops out when the two-step estimator is used we applied the one-step 'system' GMM estimator[78]. Again, the same three specifications are estimated: the first which includes the CBA variable (Appendix 5.6a); the second with CBA and defactoFIX (Appendix 5.6b) and the third with CBA, defactoFIX and CCBI variables (Appendix 5.6c).

For the reasons discussed in Section 5.4.2, the money supply growth and central bank independence variables are treated as endogenous. However, since a switch in the exchange rate regime is sometimes argued to be the result of high inflation rates this variable should be treated as endogenous as well. The Sargan test is at the border line of significance when the defactoFIX variable is treated as endogenous (Appendix 5.11). However, since we already have too many instruments we will treat this (defactoFIX) variable as exogenous, although we later allow for it to be endogeneous as a robustness check. Due to our small sample, we used the minimum number of lags. However, even with a minimum number of lags we still have more instruments than groups, due to the small sample available, from only 25 countries (the number of instruments for each specification are 56, 57, 74, respectively, while the number of groups is 25 and 17, as noted in Table 5.5). Consequently, the Hansen version of the Sargan test is too weak, which is indicated by the p-value = 1.00, meaning that it is unable to reject the null hypothesis of instrument validity (strictly, the validity of the over-identifying instruments). Although the number of instruments could be decreased by using the "collapse" option within the 'xtabond2', this option is not used since it also reduces the additional information and, in consequence, all variables in the sample are imprecisely estimated[79]. However, the Sargan test is

[78] „In one-step GMM, xtabond2's robust option is equivalent to cluster (id) in most other estimation commands, where id is the panel identifier variable, requesting standard errors that are robust to heteroskedasticity and arbitrary patterns of autocorrelation within individuals; in two-step estimation, where the errors are already robust, robust triggers the Windmeijer correction." (Roodman, 2009, p.123). The system GMM (estimated by xtabond2) makes the Windmeijer (2005) finite-sample correction to the reported standard errors in two-step estimation, without which those standard errors tend to be severely downward biased (Roodman, 2009).

[79] Another option for decreasing the number of instruments is Roodman's 'pca' (principal component analysis), which is available in the latest version of xtabond2, which creates combinations from the available instruments ("principal components") and instruments using these. This approach both reduces the number of instruments and, arguably, creates an optimum instrument set and is therefore conducted here as well. However, even with the 'pca' option the number of instruments is still larger than number of groups. These results are briefly discussed after the results without the 'pca' option. When the 'pca' option for lowering the number of instruments is included in system GMM

available and suggests that there is no problem with instrument validity in the final, t specification[80]. However, it should be noted that the Sargan test is not heteroskedasticity robust, which is why the Hansen test – which is heteroskedasticity-robust - is usually preferred (except, possibly, when the number of instruments is "too many" in relation to the number of groups). Moreover, tests for the first (m1) and second order autocorrelation (m2) suggest no problem with autocorrelation in the difference residuals, which is consistent with instrument validity. The m2+m1 procedure requires rejection of the null of m1, meaning that there is first-order autocorrelation, and "acceptance" of m2 null, meaning that there is no second-order autocorrelation; conditions which are satisfied in all specifications. Additionally, in order to observe whether the effect of CBA differs at different levels of m6.oney supply growth the interaction term between CBA and MSG is added to the preferred specification (Equation 5.15). This amendment of the model improves Sargan test. Namely, the p value of Sargan test is 0.29 which suggests the validity of the instruments used. This enables us to have some confidence in the results. However, the results did not change significantly implying the stability of the model (Appendix 5.6f).

$$LnINF_{i,t} = \alpha_0 + \alpha_1 lnINF_{i,t-1} + \alpha_2 CBA_{i,t} + \alpha_3 dejureFIX_{i,t} + \alpha_4 CCBI_{i,t} + \alpha_5 GCBA \cdot MSG + \alpha_6 GDPG_{i,t} + \alpha_7 MSG_{i,t} + \alpha_8 FB_{i,t} + \alpha_9 OPEN_{i,t} + \alpha_{10} TOT_{i,t} + \alpha_{11} EBRDI_{i,t} + \alpha_{12} EU_{i,t} + \alpha_{13} VAT_{i,t} + \gamma_t + \varepsilon_{i,t} \quad (5.15)$$

('xtabond2') estimation, the p-value for the Hansen test is somewhat lower than 1 (0.88 - 0.98, depending on the specification), while the Sargan is 0.02 when CBA and defactoFIX variables are included in the estimation. When central bank independence index is controlled for (which is, as noted above, not available for all countries in the sample and therefore when estimating this specification the number of observations is lower) the p-value for the Sargan test is 0.3, but for the Hansen test it is again 1. In all estimations using the 'pca' option the estimated effect of the variable of interest, the CBA, is still negative but is not statistically significant at conventional levels (see Appendix 5.6e). However, because in each case the number of instruments continues to exceed the number of groups (countries), so that the Hansen continues to be one or near to one, there is no obvious advantage to applying the 'pca' approach to instrumentation.

[80] Even though the Hansen test is too weak we can rely on the Sargan which is not weakened by a problem of too many instruments.

Table 5.5a: Results from the one-step 'system' GMM - Estimation of Equation 5.10 and 5.11

| Estimation technique | One-step 'system' GMM | | | |
|---|---|---|---|---|
| Variables | Equation 5.10 with a CBA | Equation 5.10 with CBA + defactoFIX | Equation 5.10 with CBA + defactoFIX + CCBI | CBA + defactofix + CCBI + CBA·MSG |
| L1.lninf | 0.464*** | 0.466*** | 0.413*** | 0.416*** |
| CBA | -0.306* | -0.303* | -0.274** | -0.352*** |
| DefactoFIX | | -0.014 | 0.126 | 0.089 |
| CCBI | | | -0.937 | -0.427 |
| GDPG | -0.006 | -0.006 | -0.013 | -0.013 |
| MSG | 0.009** | 0.008** | 0.023*** | 0.017*** |
| FB | 0.003 | 0.004 | 0.003 | 0.017 |
| OPEN | 0.003** | 0.003** | 0.004* | 0.003 |
| TOT | 0.004** | 0.004** | 0.004 | 0.003 |
| EBRDI | -0.223 | -0.240 | 0.292 | 0.219 |
| VAT | 0.621*** | 0.619*** | 0.534*** | 0.543*** |
| EU | 0.169 | 0.185 | -0.065 | -0.006 |

Note: ***, **, * donates that variables are statistically significant at the 1%, 5% and 10%, respectively

In the last column (model 5.11) marginal effects are reported since interaction terms are included

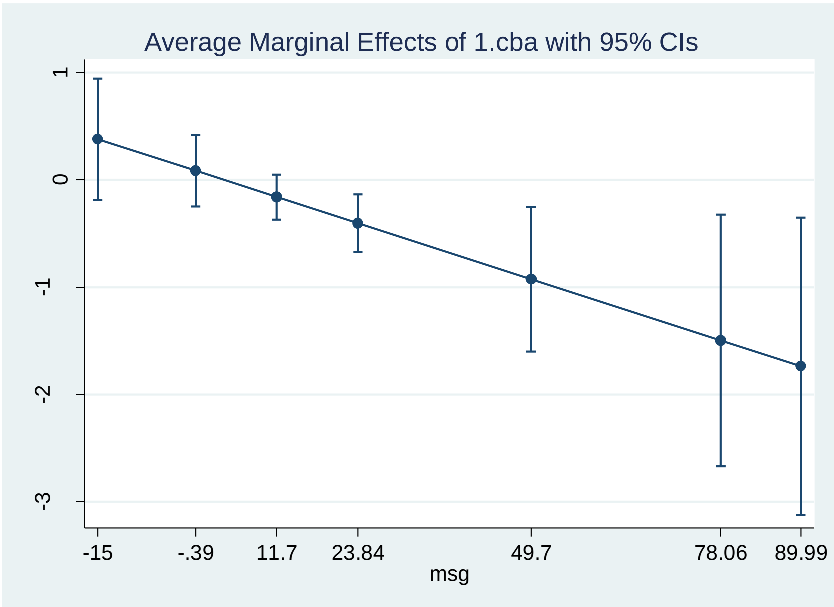
Table 5.5b: Diagnostic tests for the estimations with one step 'system' GMM

| Variables | Equation 5.10 with a CBA | Equation 5.10 with CBA + defactoFIX | Equation 5.10 with CBA + defactoFIX + CCBI | CBA + defactofix + CCBI + CBA·MSG |
|---|---|---|---|---|
| Number of observations | 229 | 229 | 153 | 153 |
| Number of groups | 25 | 25 | 17 | 17 |
| Number of instruments | 56 | 57 | 74 | |
| Hansen/Sargan (Prob > chi2) | 1/0 | 1/0 | 1/0.095 | 1/0.292 |
| m1+m2 (Pr > z) | 0.002/0.356 | 0.002/0.355 | 0.003/0.397 | 0.003/0.492 |

Results from the one-step 'system' GMM (summarised in Table 5.5) suggest that, in all specifications, the lagged dependent variable is highly significant and positive indicating that inflation is persistent in these countries. Moreover, the size of the coefficient on the lagged dependent variable from the dynamic estimation lies between the values of the coefficients from, respectively, OLS and fixed effect estimation (Appendix 5.6d). In spite of our concerns over instrument validity, given the small sample size, this diagnostic check is consistent with the validity of our model (Roodman, 2009).

The results also suggest that the CBA has a significant and negative effect on inflation, even after controlling for the fixed ER and central bank independence. The effect is somewhat larger and significant at all level of significance when interaction term is included. The coefficient on the CBA variable suggests that countries with a CBA have, on average, a 23.97[81] percentage points lower inflation rate than countries without a CBA, holding other factors constant. Moreover, the fixed ER and CCBI variables are not found to have an important influence on inflation (since they are insignificant). However, if we treat the defactoFIX variable as endogenous, the CBA variable is still negative but it loses significance (Appendix 5.11a). The money supply variable is again significant and positive in all specifications. The marginal effect of a CBA at different level of MSG indicate that the effect of CBA is significant when money supply growth s positive and it is more negative the higher the money supply growth (Figure 5.6). This suggests that the CBA tends to repress the effect of money supply growth on inflation, which is an additional argument for maintenance of a CBA.

Figure 5.6 The average marginal effect of CBA on inflation conditional on money supply growth




The dummy variable for the introduction of VAT is also highly significant and positive in all specifications indicating that it has a positive short-run effect on inflation (in the year of introduction). The differences between the inferences from

[81] "If β is the coefficient on a dummy variable, say $x_1$, when log(y) is the dependent variable, the exact percentage difference in the predicted y when $x_1=1$ versus when $x_1=0$ is $100\cdot[\exp(\beta^1)-1]$" (Wooldridge, 2006, p. 238)

the static and dynamic estimators will be explained in Section 5.4.7. Before this, the differences between CBAs with more strict versus those with less strict rules will be empirically assessed.

### 5.4.5 Examining differences between CBAs

As argued in Chapter 2, currency boards in transition countries are not the same, some of them are stricter while others are more flexible and therefore should be expected to have different effects on inflation. In order to distinguish the effect of CBAs which are stricter from the more flexible ones, the CBA variable is divided into strongCBA and weakCBA. Bosnia and Herzegovina's and Estonian CBAs are classified as 'strong', since they are argued to be more strict (and to have a higher pre-commitment index), while Bulgarian and Lithuanian CBAs are classified as 'weak' since they deviate significantly from the orthodox rules (and have a lower pre-commitment index) (this issue is discussed in more detail in Chapter 2). The same specifications (but with CBA divided for 'strong' and 'weak' CBAs) are estimated by using FEVD (Appendix 5.8) and one-step 'system' GMM (Appendix 5.9). Diagnostic tests do not significantly differ from those results reported above.

Table 5.6a: Strong and weak CBA specifications estimated by FEVD and 'system' GMM

| Estimation technique | FEVD | | | One-step 'system' GMM | | | |
|---|---|---|---|---|---|---|---|
| Variables | Strong and weak CBA | Strong and weak CBA+defactoFIX | Strong and weak CBA + defactoFIX + L1CCBI | Strong and weak CBA | Strong and weak CBA+defactoFIX | Strong and weak CBA +defactoFIX +CCBI | Strong and weak CBA+defactoFIX+ CCBI+CBA ·MSG |
| L1. lninf | | | | 0.464*** | 0.469*** | 0.413*** | 0.451*** |
| StrongCBA | -1.123*** | -0.955** | -1.088 | -0.536*** | -0.548*** | -0.597*** | -0.642*** |
| WeakCBA | -0.329 | -0.233 | -0.180 | -0.174 | -0.187 | -0.147 | -0.171 |
| DefactoFIX | | -0.211 | 0.047 | | 0.011 | 0.123 | 0.127 |
| (L1)CCBI | | | -1.744** | | | -0.849 | -0.495 |
| GDPG | -0.021 | -0.021 | -0.055 | -0.008 | -0.008 | -0.012 | -0.007 |
| (L1)MSG | 0.010*** | 0.009*** | 0.012** | 0.008** | 0.008** | 0.020*** | 0.015*** |
| FB | -0.010 | -0.010 | 0.035 | 0.001 | 0.003 | 0.005 | 0.014 |
| OPEN | 0.013** | 0.013** | 0.007 | 0.004*** | 0.004*** | 0.005* | 0.004* |
| TOT | 0.005 | 0.004 | 0.023 | 0.005** | 0.005** | 0.010* | 0.009 |
| EBRDI | -0.634** | -0.667** | -0.250 | -0.268* | -0.281** | 0.124 | -0.004 |
| VAT | 0.954* | 0.953* | 0.895 | 0.675*** | 0.663*** | 0.575*** | 0.761*** |
| EU | -0.162 | -0.167 | -0.284 | 0.170 | 0.188 | -0.058 | 0.038 |

Note: ***, **, * donates that variables are statistically significant at the 1%, 5% and 10%, respectively

Table 5.6b: Diagnostic tests for the estimations with one step ‘system’ GMM

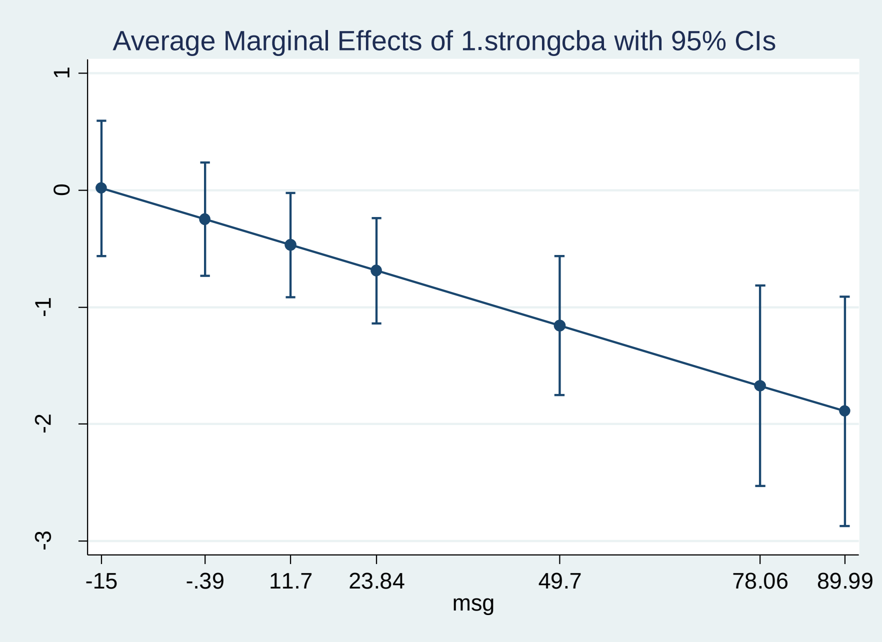
| | Strong and weak CBA | Strong and weak CBA + defactoFIX | Strong and weak CBA + defactoFIX + CCBI | Strong and weak CBA + defactoFIX + CCBI + CBA·MSG |
|---|---|---|---|---|
| Number of observations | 229 | 229 | 153 | 153 |
| Number of groups | 25 | 25 | 17 | 17 |
| Number of instruments | 57 | 58 | 75 | 108 |
| Hansen/Sargan (Prob>chi2) | 1/0.001 | 1/0 | 1/0.068 | 1/0.247 |
| m1+m2 (Prob > chi2) | 0.002/0.372 | 0.002/0.373 | 0.003/0.419 | 0.002/0.579 |

The results summarized in Table 5.6 suggest that ‘strong’ CBAs have a negative and significant effect on inflation (except in FEVD when the central bank independence variable is included, upon which the strongCBA variable loses significance), while the effect of ‘weak’ CBAs is insignificant through all specifications. Moreover, after dividing the CBA variable between ‘strong’ and ‘weak’, the effect of ‘strong’ CBA on inflation is higher compared to the effect of the combined CBA variable. The coefficient on the strongCBA variable suggests that countries with a ‘strong’ CBA have, on average, 44.96 percentage points lower inflation rate than do countries without a CBA. When estimated by ‘system’ GMM, the strongCBA variable is highly significant and negative in all specifications, even when the dejureFIX variable is treated as endogenous (however, when this variable is treated as endogenous the Sargan test is at the border line of significance; p=0.04; diagnostic tests are reported in Table 5.6b) (Appendix 5.11b). The Hansen test is again weak (indicated by p-value of 1) in all specifications[82]. Sargan test is again improved when interaction between CBA and MSG is included. However, the rest of the results do not change significantly (Appendix 5.9f). According to the marginal effects of a CBA at representative values of MSG, the effect of a strong CBA is significant and more negative the higher the money supply growth, while the effect of a weak CBA is significant (and negative) only at negative or very low growth rates of money supply (Figure 5.7 shows only the effect of strong CBA conditional on money supply growth, since the effect of weak CBA is insignificant). These additional results suggest that a weak CBA does not have a repressing effect on inflation when money

[82] As above, the ‘pca’ option is again used to lower the number of instruments. As in the specification prior to dividing the CBA variable into strong and weak, the p-value for Hansen test is somewhat lower than 1 before including CCBI variable and 1 after the inclusion of CCBI. The strongCBA variable is significant and negative in all specification (the significance is lower after including CCBI, 13 percent), while the weakCBA variable is insignificant in all specifications. DefactoFIX and CCBI are still insignificant (see Appendix 5.9d).

supply growth is positive and that stricter rules are needed to repress the effect of money supply growth on inflation.

Figure 5.7 The average marginal effect of strong CBA on inflation conditional on money supply growth




### 5.4.6 Comparison between preferred static and preferred dynamic estimations

Given that the dependent variable is included as a lagged regressor in the dynamic model, the coefficients estimated by the dynamic estimator indicate the short-run or impact effects. Specifically, the lagged dependent variable is mostly netting out the historical effect of all independent variables and, consequently, the coefficient estimates on the independent variables are capturing any current (impact) effect on the dependent variables. On the other hand, the static model gives the long-run (overall) effects of the independent variable. Therefore, in order to compare the coefficients from the static estimator with the coefficients from the dynamic estimator we have to calculate the long-run coefficients from the dynamic estimator. This is done by dividing the (short-run) coefficient on the variable of interest from the dynamic estimator by 1-coefficient on the lagged dependent variable (Equation 5.16) (for a derivation see Pugh et al., 2008). The long-run coefficients on CBA and strongCBA and weakCBA are estimated by the 'nlcom' command in Stata, which also gives us SEs and confidence intervals (Appendix 5.7 and Appendix 5.10).

$$\text{Long-run coefficient} = \frac{\text{Regressor's (short-run) coefficient}}{1 - \text{Coefficient on the lagged dependent variable}} \tag{5.16}$$

Table 5.7: Comparison of the long run coefficients on CBA, strong CBA and weak CBA from the preferred static and dynamic model

| | | CBA | Strong CBA | Weak CBA |
|---|---|---|---|---|
| Static coefficient | | -0.614 | -1.088 | -0.180 |
| Dynamic | SR coefficient | -0.274** | -0.597*** | -0.147 |
| | LR coefficient | -0.466** | -1.017*** | -0.249 |

Note: these are the coefficients from the specifications in which it is controlled for defactoFIX and CBI

This adjustment of the short-run coefficients on variable(s) of interest obtained from the dynamic panel model for the long-term closely replicates the coefficients from the static panel equation (Table 5.7). In the next section all the results will be compared and discussed and final conclusions regarding the CBA's effect on inflation performance in transition countries drawn.

## 5.5 Conclusion

The results from the previous chapter suggest that a CBA is likely to increase the credibility of the monetary authority. Therefore, it is also expected to decrease inflationary expectations and consequently inflation rates. However, this effect is not straightforward and should therefore be established through empirical analysis. Therefore, in this chapter the effect of CBA on inflation is analysed for a sample of 25 transition countries over 12 years (1998-2009), four of which operated a CBA during this period. The estimation of the simplest specification, which includes a CBA variable (before controlling for the fixed exchange rate and central bank independence), suggests that a CBA reduces inflation more than all the other monetary and exchange rate regime combinations used in countries in the sample. This result is consistent within both static and dynamic estimations. In order to test whether its negative effect on inflation is a result of a fixed exchange rate, central bank independence or the increased credibility of the monetary authority, we control first for the fixed exchange rate and then, in addition, for central bank independence.

Although its significance decreases once a fixed exchange rate is included, the CBA variable is still negative and significant at the 10% level in both the static and dynamic estimates. However, when controlling for the degree of central bank independence, the sign of the CBA variable does not change, although its significance is different within static and dynamic estimations. The static estimator suggests that after controlling for the degree of central bank independence (CBI), this variable has a significant and negative effect on inflation, while the overall effect of a CBA becomes insignificant. Since in the static estimations the coefficients are indicating the long-run (historical) effects of independent variables on inflation, this implies that if a country's central bank has a high degree of independence across recent history it does not need a CBA, since a high level of CBI contributes most with respect to inflation reduction. On the other hand, the results of dynamic estimation suggest that the short-run effect of CBA is still significant and negative after inclusion of the CBI variable, while the latter's (CBI) short-run effect on inflation is insignificant. These results suggest that when the overall (contemporaneous) effect on inflation is estimated, a CBA is not adding anything more than a higher degree of central bank independence with respect to inflation. On the other hand, the dynamic estimator suggests that the CBA continues to be important with respect to inflation even after the history of the CBA and CBI is accounted for, while the short-run effect of CBI on inflation is estimated to be insignificant. Dynamic estimation results suggest that a CBA has, on average, a 23.97 percentage points lower inflation rate than countries without a CBA, holding other factors constant.

One more important finding is that the degree of strictness of the CBA appears to be important with respect to the reduction in inflation, since the division of the CBA variable into 'strong' and 'weak' forms suggests that they do not have the same effect on inflation. According to the results from both static and dynamic estimations, the 'weak' CBAs (Bulgarian and Lithuanian), the ones which deviate more from the orthodox rules, do not have a significant effect on inflation, while the 'strong' CBAs (BH's and Estonian), the ones which are the most strict, have a significant and negative effect through all specifications (except in FEVD after the CBI variable is introduced). The results suggest that a 'strong' CBA affects inflation performance significantly and has more than double the effect of the overall CBA effect (which incorporates both 'strong' and 'weak' CBAs). However, it is important to note that we are operating with a very small sample and, therefore, it was not possible to implement some of the diagnostic tests. Moreover, the results from the static estimator should be considered only as indicative, although the evidence for serial correlation is on the border line, since the high and systematic significance of the lagged dependent variable suggests that the static model is misspecified. Moreover, discussion about the consistency of the FEVD estimator is still on-going. However, dynamic estimation suggests that a CBA should be treated as a monetary framework and that it has a current effect on inflation reduction over and above the fixed exchange rate and high degree of central bank independence, which is presumably the result of the additional credibility of the monetary authority, which operates under a 'strong' CBA. The highly significant and large effect of a CBA on inflation could be used to justify the introduction and maintenance of CBA in the European transition countries with respect to inflation performance in these countries. This also implies that there may be a continuing need for a CBA in the countries that operate under this regime, especially in those with a 'strong' CBA, though its overall sustainability and desirability depends also on its affects on the other key determinants of overall economic performance. Hence in the following chapter, we turn to consider these before drawing our final conclusions.

In Table 5.7 we summarise the effects of CBA arrangements on inflation both overall and in its strong and weak variants: these are consistently negative; consistently statistically significant (or insignificant in the case of the weak variant); and of similar magnitude. These results are obtained from entirely different modelling strategies, each one of which has different strengths and weaknesses in relation to model specification and the available data. In turn, the consistency of our estimates strengthens the case for their validity.

# CHAPTER 6: ESTIMATION OF THE EFFECTS OF CURRENCY BOARD ARRANGEMENTS ON MACROECONOMIC PERFORMANCE



## 6.1 Introduction

In the previous chapter the effect of a currency board arrangement (CBA) on inflation performance was investigated, in this chapter its effect on growth, growth volatility, as well as subjective perceptions regarding a country's economic performance are analysed. The analyses presented in this chapter are organised as follows. Section 6.2 briefly assesses relevant studies for identifying growth determinants in transition countries. Furthermore, the model specification for estimating the effect of a CBA on growth in transition countries is determined and estimated. It is conventionally argued that monetary and exchange rate (ER) regimes have no effect on long-run growth, moreover the investigation of the determinants of growth in transition countries represents a "short-run exercise" due to lack of long time-span data. Therefore, in Section 6.3 the effect of CBA on growth volatility is estimated. The analyses of the effect of CBA on growth and growth volatility are conducted by using a panel data of 25 transition countries for the period 1998-2009. In Section 6.4, a new strategy for estimating the effect of CBA on macroeconomic performance is developed and applied. This strategy relies on the usage of the subjective assessments of the economy as a proxy for the overall country's macroeconomic performance. The latter analysis covers ten Central and South Eastern European countries and the dataset is based on the Austrian National Bank surveys from 2007 (2009 in the robustness check) to 2011. Section 6.5 concludes.

## 6.2 Estimation of the effect of CBA on growth

### 6.2.1 Growth theories and the effect of monetary/ER regimes on growth

Since economic growth is usually argued to be a key indicator of economic welfare its determinants have been repeatedly investigated through history. The beginning of this attempt goes back to the era of *classical theory* (Smith, 1776; Ricardo, 1817; Malthus, 1798, as cited in Barro and Sala-i-Martin, 2004), which provided the basic determinants that appear in modern theories of economic growth, such as the effect of the growth rate of population, technological progress in the forms of labour specialisation and discoveries of new goods and methods of production (Barro and Sala-i-Martin, 2004). More recently, a further contribution was provided by *neoclassical growth theory* through its emphasis on a production function approach and a general equilibrium framework. The main contributions were provided by Solow (1956) and Swan (1956) who argued that growth rates tend to decline as the economy evolves towards its steady-state. This implies that countries with a lower starting level of real per capita GDP may grow faster than countries with high starting levels (a phenomenon now known as conditional convergence). Another prediction of the Solow-Swan model is that in the absence of continuing improvements in technological progress (which is assumed to be exogenous in the model), per capita growth must eventually cease (Barro and Sala-i-Martin, 2004). The neoclassical growth model predicts that in the long run countries reach their steady state. A new 'boom' in growth theory began with the work of Romer (1986) and Lucas (1988) who argued that growth may go on indefinitely because returns to investment do not necessarily diminish as economies develop (Barro and Sala-i-Martin, 2004). Romer incorporated research and development and imperfect competition into the growth framework and argued that technological advance results from purposive research and development activity. Since technological progress is considered to be endogenous in the model this theory is known as the *endogenous growth theory*. Contrary to neoclassical theory, endogenous growth theory argues that if there is no tendency for the economy to run out of ideas the per capita growth rate may remain positive in the long run. Moreover, this theory argues that countries may benefit not only from their own ideas, but also by imitating the advances of other counties (diffusion of technology). Beside the neoclassical and endogenous growth theories there are number of *alternative approaches* which will not be reviewed here, since our focus is on the growth determinants used in empirical work rather than on the theoretical background (for a review of the alternative approaches see Gore, 2007).

Regarding the empirical investigation of growth determinants, studies usually use the real growth rate (Fisher and Sahay, 2004; De Grauwe and Schnabl, 2008; Josafidis et al., 2011) or the real per capita growth rate (Ghosh et al., 2000; Wolf et al., 2008) as the dependent variable and two groups of explanatory variables: initial levels of some variables (GDP, schooling); and population growth rate together with control variables to reflect policy actions, institutional settings or other country characteristics (Petreski, 2011). However, there is still no consensus over the most appropriate growth specification[83] and different studies tend to include different determinants depending on their particular interest. Some studies observe the effect of monetary and ER regimes on growth, which will also be assessed in this chapter. However, it is conventionally argued that monetary and ER regimes/policies have no effect on long-run growth, since in the long run output is likely to return to its trend level due to adjustment mechanisms. Namely, the monetary authority may stimulate output growth through increases in money demand (or currency devaluation) in the short run, but in the long run workers will adapt their expectations and increase their wage demands (and producers their prices). Consequently, the actions of monetary

[83] Durlauf and Quah (1999) suggested over 90 variables as potential determinants of growth (as cited in Petreski, 2011). Staehr (2003) argued that in the "new growth" literature it is relatively easy to find theoretical arguments for including almost any variable.

authority will affect only prices/wages but not long-term output and growth. Although most economists accept that monetary actions have no long-run effects on the economy, it is also widely accepted that monetary actions or lack of monetary actions can have a significant effect on output growth in the short and medium term (Walsh, 2010). However, the strength of this effect remains unclear since there are two opposing channels that may affect growth. Stricter regimes are likely to provide greater stability and therefore may increase growth through a positive effect on trade and investment (De Grauwe and Schnabl, 2004b). On the other hand, there is a possibility of a negative effect of more strict regimes on trade (and consequently growth) if traders are either extremely or not at all risk averse, although there is only a limited amount of empirical evidence that support this possibility (Ćorić and Pugh, 2010). Moreover, it is usually argued that more discretionary monetary regimes may provide quick adjustments to shocks, while these adjustments under stricter regimes are likely to be channelled through prices and wages into the real economy (Friedman, 1953; Fisher, 2001). Since shocks are likely to affect short-run variations in output the effect of different regimes on macroeconomic performance through the latter channel might be better observed through their effect on output or growth volatility rather than on growth rates. Moreover, since growth should be measured over decades rather than years, on both theoretical and empirical grounds, and our sample covers only 12 years, macroeconomic performance will be measured by both GDP growth and growth volatility.

Given that we are interested in the effect of a specific monetary framework on macroeconomic performance in transition countries, we will focus on studies that investigate the effect of different monetary/ER regimes on macroeconomic performance and those that investigate the main growth determinants in transition countries. Due to the small sample size, we use a minimally specified growth model, which will allow us to estimate the effect of the variable of interest.

### 6.2.2 Growth determinants in transition economies

Studies that focus on growth determinants in transition countries typically argue that these countries and market-oriented economies at a similar level of GDP per capita are not structurally identical and therefore should not have the same model specifications (see Table 6.1). Fisher et al. (1996a) identified two sets of growth forces in transition countries: those arising from the transition and transformation process; and the basic neo-classical determinants of growth. Most of the studies which focused on the countries in transition found that initial conditions, macroeconomic (in)stability and structural reform are the main growth determinants during the first years of transition (De Melo et al., 1996; Fisher et al., 1996b). However, even those studies together with a few that estimated the growth determinants in the second period of transition pointed out that the importance of the determinants that reflect the transition process diminishes as a country progresses through transition and that greater weight over time should be put on the standard determinants of growth (Fisher et al., 1996a; Dragutinović and Ivančev, 2010). This especially relates to the effect of initial conditions, which has been estimated to vanish over time (Staehr, 2003; Fisher and Sahay, 2004, Dragutinović and Ivančev, 2010; Josifidis et al., 2011). However, the effects of macroeconomic stability factors and structural reform are still found to be significant (Fisher and Sahay, 2004; Dragutinović and Ivančev, 2010; Josafidis et al., 2011). Recent studies mostly focus on growth determinants in those transition countries that became EU members in 2004 and identify economic integration through trade and financial integration as an important growth driver (Bower and Turrini, 2009; Friedrich et al., 2010; Kose and Prasad, 2010). Most of the recent studies (Staehr, 2003; Barlow, 2006; Falcetti et al., 2006; Josafidis et al., 2011) include the *lagged dependent variable* as one of the explanatory variables, since current growth rates are likely to be influenced by the previous year's growth rate. Moreover, when the model is correctly specified, the estimation of a dynamic panel model allows easier controlling for potential endogeneity, which is an important issue in growth estimations. Variables that will be included in our growth model are divided into four categories: variables that affect macroeconomic stability; variables that represent progress in transition and initial conditions; traditional growth determinants; and variables that control for the effect of the financial crisis.

Table 6.1: Summary of the empirical research of the growth determinants in transition countries

Highlighted studies are those that assess the effect of ERR on growth

| Study | Sample | Dependent variable(s) | Controls | The effect of fixed ERR on the dependent variable compared to other regimes | Technique |
|---|---|---|---|---|---|
| Fisher et al. (1996a) | 25 transition countries, 1992-1994 | GDP growth | Fixed ERR, government balance, cumulative value of the liberalisation index, measures of exports, log of initial (1991) per capita income | Positive | Fixed effects model |
| Fisher et al. (1996b) | 20 transition countries, 1992-1994 | GDP growth | Logarithm of the annual inflation rate, ratio of fiscal surplus and GDP, official external assistance as a percentage of GDP, an index which measures the degree of enterprise- and banking- sector reforms and privatisation | Not addressed | 2 step GLS |
| | | Growth rate of aggregate income | Initial level of real per capita income, growth rate of population, secondary school enrolment rate, the share of investment in GDP | | |
| Staehr (2003) | 25 transition countries, 1989 - 2001 | Growth rate | Lagged growth rate, trend variable, conflict dummy, consumer price index (log(100+I)), initial conditions, reform variables (included in differences and in lags) | Not addressed | WLS and GMM |
| Domac et al. (2001) | 22 transition countries, 10 years (different period for each country) | Growth rate | Budget balance, change in liberalization index, lagged liberalization index, inflation, years under communism, share of industry, urbanization, share of CMEA trade, dummy variables for different ERRs (fixed ER, intermediate and floating ERR) and dummy variables for Central Europe and Baltic Countries | Inconclusive | Switching regression technique |
| Fisher and Sahay (2004) | 25 transition economies, 1991-2001 | GDP growth | Dummy variable for the fixed ERR/inflation (lagged), initial condition index, initial conditions index*year, change in fiscal balance, reform index and state reform index | Negative and significant if inflation is not included, insignificant when inflation is included, positive and significant when initial conditions and institutional developments are not controlled for. | 2 SLS panel regression |

Table 6.1 (continuing): Summary of the empirical research of the growth determinants in transition countries

Highlighted studies are those that assess the effect of ERR on growth

| **Study** | **Sample** | **Dependent variable(s)** | **Controls** | **The effect of fixed ERR on the dependent variable compared to other regimes** | **Technique** |
|---|---|---|---|---|---|
| Barlow (2006) | Transition countries | Growth rate | Lagged growth rate, percentage rate of inflation (in logs), index of trade policy, index of privatization, index of internal market reforms (indices included in differences and lagged and interaction terms between indices), dummy variable for war | Not addressed | Arellano-Bond (1991) technique |
| Falcetti et al. (2006) | 25 transition countries, 1989-2003 | Growth rate, GDP per capita growth rate | (Lagged growth rate), Initial conditions index, average EBRD indicator (lagged), general government balance to GDP, civil liberties index, dummy variable for recovery, annual net exports of oil, external growth | Not addressed | OLS, 2SLS, Arellano-Bond (1991) technique |
| De Grauwe and Schnabl (2008) | 10 CEE countries, 1994-2002 | Growth rate | Indicators of ER stability, ratio of investment to GDP, the growth rate of dollar exports, the budget deficit to GDP, short-term capital inflows to GDP, real growth of the EU 15, dummies for 1998 crisis and inflation targeting | Insignificant (when de jure ER stability is used) Negative and significant (when de facto ER stability used) | Panel GLS estimation |
| Dragutinović and Ivančev (2010) | 27 transition counties, 1999-2009 | Growth rate | Fiscal balance, consumer price index, government expenditure, investment, investment lagged, education, average EBRD indicator, dummy for EU candidates, dummy for SAA, dummy for EU member countries, initial GDP | Not addressed | FE, ECGLS, G2SLS, |
| Josifidis et al. (2011) | Ten Emerging Economies and five West Balkan 1997-2009 | Growth rate | Lagged value of GDP; fiscal balance to GDP, logarithm of consumer price index, government expenditure to GDP; aggregate EBRD indicators (lagged), FDI inflow per capita (lagged), share of total volume of trade in GDP, initial level of GDPpc (in 1989); interaction terms of all explanatory variable and Emerging Europe dummy | Not addressed | System GMM |

*Macroeconomic stability variables*

Fisher et al. (1996b) argued that macroeconomic stability might be captured by the budget balance and an exchange rate regime dummy. Fisher and Sahay (2004) argued that a variable for the inflation rate might be used instead of an exchange rate regime variable, since they assume that the fixed exchange rate regimes are expected to increase growth in the long run because they bring inflation down much faster than other ERRs. This effect might also be partially captured through the inclusion of regimes that were introduced to stabilise the macroeconomic situation in a country. In the countries with a CBA, monetary stabilisation was hypothesised to have been established through the introduction of CBA, since it is likely to increase the monetary authority credibility and to lower inflation (as suggested by the analysis presented in Chapters 4 and 5). The CBA is therefore observed as a monetary framework that is expected to maintain monetary stability. However, its effect on macroeconomic stability and growth is more ambiguous.

As explained in Section 5.2 and discussed in more detail in Chapter 2, a CBA may influence the economy through several channels. In particular, it may enhance growth through an increase in monetary stability, since a fixed exchange rate regime decreases exchange rate risk and uncertainty and should consequently increase investment and international trade, which should increase GDP growth. Additionally, this effect/channel might be enhanced through the additional features of CBA, such as the high degree of central bank independence and limited discretion of the monetary authority, which also decrease uncertainty and inflation (as suggested by the empirical analysis in Chapter 5). On the other hand, a CBA may negatively influence growth in a period of crises and shocks, since the monetary authority cannot give loans to government or banks and it cannot act as a lender of last resort. Since adjustments to shocks cannot be channelled through changes in the exchange rate or through the central bank's support to the financial sector shocks are transmitted into the real economy. This negative effect might prevail due to constraints posed on fiscal policy in transition countries (this is elaborated for BH in Chapter 1). Since the monetary authority under a CBA cannot finance government deficits, the usage of fiscal policy instruments in period of crises is restrained as well. This is likely to repress output, employment and consequently growth. However, the effect of all of these channels is not straightforward and it is hard to distinguish between them.

The results of the studies that estimated the effect of a CBA on growth performance, which were appraised in Section 5.2, are also inconclusive: some found a positive (Anastassova, 1999; Ghosh et al., 2000), while others found no effect of a CBA on growth (Wolf et al., 2008). As elaborated in the previous section, the effect of exchange rate regime on growth is not straightforward and the empirical results of studies that estimate the effect of *exchange rate regime* on growth are also inconclusive. Levy-Yeyati and Sturzenegger (2002) and Bleaney and Francisco (2007b) found a negative effect of pegged ERR (and CBA) on growth for developing countries, while Huang and Malhota (2005) found that developing countries with a fixed ERR outperform those with other ERRs with respect to growth. Studies that focus only on transition countries also give mixed results. Domac et al. (2001) found that none of the ERRs are superior with respect to growth in transition countries. Fisher et al. (1996b) found that transition countries with fixed ERR had better growth performance than countries with other ERRs. De Grauwe and Schnabl (2004a, 2008) found that among Central and Eastern European countries the ones with a pegged ERR had, on average, higher growth rates than countries with other ERRs. Studies also differ in their methodologies and other growth determinants included (see Table 6.1). Additionally, some studies which focused on the estimation of different ERRs on growth argued that there is an endogeneity (caused by simultaneity) between growth and ERR and addressed this issue by using simultaneous equations (Eichengreen and Leblang, 2003) or by treating it as endogenous in a dynamic panel estimation (Petreski, 2011). Studies that focused on estimating the effect of CBA on growth and studies that focused on growth determinants in transition counties did not address this issue. However, there is no reason to assume that there is a problem with endogeneity between CBA and growth since there is no reason to assume that countries with higher or lower growth tend to introduce or maintain a CBA.

Fisher et al. (1996b) argued that lower *inflation* is one of the preconditions for macroeconomic stabilisation, which is likely to enhance growth. Fisher et al. (1996b) argued that countries that succeeded in reducing inflation also began to grow, typically with a lag. On the other hand, prioritising low inflation may depress economic activity that lowers growth in the short run. Verme (2004) argued that a low inflation rate up to a certain threshold level might stimulate domestic output. However, Verme (2004, p.856) further argued that "in economies with fixed exchange rates, increases in the foreign (and domestic) rate of inflation always have adverse consequences for real activity." However, a measure of inflation is usually not included when a variable for the exchange rate regime is in the model. Fisher and Sahay (2004) argued that inflation and the exchange rate regime variable are strongly correlated, and that they are not separately significant if both entered into the regression. To avoid extreme inflation rate observations a logarithmic transformation is usually used (Staehr, 2003[84]; Barlow, 2006).

Another variable that is considered to capture the macroeconomic stabilisation effect is *fiscal balance*, which is included in some studies (see Table 6.1), though this variable is likely to be highly correlated with the inflation rate variable. However, studies that included both fiscal balance and inflation generated mixed results[85]. Studies that included only fiscal balance as a measure of macroeconomic stability found a positive effect of fiscal surplus on growth (Fisher et al., 1996b; Falcetti et al., 2006). Most of the studies emphasise that this variable is likely to be endogenous (Berg et al., 1999; Falcetti et al., 2002) and some include it with a lag in order to avoid this potential problem (Falcetti et al., 2006). In order to control for the above effects and to address all emphasised issues, inflation and the fiscal balance (a fiscal deficit takes on a negative value) are included with a one-year lag. Additionally, for a robustness check the fixed exchange rate dummy, inflation rate and fiscal balance variable will be incrementally added in order to check whether the inclusion of one is affecting the inclusion of another, which is suggested by some studies. Beside the fiscal balance variable, some studies also control for the *size of government* by including the ratio of government expenditures to GDP (Dragutinović and Ivančev, 2010, Josifidis et al., 2011). However, the direction of this effect is not straightforward, since it depends on the relative size and type of government consumption and investment and distortions associated with its financing (Fisher et

[84] $LI = \log(100+I)$

[85] The difficulties in separating the effects of inflation and fiscal deficit on growth could be explained in several ways: regression models did not include possible simultaneous determination of inflation and growth (Havrylyshin, 2001), or it is due to endogeneity of the fiscal balance variable (Berg et al., 1999; Falcetti et al. 2002) (as cited in Dragutinović and Ivančev, 2010).

al., 1998). Namely, a 'big' government reduces private-sector risk-taking and hence lowers growth, whilst on the other hand it may be associated with relatively high investment in infrastructure that supports growth.

*Progress in transition and initial conditions*

Most of the studies that estimated the growth determinants in transition countries emphasised the importance of controlling for the *progress in transition/reform*. This is one of the controls which have been recognized as the most important in transition countries, especially during the first period of transition (Fisher et al., 1996b; De Melo et al., 1997). However, its effect is estimated to be significant during the second period of transition as well (Fisher and Sahay, 2004; Dragutinović and Ivančev, 2010). It is expected that the higher the progress in transition is the higher the growth rates are. However, Dragutinović and Ivančev (2010) found a negative effect of reform on growth during the second period of transition. They explain this by arguing that: “transition countries that were late with the reforms could be faced with further time taking reforms and slower growth in the second decade, despite the fact that they undertake them properly” (p.26). Most of the studies used the average of various reform indices to capture this effect. Some studies tried to estimate the effect of individual (specific) indices instead of the aggregate one in order to distinguish between different types of progress. However, Havrylyshyn et al. (1998) argued that an aggregate index performs best, whereas parameters to individual reform elements are estimated very imprecisely. Moreover, it is argued that individual indices tend to be highly correlated (countries usually proceed with liberalisation, privatisation and structural reform simultaneously) which is likely to result in imprecise estimates (Staehr, 2003). As a measure of reform the EBRD indices are usually used (Fisher and Sahay, 2004; Barlow, 2006; Josafidis et al., 2011) and Staehr (2003, p.12) argued that these indices are “established in the literature, allow a long sample and are all collected by the same source”. Fisher and Sahay (2004) argued that the aggregate EBRD index is a measure of the extent of reform and a measure of institutional change. Moreover, Havrylyshyn and van Rooden (2000) (as cited in Staehr, 2003) found that nearly all of a large number of institutional indicators are strongly correlated with the EBRD indices. However, since it also might be expected that higher growth tends to accelerate progress in transition the endogeneity issue is again raised. Some studies include this variable with a one period lag (Staehr, 2003; Barlow, 2006[86]; Falcetti et al., 2006; Josafidis et al., 2011) since it may be argued to have a delayed impact on growth and since it reduces the problem of endogeneity. Following the above discussion, we include the aggregate EBRD indicator as a proxy for progress in transition, with a one-year lag.

*Initial conditions* which represent macroeconomic distortion at the beginning of transition (in terms of the initial, pre-transition level of GDP per capita) are expected to be negatively correlated with economic growth, indicating that poor countries typically grow faster than less poor ones. However, as noted above, this relationship appears to be significant only in the initial phase of transition and to fade over time (Fisher and Sahay, 2004; Dragutinović and Ivančev, 2010). Additionally, Staehr (2003) argued that the inclusion of fixed-effect dummy variables "soak-up" the effect of initial conditions since they are country specific. However, since the initial conditions capture the effect of conditional convergence and are regularly included in almost all growth models, we will control for this effect by including the GDP per capita at the first year of transition. Although most of the studies use GDP per capita in 1989 (as the pre-transition year) to control for initial conditions in transition countries it might be argued that this year should be determined on a country-by-country basis since a beginning of transition process is country specific. Fisher and Sahay (2004) determined different years of beginning of transition (transition years) for different groups of transition countries, assigning 1990 as a starting point of transition for Croatia, Hungary, Macedonia, Poland and Slovenia; 1991 for Albania, Bulgaria, Czech Republic, Romania and Slovak Republic; and 1992 for the Baltic and CIS countries. For countries that are included, both in Fisher and Sahay's and in our own analysis, we will use the transition years established in this study. Only BH and Serbia from our sample are not included in Fisher and Sahay's (2004) sample. Although Dragutinović and Ivančev (2010) use 1990 as a transition year for both Serbia and BH, it may be argued that the real process of transition in these countries started later, due to the specific circumstances in these countries during the early 1990s. The real process of transition in Serbia is usually argued to begin in 2000,

[86] Staehr (2003) and Barlow (2006) included reform variables in both levels (in the first differences) and in lags. Instead of creating one aggregate index Staehr (2003) used individual EBRD indices while Barlow (2006) included three groups of reform indices (for liberalisation, privatisation and internal market reforms).

since during the 1990s it was still a state-dominated and deeply criminalised country and processes of liberalisation, privatisation and financial reforms did not start before 2000 (Zivkovic, 2004). As discussed in Chapter 1, the transition process in Bosnia and Herzegovina started later due to the war. Therefore, as a transition year for BH 1998 is used, since implementation of most of the new (market-oriented) laws started in that year.

*Traditional growth determinants*

Beside ‘transition-specific’ determinants, recent studies on growth in transition countries also control for some traditional determinants from the ’standard’ economic growth theories, such as population growth, investments in fixed and human capital and the level of economic integration. The ‘traditional’ growth variables that will be included in our model specification are discussed next. As noted in Barro and Sala-i-Martin (2004) a higher rate of *population growth* is expected to lower the steady-state level of capital and output per worker and thereby to reduce the per capita growth rate for a given initial level of per capita output. The effect of the *investment in fixed and human capital* is usually measured by including two variables in the model: *investment* (as a percentage of GDP) and *educational attainment*. It is expected that higher investment and higher educational attainment will increase growth. As suggested by Dragutinović and Ivančev (2010), the *investment* variable will be included with one lag to avoid potential endogeneity between investment and growth. Dragutinović and Ivančev (2010) also find that *openness* of the economy appears to be important growth determinant in the second phase of transition. According to neoclassical theory, more open economies tend to grow faster due to increased competition from international markets, while according to the endogenous theory this relationship is argued to be channelled through increased economies of scale and faster technological diffusion between countries (Mirestean and Tsangarides, 2009). Moreover, Calvo et al. (2004) (as cited in Kose and Prasad, 2010) found that greater trade openness makes countries less vulnerable to financial crises, including sudden stops and currency crashes and a positive effect of openness on growth has been found in several studies (Dragutinović and Ivančev, 2010; Friedrich et al., 2010). However, in the context of the latest global financial crisis the direction of this effect is less certain. The commonly used measure for the openness variable is the ratio of the sum of exports and imports to GDP. Additionally, some studies include a *terms of trade* variable to control for external shocks (Anastassova, 1999; Wolf et al., 2008; Mirestean and Tsangarides, 2009). The expected sign on this variable is positive since an increase/improvement in the terms of trade means that a country can buy more imports for any given level of exports, and this is expected to positively affect growth. Finally, recent studies emphasise the importance of the effect of economic integration. Dragutinović and Ivančev (2010) estimate the effect of different stages towards EU accession on growth and find that only the phase of full EU membership has an impact on growth dynamics and it appears to be negative. Dragutinović and Ivančev (2010, p.7) explain this negative effect "by the fact that there are common patterns for countries at a similar level of development. Namely, once the transition country improves its general welfare, which happens along with its accession to the EU, it follows a similar growth path to other EU countries in terms of lower growth rates."

*Growth during the crisis*

A few recent studies emphasise the importance of the recent financial crisis on growth. Josafidis et al. (2011) argue that this crisis hit transition countries relatively hard, since they were highly reliant on the international financial markets. Tsangarides (2010, p.6) specifies the growth function for the period of crisis by including "proxies of the 'trade' and 'financial' channels in the transmission of shocks in the global economy". He estimates that in the recent financial crisis countries with pegged regimes performed better than countries with floating exchange rate regimes, but worse during the recovery period 2010-2011. Josafidis et al. (2011) try to capture the effect of crisis by estimating the sample first before the crisis and then by including a crisis period and comparing the results. In order to control for the effects of crisis, time dummy variables will be included in our analysis. Table 6.2 summarises variables which will be included in the growth model, providing their description, expected sign and data source.

Table 6.2: Growth regression variables – label, description, expected sign and data source

| Variable name | Label | Description | Expected sign | Data source | Notes |
|---|---|---|---|---|---|
| Real GDP per capita growth | GDPPCG | Growth rate of GDP per capita based on constant local currency (annual % change) | Depend-ent variable | WDI | |
| Currency board arrangement | CBA | Dummy variable (1 for CBA countries) | ? | | |
| Fixed exchange rate (regime) | defactoFIX | Dummy variable for countries with de facto fixed exchange rate regime | + | Ilzetski, Reinhart, Rogoff (2010) | |
| Inflation | lnINF | Natural log of inflation, measured as percentage change of consumer price index | - | WDI | For BH national statistics is used; infla-tion in BH is measured by using the retail price index until 2007 |
| Fiscal balance/GDP | FB | The ratio of fiscal balance to real GDP (%) (a fiscal surplus takes on a positive sign) | ? | EBRD | Data for Moldova taken from various EBRD transition reports and EconStat |
| Government expenditure | GOV | Government expenditures in percentage of GDP | ? | EBRD | |
| EBRD progress in transition indicator | EBRDI | Average of eight EBRD transition indicators (for the liberalisation, privatisation and credit reform) (index) | ? | EBRD | Available for all countries in the sample except for Czech Republic in years 2008 and 2009 |
| Initial conditions | IC | GDP per capita in transition year | - | Fisher and Sahay (2004) | For BH and Serbia own assessment |
| Population growth | POPG | Growth rate of total population [87] | - | WDI | |
| Investment | INV | Total investment (% of GDP) | + | IMF, WEO | Data for Macedonia not available |
| Education | EDUC | School enrolment, tertiary (% gross) | + | WDI | |
| Openness | OPEN | (exports + imports) / GDP (%) | + | WDI | |
| Terms of trade | TOT | Ratio of the export unit value index to the import unit value index (base year 2000) | + | UNCTAD STAT | Data not available for years 1998 and 1999 and data for Serbia is joint with data for Montenegro, therefore data for 2008 and 2009 missing for this county |
| EU membership | EU | Dummy variable for EU member countries | ? | | |

[87] Since there might be a problem with including population growth on the right hand side when the growth of GDP per capita is on the left, the preferred estimations without this variable was estimated and the results were quite similar. Levy-Yeyati and Sturzenegger (2001) also included population growth and used GDP per capita growth as the dependent variable.

### 6.2.3 Descriptive statistics and model specification

After specifying growth determinants in the previous section the average trends in GDP per capita growth and growth determinants between countries with a CBA and countries with other regimes will be summarised (Table 6.3) and the initial model specified (Equation 6.1).

Table 6.3: Comparison of average trends in GDP growth and growth determinants between countries with a CBA (four countries) and countries with other regimes (twenty one countries)

| Variable | CBA | | | | OTHER REGIMES | | | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Standard deviation | Min | Max | Mean | Standard deviation | Min | Max |
| GDPPCG | 5.08 | 5.48 | -14.55 | 11.79 | 5.07 | 5.48 | -17.62 | 33.03 |
| INF | 4.69 | 4.02 | -1.13 | 18.67 | 12.29 | 24.46 | -8.53 | 293.68 |
| FB | -0.60 | 2.75 | -9.18 | 3.37 | -2.73 | 3.96 | -13.14 | 25.46 |
| POPG | 1.00 | 0.25 | 0.13 | 2.19 | 1.11 | 0.86 | 0.05 | 10.73 |
| EDUC | 55.53 | 13.22 | 33.5 | 79.53 | 43.89 | 18.67 | 13.25 | 87.62 |
| INV | 26.17 | 6.18 | 10.64 | 39.64 | 25.04 | 6.89 | 4.39 | 57.99 |
| EBRDI | 3.31 | 0.56 | 2.13 | 4.00 | 3.07 | 0.54 | 1.42 | 4.00 |
| OPEN | 122.91 | 23.12 | 87.28 | 172.80 | 99.06 | 31.15 | 45.13 | 203.20 |
| TOT | 110.97 | 17.39 | 97.95 | 148.66 | 105.64 | 21.26 | 73.51 | 238.18 |
| GOV | 39.27 | 6.17 | 33.17 | 62.85 | 35.83 | 9.72 | 3.10 | 60.39 |

Countries included in the analysis are the same transition countries as those in Chapter 5 and the period is 1998-2009. Again, four countries, BH, Bulgaria, Estonia and Lithuania, out of 25 in the sample had a CBA during this period. According to Table 6.3 countries with a CBA recorded, on average, a startlingly similar GDP per capita growth rate (GDPPCG) and had only slightly higher levels of education (EDUC), investment (INV), progress in transition (EBRDI) and government expenditures (GOV) than countries with other regimes. CBA countries were, on average, also more open and had better terms of trade than countries with other regimes. In contrast, as expected, inflation and fiscal deficit, variables are markedly lower in CBA countries than in those with other regimes. However, these are only unconditional averages of variables. Therefore, before making any inference about the effect of CBA on macroeconomic performance a more formal empirical analysis should be conducted. Accordingly, the effect of CBA (compared to other regimes) on GDP growth (Equation 6.1) will be estimated taking into account all the above specified controls. Moreover, time-specifics (such as a shock of oil or food prices) are controlled for by including time dummy variables ($\gamma_t$); $\varepsilon_{i,t}$ is a standard error term.

$$GDPPCG_{i,t} = \alpha_0 + \alpha_1 CBA_{i,t} + \alpha_2 defactoFIX_{i,t} + \alpha_3 lnINF_{i,t-1} + \alpha_4 FB_{i,t-1} + \alpha_5 IC_i + \alpha_6 POPG_{i,t} + \alpha_7 EDUC_{i,t} + \alpha_8 INV_{i,t-1} + \alpha_9 EBRDI_{i,t-1} + \alpha_{10} OPEN_{i,t} + \alpha_{11} TOT_{i,t} + \alpha_{12} GOV_{i,t} + \alpha_{13} EU_{i,t} + \gamma_t + \varepsilon_{i,t} \quad (6.1)$$

### 6.2.4 Methodology and results

Since possible endogeneity issues have been emphasised in the growth literature some of the appraised studies used instrumental variable methods, such as 2SLS, 3SLS and G2SLS (Fisher and Sahay, 2004; Falcetti et al., 2006; Dragutinović and Ivančev, 2010), while others used a dynamic model estimator (Staehr, 2003; Barlow, 2006; Falcetti et al., 2006; Josifidis et al., 2011). Here, this issue is addressed by initially using lagged values of potentially endogenous independent variables and later by using their lags as instruments in a dynamic model estimator.

*Static panel model estimation*

The estimation of Equation 6.1 by pooled OLS suggests that the CBA variable is insignificant. According to the correlation matrix, these variables are not highly correlated (Appendix 6.1). Only variables for the progress in reform and government consumption are estimated to be significant at the 5 percent level, with inflation and fiscal balance being significant at the 10 percent level (Appendix 6.2). However, this is not the preferred estimator since it does not account for countries' fixed effects and these results will not be discussed further. After plotting the residuals it may be observed that there are some outliers that may affect the results. To control for the outliers country-time dummies are included: for Azerbaijan in 2006 and 2007 and for Latvia and Armenia in 2009. Azerbaijan experienced exceptionally high levels of GDP growth in 2006 and 2007 due to very large trade surpluses (which were the result of an expanding oil industry and an increase in the world price of oil) (Garbe-Emden et al., 2011). One the other hand, Latvia and Armenia experienced a severe decline in their growth rate in 2009. Sharp declines in the construction sector and workers' remittances in Armenia, particularly from Russia, are argued to be the main reasons for the latter downturn. Inclusion of country-time dummies (for the above mentioned countries in particular years: Azerbaijan 2006 and 2007 (variables $aze_{2006}$ and $aze_{2007}$), Latvia and Armenia in 2009 (variables $lat_{2009}$ and $arm_{2009}$)) improves the statistical properties of the model with respect to normality and linearity since, after controlling for these outliers, diagnostic tests suggest that hypotheses of linearity, homoscedasticity and normality cannot be rejected (Appendix 6.3). The F-test suggests that these variables are jointly significant and results of the estimation in which these country-time dummy variables are included suggest their individual significance as well. Estimations suggest that the fixed effect model is preferred over the OLS. However, our variable of interest drops out from the fixed effect estimation as it is time invariant (Appendix 6.4). Since we are interested in the effect of CBA and, as discussed in Section 5.4 random effects are argued to result in biased and inefficient estimates in small samples, the FEVD will again be used as a preferred static estimator (for further explanations on FEVD estimator see Section 5.4.3).

Diagnostic tests after the three stage-by-stage estimation suggest the hypotheses of linearity, homoscedasticity and normality cannot be rejected. As in the inflation regression (Section 5.4.3), the CBA variable and EBRDI are treated as time invariant/slowly changing. Since the population growth variable slowly changes both between and within countries it is also included in the second stage. Moreover, the variables for openness, education and government consumption are included in the second stage since their between-to-within ratio is close to 2 (Appendix 6.5a).

*FE model (Stage 1 FEVD)*

$$GDPPCG_{i,t} = \alpha_0 \ (+\ \alpha_1 CBA_{i,t}) + \alpha_2 defactoFIX_{i,t} + \alpha_3 lnINF_{i,t-1} + \alpha_4 FB_{i,t-1} + \alpha_5 IC_i + \alpha_6 POPG_{i,t} + \alpha_7 EDUC_{i,t} + \alpha_8 INV_{i,t-1} + \alpha_9 EBRDI_{i,t-1} + \alpha_{10} OPEN_{i,t} + \alpha_{11} TOT_{i,t} + \alpha_{12} GOV_{i,t} + \alpha_{13} EU_{i,t} + \alpha_{14} aze_{2006} + \alpha_{15} aze_{2007} + \alpha_{16} lit_{2009} + \alpha_{17} arm_{2009} + \gamma_t + u_i + \varepsilon_{i,t} \tag{6.2}$$

*Stage 2 in FEVD*

$$u_i = \beta_0 + \beta_1 CBA_{i,t} + \beta_2 EBRDI_{i,t-1} + \beta_3 POPG_{i,t} + \beta_4 OPEN_{i,t} + \beta_5 GOV_{i,t} + \beta_2 EDUC_{i,t} + h_i \tag{6.3}$$

*Stage 3 in FEVD*

$$GDPPCG_{i,t} = \delta_0 + \delta_1 CBA_{i,t} + \alpha_2 defactoFIX_{i,t} + \alpha_3 lnINF_{i,t-1} + \alpha_4 FB_{i,t-1} + \alpha_5 IC_i + \alpha_6 POPG_{i,t} + \alpha_7 EDUC_{i,t} + \alpha_8 INV_{i,t-1} + \alpha_9 EBRDI_{i,t-1} + \alpha_{10} OPEN_{i,t} + \alpha_{11} TOT_{i,t} + \alpha_{12} GOV_{i,t} + \alpha_{13} EU_{i,t} + \alpha_{14} aze_{2006} + \alpha_{15} aze_{2007} + \alpha_{16} lit_{2009} + \alpha_{17} arm_{2009} + \alpha_{16} h_i + \gamma_t + \varepsilon_{i,t} \quad (6.4)$$

The FEVD results suggest that a CBA has no effect on growth, when estimated by 3 stages procedure and using the 'xtfevd' command (Appendices 6.5b and 6.5c). The results are not altered when fixed ER, inflation and fiscal balance are excluded (separately or together) from the specification (Appendix 6.5d); reasons for conducting these additional estimations are noted in Section 6.2.2. All other variables, except government expenditure, which as expected has a negative effect on growth, are insignificant. The results do not differ when the CBA variable is divided into 'strong' and 'weak' (Appendix 6.6). Since some studies suggest that previous growth rates are likely to influence current growth rates, a dynamic panel estimator will be next used. Moreover, the hypothesis of no serial correlation is rejected at all conventional levels of confidence (the last test within diagnostic tests in Appendices 6.5b and 6.6a), which also suggests that static models are misspecified and that dynamics should be included in the model.

*Dynamic panel model estimations*

As suggested in the recent literature and estimated in some studies (Staehr, 2003; Barlow, 2006; Falcetti et al., 2006; Josifidis et al., 2011) GDP growth is likely to be persistent and therefore the lagged dependent variable will be included and a dynamic model estimated.

$$GDPPCG_{i,t} = \alpha_0 + \alpha_1 GDPPCG_{i,t-1} + \alpha_2 CBA_{i,t} + \alpha_3 defactoFIX_{i,t} + \alpha_4 lnINF_{i,t} + \alpha_6 FB_{i,t} + \alpha_8 IC_i + \alpha_9 POPG_{i,t} + \alpha_{10} EDUC_{i,t} + \alpha_{11} INV_{i,t} + \alpha_{13} EBRDI_{i,t} + \alpha_{15} OPEN_{i,t} + \alpha_{16} TOT_{i,t} + \alpha_{17} GOV_{i,t} + \alpha_{18} EU_{i,t} + \alpha_{19} aze_{2006} + \alpha_{20} aze_{2007} + \alpha_{21} lit_{2009} + \alpha_{22} arm_{2009} + \gamma_t + \varepsilon_{i,t} \quad (6.5)$$

where $\varepsilon_{i,t} = u_i + v_{i,t}$ ($u_i$ is a group-specific effect and $v_{i,t}$ is white noise)

According to the results of the dynamic estimation (one-step 'system' GMM) the CBA variable is again insignificant, before and after controlling for the fixed exchange rate regime, inflation and fiscal balance (Appendices 6.7a and 6.7c). According to the results government expenditures are again significant and negative, investment is significant and positive and the lagged dependent variable[88] is significant and positive. Other variables are insignificant (Appendix 6.7). The results are very similar when the CBA variable is divided into 'strong' and 'weak' CBA (Appendix 6.7d). However, the Hansen test is too weak and the Sargan test suggests that the hypothesis of instrument validity is rejected and therefore we cannot make any inference from these results. Therefore, we do not present the results in the main text, but these are available in the appendices.

Standard growth models focus on the very long run. Accordingly, given the limited time series depth of our data (12 years), the estimation of a GDP growth function is more indicative of the determinants of short-run variations in growth rather than the GDP trend. Therefore, the effect of CBA on macroeconomic performance in transition countries will next be estimated by focusing on growth volatility.

## 6.3 Estimation of the effect of CBA on growth volatility

### 6.3.1 Growth volatility as a proxy for macroeconomic performance in transition countries

Since standard growth models focus on the long run and we are operating with a short sample period, macroeconomic performance in transition countries could be represented better by output or growth volatility[89] rather than output growth. Moreover, since we are estimating the effect of a specific monetary framework on macroeconomic performance the estimation of its effect on growth is not fully convincing on theoretical or empirical grounds. As argued in Section 6.2.1, it is usually argued that the monetary/ER regimes/policies have no effect on growth since in the long run output is likely to return to its trend level due to adjustment

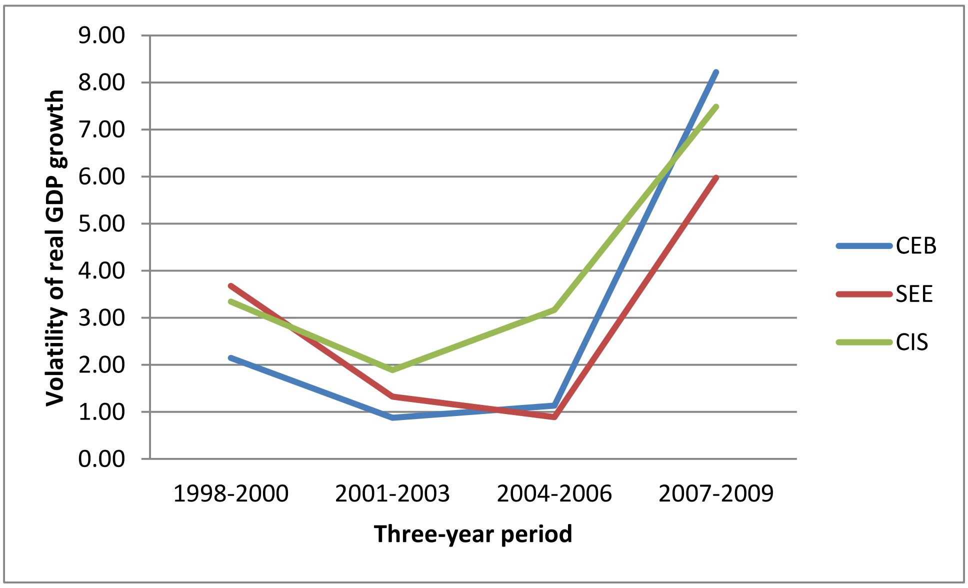
[88] The size of the coefficient on the lagged dependent variable from the dynamic estimation is between the values of the coefficients from the OLS and fixed effect estimates (Appendix 6.7b).

[89] Previous studies used both output and growth volatility as measure of volatility. Even though we use growth volatility, for the reasons discussed below, we refer to and assess both output and growth volatility studies in order to determine our model specification.

mechanisms. Therefore, the focus will next be placed on estimating the effect of CBA on growth volatility.

Kose and Prasad (2010, p. 45) emphasise that "even if volatility is considered intrinsically a second-order issue, its relationship with growth indicates that volatility could indirectly have first-order welfare implications". Toit (2009) and Leonidas (2010) emphasise that output volatility is usually higher in less developed countries (compared to the developed ones) and that it matters in terms of economic welfare. As noted in Athanasoulis and Van Wincoop (2000) (as cited in Leonidas, 2010), the effects of volatility on welfare can be significant, even reaching 5-10 percent of consumption. Leonidas (2010) emphasises that understanding the causes of volatility in growth rates is important since volatility is likely to create economic uncertainty that may negatively impact on future growth rates (as first documented in Ramey and Ramey, 1995). This negative correlation between growth rates and their volatilities may also be observed in our sample by comparing Figures 5.3 and 6.1. According to Figure 5.3 after a relatively steady growth from 1999 to 2006 (2007 for SEE countries), there has been a significant decline in growth rates in all observed transition countries. Accordingly, growth volatility declined until 2001-2003 (2004-2006 in SEE countries) and increased significantly after 2004-2006 in all transition countries (Figure 6.1).

Figure 6.1: Volatility of real GDP growth in CEB, SEE and CIS counties




Volatility is calculated as standard deviations over three-year GDP growth rates

None of the studies that focused on transition economies investigated directly output or growth volatility determinants nor used measures of volatility as a dependent variable. Moreover, there is only a limited literature that focuses on the effect of different monetary and ER regimes on output or growth volatility. A few studies that estimated the effect of CBA on macroeconomic performance estimated its effect on both output growth and volatility. In determining the output volatility specification, these studies used a very similar specification to that in growth studies, with the only differences that volatility instead of growth of some variables (volatility of investment, volatility of terms of trade) was used (Ghosh et al., 2000; Wolf et al., 2008, see Table 5.1). Some studies which estimated the effect of different ERRs on output or growth volatility even used the volatilities of the same explanatory variables as in the growth regression (Levy-Yeyati and Sturzenegger, 2001; Bastourre and Carrera, 2004, as cited in Petreski, 2011). However, none of these studies offered a rationale for this, nor did these studies focus on transition countries. In order to determine the appropriate model specification we will reflect on studies which focus on determining growth determinants in transition countries (Section 6.2.2). Additionally, output growth and output and growth volatility studies will be consulted, especially those that focus on estimating the effect of different monetary /ER regimes on volatility, in order to identify further likely growth volatility determinants.

### 6.3.2 Output and growth volatility measures and determinants

Studies that focus on the determinants of output and growth volatility differ in their choice of explanatory variables. Leonidas (2010, p.3) notes that: “The current state of the literature on the determinants of volatility parallels the first phase of the growth literature, as it is comprised of a number of studies using very different and specific subsets of variables with often diametrically opposite conclusions”. There is also no consensus on which measure should be used for volatility. Some studies used the standard deviation of the annual GDP growth rate (Ramey and Ramey, 1995; Bleaney and Fielding, 2002[90]; Bejan, 2006; Kose and Prasad, 2010) or the standard deviation of GDP level (Gavin and Hausman, 1996), while other studies used a three-year or five-year moving standard deviation of GDP per capita level and/or growth

[90] Bleaney and Fielding (2002) used this measure in logs

(Ghosh et al., 2000; Levy-Yeyati and Sturzenegger, 2001). Wolf et al. (2008) used the centred three-year standard deviation of the log of real GDP relative to its Hodrick-Prescott (HP) trend and the three-year standard deviation of the real GDP growth rate. In our estimations, the variability of GDP growth will be used, since the variability of GDP levels would show us the changes in output, which represents growth. Haddad et al. (2010, p.7) emphasise three reasons for using volatility of growth rather than volatility of output: "First, even a stable growth path at a constant annual rate of growth will generate a positive volatility measure, even though this is both a desirable and perfectly forecastable outcome. Second, policymakers are generally more concerned with maintaining a stable growth rate, as opposed to stable output levels, since it is the former on which policy decisions are predominantly based. Third, we follow the standard approach in the literature on the effects of volatility and these papers (Easterley and Kraay, 2000 and Ramey and Ramey, 1995) have generally focused on growth rather than output volatility".

Another issue when formulating the dependent variable is the number of years over which the standard deviation should be calculated. A commonly used measure is the standard deviation over the whole period or three-year period of GDP growth or GDP level. However, Ćorić (2008) argued that these measures are arbitrary and that the time periods over which the standard deviation is to be calculated should be determined according to the detected break points (years) in volatility. Another issue is whether rolling standard errors should be used or standard deviations should be calculated for the separate periods without overlapping. When applied to annual-level data, a few problems with using the rolling standard errors are usually emphasised (Bastourre and Carrera, 2004; Petreski, 2011): it adds persistence to the series, i.e. induces high autocorrelation; moving average time series typically generate spurious cycles (the Yule-Slutsky theorem); and the way in which each standard deviation should be assigned to a particular year is not clear. Therefore, we will use standard deviations calculated for non-overlapping periods, even though there is a significant information loss and with 12 year periods only 4 time periods are available (when 3-year standard deviations, based on non-overlapping averages of GDP growth, are used). The procedure suggested by Ćorić (2008) for determining the periods over which standard deviations should be calculated cannot be applied in our case for several reasons: with only 12 years period data we cannot identify long-run structural changes (therefore we cannot form periods according to these breaks); since we are dealing with short-run data, the only way to analyse growth variance is by a simple measure over short periods; because of the need for as many degrees of freedom as possible, the minimum period possible for calculating GDP growth volatility will be used (3-year period).

Although different studies used different determinants of output and growth volatility, the consensus is that a regression should contain variables that represent shocks and shock buffers. As noted in the previous section, studies that focus on transition recognised the importance of macroeconomic stabilisation and reform variables as determinants of macroeconomic performance. There is no agreement on whether variables should be included in levels or volatilities. In further analysis we identify those that are determined to be the most commonly used and which will be used in our empirical analysis. After considering these potential macroeconomic performance determinants, the growth volatility model, which focuses on the effect of monetary/ER regimes in transition countries, will be determined.

The monetary/ER regime might be considered a potential measure of a shock buffer as well as a potential tool for macroeconomic stabilisation. If *CBA* is considered as a potential monetary stabilisation tool its effect on growth volatility is not straightforward. On the one hand, a CBA is likely to decrease inflation (as suggested in Section 5.4) which is likely to induce monetary stability and consequently growth stability. On the other hand, a CBA may increase growth volatility in a period of crises and shocks, since the monetary authority cannot give loans to government or banks and it cannot act as a lender of last resort. Since adjustments to shocks cannot be channelled through changes in the exchange rate or through central bank support to the financial sector, the shocks will be transmitted into the real economy, especially when prices and wages are sticky. This negative effect might prevail in transition economies due to constraints posed on fiscal policy. Since the monetary authority under CBA cannot finance government deficits the usage of fiscal policy instruments in period of crises may be restrained as well. This is likely to increase growth volatility, since both monetary and fiscal buffers are limited.

Studies that estimated the effect of CBA on macroeconomic performance, which are appraised in Section 5.2, treated the CBA as an ERR. Their results for the CBA effect on output volatility are inconclusive: Ghosh et al. (2000) found no significant effect, while Wolf et al. (2008) found different effects depending on the level of a country’s development. Their results suggested that amongst higher-income countries, countries with CBAs experience higher output volatility while amongst lower-income countries CBAs are associated with lower volatility, relative to countries with either a floating ER regime or soft pegs. They justified these findings by arguing that there were differences in price and wage stickiness between countries with different levels of development. Namely, they argued that in less developed countries “wages and prices are less likely to be sticky and macroeconomic policies may themselves be a source of volatility. In such circumstances, the discipline of a currency board arrangement may help provide greater economic stability”. (p.112). It may also be argued that this effect may occur in transition counties due to their extensive informal sectors, which may buffer shocks even when wages and prices in the formal sector are sticky. However, studies which estimated the affect of CBA on output volatility did not provide any robustness checks or explanation for using almost the same specification for examining the determinants of growth and output volatility (see Table 5.1). In addition, these studies failed to control for inflation, with Ghosh et al. (2000) failing to control for fiscal balance as well. Finally, none of these studies reported the results of diagnostic tests. However, we cannot control for the fixed ERR since we are averaging data over a three-year period and the effect of ERR is measured by a dummy variable which is changing in some countries during these sub-periods. This problem does not occur with the CBA variable, since no country introduced or ended a CBA in the observed period.

Identification of the effect of *fixed exchange rate regime* on growth volatility is also not straightforward. While some studies found a positive effect of fixed exchange rate regimes on output/growth volatility (Bastourre and Carrera, 2004; Bleaney and Fielding, 2002; Edwards and Levy-Yeyati, 2005), others did not find any significant effect (Haddad et al., 2010). Petreski (2011) emphasises that the effect of ERR on output volatility depends on the type of shock experienced, arguing that in the case of predominantly nominal domestic shocks more rigid regimes are expected to prevent their transmission to the real economy, while more flexible regimes are believed to behave as buffers when real (mostly exogenous) shocks hit an economy. Levy-Yeyati and Sturzenegger (2001) argued that this effect depends on the level of development of an economy. Their results suggested a positive effect in developing countries and insignificant effect in advanced economies. However, there are only a limited number of studies that estimated the effect of different ERRs on output or growth volatility and these differ in controls and techniques used (for summary of these studies see Table 6.4). Furthermore, *inflation* is also argued to be an appropriate measure of monetary stability and a function of stabilisation policy (Staehr, 2003) and it is expected that countries with lower inflation rates have lower volatility. A *fiscal balance* variable is also considered one of the potential stabilisation measures and fiscal surpluses may be expected to give more scope for fiscal activism in the event of an adverse shock and therefore to decrease output and growth variability. This effect is also suggested for the lower income countries in the empirical analysis conducted by Wolf et al. (2008). These three variables are also used as monetary stabilisation variables in some of the studies which estimated macroeconomic performance ("growth") in transition countries (for the summary of empirical evidence of the studies which focused on macroeconomic performance determinants in transition countries see Table 6.1). The way specific monetary-ER regimes affect output and growth volatility might be argued to depend on the *level of development of the financial system* (Easterly et al., 2000; Petreski, 2011). Namely, if the financial system is well-developed it may cushion the shock effects on the real economy even when a rigid regime is used. Therefore, a measure of the level of financial development should be included. Ćorić (2008) used the private credits to GDP ratio and the M2 to GDP ratio as measures of financial development, while Petreski (2011) used the total bank assets as a proportion of GDP as a measure of financial development. Easterly et al. (2000) suggested a whole set of variables as measures of financial system development: change in private credit/gross domestic investment, standard deviation of M3/GDP, stock market value traded/GDP, credit to private sector/GDP, long-term private debt issues/GDP, private bond market/GDP and public bond market/GDP. Bejan (2006) used the black market premium, interest rate, liquid liabilities and credit to private sector as measures of financial development. Due to data limitations and small sample properties we will use two variables as measures of financial development: *domestic credit provided by banking sector* (as a % of GDP) and *the volatility of money supply growth*, measured as a standard deviation of the three-year broadest monetary aggregate annual growth. In the light of the recent Global Financial Crisis and, in particular, its effect on transition countries, the sign of this variable is debatable. The contemporaneous effect of domestic credit may be stabilising; but the lagged effect can be very destabilising. The money supply growth variable is also argued to represent a measure of nominal policy shocks (as noted below). Bejan (2006) and Ramey and Ramey (1995) (as cited in Bejan, 2006) also controled for total investment arguing that a negative effect might be expected since “a country with a higher level of investment should display less volatility in its output” (p.8). Conversely, the effect could also be positive, meaning higher volatility, since investment is typically the least stable component of GDP (much less stable than consumption, for example). *Wage flexibility* is also usually emphasised as a determinant of output and growth volatility. It is usually argued that more flexible wages are likely to decrease output and growth volatility. On the other hand, Easterly et al. (2000) emphasised that the adverse aggregate demand effects of wage adjustment may offset the positive effects arising from wage flexibility. However, Easterly et al. (2000) found no effect of real wage flexibility on volatility. Due to data limitations we cannot control for this potential effect in our sample. Moreover, on theoretical grounds, we do not consider that controlling for real wage flexibility in a volatility model is of first-order importance (and most of the studies appraised below did not use this control).

Table 6.4: Summary of the empirical research on the effect of different ERRs on output growth and volatility

| Study | Sample | Dependent variable(s) | Controls | The effect of fixed ERR on dependent variable compared to other regimes | Endogeneity | Technique |
|---|---|---|---|---|---|---|
| Easterly et al. (2000) | 60-74 countries (depending on the spec.), aggregating over periods 1960-1978 and 1979-1997 | Volatility of GDPpc growth (measured by SD of GDPpc growth rate) | Developing country dummy, openness (X+M/GDP), SD change log real wage index, SD M1 growth, private capital flows/GDP, SD private capital flows/GDP, credit to private sector/GDP (and squared), (initial GDPpc, openness*initial GDPpc) | Not addressed | Credit to private sector and SD of private capital flows treated endogenous in EC2SLS | OLS, EC2SLS |
| Levy-Yeyati and Sturzenegger (2001) | 154 countries over the period 1974-1999 | Growth of real per capita GDP | Investment-to-GDP ratio, the rate of change of the terms of trade, growth of government consumption (lagged), population growth, political instability, initial per capita GDP, secondary enrolment, openness, regional dummies: Sub-Saharan Africa, Latin America and transition economies and year dummies; (additionally added: lagged inflation, dummy for currency crisis and bank runs) | Negative (fixed ER regimes are associated with a lower per capita output growth rate (results are driven by non-industrial economies; for industrial economies the ERR is unrelated to growth performance) | Additionally addressed for ERR (standard multinomial logit model of the choice of exchange rate regime) | OLS, 2SIV |
| | | Volatility of real per capita growth (measured as the standard deviation of the growth rate over a centred rolling five-year period) | Volatilities of the investment ratio, change in government consumption, and of the terms of trade, measures of openness, initial wealth, and political instability, regional and year dummies. | Inconclusive (fixed exchange rate regimes are associated to higher output volatility only in the case of non-industrial countries, with no significant impact on volatility within the group of developed economies) | Not addressed | OLS |
| Bleaney and Fielding (2002) | 80 developing countries, 1980-1989 | Volatility of real output growth (measured as standard deviation of real output growth in logs) | Pegged exchange rate dummy, single-currency peg dummy, standard deviation of terms of trade, agriculture share (mean log share of agriculture value added in GDP), country size (mean log of GDP), region dummies | Positive (fixed ERR induce higher output volatility) | Report no presence of endogeneity between ERR and volatility | Cross-country regression analysis (OLS? - not specified) |

Table 6.4 (continuing): Summary of the empirical research on the effect of different ERRs on output growth and volatility

| Study | Sample | Dependent variable(s) | Controls | The effect of fixed ERR on dependent variable compared to other regimes | Endogeneity | Technique |
|---|---|---|---|---|---|---|
| Bastourre and Carrera (2004) | 45 countries, 153 countries (depending on the model specification) 1974-2000 | Output volatility (measured as standard deviation of the log-differences in the seasonal-adjusted industrial production index and as SD of GDP growth in sub-periods) | PPP per capita GDP, the same variable squared, GDP growth, trade openness, inflation volatility (SD of inflation rate), terms-of-trade volatility, investment volatility, an institutional index, exchange-rate dummies | Positive (more rigid ERR greater output volatility) | Treated in the GMM but not noted which variables are treated endogenous | Fixed and random effects panel data estimators; dynamic GMM |
| Edwards and Levy-Yeyati (2005) | 183 countries, 1974-2000 | Real growth | Investment to GDP, GC, political instability, initial per capita GDP, population, openness, secondary enrolment, regional dummies and exchange-rate dummies | Negative | Not addressed | FGLS |
| | | Change of real per capita GDP | Level of adjustment of the growth rate towards its long-run equilibrium [difference between the term stemming from the growth equation and the lagged actual growth]; terms of trade; civil unrest | Positive | Not addressed | |
| Bejan (2006) | 111 countries 1950-2000 | Output volatility (measured as standard deviation of the growth rate of real GDP per capita in constant prices) | Openness, GDPpc, population, human capital, FDI inflow, investment, government expenditure, export index, terms of trade volatility, inflation volatility, black market premium, interest rate liquid liabilities, credit to private sector and foreign debt | Not addressed | Not addressed | Not specified |
| Ćorić (2008) | 97 countries, 1961-2005 (due to averaging maximum three time periods available, depending on country group) | The standard deviation of the real GDP growth for each country-period (which are determined according to identified break points in volatility), non-overlapping averages; SD of GDP growth rates around the HP trend in GDP growth | International net worth diversification measure: FDI; Monetary shocks: inflation rate volatility, money growth volatility; fiscal shocks: volatility of share of government consumption in GDP; supply side economic shocks: volatility in terms of trade; trade and financial system development: (country-period average value of) openness, the ratio of M2 to GDP, ratio of credits to the private sector to GDP; GDP per capita growth; government share in GDP; civil liberties index; additionally: financial openness: share of gross capital flows in GDP; measure of fiscal volatility | Not addressed | Endogeneity of variable of interest addressed by using IV estimation of FE (instrumented by the average share of urban population, the average life expectancy and by the beginning of country-period values of GDPpc) | Fixed effect estimator (preferred), pooled OLS, and random effects estimator; IV estimation of the one-way FE (xtivreg2); GMM as robustness check |

Table 6.4 (continuing): Summary of the empirical research on the effect of different ERRs on output growth and volatility

| Study | Sample | Dependent variable(s) | Controls | The effect of fixed ERR on dependent variable compared to other regimes | Endogeneity | Technique |
|---|---|---|---|---|---|---|
| Haddad et al. (2010) | 77 developing and developed countries, 1976-2005 | Output growth volatility (measured as the SD of GDPpc growth across each 5-year period) | Lagged volatility of growth, trade openness, measures of product and market diversification, interaction term between openness and diversification (specific interest of the study), financial openness, capital flow volatility, foreign growth volatility, term of trade volatility, ER volatility, inflation volatility, banking crisis, (5-year period averages (SDs in the case of volatility measures)) | Insignificant effect of ER volatility on growth volatility (inflation significant and positive amongst low income countries; insignificant among high income countries) | Endogeneity of openness less of an issue in volatility regressions but not totally removed | System GMM |
| Petreski, 2011 | 169 countries, 1976-2006 | Per capita GDP growth | Initial GDP; average years of schooling; 1/(life expectancy at age 1); government consumption/GDP; trade openness; inflation rate; investment/GDP; fertility rate; democracy index; population growth; rule of law index; exchange-rate regime; regional/country specific/time dummies | No significant effect of ERR on growth (regardless of level of countries' development, ERR classification used and duration of specific ERR) | Addressed for ERR in GMM | Dynamic system-GMM panel method |
| | | Output volatility | Terms-of-trade volatility; money-supply volatility; government consumption volatility; civil unrest; GDP per capita growth; financial development; trade and financial openness; inflation; exchange-rate regime; exchange-rate regime*TOT volatility; regional/country specific/time dummies | Some, though not overwhelming, effect of exchange rate regime on output volatility[91] | Volatility of money growth, government consumption volatility, measure of financial development and inflation treated endogenous[92] | Hausman-Taylor, 2SLS, GMM and dynamic system-GMM |

Note: Highlighted studies are those that assess the effect of ERR on output or growth volatility

[91] i. Long fixed (a fixed exchange rate longer than five years), limited-flexible and flexible regimes, as compared to a float, reduce output volatility in general; ii. A long fixed rate, compared to a float, is associated with higher output volatility under an aggregate-supply shock, but limited-flexible and flexible regimes have marginally lower output fluctuations than long pegs; iii. Overall, a TOT shock larger than 7 p.p. under a fixed, and larger than 8-9 p.p. under limited-flexible and flexible exchange-rate regimes, will give a higher output volatility compared to a float; and iv. Exchange-rate regimes are not important for channelling nominal shocks to real activity.

[92] The potentially endogenous variables (financial development, monetary and fiscal volatility, and inflation) are instrumented by: their first and second lags, terms of trade, inflation and growth and their first lags; and population.

Other measures that have been considered as potential shock buffers, or as Haddad et al. (2010, p.8) call them 'measures of the actual exposure of a country to international markets', are trade and financial openness. *Trade openness*, commonly measured as the ratio of sum of exports and imports to GDP, is emphasised as a potentially important determinant of output and growth volatility, since it affects an economy's vulnerability to shocks. However, its effect is not straightforward: Easterly et al. (2000) and Levy Yeyati and Sturzenegger (2001) suggested that more open countries are exposed to higher volatility, while, on the other hand, more open economies may more easily offset internal shocks. Bejan (2006) found that higher openness increased volatility in developing countries, while it helped smooth growth in developed countries. Most of the studies that estimated growth determinants in transition countries emphasised the importance of controlling for the *progress in transition/reform* (as noted in Section 6.2). This variable may also represent a buffer from shocks, although it is not commonly included in output and growth volatility regressions. Some studies used the above mentioned variables in levels, while other included them as volatilities.

Regarding the variables which capture the effect of external shocks, the *volatility of the terms of trade* has been distinguished as one of the main causes of growth volatility in emerging markets (Medoza, 1997, as cited in Coricelli and Masten, 2004). In addition, some studies included *money supply growth* and *government expenditure variables* (Levy Yeyati and Sturzenegger, 2001) in levels or volatilities as measures of nominal policy shocks (Petreski, 2011). Therefore, these variables will be included in our regression as well. The determinants used in our specification are defined in Table 6.5 below.

Table 6.5: Growth volatility regression variables – label, description, expected sign and data source

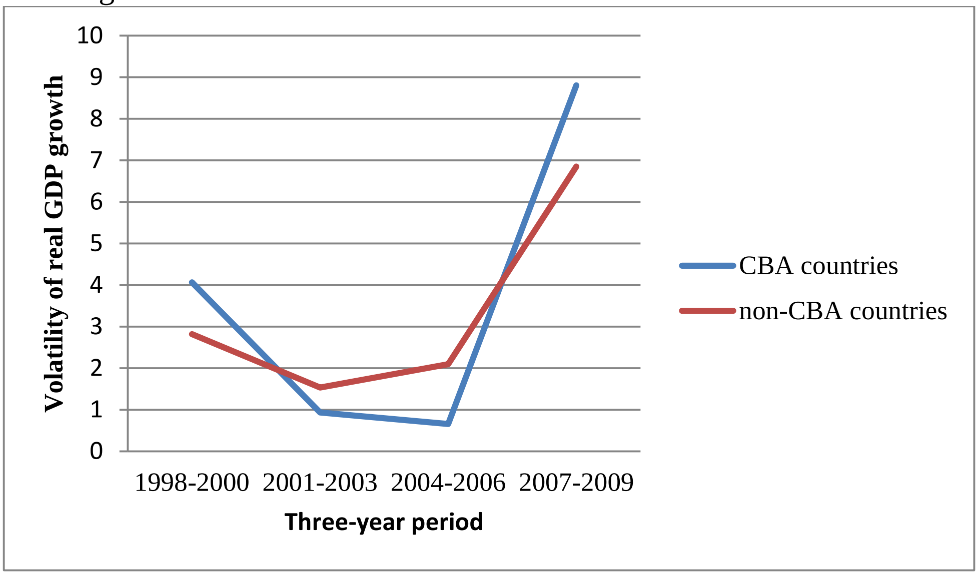
| Variable name | Label | Description | Expected sign | Data source | Notes |
|---|---|---|---|---|---|
| Growth volatility | lnGDPG VOL | The dependent variable: standard deviation of three year GDP growth rate (in logs) | | WDI | |
| Countries with currency board arrangement | CBA | Dummy variable (1 for countries with a CBA) | ? | | |
| Inflation | lnINF | Natural log of inflation (which is measured as annual percentage change in consumer price index) | + | WDI | For BH national statistics is used; inflation in BH is measured by using the retail price index until 2007 |
| Fiscal balance/GDP | FB | The ratio of fiscal balance to real GDP (%) (a fiscal surplus takes a positive sign) | - | EBRD | Data for Moldova taken from various EBRD transition reports and EconStat |
| Domestic credit | CRED | Domestic credit provided by banking sector (as % of GDP) | ? | | |
| Investment | INV | Total investment (as % of GDP) | ? | WDI | |
| Trade openness | OPEN | exports + imports as % of GDP) | ? | WDI | |
| EBRD progress in transition indicator | EBRDI | Average of eight EBRD transition indicators (for the liberalisation, privatisation and credit reform) (index) | - | EBRD | Available for all countries in the sample except for Czech Republic in years 2008 and 2009 |
| Terms of trade volatility | TOTvol | Standard deviation of the ratio of the export unit value index to the import unit value index (base year 2000) | + | UNCT AD STAT | Data not available for years 1998 and 1999 and data for Serbia is joint with data for Montenegro, therefore data for 2008 and 2009 missing for these countries |
| Volatility of the broad money supply growth | MSGvol | Broad money supply growth[93] (annual % change) | ? | | Data on broad money for Slovenia taken from various EBRD transition reports |
| Government expenditure | GOV | Government expenditure (as % of GDP) | ? | EBRD | |

[93] Broad money is calculated as the sum of currency outside banks; demand deposits other than those of the central government; the time, savings, and foreign currency deposits of resident sectors other than the central government; bank and traveller's checks; and other securities such as certificates of deposit and commercial paper

### 6.3.3 Model specification and descriptive statistics

After specifying the determinants of volatility in Section 6.3.2 the average trend in GDP growth volatility and its hypothesised determinants will be summarised and the model will be specified.

Figure 6.2: Volatility of real GDP growth in countries with CBA and countries with other regimes




Volatility is calculated as rolling standard deviations over three-year GDP growth rates

From Figure 6.2 it can be observed that there are generally no major difference in growth volatility between CBA countries and those with other regimes and that the trends in the two groups are similar. However, the figure suggests that CBA countries had lower volatility during the period 2001-2006, but higher after 2007, which is the period of financial crisis. This might suggest that due to their limited ability to use monetary policy instruments, the countries with CBA had more trouble facing financial shocks. However, to make any inference about this we have to control for other potential determinants of growth volatility. For the reasons discussed above we are averaging over 3-year period and therefore levels are calculated as the 3-year mean, while volatilities are calculated as 3-year standard deviations (SDs). Consequently, we are operating with 4 year time periods for estimation.

Table 6.6: Comparison of average trends in GDP growth volatility and growth volatility determinants between countries with a CBA and countries with other regimes

| Variable | CBA | | | | Other regimes | | | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Standard deviation | Min | Max | Mean | Standard deviation | Min | Max |
| GDPGvol | 3.61 | 3.82 | 0.19 | 12.81 | 3.32 | 3.26 | 0.08 | 14.64 |
| INF | 4.69 | 2.70 | 0.17 | 10.52 | 12.29 | 21.33 | -2.50 | 178.39 |
| FB | -0.60 | 2.10 | -4.49 | 2.85 | -2.71 | 3.40 | -11.01 | 12.43 |
| CRED | 44.02 | 22.70 | 14.89 | 98.80 | 35.22 | 19.43 | 7.42 | 91.09 |
| OPEN | 122.99 | 21.50 | 94.84 | 162.41 | 99.30 | 30.34 | 50.36 | 182.00 |
| INV | 26.17 | 4.96 | 17.58 | 35.18 | 25.04 | 6.04 | 8.68 | 43.13 |
| EBRDI | 3.31 | 0.57 | 2.14 | 4.00 | 3.07 | 0.54 | 1.42 | 4.00 |
| TOTvol | 1.89 | 1.62 | 0.58 | 6.32 | 4.84 | 7.88 | 0.11 | 32.04 |
| MSGvol | 10.39 | 10.70 | 2.02 | 46.50 | 15.05 | 16.16 | 0.83 | 79.38 |
| GOV | 39.27 | 5.90 | 33.42 | 58.14 | 35.80 | 9.36 | 17.58 | 56.45 |

According to Table 6.6 countries with a CBA recorded, on average, lower inflation, lower fiscal deficits, worse terms of trade and lower volatility of the money supply growth than countries with other regimes. Moreover, CBA countries were, on average, more open, with a higher ratio of domestic credits to GDP, slightly higher government expenditure and investment compared to the countries with other regimes. CBA countries also recorded a higher EBRD index than countries with other regimes.

However, these are only unconditional averages of variables. Therefore, before making any inference about the difference in growth volatilities in countries with a CBA compared to those with other regimes a more formal empirical analysis should be conducted. On the basis of the previous discussions the model is specified in Equation 6.16, as suggested by other studies a time (3-year period) dummy variables ($\gamma_t$) will be included in order to control for common shocks.

$$lnGDPGvol_{i,t} = \alpha_0 + \alpha_1 CBA_{i,t} + \alpha_2 lnINF_{i,t} + \alpha_3 FB_{i,t} + \alpha_4 CRED_{i,t} + \alpha_5 OPEN_{i,t} + \alpha_6 INV_{i,t} + \alpha_7 EBRDI_{i,t} + \alpha_8 TOTvol_{i,t} + \alpha_9 MSGvol_{i,t} + \alpha_{10} GOV_{i,t} + \gamma_t + \varepsilon_{i,} \qquad (6.6)$$

The dependent variable is calculated as standard deviation of GDP growth in logs in order to decrease the potential influence of outliers (this measure is also used by

Bleaney and Fielding, 2002). Regarding the issue of whether to include variables in levels or volatilities the EBRDI variable will be included in levels since it is slowly changing (as evident from Table 6.6, its volatility is close to zero). As discussed above there is no rationale for including investment and government expenditures in volatilities and therefore these variables will also be included in levels. The TOT variable is used in volatilities in almost all studies appraised above and therefore it will be measured as SD of 3-year TOT. The variable that measures openness is in all above studies included in levels. Regarding inflation, it could be included in both levels and volatilities. However, we include this variable only in levels, which is argued to represent a monetary stabilisation measure. Since the money supply growth variable (in levels) is highly correlated with inflation and credit (in levels)[94] it will be included in volatilities, while the credit variable will also be included in levels (for correlations between the variables see Appendix 6.8). Therefore, the credit variable is designed to capture the effect of changing levels of financial development, while the money supply growth variable captures the effect of nominal shocks.

### 6.3.4 Estimation strategies and results

Previous studies that estimated growth volatility by averaging over the whole sample period have used an OLS estimator. Studies that averaged over a few years or used the rolling standard deviations used different static and dynamic panel estimators. However, there is no agreement in these studies either about the estimation strategy that should be applied in the output and growth volatility estimations or about any potential endogeneity problem in this framework. Consequently, studies differ significantly in their approaches and techniques. Studies which addressed the issue of endogeneity used estimators such as 2SLS (Easterly et al., 2000; Petreski, 2011), the IV estimator of the fixed effect model (Ćorić, 2008) and/or the dynamic GMM estimator (Bastourre and Carrera, 2004; Haddad et al., 2010; Petreski, 2011), estimation strategies used in the appraised studies are noted in Table 6.4. Most of these studies focused on the potential simultaneity between the specific variable of interest and output/growth volatility. However, the endogeneity of our variable of

[94] This high correlation between money supply growth, inflation and credit when all are expressed in levels might have been expected since money supply growth is measured as the broadest monetary aggregate and its increase is expected to increase credit and potentially inflation.

interest is not an issue, since it is not likely that countries will decide to maintain or abandon CBA (since all countries introduced CBA before the sample period) as a result of volatilities in growth rates.

Estimation of Equation 6.16 by pooled OLS suggests that none of the explanatory variables has a significant effect on growth volatility (Appendix 6.9a). Diagnostic tests after the pooled OLS do not suggest problems with heterogeneity or normality. However, since it does not account for countries' fixed effects this is not the preferred estimator. Although the F-test after the FE estimation suggests that the OLS estimator is preferred over the FE (Appendix 6.9b), in order to control for countries' specifics, the countries' fixed effects will be included. However, if we want to control for countries' fixed effects and not lose the variable of interest, which is time invariant, we cannot use the FE estimator. Therefore, the FEVD estimator will again be used (the reasons for using the FEVD estimator are explained in detail in Section 5.4.3).

Since the between to within ratio for the variables for progress in transition (EBRDI) and for government expenditure (GOV)[95] is higher than 2 (Appendix 6.10), suggesting that these are slowly changing variables (variation between countries is higher than within countries) and they are significant in the second FEVD stage, then these will also be treated as slowly changing variables (beside CBA, which is time invariant). Diagnostic tests after the 3-stages FEVD estimation suggest that the assumptions of normality, homoscedasticity and linearity cannot be rejected at all conventional levels of significance (Appendix 6.11a). The joint test suggests that the model as a whole has explanatory power, since the hypothesis of insignificant coefficients is rejected at all conventional levels of confidence. According to the results in the third stage the CBA variable has a significant and negative effect on growth volatility. However, since in the stage-by-stage FEVD estimation the SEs are not adjusted for the variance from the previous stage the results after the 'xtfevd' (which provide these adjustments) should be observed. These results suggest that none of the variables has a significant effect on growth volatility (Appendix 6.11b). The CBA variable also has a negative sign but is significant only at the 30% level of

[95] The openness variable also has a high between to within ratio, but it is highly insignificant in the second stage and therefore is not treated as a slowly changing variable.

significance. Moreover, dividing the CBA variable into ‘strong’ and ‘weak’ makes no difference in the results and diagnostic tests (Appendix 6.12). The test for serial correlation suggests that the assumption of no serial correlation cannot be rejected at all conventional levels of significance (Appendix 6.9). Moreover, the number of observations is too small for conducting a dynamic estimation.

These inconclusive results of growth and growth volatility models might be expected due to short data span for transition countries, massive structural changes and poor quality and inconsistent data. Moreover, by creating the volatility variables we are operating with a very small number of observations, which additionally questions the reliability of the results of growth volatility estimation. To overcome these problems we will apply a different strategy for measuring macroeconomic performance in a country. This is using the subjective assessment of a country’s economic performance as the dependent variable.

## 6.4 The effect of a CBA on the subjective assessment of a country’s economic performance

The results of the analysis of the effect of CBA on growth and growth volatility suggest that there is no firm evidence that a CBA has an effect on growth and growth volatility. In Section 5.2 we concluded that the results of previous studies on the effect of CBA (and ERR in general) on growth and output/growth volatility were also inconclusive, with the coefficients of interest usually being insignificant. In this section an alternative approach to analysing the effect of a CBA on a country’s performance, based on citizen’s subjective assessments of the economic situation in their country, is pioneered. These subjective assessments are captured by using the answers to the Austrian National Bank survey questions: *“Currently, the economic situation of [MY COUNTRY] is very good”* and *"Over the next five years, the economic situation of [MY COUNTRY] will improve"*. By using the answers to these questions as the dependent variables (since answers to both questions are used for the dependent variable, the SUR is again used as a preferred estimator) we are in principle combining our previously estimated models (inflation, growth, growth volatility) and utilising a composite measure of a country’s economic well-being. As noted in Chapter 4, the approach of using subjective assessments can be argued to be superior to using indicators that attempt to measure objectively ‘real’ outcomes.

### 6.4.1 Theoretical background and model specifications

Although there is no comparable study, to our knowledge, utilising perceptions about the economic performance of a country to estimate the effect of monetary/exchange rate regime on macroeconomic performance, there are a few in related areas that may provide useful insights. First, there are studies that investigate the welfare effects of a monetary regime/policy. These studies investigate the domestic and foreign welfare effects of changes in domestic monetary policy, the so called “beggar-thy-neighbour policy” (Obstfeld and Rogoff, 1995; Berger, 2003; Tervala and Engler, 2010). The authors argued that the welfare effects depend on the degree of interdependence of the economies (cross-country substitutability), competitiveness of markets and preferences of consumers and considered consumption of both domestic and foreign goods in their models. Some studies estimate the effect of monetary policy variability (rules vs. discretion) on welfare, represented by variability of output and inflation (Woodford, 2003; Mahmood and Shahab, 2012). In these studies it is emphasised that different monetary policies/rules and types of monetary regimes are likely to influence economic welfare differently. Mahmood and Shahab (2012, p.158) find that in an emerging economy “central banks will have to sacrifice the discretionary status if the maximization of welfare is the objective”, since discretion, according to their findings, “serves only to control the variation in interest rate whereas the volatility in macroeconomic variables was higher”. On the other hand, some studies found no effect of monetary/exchange rate fluctuations on welfare (Gali and Monacelli, 2005).

Second, there are political science studies that have used perceptions about the economic situation in a country as the dependent variable[96]. They observed the relationship between perceptions about the economic situation in a country and the

[96] In these studies, beside estimating the effect of electoral preferences of respondents on perceptions about the economic situation in a country, the authors also estimated the adverse effect where the effect of perceptions about the economic situation in a country is used as the independent variable and their effect on the electoral preferences of respondents was estimated.

electoral preferences of respondents in what is called 'sociotropic'[97] models of voting, which are based on the perceptions about the economic situation in a country (Evans and Andersen, 2001; Hansford and Gomez, 2011). Although these studies have a very different focus from ours, they are examined in order to assist our own model specification. Hansford and Gomez[98] (2011, p.9) noted that subjective evaluations of the economy are likely to be influenced by both objective national economic conditions and respondents' (personal) characteristics, namely age, gender, race, education, personal income and employment status. They also noted the importance of controlling for the party for which the respondent voted. Hence, they interacted all of these variables with a 'democratic incumbent' term, which depends upon the party of the incumbent president. They noted that "objective national economic conditions" are captured by the "election fixed effects, and an idiosyncratic 'error term'" (p.12). Because of the endogeneity issue (due to hypothesised reciprocal effects of political preferences and economic perceptions) they used changes in country income and country unemployment[99] as instruments for their 'sociotropic' evaluation. They argued that: "It makes theoretical sense, though, for voters to use local, tangible, and easily accessible economic information to make inferences about the state of the national economy (Books and Prysby 1991, p. 146, as cited in Hansford and Gomez, 2011, p.14). As argued by Hansford and Gomez (2011, p.14) this is "consistent with what psychologists refer to as the 'availability heuristic', which is the tendency for people to use readily available information to make inferences about distant phenomena". Hansford and Gomez (2011) found a positive effect of an increase in a country's income and a negative effect of an increase in unemployment on views of the state of the national economy. As with Hansford and Gomez, Evans and Andersen (2001) also noted the importance of controlling for demographic variables (age, gender, education, region, income, and

[97] In these studies the distinction between personal economic perceptions and perceptions of the state of the national economy is emphasised. The first is noted as egocentric ('pocket-book') and the second 'sociotropic' model. Since we are using the perceptions about the economic state we will focus on the estimations and discussions of the latter.
[98] Hansford and Gomez (2011) primarily focus on estimating the effect of subjective assessment of the economy on voting choices but they also conduct the reverse effects: they estimated probit model in which sociotropic evaluations is the dependent variable. Therefore, we will reflect on this study in determining control variables.
[99] The change in country's income is measured as the change in the inflation-adjusted median income in the survey respondent's country of residence since the last presidential election. The change in unemployment is measured as the change in the unemployment rate in the respondent's home county since the last presidential election.

social class of the respondents). However, they do not control for any objective economic variables. Evans and Andersen also noted that the public's perceptions about economic performance[100] were strongly influenced by aspects of respondents' political orientations and beliefs about their country's political system. They used a large number of political indicators, which were available from the surveys they used in their analysis. Although in our database there are no questions that could be used as indicators of respondents' political orientation, beliefs in a country's political system might be captured by a trust in government variable, which we include in our analysis. However, once again almost half of the observations are lost when this variable is included, since the variable was not included in the first three survey waves.

Based on the above studies and our specific interest, the specification of the model is now explored. As the dependent variables are categorical, for easier interpretation of the results they are each transformed into a binary: an "agree" category, which combines the answers "strongly agree", "agree", "somewhat agree"; and a "disagree" category, which combines the answers "somewhat disagree", "disagree", "strongly disagree". Since we are interested in the effect of a CBA on respondents' assessment of the current and future economic situation in a country, we include a dummy variable for the presence or otherwise of CBA. As noted above, the trust in government variable from the survey is also introduced and again interacted with the CBA dummy. Since perceptions and expectations about the economic situation in a country are used as the aggregate measure of economic well-being in a country, we control for the main macroeconomic variables, namely inflation rate, real GDP growth and unemployment rate. As countries in the sample are at different levels of development, which is also likely to affect respondents' perceptions/expectations about economic performance, we include GDP per capita. The same variables are used in both (perceptions and expectations) specifications, which form the SUR (equations 6.7). We expect lower inflation, lower unemployment and higher GDP growth to positively affect (perceptions/expectations about) a country's economic well-being. Since respondents' perceptions/expectations about the economic

[100] By 'objective' we mean as embodied in official statistics. Whether or not these are more objective than peoples' perceptions we leave to future discussion and investigation, which is beyond the scope of this thesis.

situation in a country are assumed to be influenced both by the current state of macroeconomic variables that they experience, and by the published data on macroeconomic performance, which they can perceive but with a lag[101], we will include macroeconomic variables in their current values and with a one-year lag. A higher level of trust in government is expected to affect positively perceptions/expectations regarding the current economic situation in a country, other things being equal. Respondents' satisfaction with their life is also likely to influence their perceptions/expectations about their country's economic performance. However, this variable is not available from the survey. In order to observe whether there is a lot of variation in life satisfaction during the period observed, data from the Eurobarometer surveys was considered. In the countries from our sample included in the Eurobarometer survey, life satisfaction was quite steady. An aggregate value of life satisfaction from Eurobarometer survey could be entered into the equation as a proportion of respondents that answered they are satisfied. However, due to data limitations (data for only one country with a CBA is available) we do not control for this effect.

Since we are interested in the effect of CBA (compared to non-CBA) conditional on different levels/values of trust in government and macroeconomic variables, we interact trust in government and all macroeconomic variables with the CBA variable. We also control for socio-demographic characteristics of respondents (as suggested by Evans and Andersen, 2001; Hansford and Gomez, 2011) since they may affect the weights attached to the different macroeconomic outcomes. Beside age, gender, level of education completed, employment status, which were used in Chapter 4 (for categories and the base category for each of these variables see Section 4.5.4), we also control for income status, since its inclusion in models with perceptions/expectations about national economic situation is emphasised as important in the above studies. We assume that respondents in a relatively high income group in their country are more likely to perceive/expect the current/future economic situation in their country more favourably than those in a lower income group, ceteris paribus. Respondents' income is grouped in four categories: low,

[101] Since the most recent data is usually not available to respondents (due to lags in data publishing) and since it "takes some time until a country's population becomes fully aware of changes in its economy's state" (Fisher and Hahn, 2008, p. 6), the actual macroeconomic variables will also be lagged.

medium, high and no answers (and the first one is used as the base category). ‘No answers’ are kept as a separate category since there are 15% of observations with no answers, so by excluding them we would lose a lot of observations. By creating a separate category for ‘no answers’ the omitted category is clearly defined. Finally, we control for country-group and time specifics.

Due to the problem of perfect multicollinearity (explained in Section 4.3) country dummies are again not included. However, here, we are controlling for country’s specifics by including the main macroeconomic variables, which is consistent with suppressing the other effects of individual countries. Moreover, we control for EU membership ($EU_i$) and we expect people in EU member countries to perceive/expect the situation in their country to be better than people in countries which are still in the process of accession to EU. We also control for the Ex-Yugoslavia membership ($ExYu_i$), assuming that people from those countries are more pessimistic due to higher political uncertainties and tensions. In our specification wave fixed effects are included to capture the characteristics specific to each wave. As noted above, the SUR is used as a preferred estimator and it consists of two equations: one for perceptions and the other for expectations about the economic situation in a country. We used the SUR again since we assume perceptions and expectations about the economic situation to be jointly determined. Moreover, these variables are assumed to have all the same observable variables, which are appraised above. Beside these, there are some unobservable variables common to both perceptions and expectations variable, such as respondents’ satisfaction with life and extent of their knowledge about the economic situation in their country. The specification is listed below in Equation 6.7a, b and c.

$$ESagree_i = \alpha_0 + \alpha_1 CBA_c + \alpha_2 Gtrust_i + \alpha_3 gdppc_c + \alpha_4 gdpg_c + \alpha_5 lgdpg_c + \alpha_6 inf_c + \alpha_7 linf_c + \alpha_8 un_c + \alpha_9 lun_c + \alpha_{10} CBA\cdot Gtrust_i + \alpha_{11} CBA\cdot gdppc_c + \alpha_{12} CBA\cdot gdpg_c + \alpha_{13} CBA\cdot lgdpg_c + \alpha_{14} CBA\cdot inf_c + \alpha_{15} CBA\cdot linf_c + \alpha_{16} CBA\cdot un_c + \alpha_{17} CBA\cdot lun_c + \alpha_{18} h\_age1_i + \alpha_{19} h\_age2_i + \alpha_{20} h\_age3_i + \alpha_{21} h\_female_i + \alpha_{22} h\_edu\_medium_i + \alpha_{23} h\_edu\_high_i + \alpha_{24} h\_retired_i + \alpha_{25} h\_student_i + \alpha_{26} h\_unemployed_i + \alpha_{27} h\_inc\_medium_i + \alpha_{28} h\_inc\_high_i + \alpha_{29} h\_inc\_no\_answer_i + EU_i + ExYu_i + \gamma_t + \varepsilon_i \tag{6.7a}$$

$$ExpESagree_i = \beta_0 + \beta_1 CBA_c + \beta_2 Gtrust_i + \beta_3 gdppc_c + \beta_4 gdpg_c + \beta_5 lgdpg_c + \beta_6 inf_c + \beta_7 linf_c + \beta_8 un_c + \beta_9 lun_c + \beta_{10} CBA\cdot Gtrust_i + \beta_{11} CBA\cdot gdppc_c + \beta_{12} CBA\cdot gdpg_c + \beta_{13} CBA\cdot lgdpg_c + \beta_{14} CBA\cdot inf_c + \beta_{15} CBA\cdot linf_c + \beta_{16} CBA\cdot un_c + \beta_{17} CBA\cdot lun_c + \beta_{18} h\_age1_i + \beta_{19} h\_age2_i + \beta_{20} h\_age3_i + \beta_{21} h\_female_i + \beta_{22} h\_edu\_medium_i + \beta_{23} h\_edu\_high_i + \beta_{24} h\_retired_i + \beta_{25} h\_student_i + \beta_{26} h\_unemployed_i + \beta_{27} h\_inc\_medium_i + \beta_{28} h\_inc\_high_i + \beta_{29} h\_inc\_no\_answer_i + EU_i + ExYu_i + \gamma_t + \varepsilon_i \quad (6.7b)$$

$$\rho = Cov(\varepsilon_{1i}, \varepsilon_{2i}) \quad (6.7c)$$

Subscript ‘i’ indicates that the value of a particular variables differs between the respondents, while subscript ‘c’ indicates that the value changes only between countries (it is the same for each respondent coming from the same country).

According to the descriptive statistics in Chapter 4 and Figures 4.4a and 4.4b around 80% (50%) in non-CBA and 90% (60%) in CBA countries do not agree with the statement that the economic situation in their country is (expected to be) good. These differences are statistically significant at all conventional levels of significance and can be regarded as considerable given that the sample is large. However, to get more information and more precise estimates we proceed with the estimation of Equations 6.7.

### 6.4.2 Estimation issues and results

Methodology and empirical issues are similar to those elaborated and applied in Chapter 4 and therefore we refer to Section 4.5 for more details on empirical issues. Since we are using quarterly data on actual macroeconomic variables in this analysis[102], which is different from the strategy applied in Chapter 4, we will elaborate on the usage of this data. GDP per capita is included only in contemporaneous values, since it does not change significantly quarter by quarter and we include this variable to control for the differences in the level of development between the countries. As noted above, other macroeconomic variables are included

[102] Quarterly data could not have been used in Chapter 5 and the first part of this chapter due to a lack of data for other macroeconomic variables included in these models in these analyses.

in both contemporaneous and lagged values. Surveys conducted in April/May are matched with macroeconomic data from the first quarter of the same year and with lagged values from the last quarter of the previous year (i.e. values of macroeconomic variables from both quarters are matched with the same answer/observation of the dependent variable); and surveys conducted in October/November are matched with macroeconomic data from the third and the second quarter of the same year. By doing this we covered the whole period between the surveys, as suggested by Walti (2012), although he used biannual average of the monthly values of explanatory variables between the biannual fieldworks. Since all macroeconomic data is for periods prior to the relevant fieldwork we avoid potential endogeneity (caused by simultaneity[103]) between the dependent variable and contemporaneous macroeconomic variables. There is no rationale for assuming that there is a simultaneity problem between CBA and the dependent variable, since current perceptions and future expectations about national economic performance are not likely to affect the likelihood of a CBA being in operation/having a CBA. As expected, there is high collinearity between the contemporaneous and lagged values of the same variable (Appendix 6.13). However, multicollinearity can be dealt with by increasing the sample size (Maddala, 2001). Therefore, we do not think this should be a problem here, since we are operating with a large sample. Additionally, as stated in Maddala (2001, p.270): "When we have more than two explanatory variables, the simple correlations among them become all the more meaningless". Hence, despite the high collinearity, we prefer keeping both contemporaneous and lagged values, since we get more information than in the case when we average the data over the period. As noted in Section 6.4.1, current values are indicating how macroeconomic performance is being experienced (and this experience reflected on perceptions) by respondents, while the lagged values are indicating how the published data on macroeconomic performance is being perceived by respondents. For a robustness check we used semi-annual macroeconomic data: the average between the two quarters preceding the survey fieldwork.

[103] The potential endogeneity problem that may arise from the reverse effect of the contemporaneous actual macroeconomic performance on contemporaneous perceptions about the economic situation in a country is overcome by including macroeconomic data prior the fieldwork, even for contemporaneous values.

GDP per capita data is collected from the World Development Indicator database. Quarterly data on GDP growth and the inflation rate was delivered on request from the EBRD. Data on the unemployment rate delivered by the EBRD or by national statistical agencies differ by the type of measure reported (some report labour force survey, LFS, based unemployment, while others report registered unemployment). However, it is important to be consistent since the two might differ substantially, as they usually use different sources of data, different reporting units, observation periods, data gathering methods and cycles and, sometimes, definitions of employment and unemployment (see Labour Force Survey, BH, e.g. 2008, p.16). Therefore, the data from the International Labour Organisation, which reports only labour force survey based data, is used. However, these data were not available for all countries at the quarterly level. Namely, in Serbia the survey is conducted twice a year (in April and October), while in BH it is conducted only once a year (April). In order to 'create' quarterly rates for these two countries, data on the registered unemployment rate is used, which is available at quarterly level. We calculated quarter-to-quarter percentage changes in the registered unemployment rate within each year and transferred these changes to LFS rates. Since the LFS is conduced usually in April we observe it as a first quarter unemployment rate and then apply the percentage change in the registered unemployment rate to calculate the second quarter (created) LFS unemployment rate. For BH the percentage change in registered unemployment from the second to third and from the third to fourth quarter is applied, while in Serbia the second LFS survey was used for the third quarter unemployment rate and the rate for the fourth quarter is again applied from the percentage change in the registered unemployment from the third to the fourth quarter. However, we have to add a note of caution given that seasonal and occasional jobs are also not likely to be registered. For Albania, the registered unemployment rate is used since the LFS has only been conducted every four years. The results of the estimations for the model specification specified in the previous section are presented in Table 6.7 (and in Appendices 6.14 and 6.15).

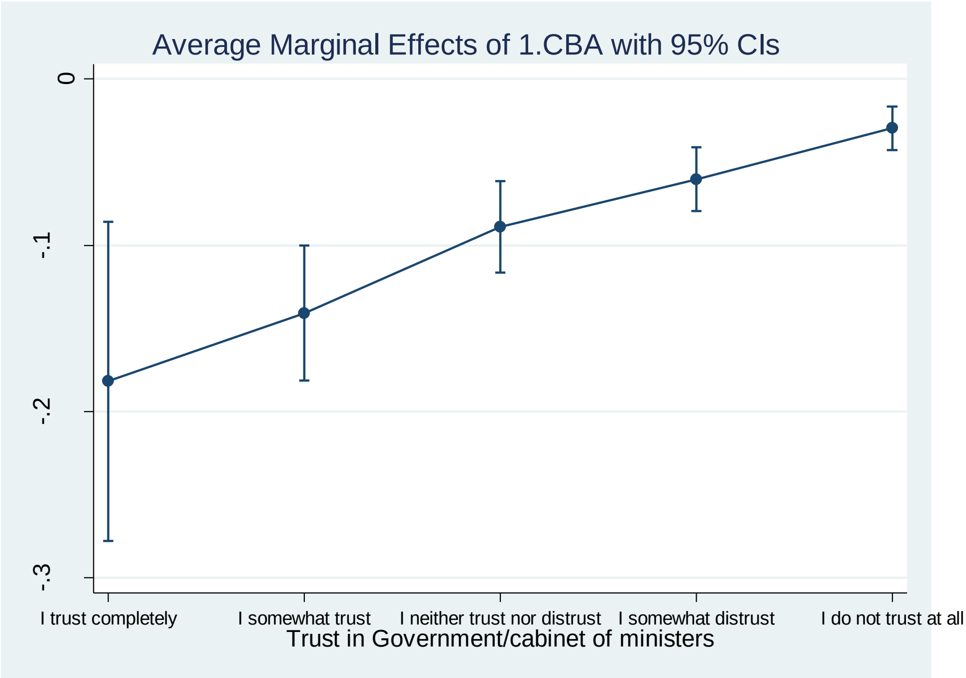
Table 6.7: SUR results - Estimation of the perceptions/expectations about the economic situation in a country (as specified in Equations 6.7, number of observations: 40,832)

| Questions used for the dependent variables: **"Currently, the economic situation of [MY COUNTRY] is very good" (ESagree) and "Over the next five years, the economic situation of [MY COUNTRY] will improve" (ExpESagree)** (1="Strongly agree", "Agree" and "Somewhat agree", 0="Strongly disagree", "Disagree" and "Somewhat disagree") | Marginal effects; clustered on country | | Marginal effects; clustered on region | |
|---|---|---|---|---|
| | unweighted | weighted | unweighted | weighted |
| **CBA**<br>1=CBA is implemented<br>*Base category: CBA not implemented* | -0.0841***<br>(0.0127) | -0.0819***<br>(0.0121) | -0.0841***<br>(0.0102) | -0.0819***<br>(0.0102) |
| **Gtrust2**<br>Trust in Government: "I somewhat trust" | -0.0530<br>(0.0346) | -0.0500<br>(0.0336) | -0.0530***<br>(0.0182) | -0.0500***<br>(0.0184) |
| **Gtrust3**<br>Trust in Government: "I neither trust nor distrust" | -0.128***<br>(0.0366) | -0.123***<br>(0.0348) | -0.128***<br>(0.0195) | -0.123***<br>(0.0193) |
| **Gtrust4**<br>Trust in Government: "I somewhat distrust" | -0.182***<br>(0.0421) | -0.176***<br>(0.0405) | -0.182***<br>(0.0209) | -0.176***<br>(0.0206) |
| **Gtrust5**<br>Trust in Government: "I do not trust at all"<br>*Base category: Trust in Government: "I trust completely"* | -0.216***<br>(0.0416) | -0.211***<br>(0.0401) | -0.216***<br>(0.0203) | -0.211***<br>(0.0200) |
| **Gdppc**<br>GDP per capita | -7.70e-06**<br>(3.02e-06) | -7.75e-06**<br>(3.03e-06) | -7.70e-06*<br>(4.12e-06) | -7.75e-06*<br>(4.33e-06) |
| **Gdpg**<br>GDP growth | 0.0119***<br>(0.00327) | 0.0115***<br>(0.00319) | 0.0119***<br>(0.00235) | 0.0115***<br>(0.00242) |
| **Lgdpg**<br>Lagged GDP growth | 0.00590<br>(0.00371) | 0.00602<br>(0.00381) | 0.00590***<br>(0.00220) | 0.00602***<br>(0.00223) |
| **Inf**<br>Inflation rate | 0.00674<br>(0.00523) | 0.00591<br>(0.00616) | 0.00674<br>(0.00561) | 0.00591<br>(0.00580) |
| **Linf**<br>Lagged inflation rate | -0.0180***<br>(0.00532) | -0.0171***<br>(0.00605) | -0.0180***<br>(0.00526) | -0.0171***<br>(0.00549) |
| **Un**<br>Rate of unemployment | -0.0107**<br>(0.00470) | -0.00932*<br>(0.00489) | -0.0107***<br>(0.00408) | -0.00932**<br>(0.00436) |
| **Lun**<br>Lagged rate of unemployment | 0.00766<br>(0.00483) | 0.00672<br>(0.00513) | 0.00766**<br>(0.00383) | 0.00672<br>(0.00418) |

Robust standard errors (clustered on country and region) in parentheses; *** p<0.01, ** p<0.05, * p<0.1
Note: The results presented in this table are only an extract from the full results reported in Appendices
Note: The marginal effects calculated after the biprobit SUR estimation are reported

Due to reasons explained in Chapter 4, both country and region are used to cluster and both weighted and unweighted results are presented. Again, SUR is the preferred estimator and the specifications are first estimated by using a ‘biprobit’ estimator, since perceptions and expectations about the economic situation in a country can be assumed to be part of a wider system and jointly determined. This correlation is also indicated by the positive ‘rho’ coefficient and by the small standard error for ‘rho’. All presented results are the average marginal effects since, as elaborated in Section 4.5.3, when the interaction terms are included it is sensible to only interpret the marginal effects. The effect of CBA on perceptions/expectations about the economic situation in a country is highly significant and negative. The average marginal effect for CBA is -0.08, meaning that on average individuals coming from a CBA country are 8 percentage points less likely to perceive/expect economic situation in their country as good than are individuals coming from a country with some other regime. This can be explained by the fact that under a CBA a central bank cannot stimulate growth or mitigate shocks and, consequently, it can negatively affect the economic performance of a country, which is here proxied by the perceptions and expectations about the economic situation. However, since the average marginal effect is creating two hypothetical populations (as explained in Chapter 4) this result is not suggesting that this effect is significant and negative in countries which actually have a CBA, but what its effect would have been if everybody had had a CBA. Therefore, we also estimated the effect separately for CBA and non-CBA countries. According to the results there is a suggestion that a CBA would have had a significant and negative effect in both CBA and non-CBA counties (Appendix 6.14c). Even though the results suggest that hypothetically having a CBA would have a somewhat larger negative effect in the non-CBA (-0.086) than in the CBA subsample (-0.065), we should not make inference regarding the non-CBA countries without further analysis, which is beyond the purpose of this thesis. However, this result further implies that even though we could not find a robust effect of CBA on actual macroeconomic performance, proxied by growth and growth volatility, a CBA does seem to have an effect on residents' assessment of the state of their economy. The results also imply that, as expected, the lower is trust in government the larger is the negative effect it has on the perceptions and expectations about the economic situation in a country. The average marginal effects suggest that those that somewhat distrust and those that do not trust government are, respectively, 17.6 and 21.1 percentage points less likely to perceive the economic situation in their country to be good than those that trust completely. The effect of GDP per capita is negative indicating that the lower the level of development in a country the more likely that the residents will perceive and expect the economic situation in their country as good. This is not as expected, but this effect is very small; namely one unit (dollar) increase in GDP per capita is associated with 0.00077 percentage points decrease in the probability of a respondent assessing the economic situation in their country as good. The results on both contemporaneous and lagged GDP growth (the latter being significant only when region is used as the cluster) indicate that a one percentage increase in growth rate is likely to increase the possibility of a respondent being satisfied and optimistic regarding the economic situation in a country, 1.15 and 0.6 percentage points, respectively. The average marginal effect suggest that a one percentage increase in the lagged inflation rate and unemployment rate is likely to decrease the probably of the economic situation being assessed as good by 1.7 and 0.9 percentage points, respectively. The negative effect of lagged inflation suggest that, after being experienced (and acknowledged) by residents,  inflation has a negative effect on respondents’ assessment of the current and future economic situation. As expected, unemployment also has a negative effect, suggesting that higher unemployment rates are likely to worsen the perceptions and expectations about the economic situation in a country. In order to observe the effect of CBA conditional on the level of trust in government the ‘marginsplot’ is presented (Figure 6.3; Appendix 6.14d). This indicates that the negative effect of the CBA on the probability of perceiving and expecting a good/better economic situation in a country (compared to bad/worse) is smaller the lower the level of trust in government. The results suggest that at high levels of trust in government (trust completely) those in countries with a CBA are 18 percentage points less likely to perceive the economic situation in a country as good than those in non-CBA countries. Results further suggest that when there is a high level of distrust in government (do not trust at all) the negative effect of a CBA is much smaller, with the probability of assessing the economic situation as good only 3 percentage points lower than for non-CBA. These differences in the effect of CBA at different levels of trust in government are statistically significant. These results suggest that in a high trust environment a CBA is observed as an economic hindrance, due to limitations imposed on the central bank to stimulate country’s economic performance. However, in a low trust environment it may be thought to be a necessity for stabilisation and therefore its negative effect on the assessments of the economic situation in a country is significantly smaller.

Figure 6.3: The average marginal effect of CBA on the probability of high current confidence and expectations about the economic situation in a country conditional on the level of trust in government




According to the results (Appendix 6.14e), the effect of CBA is not differing conditional on different levels of GDP per capita, inflation and lagged unemployment rate. Regarding the effect of CBA conditional on GDP growth there is some indication of an increasing negative effect of CBA at higher levels of GDP growth (both contemporaneous and lagged). Results further suggest that the negative effect of CBA is increasing as contemporaneous unemployment rates are increasing. The effect of both EU and Ex-Yugoslavia membership dummy are positive and significant, indicating that respondents in the countries who are/were members of these unions are more likely (7.8 and 6.5 percentage points, respectively) to positively perceive current and future economic situations in their countries than are those in the countries not belonging to these unions.

The inclusion of the trust in government variable might raise some difficulties, since it is not clear whether there is a potential problem of simultaneity or joint determination with the dependent variable and this issue is not addressed by theory. Therefore, we estimate the model without the trust in government variable as a robustness check. Other robustness checks are conducted by augmenting the preferred specifications by the variables related to financial situation and financial stability; by excluding the interaction terms and, finally, by using semi-annual instead of quarterly macroeconomic data. The results of these estimations are presented in Tables 6.8a and 6.8b, below (and in Appendix 6.16). The presented results are those where country is used as the cluster and weights applied.

Table 6.8a: SUR results (the first part) - robustness checks (the results for the first three columns continue in Table 6.8b)

| Question used for the dependent variable: **"Currently, the economic situation of [MY COUNTRY] is very good" and "Over the next five years, the economic situation of [MY COUNTRY] will improve"** ESagree, ExpESagree (1="Strongly agree", "Agree" and "Somewhat agree", 0="Strongly disagree", "Disagree" and "Somewhat disagree") | Controlling for perceptions about the financial stability in a country | Controlling for perceptions about the financial situation in a country and financial situation of a household | Semi-annual macroeconomic variables instead of quarterly used | Using large dataset (trust in government variable excluded); no. of observations: 69,540 | No interaction terms used |
|---|---|---|---|---|---|
| **CBA** | -0.0808*** | -0.0733*** | -0.0826*** | -0.0967*** | -0.0581*** |
| 1=CBA is implemented | (0.0124) | (0.00895) | (0.0113) | (0.0287) | (0.0111) |
| *Base category: CBA not implemented* | | | | | |
| **Gtrust2** | -0.0448 | -0.0370 | -0.0534 | | -0.0497*** |
| Trust in Government: "I somewhat trust" | (0.0291) | (0.0251) | (0.0344) | | (0.0184) |
| **Gtrust3** | -0.108*** | -0.0878*** | -0.127*** | | -0.124*** |
| Trust in Government: "I neither trust nor distrust" | (0.0306) | (0.0264) | (0.0360) | | (0.0190) |
| **Gtrust4** | -0.158*** | -0.130*** | -0.178*** | | -0.176*** |
| Trust in Government: "I somewhat distrust" | (0.0358) | (0.0302) | (0.0425) | | (0.0205) |
| **Gtrust5** | -0.189*** | -0.155*** | -0.215*** | | -0.210*** |
| Trust in Government: "I do not trust at all" | (0.0358) | (0.0304) | (0.0410) | | (0.0201) |
| *Base category: Trust in Government: "I trust completely"* | | | | | |
| **Gdppc** | -9.00e-06*** | -5.57e-06** | -7.97e-06** | 1.33e-06 | -4.11e-06** |
| GDP per capita | (3.07e-06) | (2.79e-06) | (3.99e-06) | (3.29e-06) | (1.70e-06) |
| **Gdpg** | 0.0118*** | 0.00819*** | | 0.0118*** | 0.0120*** |
| GDP growth | (0.00304) | (0.00224) | | (0.00208) | (0.00218) |
| **Lgdpg** | 0.00536 | 0.00508* | | 0.0120*** | 0.00647*** |
| Lagged GDP growth | (0.00376) | (0.00298) | | (0.00354) | (0.00155) |
| **Inf** | 0.00745 | 0.00433 | | 0.00932 | -0.00124 |
| Inflation rate | (0.00615) | (0.00567) | | (0.00820) | (0.00487) |
| **Linf** | -0.0176*** | -0.0117** | | -0.0185*** | -0.0108** |
| Lagged inflation rate | (0.00605) | (0.00520) | | (0.00652) | (0.00488) |
| **Un** | -0.00790* | -0.00193 | | -0.00743** | -0.00613 |
| Rate of unemployment | (0.00443) | (0.00434) | | (0.00304) | (0.00433) |
| **Lun** | 0.00496 | 0.000318 | | 0.00789** | 0.00378 |
| Lagged rate of unemployment | (0.00467) | (0.00460) | | (0.00360) | (0.00411) |

Table 6.8b: SUR results (the second part) - robustness checks (continuing results from the first three columns from Table 6.8a)

| **Questions used for the dependent variable: "Currently, the local currency is very stable and trustworthy?" and "Over the next five years, the [LOCAL CURRENCY] will be very stable and trustworthy"** Dependent variable: probability of both questions being equal to 1 (answers: "Strongly agree", "Agree" and "Somewhat agree") as opposed to 0 (answers: "Strongly disagree", "Disagree" and "Somewhat disagree") | Controlling for perceptions about the financial stability in a country | Controlling for perceptions about the financial situation in a country and financial situation of a household | Semi-annual data for macroeconomic variables used instead of quarterly used |
|---|---|---|---|
| Currently, banks and the financial system in a country are stable: | | | |
| **FS2** "Agree" | -0.0139<br>(0.00951) | -0.00941<br>(0.00823) | |
| **FS3** "Somewhat agree" | -0.0544***<br>(0.0112) | -0.0361***<br>(0.00825) | |
| **FS4** "Somewhat disagree" | -0.0887***<br>(0.0141) | -0.0602***<br>(0.0104) | |
| **FS5** "Disagree" | -0.103***<br>(0.0122) | -0.0701***<br>(0.00924) | |
| **FS6** "Strongly disagree" | -0.123***<br>(0.0129) | -0.0847***<br>(0.00871) | |
| **FSdnk** "Do not know" | -0.105***<br>(0.0131) | -0.0700***<br>(0.00920) | |
| **Base category: "Strongly Agree"** | | | |
| Currently, the financial situation of my household is good | | | |
| **FSH2** "Agree" | | -0.00866<br>(0.00974) | |
| **FSH3** "Somewhat agree" | | -0.0425***<br>(0.0130) | |
| **FSH4** "Somewhat disagree" | | -0.0909***<br>(0.0165) | |
| **FSH5** "Disagree" | | -0.112***<br>(0.0146) | |
| **FSH6** "Strongly disagree" | | -0.139***<br>(0.0155) | |
| **Base category: "Strongly Agree"** | | | |
| Over the last 12 months, the financial situation of my household has got better | | | |
| **ExpFSH2** "Agree" | | 0.00123<br>(0.00148) | |
| **ExpFSH3** "Somewhat agree" | | -0.00392***<br>(0.00145) | |
| **ExpFSH4** "Somewhat disagree" | | -0.0261***<br>(0.00213) | |
| **ExpFSH5** "Disagree" | | -0.0400***<br>(0.00364) | |
| **ExpFSH6** "Strongly disagree" | | -0.0538***<br>(0.00403) | |
| **Base category: "Strongly Agree"** | | | |
| **gdppc** GDP per capita | | | -7.97e-06**<br>(3.99e-06) |
| **sagdpg** Semi-annual GDP growth | | | 0.0171***<br>(0.00496) |
| **sainf** Semi-annual inflation rate | | | -0.0131***<br>(0.00318) |
| **saun** Semi-annual rate of unemployment | | | -0.00261<br>(0.00166) |

Robust standard errors (clustered on country and region) in parentheses; *** p<0.01, ** p<0.05, * p<0.1
Note: The results presented in this table are only an extract from the full results reported in Appendices
Note: The marginal effects calculated after the biprobit estimation are reported, in all estimations weights are controlled for and country is used as a cluster

First, the preferred specification is augmented for perceptions about the financial stability in a country (result column 1 in Tables 6.8a and 6.8b) and then subsequently for perceptions/expectations about the financial situation of a household (result column 2 in Tables 6.8a and 6.8b). These inclusions do not alter the results from the preferred specification. The estimates on the added variables imply that the worse the perceptions about the financial stability in a country and the worse the perceptions and expectations about the financial situation of a household are, the worse the perceptions and expectations about the economic situation in a country will be (the first and the second result column in Table 6.8b). However, these are not the preferred results since there is a potential endogeneity, caused by simultaneity between variables that refer to financial stability in a country and financial situation in a country, on one side and the dependent variables, on the other. Next, we estimated the model with semi-annual instead of quarterly macroeconomic data. The results are very similar to those with quarterly data and the effect of CBA is again highly significant and negative (the third result column in Tables 6.8a 6.8b). Next, the model is estimated without trust in government variable (the fourth result column in Table 6.8a), which enabled us to use larger dataset (since the trust in government variable was not included in the first three survey waves). The results again imply that the CBA has negative and significant effect on combined perceptions and expectations about the economic situation in a country. The difference in the rest of the results is that the GDP per capita variable becomes insignificant, the lagged GDP growth becomes significant and positive and the lagged unemployment rate also becomes significant and positive. The model is also estimated without the interaction terms. Here, the results from the ‘biprobit’ are also indicative and they again imply a negative and insignificant effect of the CBA on both perceptions and expectations about the economic situation in a country; for comparison the marginal effects are again presented (the last column in Table 6.8a). Finally, the single equations which form the SUR are also estimated. The implications are very similar to those when the equations are estimated as a system and again suggest a negative and significant effect of the CBA on perceptions and expectations about the economic situation in a country (Appendices 6.17 and 6.18). The results of the single equations imply that people in countries with a CBA are 9.5 and 18.8 percentage point less likely to perceive and expect the economic situation in their country to be good (to improve), respectively. Since there is around 8% of ‘do not know’ answers to the question about the future economic situation in a country and 2% to the question about the current economic situation, the same strategy as in Chapter 4 is applied. Multinomial probits without interaction terms are estimated and the results are compared with those of the probit estimations without interaction term. The results imply that the effect of the CBA in the 'agree' ('trust') category compared to 'disagree' ('distrust') category are similar to those from the probit estimation without the interaction term and the implications are the same as those from the preferred estimation. However, the effect of CBA in the 'do not know' category compared to the ‘distrust’ category is also highly significant and still negative (Appendix 6.19). These results suggest that there might be some bias but it can be argued that this is likely to be minimal given that the sample used in estimation is representative of almost 90 per cent of the sample population.

## 6.5 Conclusion

In assessing the effect of a CBA on macroeconomic performance the effect on inflation, growth and growth volatility is estimated. The results of the previous chapter suggest that the presence of a CBA is likely to lower inflation. In this chapter we have not been able to uncover a robust relationship between CBA and either growth or growth volatility using an applied modelling strategy. There is a data availability constraint since the data for macroeconomic variables for transition countries is available only for 10-20 years, while growth models require a much longer time span. Therefore, we decided to apply a different strategy in the second part of the chapter, where we used subjective perceptions and expectations about the economic situation in a country. This provided a much larger sample size, since the model is based on answers from the surveys conducted in the selected European countries. As argued in Chapter 4, this approach can be considered as superior to that of relying on official macro data-based when considering the desirability of a CBA and, in addition, the large samples yield more precise results. From a welfare perspective it is peoples’ subjective perceptions and expectations that matter, rather than abstract, and limited, measures like GDP.

The results of our analysis suggest that, other things being equal, a CBA is likely to deteriorate perceptions/expectations about the economic situation in a country. This could be explained presuming that growth is sacrificed when the stability of the local currency and prices is assured/gained (the latter is implied by the results from Chapter 4 and Chapter 5). This could be explained by the constraints on domestic stabilisation policy imposed by a CBA, since in this regime a central bank cannot stimulate growth or buffer shocks. This further implies that even though we could not find a robust effect of CBA on macroeconomic performance, proxied by growth and growth volatility, the presence of a CBA seems to have a significant effect on residents' assessment of the state of their economy. The usage of survey data enabled us also to estimate the effect of CBA conditional on different levels of trust in government, which is argued to be an important determinant of perceptions and expectations about the economic situation, especially in the transition countries. A low level of trust in government is also argued to be an important reason for introducing and maintaining a CBA (see Chapters 1 and 2). The findings suggest that this interaction is significant and that the lower the trust in government the smaller the negative effect of CBA on perceptions/expectations about the economic situation in a county. This implies that in the high trust environment a CBA is more frequently observed as a hindrance than in the low trust environment where it is also more likely to be thought of as a necessity for stabilisation. This is an important finding that should be reflected upon in the following chapter where we draw conclusions about the desirability of maintaining a CBA in BH.

# CHAPTER 7: CONCLUSIONS



## 7.1 Introduction

Since the end of the war Bosnia and Herzegovina (BH) has implemented a currency board arrangement (CBA) as its monetary framework. It was introduced as a transitional regime that was aimed at facilitating the process of recovery and early transition. However, 17 years later it is still in operation and its sustainability and desirability, especially in turbulent periods and with the low ability of BH's economy to counter shocks, should now be questioned. Studies investigating the CBA in BH are relatively scarce and the few that addressed this issue lack any empirical investigation. This research was aimed at closing this gap. The purpose of this thesis was to investigate whether the CBA in BH is sustainable and desirable in the short-to-medium run. Due to the lack of a long span of data for BH in all the empirical analyses conducted in this thesis, BH's CBA was assessed jointly with CBAs in other European transition countries. The sustainability of a CBA was assessed through an investigation into the confidence and credibility of the monetary authority under the CBAs in BH and Bulgaria. The desirability of CBA was assessed through estimation of the effect of all CBAs in European transition countries (BH, Bulgaria, Estonia and Lithuania) on macroeconomic performance, proxied by inflation, growth and growth volatility. Since the effect of this monetary/exchange rate regime on growth is ambiguous, both on theoretical and empirical grounds, and since growth models require long data span, which is not available for the transition countries, the desirability of a CBA was also estimated by assessing its effect on citizens' subjective perceptions and expectations regarding the economic situation in their country. Even though the empirical analyses were not focused solely on BH, the conclusions presented in this chapter are specifically related to BH and the specific circumstances of its economy.

This chapter is organised as follows. The main findings and contributions of the analyses conducted in the thesis are elaborated in Section 7.2. In Section 7.3 conclusions regarding the medium-run desirability and sustainability of the CBA in BH are drawn from these empirical analyses, taking the specific circumstances and future goals of BH into account. In Section 7.4 the limitations of the research programme are specified and suggestions for further research developed.

### 7.2 Main findings and contributions to knowledge

Most of the studies that estimated the effects of CBA on macroeconomic performance treated a CBA as an exchange rate regime. In this research it was treated as a monetary framework, which integrates both monetary and exchange rate rules. Therefore, in all the empirical analyses conducted in this thesis a CBA was compared to all other monetary frameworks, not only to other exchange rate regimes, implemented in other countries in the samples. Even though it would be useful to specify and control for all combinations of monetary-exchange rate regimes that are in use in these other countries, it would further complicate the analyses and it is beyond the scope and interest of this thesis. However, controlling only for other exchange rate regimes and treating a CBA just as a type of fixed exchange rate regime, as conducted in previous cross-country studies that investigated the effect of CBA on macroeconomic performance, is likely to neglect some important features of the regime. By treating a CBA as a monetary framework, we allow for other important characteristics of this regime, beside the fixed exchange rate. Those other characteristics include the monetary rule/target of the monetary authority and the restrictions imposed on the monetary authority regarding the usage of monetary policy instruments. Under a CBA, central banks have to keep 100 percentage coverage of the monetary base and they cannot use most monetary policy instruments. Moreover, all of these rules are embedded in law in CBA countries, which should make a regime ‘tougher’ than other regimes that also seek to maintain the local currency fixed to some other stable currency. However, modern CBAs which are used in the European transition countries deviate to different extents from these orthodox rules. The CBA implemented in BH is usually identified as the strictest type[104], allowing only the usage of reserve requirements instrument.

The trends in macroeconomic and financial variables in BH, analysed in Chapter 1, suggest that there are misalignments in policies and inflexibilities in fiscal policy, as well as in prices and wages in economy that may potentially undermine the CBA's sustainability and desirability. However, in order to draw any implications regarding that regime's sustainability and desirability a detailed empirical analysis has to be conducted. As appraised in Chapter 3, sustainability has been defined and addressed differently in different studies, but the main issue related to it is the existence and maintenance of the monetary authority's credibility. Therefore, in order for the monetary framework to be sustainable, the residents should believe that the monetary authority's main objective would be maintained in the medium-to-long run. Since the main objective of a CBA is the maintenance of the fixed exchange rate, in Chapter 4, credibility was investigated through estimation of the effect of a CBA on perceptions and expectations of respondents about the local currency's stability. This is a novel approach to estimating a CBA's credibility. Another novelty was in using subjective attitudes about the economic situation in a country as a control in this model. Previous studies that investigated the credibility of a monetary authority controlled for a country's economic situation by including actual macroeconomic data (as reported by the official statistics), although they used subjective attitudes (about the trust in the central bank) as the dependent variable. However, we argue that respondents react and respond according to their perceptions, rather than the formal data with which they may not be familiar. Moreover, using only survey data allows for a higher order of magnitude (more observations), since with macroeconomic variables the same value has to be attached to each respondent coming from the same country in the same survey wave. Previous studies used the Eurobarometer survey and the question about trust in the European Central bank as an indicator of its credibility. In this thesis, surveys from the Austrian National Bank and questions about the local currency's current and future stability were used. These data were

[104] The Camilleri pre-commitment index, which controls for deviations of modern CBAs from the theoretical benchmark, for BH is 0.93 and the Cukierman index for central bank independence for BH is 0.98 (for more details see Chapter 2).

made available exclusively for this research and, to our knowledge, have not been previously used for this kind of research.

Considering the main characteristics of CBA, which were elaborated in Chapter 2, we may expect that the credibility of the monetary authority that implements a CBA will be increased. However, a higher credibility in countries with a CBA, compared to countries with other monetary frameworks, is not automatic, since credibility could be undermined by political and other circumstances in the economy. Therefore, it is important to control for these circumstances in the empirical analysis. In our analysis inclusion of answers to the questions about the economic situation and trust in government provides that control. Findings from our empirical analysis imply that a CBA has a positive and significant effect on respondents' subjective attitudes towards their currency's stability, which suggests that having a CBA increases the credibility of the central bank. A further contribution of this analysis is that it investigates the circumstances under which a CBA is most effective. This was conducted by introduction of interaction terms between CBA and respondents' trust in government and CBA and their perceptions/expectations about the economic situation in their country. The results imply that the effect of CBA on favourable perceptions/expectations about the local currency's stability is higher the lower the level of trust in government and the lower the perceptions about the current economic stability in a country. From this analysis, we can also conclude that the CBA is likely to be an important mechanism for positively affecting residents' perceptions/expectations about their local currency's stability and trustworthiness, even in the period of crises, since the period investigated was the period of the Global financial crisis (GFC) and the euro crisis (2009-2011 was the observed period for the main results and 2007-2011 for robustness check). These results contradict the suggestions of some authors that credibility in countries with rigid monetary-exchange rate regimes is likely to be undermined in periods of economic stress (Drazen and Masson, 1994; Feuerstein and Grimm, 2006; Castren et al., 2010). This is an important finding for BH, since its low quality institutions and political uncertainties would have likely resulted in a low trust in the local currency if it were not subject to the strict rules imposed by its CBA.

As a result of this increased credibility, as well as the fixed exchange rate with respect to a stable anchor currency, we may also expect a CBA to lower inflationary expectations and consequently the inflation rates. However, this effect is ambiguous, especially in transition countries in which higher productivity growth in the tradable sector (due to the low base level of productivity) might result in higher inflation (the Balassa-Samuelson effect). Therefore, the effect of CBA on inflation performance was investigated in Chapter 5 using a sample of transition countries. In order to estimate the effect of a CBA on inflation performance a static estimator was first applied. Since the countries in the sample that had a CBA did so through the whole period observed (1998-2009), we applied a relatively new estimator, called the fixed effect vector decomposition (FEVD), introduced by Plumper and Troeger (2007), which allows estimation of time-invariant variables. The results imply that the CBA countries have had, on average, better inflation performance than transition countries with other monetary frameworks. To our knowledge, this relatively novel approach has not been previously applied for this kind of research. However, since the debate about the consistency of the FEVD estimator is still on-going and since the static model did not include the influence of past inflation rates on the current rates, a dynamic estimator was next applied. The results from the dynamic estimation also imply that CBA reduces inflation more than the monetary frameworks implemented in other transition countries. In order to test whether this effect of a CBA was induced by the fixed exchange rate, high level of the central bank independence, which are assumed under this framework, or some other feature of the regime, the former two were controlled for in the model. As expected, the effect of the CBA variable is somewhat smaller after the inclusion of these controls, but is still significant. This implies that a CBA has a positive effect on inflation performance over and above fixed exchange rate and high level of central bank independence. This is presumably the result of the increased credibility of the monetary authority, which is also suggested by the estimations based on the survey data (which were estimated in Chapter 4). The additional contribution of this research is that the 'strong' CBAs, those with the stricter rules, which deviate less from the orthodox CBA (the ones in Bosnia and Herzegovina and Estonia), are highly significant in all specifications, while the less strict ones (those in Bulgaria and Lithuania) do not have a significant effect on inflation performance. Since BH is the country with the strictest CBA, these results imply that it had benefited from its implementation with respect to inflation.

Beside its effect on inflation performance, the effect on growth and growth volatility were also estimated (in the first part of Chapter 6). The results of these estimations were not robust[105]. However, growth models require a long span of data, which is not available for transition countries. Moreover, the expected effect of the monetary regime on growth is ambiguous on both theoretical and empirical grounds (even with a longer span of the data). Therefore, in the second part of Chapter 6, we applied a novel approach for estimating the effect on economic performance by using surveys from the Austrian National Bank. Answers to the questions about the economic situation in a country were used as an indicator of the economic situation in a country. Behavioural economics studies emphasise the importance of subjective attitudes in affecting consumer and producer behaviour and hence the overall economic situation in a country. The results of our own study imply that a CBA is likely to decrease the probability of perceiving the current and future economic situation in a country as good. One explanation for these findings may be the strictness of the monetary authority under a CBA, since the economic situation cannot be improved through discretionary monetary policy. This further implies that a CBA, while increasing monetary credibility and potentially macroeconomic stability, cannot improve the economic situation in a country, and may consequently lower its potential growth. The important additional finding is that this negative effect becomes smaller the lower the trust in government. This again implies that a CBA is more effective in a low trust environment, where it can be argued to be observed as a necessity for stabilisation, than in a high trust one, where is it more likely to be viewed as a net impediment to economic policymaking.

The main contribution to knowledge of the research presented in this thesis is the detailed empirical investigation of the credibility of CBA, which has not been undertaken previously. In conducting this investigation, a novel approach and a novel database were used. Namely, the answers to questions regarding currency stability

[105] There is some evidence of the negative effect of CBA on growth volatility (meaning that it tends to decrease growth volatility), when estimated by three-stage FEVD procedure. However, the effect is insignificant when estimated with the ‘xtfevd’ command, which accounts for the additional variance in standard errors.

were used as a measure of the monetary authority's credibility and respondents' subjective assessments of the economic situation and government were used as controls. For this data, surveys from the Austrian National Bank, which were made available exclusively for this research, were used. Another novelty is in the treatment of a CBA as an exchange rate-monetary framework, not just an exchange rate regime, which was the practice in previous studies and in the IMF classification. The next contribution is derived from this specific approach, since in the estimation of the effect of a CBA on macroeconomic performance the CBA was compared to other exchange rate-monetary frameworks (not just other exchange rate (ER) regimes as in other studies). Moreover, when estimating its effect on macroeconomic variables, some additional features of the regime are controlled for, namely fixed exchange rate and high level of central bank independence, in order to observe whether the CBA is effective over and above these features. Another contribution is in the usage of respondents' perceptions and expectations about the economic situation in a country as an indicator of a country's macroeconomic performance. This enabled us to estimate the effect of CBA on country's economic well-being, since the results on economic performance, proxied by GDP growth and volatility were, due to short data span, inconclusive. Finally, a further important novelty is in connecting the effect of CBA with the level of trust in government. The inclusion of this interaction term was significant and enabled us to estimate whether the CBA is more effective in a low trust or high trust environment.

Taken together the results from this research programme imply that a CBA is likely to have positive effect on increasing monetary authority's credibility and improving the inflation performance in a country. However, as expected, the CBA's effect on the perceptions about the current and future local economic situation in a country is negative. These results might be explained by a trade-off between increased stability and growth, with the latter capable of being boosted by greater discretion. However, in order to draw firm conclusions about the sustainability and desirability of maintaining that regime the specific circumstances in the country of interest, as well as its future goals, should be considered. This will be undertaken in the next section.

## 7.3 Policy implications

In this section, the current and future sustainability and desirability of the CBA in BH is assessed in the light of the empirical findings presented in this thesis and the prevailing circumstances in the country. As noted in Chapter 3, the concepts of sustainability and desirability of a policy regime are very complex and interrelated, and in the empirical analyses presented above only some of their features were estimated. Those that were not directly investigated in these analyses were appraised and discussed in Chapters 1, 2 and 3 and will be incorporated into the following analysis before drawing final conclusions regarding the maintenance/abandonment of the CBA in BH.

As implied by the estimations in Chapters 4 and 5 a CBA is likely to be an efficient regime for increasing monetary credibility and price stability, features which should increase macroeconomic stability and consequently positively affect growth. However, its overall effect on growth is ambiguous since monetary policy is restricted under a CBA and the monetary authority cannot use monetary policy instruments to mitigate shocks or stimulate economic growth. Since currently there is not a long enough series of data to estimate its effect on growth the findings of the analysis of the effect of CBA on growth and growth volatility conducted in Chapter 6 were inconclusive. For this reason we focused on estimating the effect of CBA on preferences and expectations about the economic situation in a country and these imply that the effect of the CBA is negative (Chapter 6). However, the results also suggest the lower the trust in government then the larger the positive effect of a CBA on perceptions and expectations about the local currency and the smaller the negative effect of CBA on perceptions and expectations about the economic situation. These results have very important implications given the recent and current political situation in BH. Namely, as noted in Chapter 1, the political situation in BH can be characterised as fragmented and deadlocked, with a very low quality of state and entities' institutions and regulations. These results suggest that under the current circumstances in the country the maintenance of CBA is justified. Therefore, suggestions about the future monetary regime in BH should focus on any benefits from introducing more flexibility into the CBA rather than the abandonment of it. As explained in Chapter 2, these flexibilities are already present in CBAs in other

European countries (Bulgaria, Lithuania and Estonia, before entering EMU) which implement(ed) this regime and which could be advantageous in periods of crisis. As appraised in Chapter 1, during the GFC the BH's central bank could not mitigate the shocks or stop withdrawals of money from BH subsidiaries, both those by residents and the foreign parent banks. At the beginning of the crisis, when leverage requirements in European banks were increased, mother banks started withdrawing money from their BH subsidiaries and if the Vienna initiative, initiated by the IMF, was not signed and implemented this would have had severe consequences for both the financial and real sectors. This is one of the reasons for advocating a more flexible CBA in BH. These flexibilities should go in the direction of developing buffer mechanisms for the periods of crisis. These buffers could be provided from the share of reserves in the central bank that exceeds 100 percent backing of the monetary base, and could be used as a support for financial institutions during the periods of crises (i.e. introduce a limited lender of last resort function). This would provide more security to banks and could also potentially stimulate them to lend more domestically (as discovered in Chapter 1, currently banks in BH are excessively liquid). However, prior to allowing more discretion to the monetary authority, more stability in other sectors in the economy, namely more efficient government institutions and more developed financial market, are required Moreover, the Eurozone has been facing problems recently and its future stability has been questioned. Therefore, future pegging solely to this currency might be problematic and unjustifiable. However, we do not presently suggest abolition of the CBA in BH, since its operation contributes to the increased credibility of the monetary authority and consequently assists overall macroeconomic stability. Another important fact is that the governing board of the Central Bank BH is chosen by the Presidency of BH and these choices are mostly driven by political interests rather than the expertise of those chosen. These members then choose governor and vice-governors based on the same principle. Even though the members cannot be involved in government, some of them had previously been involved in party politics and most of them have informal connections with those in the government/political parties that chose them. Therefore, the question is how professional these members would be in leading monetary policy if there was no CBA. It is likely that they would try to promote political interests rather than the interest of the country. Again, it is likely that the monetary policy would be inefficient as BH's fiscal policy and consequently macroeconomic stability is likely to be highly endangered. An additional argument for maintaining the CBA is that it is a good instrument for limiting moral hazard and adverse selection problems.

As noted in Galic (2012, p.66), a country is not ready for the abandonment of the CBA until fiscal policy is credible enough to "amortize certain impacts on the credibility of the system at the moment of abandonment of the currency board". Since the confidence in BH's economic policy makers is low, the abandonment of the CBA is likely to lead towards the destabilisation of the monetary sector. It might be assumed that in BH political pressures for monetisation of fiscal deficit, if the CBA is abandoned, would be strong and could therefore result in inflation and a decrease of confidence in the local currency. Furthermore, as noted in Galic (2012), changes in legislation in BH may be difficult, since these would require consensus of both entities and the international community, which has proved in the past to be problematic and require a lengthy process of discussion. Given the fragmented political constitution and high level of corruption (which were appraised in Chapters 1 and 3), even if this consensus was achieved, "it would be extremely difficult for the [BH's] central bank to pursue discretionary monetary policy without influencing stability" (Galic, 2012, p. 67). Since BH is heading towards EU accession, one suggestion, based on the Estonian example, could be to maintain the CBA until the EMU accession. There is a number of studies that advise this strategy (Keller, 2000; Sepp and Randveer, 2002c; Galic, 2012). Kaasik (2014) argued that a "CBA offers the closest monetary environment to the euro area, preparing the economy for the euro adoption". Katsimi (2008) emphasised some reasons for maintaining the CBA until EMU accession: maintenance of credibility, no cost of introducing new institutions and policy instrument when switching to another regime, no inflationary pressures from moving to a more discretionary environment, no threats of speculative attacks (due to weak fundamentals or contagion effect), lower risk of contagion in the presence of financial instability. Keller (2000) (as cited in Sepp and Randveed, 2002c, p.35) emphasised that the abandonment of the CBA could lead to significant fluctuations that could destabilise the markets "as market participants speculate about the rate for euro-zone entry". In addition, he noted that, "abandoning a well-functioning and credible currency board could lead to reduced policy transparency and discipline, lower investment as a result of greater uncertainty, and the potential for households to shy away from local currency savings. Very importantly, there may be no obvious candidate for an alternative monetary policy framework since, following an extended period with a CBA, it might be difficult to identify a stable quantitative framework linking policy instruments to inflation, while the range of available central bank instruments might also be inadequate". Due to political uncertainties, high level of corruption and low level of rule of law in the country (these were analysed and compared with some other transition countries in Appendix 1.1), a higher level of discretion (after the abandonment of CBA) could easily be misused and lead towards a decrease of trust in the currency.

In the recent crisis a lot of central banks in the world implemented expansionary monetary policy primarily to stop the collapse of the financial sector and later to try to stimulate growth. However, in order for expansionary monetary policy actions to have a positive effect on economic activity a base for intervention is needed, and this is usually what small undeveloped economies lack. This base assumes a developed financial market which can process newly created money and insure that money stays in the country and is made available in the market, especially for investment. Namely, if banks are not willing to lend domestically they will just increase their excess liquidity, or alternatively they may decide to invest funds outside the country. Reviewing the pattern of government/public spending is also important, especially if expansionary monetary policy is being implemented through financing fiscal deficits. As shown in Chapter 1, currently, a large share of total government expenditures in BH is on public administration wages and social expenditures. In this case, an increase in these types of public expenditures, which can be characterised as generally less productive, compared to capital spending, generated by the expansionary monetary policy, is likely to lead towards higher inflation and lower stability. Some of BH's politicians suggest that the high foreign reserves, which have to be held under a CBA, have high opportunity costs and that these should be used for fiscal purposes. However, the very low share of more productive public expenditures in total public spending indicates that it is likely that the reserve money would also mainly be used to fund 'unproductive' expenditures. This behaviour is suggested by the usage of the recent loans from the IMF, which were mostly used for higher wages in public sector and pensions. Therefore, the result of such moves would likely lead towards increased destabilisation without any positive effect on growth. Keller (2000) (as cited in Sepp and Randver, 2002c, p.9) has argued that "an effective anti-cyclical monetary policy is difficult enough to pursue in developed, large and therefore relatively closed economies. In transition countries, with rapid structural transformations, the knowledge of our profession regarding the exact transmission channels and relevant time lags is clearly less deep. Therefore, the balance of risk appears to favour small transition economies with fixed exchange rates to maintain their exchange rate policy".

An inability to use devaluations of the local currency to stimulate demand for domestic exports is also sometimes emphasised as a disadvantage of a CBA. Here again, the consequences of such moves, under the local circumstances, have to be considered. Namely, import and export flexibilities have to be investigated. Export flexibility is quite low in BH due to the limited capacities of domestic producers. Furthermore, there are no institutions for certification of the quality of domestic products, which is an additional limitation on the potential to increase exports. On the other hand, as explained in Chapter 1, the country is highly dependent on imports, since it imports a lot of raw materials and intermediate goods, and devaluation would increase the prices of these goods and consequently those of the final domestic products. As Davies and Green (2010) argue: "There is evidence that changes in import prices as a consequence of a fall in the exchange rate are passed through to domestic prices more rapidly in EMCs [emerging market economies], making inflation more sensitive to parity changes" (p. 225). Therefore, any potential increase in aggregate demand caused by devaluation would, to a great extent, leave the country through higher imports and further devaluations would be needed. Consequently, the stability of the local currency would be undermined once the monetary authority deviates from the fixed exchange rate, while the positive effects on economic growth are likely to be very limited or even absent. Devaluation of the local currency is further likely to decrease the efforts of domestic producers to become more productive and competitive since it protects them. It would be better to protect against any 'unfair' foreign competition through laws and controls rather than decreasing overall competitive pressures. Moreover, as shown in Chapter 1, debt nominated in the foreign currency (the euro), against which BH would devalue its local currency, is relatively high[106], so devaluation would increase the burden of debt. In all the above processes, the propensities to consume and import as well as price elasticises of domestic and foreign demands for imports/exports have to be assessed. However, those calculations are beyond the scope of the thesis, but it has to be emphasised that all of these have to be investigated in detail and taken into account when discussing the potential effects of changes in the currency and the regime itself.

However, the maintenance and sustainability of CBA depends on the soundness and flexibilities of other sectors (which were investigated in Chapter 1 for BH). As noted by Kaasik (2014) “CBA cannot be successful without supportive economic policies”. Namely, fiscal discipline and effectiveness are an important prerequisite for the sustainability of the CBA since ineffective and irresponsible fiscal policy, which is unable to stabilise and support the economy, might build pressure for abandoning the CBA (Sepp and Randveer, 2002c). Furthermore, wages, prices and consequently real effective exchange rate, should be flexible to adjust to internal and external shocks, since this adjustment cannot go through nominal exchange rate. In Chapter 1 it was argued that wages are not flexible in BH, since their increase has been higher than the increase of GDP growth and employment. Productivity, inflation and interest rates convergence with the euro area are also important for synchronisation of business cycles with the EMU. Inflation rates have had similar trends in BH and the Eurozone, as well as the interest rates, although the level of interest rates differ due to differences in the country risks and the level of development of financial markets (Chapter 1). Moreover, the financial sector should be resilient, well-capitalised and liquid. Banks in BH are considered to be very liquid. However, the potential threat here is the high presence and dependence on foreign banks, which can withdraw money from the country (e.g. at the beginning of the GFC) and which have an oligopoly in determining the interest rates in the country (which cannot be affected by the central bank), since a very high percentage of total banking sector assets are

[106] According to the currency structure of public debt on 31/12/2013, the Euro and SDRs make up 85% of the total public debt of BH (separate data for the two is not available, but the effective payments are in Euros) (Ministry of Finance and Treasury, Information about the public debt of Bosnia and Herzegovina on 31st of December 2013, Sarajevo, May 2014, p.10; http://www.mft.gov.ba/bos/images/stories/dug/informacija_2013_bs.pdf)

held by a few banks[107]. Moreover, as appraised in Chapter 1, a lot of money is leaving the country largely due to a maturity mismatch problem which cannot be overcome in the domestic market due to undeveloped money and capital markets and strict banking rules. In order to overcome restrictions on long-term loans the development of the capital market should be encouraged. Moreover, the existing legislation in the area of commercial banking and the rigidity of some legal regulations (such as maturity harmonisation), which has resulted in a high level of excess liquidity in the commercial banking sector, on one hand, and very low liquidity of the business sector, on the other hand, should be loosened. Additionally, the market is divided between two entities; there are two banking agencies and two stock markets; and integration of the market at the state level is needed. As noted in Chapter 3, it is difficult to integrate all of the features which can affect a CBA's sustainability and desirability into one model, but these should at least be identified and separately assessed. The effects of CBA on credibility and economic performance, which were investigated empirically in this thesis, are just some of the features that have to be assessed in making conclusions about the sustainability and desirability of CBA. Since some other features affect the sustainability of a CBA through affecting the economic performance of a country, we control for the state of economy in the empirical analyses. However, some features, which have to be considered before making conclusions about the CBA's sustainability and desirability, cannot be quantified, for some there is no data available or not a long enough span of data and others are difficult to integrate into model. In the following section we assess the limitations of the research presented in this thesis and identify how some of these could be addressed in future research.

## 7.4 Limitations and suggestions for further research

The main limitation of this research is the short data span and unavailability of relevant data for the country of interest. Since the war in BH stopped 19 years ago data for most of the variables is available only for 10-15 years, or less. Moreover, the CBA was introduced after the war and there is no data available before the war, and

[107] As of the end of 2012, foreign-owned banks accounted for 91.9 per cent of total assets and the five largest foreign-owned banks control more than half of total assets of the BHs banking sector (CBBH, 2012a)

therefore this prevents us from conducting a ‘before and after’ analysis which may have given us some additional insights into the stabilising effect of the regime. Therefore, only cross country identification is possible. Moreover, the availability and accuracy of data in transition countries are limited due to the “weaknesses of national statistical agencies and the failure to account for the large informal economy” (Sanfey and Teksoz, 2005). In the analysis presented in this thesis, where possible, this limitation is partially overcome by usage of the survey data; considering that the sample is representative. Another limitation is unavailability of more details about the surveys conducted. Namely, the variables necessary for controlling for a survey design were not provided by the data provider. Moreover, not all potentially relevant questions were contained in the surveys. Another limitation is the small number of countries with a CBA (currently it is used in only three countries in Europe). The surveys were conducted only in two countries with a CBA. This prevents us from including both a CBA dummy and country dummies due to perfect collinearity.

Studies which investigated the credibility of monetary/ER regimes usually used the interest rate differentials relative to the anchor (or some credible) monetary policy as a proxy for the credibility of monetary/ER regimes (Weber et al., 1991; Drazen and Masson, 1994; Ledesma et al., 2005, Arestis and Mouratidis, 2005; Ho and Ho, 2009). However, this cannot be conducted for the country of interest since there is no money market in BH. One alternative might be to use the difference between interest rates on loans in domestic and those indexed to a foreign currency. However, the difference between these two is small in BH (significantly smaller than in other countries, e.g. Estonia, Croatia, Latvia) and does not vary much over time (as presented in Chapter 3). Moreover, only a very small portion of total loans in BH are recorded as being ‘indexed to the euro’. Finally, data on interest rates is recorded separately for domestic currency loans and those indexed to the euro only from 2007 and for time-series analysis a longer period is required.

To further analyse the desirability of the CBA it would also be useful to simulate the effect of the alternative regimes on BH’s economic performance. At the moment, this cannot be conducted since an appropriate and fully specified macroeconomic model of the country still does not exist. The available model for BH created by

Weyerstrass (2009) does not provide all the relevant and necessary equations and the quality of the model itself is questionable[108]. Therefore, it is not possible to empirically address the issue of alternative regimes, which would give us more information regarding the desirability of the current regime. This also prevents us from including the availability of other tools for stimulating economic activity and accommodating economic shocks in the empirical analysis, which is important when assessing the desirability and sustainability of the particular monetary regime, in this case a CBA. Further research, after the appropriate macroeconomic model of a country is available, can go in the direction of conducting more complex analyses and examining the relative attractions of alternative exit strategies.

In all the empirical analyses in the thesis, the effect of CBA is captured by a dummy variable, which is 1 for countries that have had a CBA and 0 otherwise. Therefore, we are comparing the effect of CBA with (the average effect of) all other regimes implemented in other countries in the sample. However, it would be useful to observe the effect of CBA compared to the specific regimes used in other countries, separately, not to all other regimes, but, as noted in Chapter 4, since the interaction terms between CBA and trust in government and CBA and perceptions/expectations about the economic situation were used, for the simplicity, CBA is compared to all other regimes (compared to not having the CBA). Since the effect is captured with the dummy variable we had to make an assumption that the CBA variable is capturing the effect of CBA, not some other common specific for countries which implement a CBA. In order to be more assured we investigated other macroeconomic and political circumstances in those countries and we could not find any other characteristics which could distinguish these (CBA) countries from countries that form the comparison group (Chapter 3). Moreover, CBA countries differ between themselves in their level of development, progress in transition and the relationship to the EU.

[108] Some equations which are likely to be important for this kind of simulations are not included in the Weyerstrass's model, such as money supply, bank credit, producer price inflation, the tradable and non-tradable inflation (those are used in the Sepp and Randveer (2002c) paper in which alternative regimes are assessed for Estonia). Moreover, the Weyerstrass's model was offered to the Central Bank of Bosnia and Herzegovina and was not accepted due to the failure of the author to provide some explanations and diagnostic reports.

Further analysis can try to overcome this limitation by using more complicated (system of) models (with more controls) and estimators and should also try to integrate as many features that can affect sustainability and desirability of a CBA into the model (or set of models which should be observed as a system). On the policy side, these features do not necessarily have to be integrated, but it is necessary to assess all identified pillars and the potential effects of any changes in the monetary regime, taking the specific circumstances of the country into account, before finally deciding to conduct any change to the currently stable and credible monetary regime. According to our analyses, due to political situation in the country and due to estimated high current credibility of the regime, we do not suggest the abandonment of the CBA in BH in the medium term. The introduction of some small additional flexibilities might be desirable, but under very strict and clearly specified circumstances.

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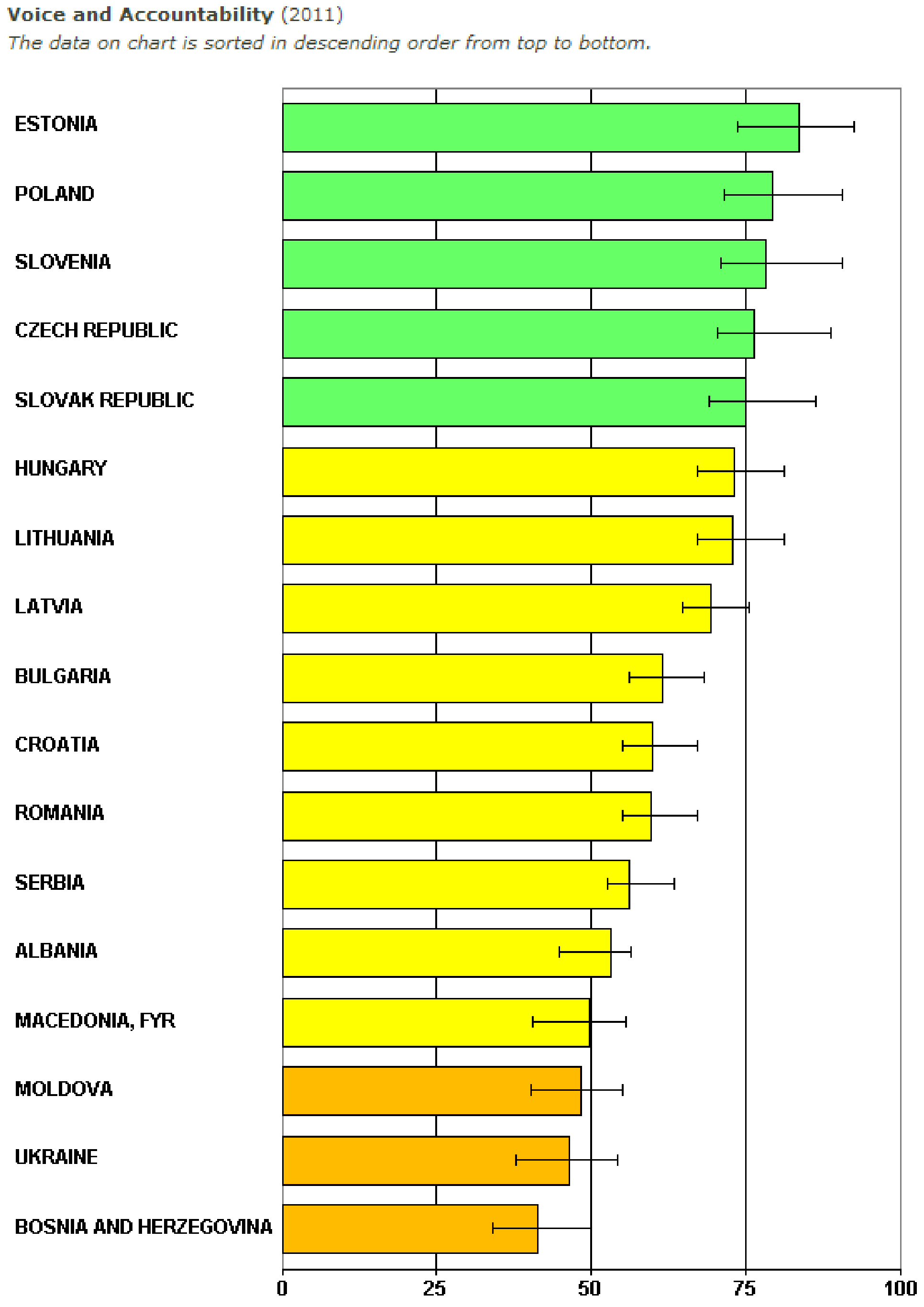
# APPENDICES

## Appendices Chapter 1

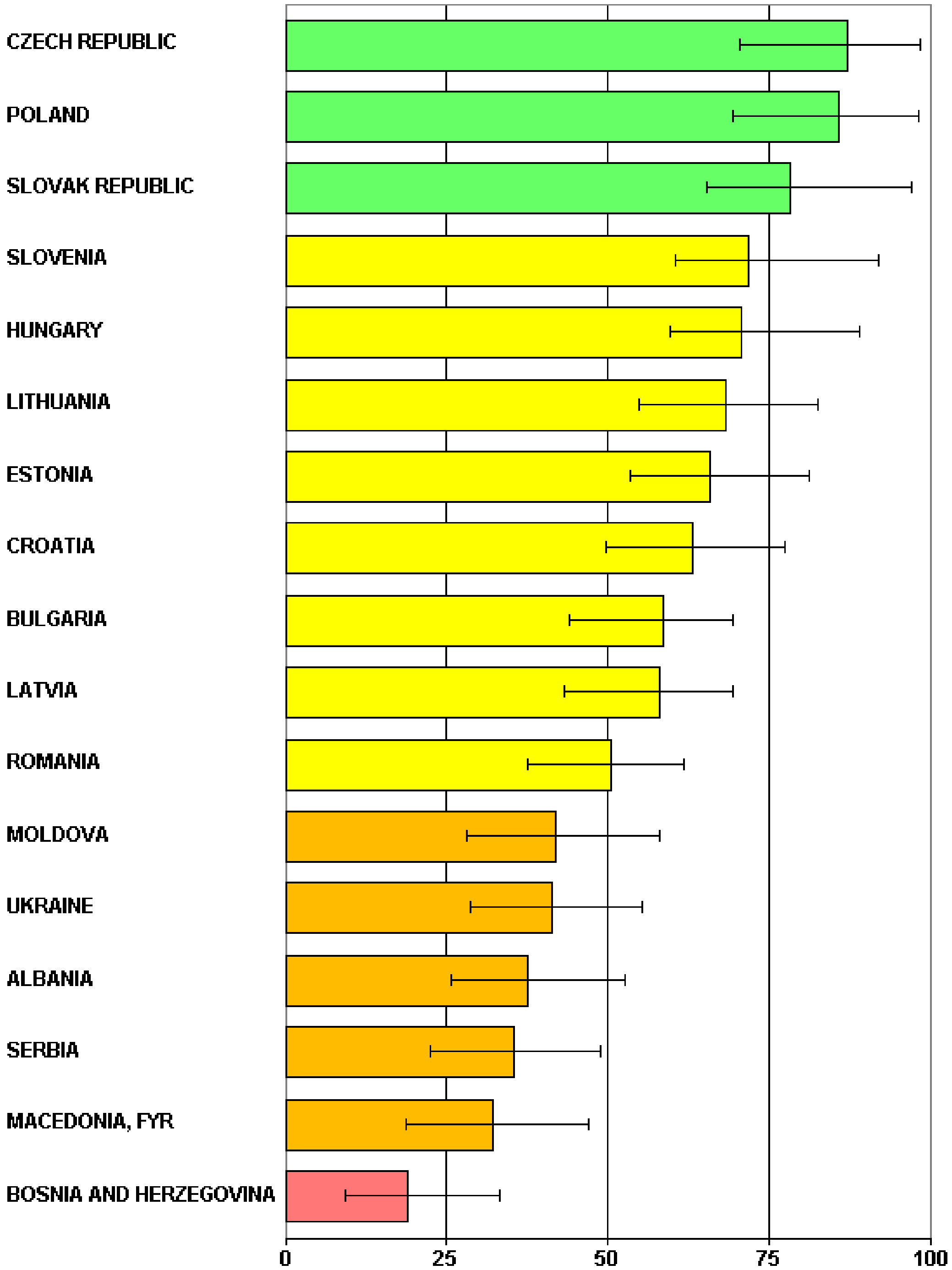
### Appendix 1.1: World Governance Indicators, 2011
(selected confidence interval: 90%)

Countries percentile rank (0-100): Dark green – $90^{th}$ – $100^{th}$ percentile; light green – $75^{th}$ – $90^{th}$ percentile; light yellow – $50^{th}$ – $75^{th}$ percentile; dark yellow – $25^{th}$ to $50^{th}$ percentile; light red $10^{th}$ – $25^{th}$ percentile; dark red – $0^{th}$ to $10^{th}$ percentile



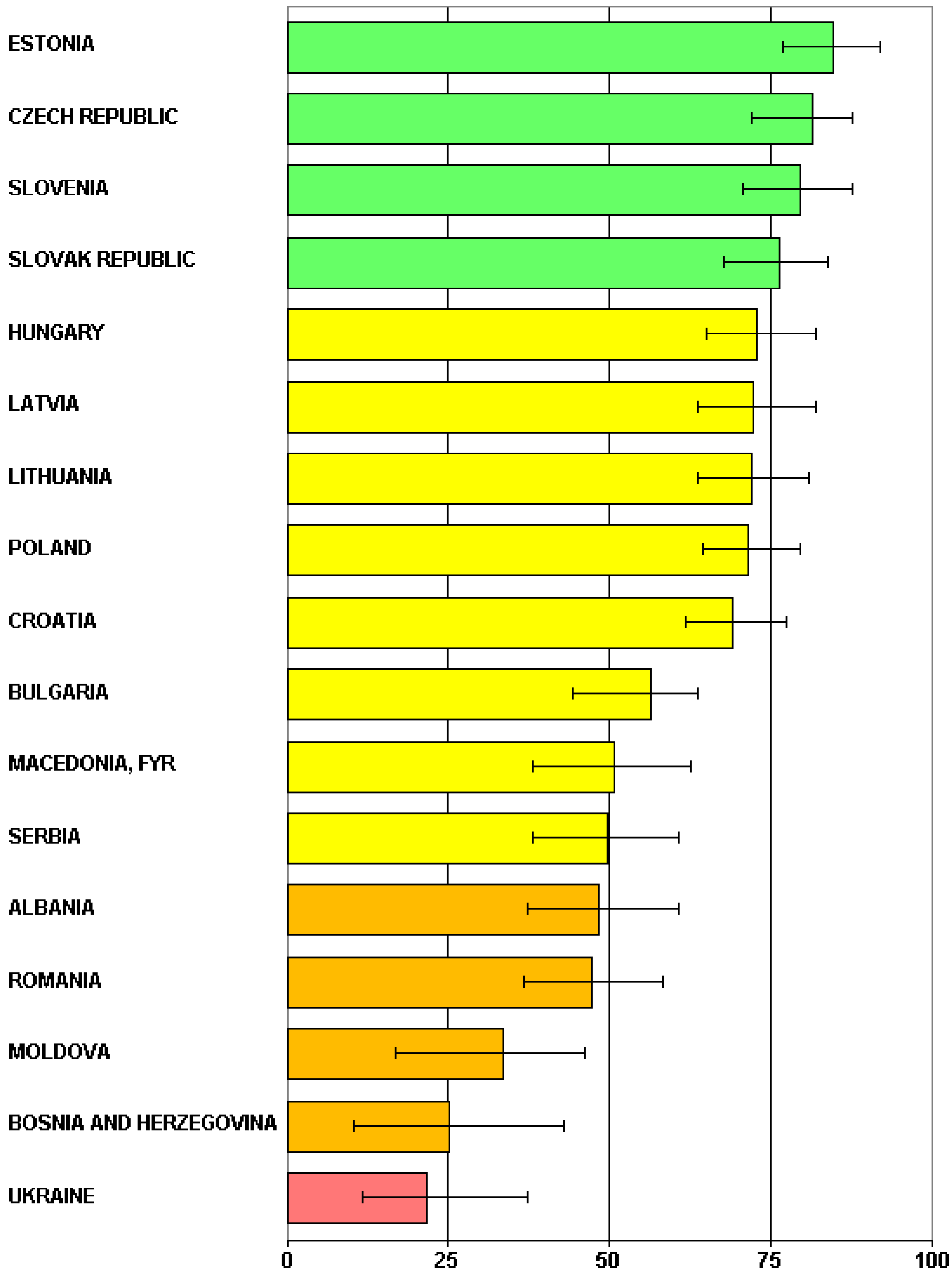
**Political Stability/Absence of Violence** (2011)

*The data on chart is sorted in descending order from top to bottom.*



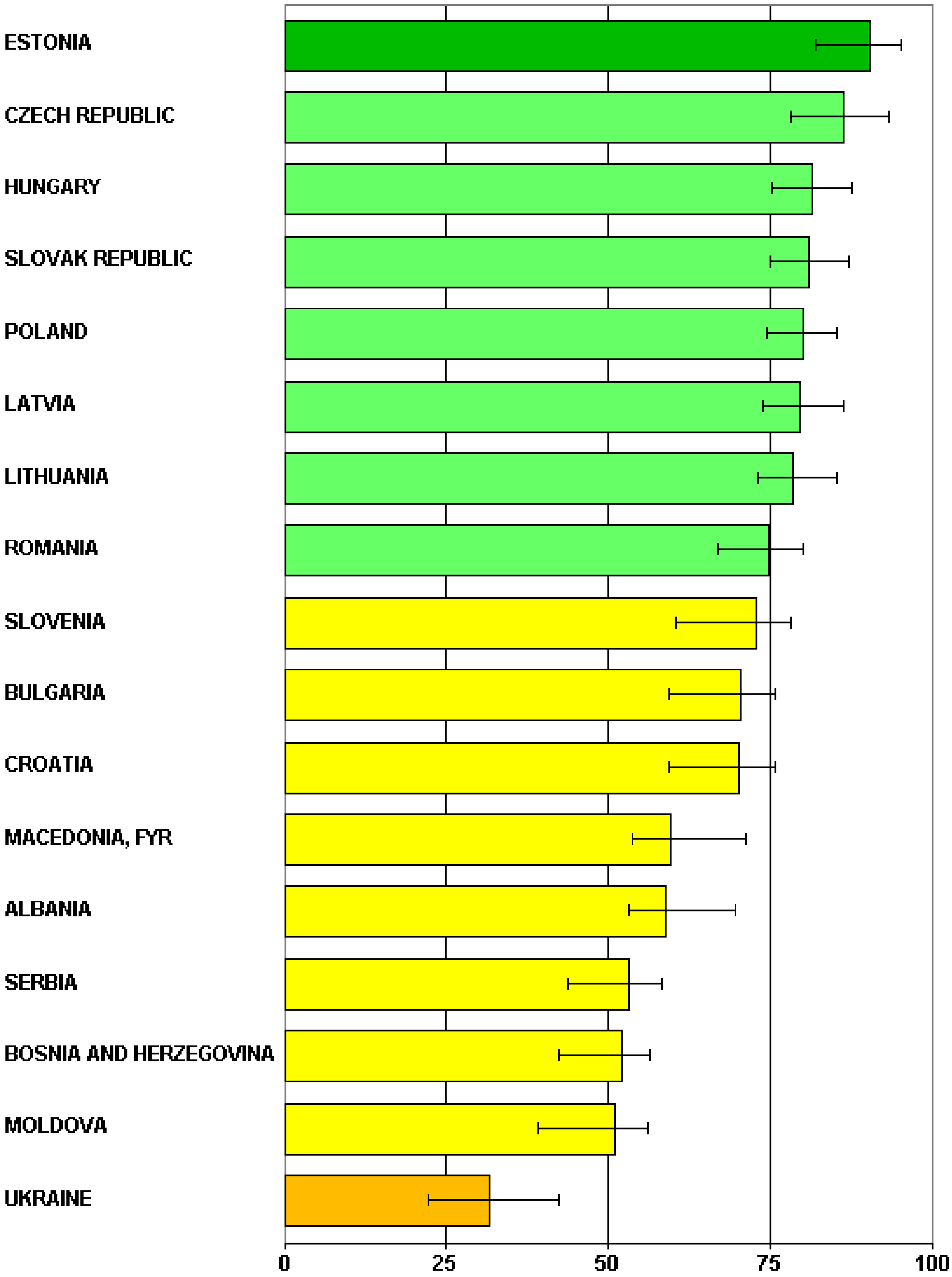
**Government Effectiveness** (2011)

*The data on chart is sorted in descending order from top to bottom.*



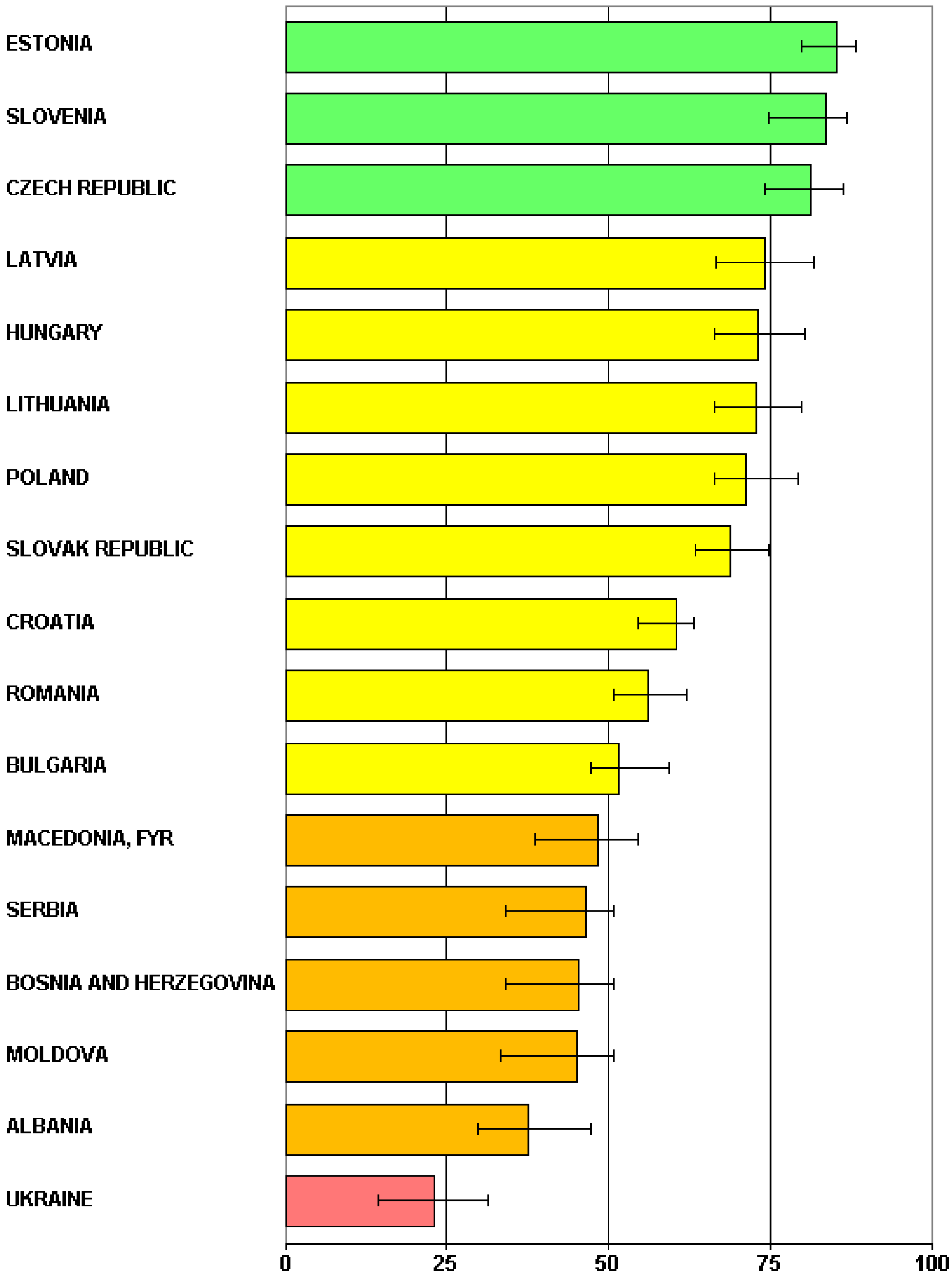
**Regulatory Quality** (2011)

*The data on chart is sorted in descending order from top to bottom.*

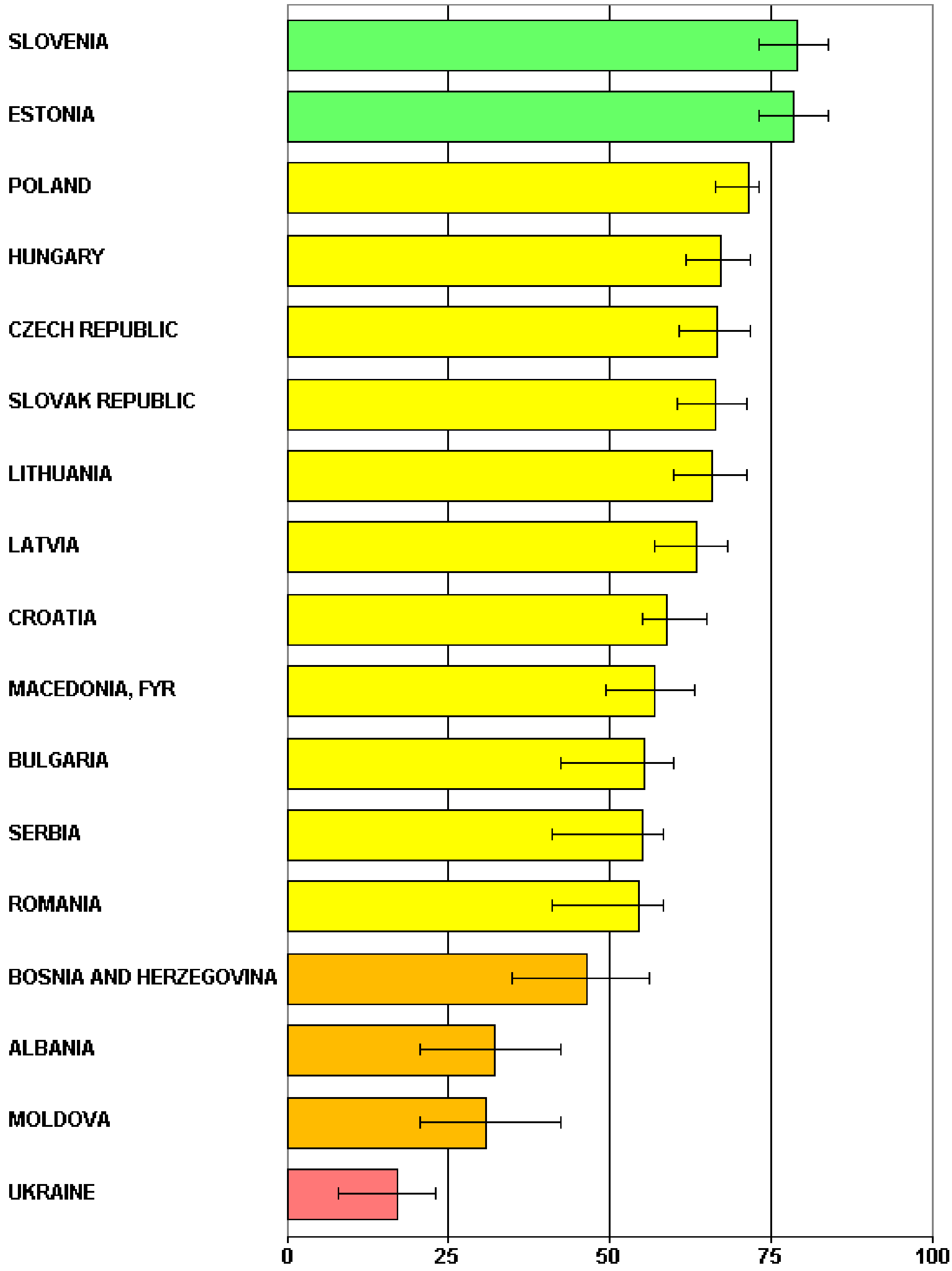


**Rule of Law** (2011)

*The data on chart is sorted in descending order from top to bottom.*

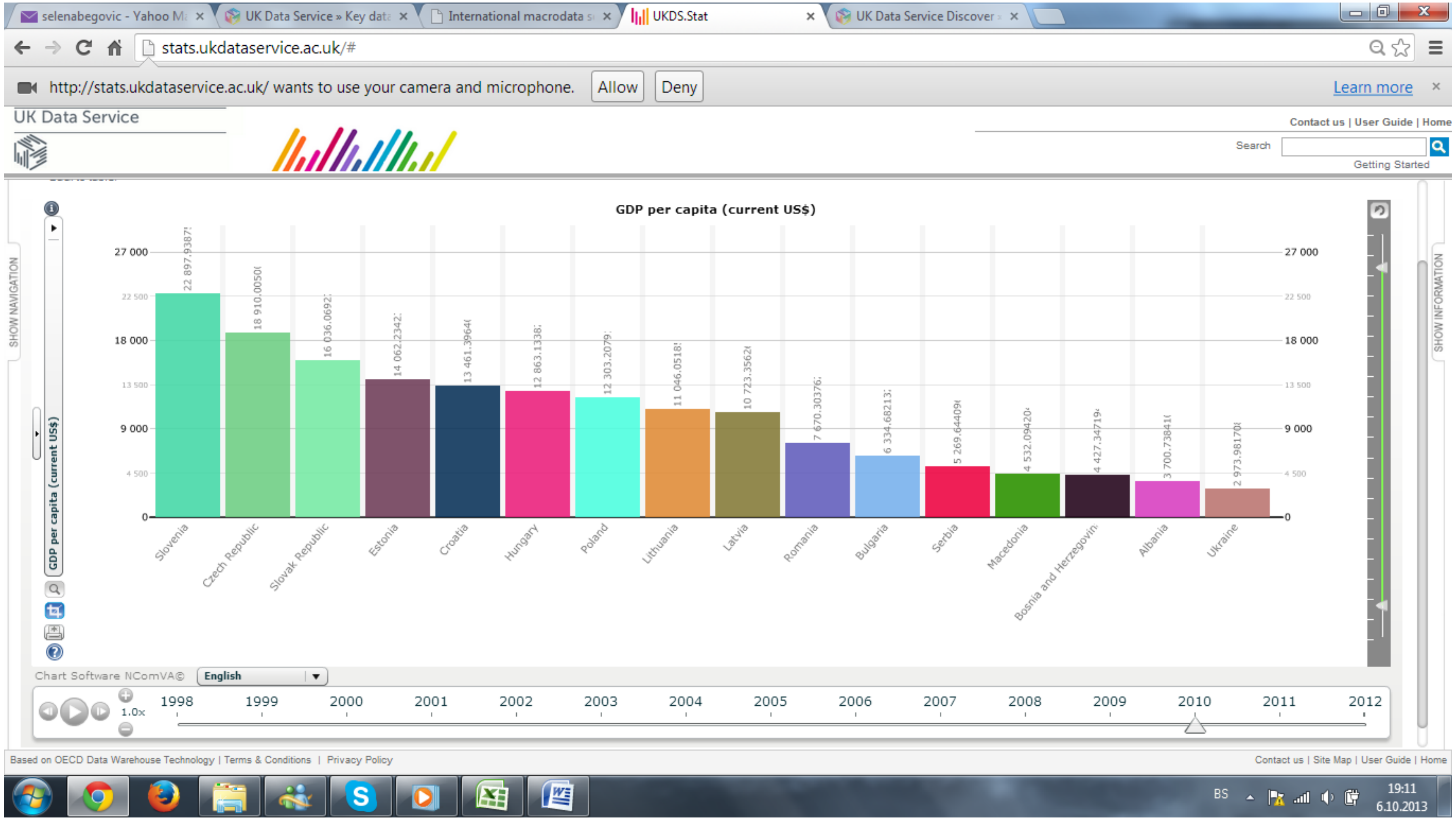


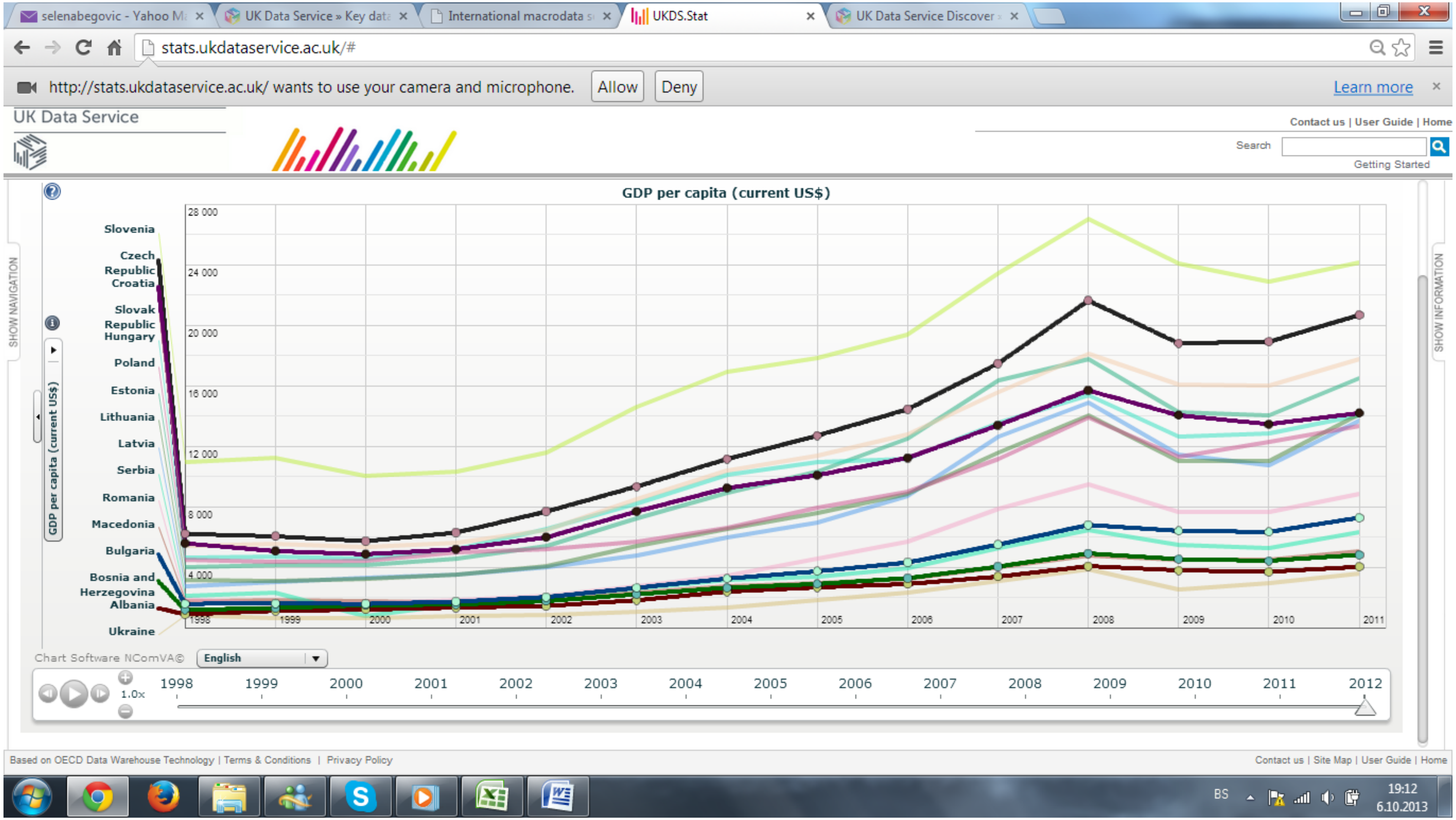
**Control of Corruption** (2011)
*The data on chart is sorted in descending order from top to bottom.*



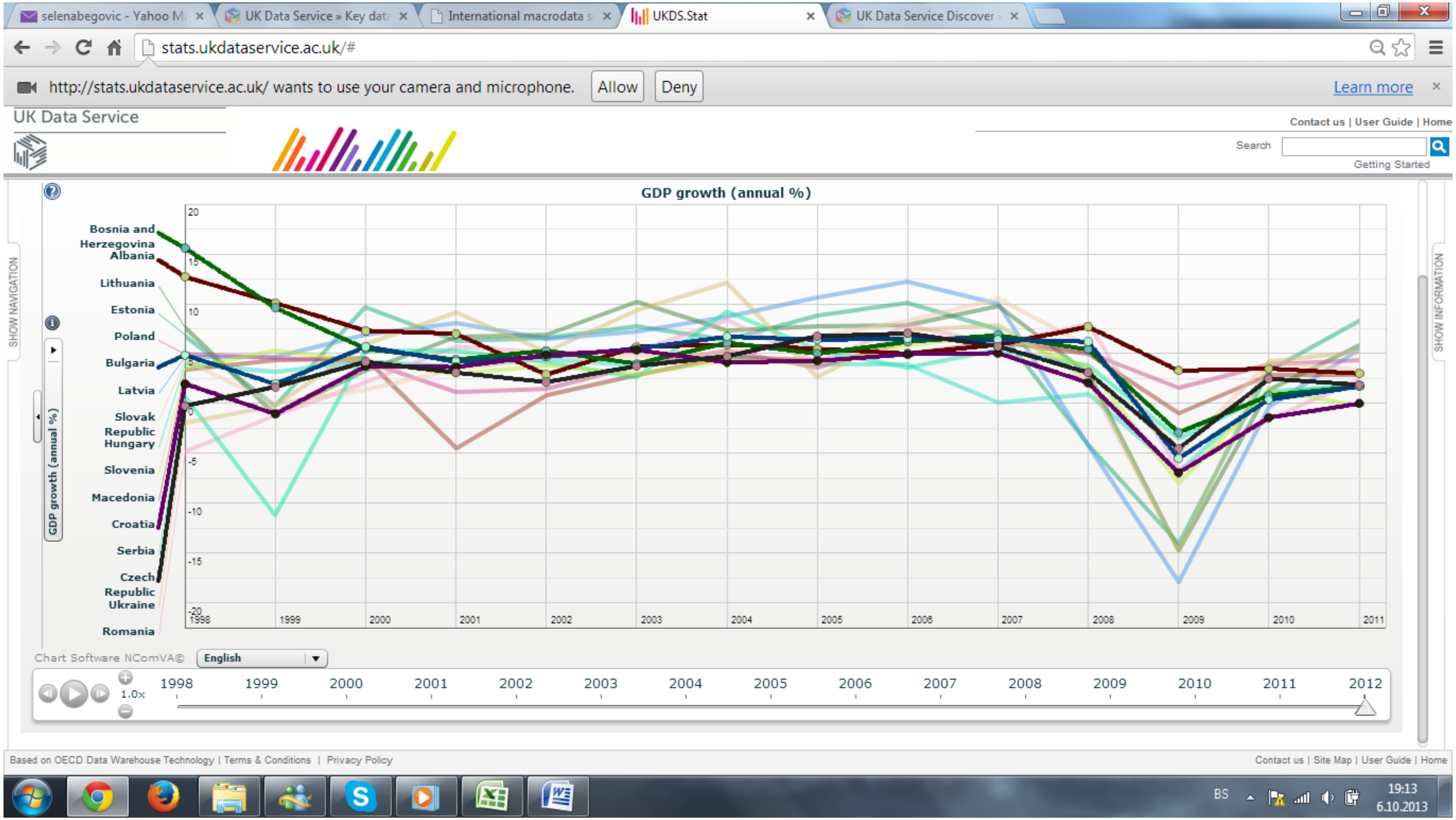
**Appendices Chapter 2**

**Appendix 2.1: Trends in macroeconomic variables in European transition countries (1998-2012)**





GDP per capita (current US$)
Slovenia
Czech Republic
Croatia
Slovak Republic
Hungary
Poland
Estonia
Lithuania
Latvia
Serbia
Romania
Macedonia
Bulgaria
Bosnia and Herzegovina
Albania
Ukraine
GDP per capita (current US$)
28 000
24 000
20 000
16 000
12 000
8 000
4 000
1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
Chart Software NComVA©
English
1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012


stats.ukdataservice.ac.uk/#
http://stats.ukdataservice.ac.uk/ wants to use your camera and microphone.
Allow
Deny
Learn more
UK Data Service
Contact us | User Guide | Home
Search
Getting Started
GDP growth (annual %)
Bosnia and Herzegovina
Albania
Lithuania
Estonia
Poland
Bulgaria
Latvia
Slovak Republic
Hungary
Slovenia
Macedonia
Croatia
Serbia
Czech Republic
Ukraine
Romania
GDP growth (annual %)
Chart Software NComVA©
English
1998
1999
2000
2001
2002
2003
2004
2005
2006
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2011
2012
Based on OECD Data Warehouse Technology | Terms & Conditions | Privacy Policy
Contact us | Site Map | User Guide | Home
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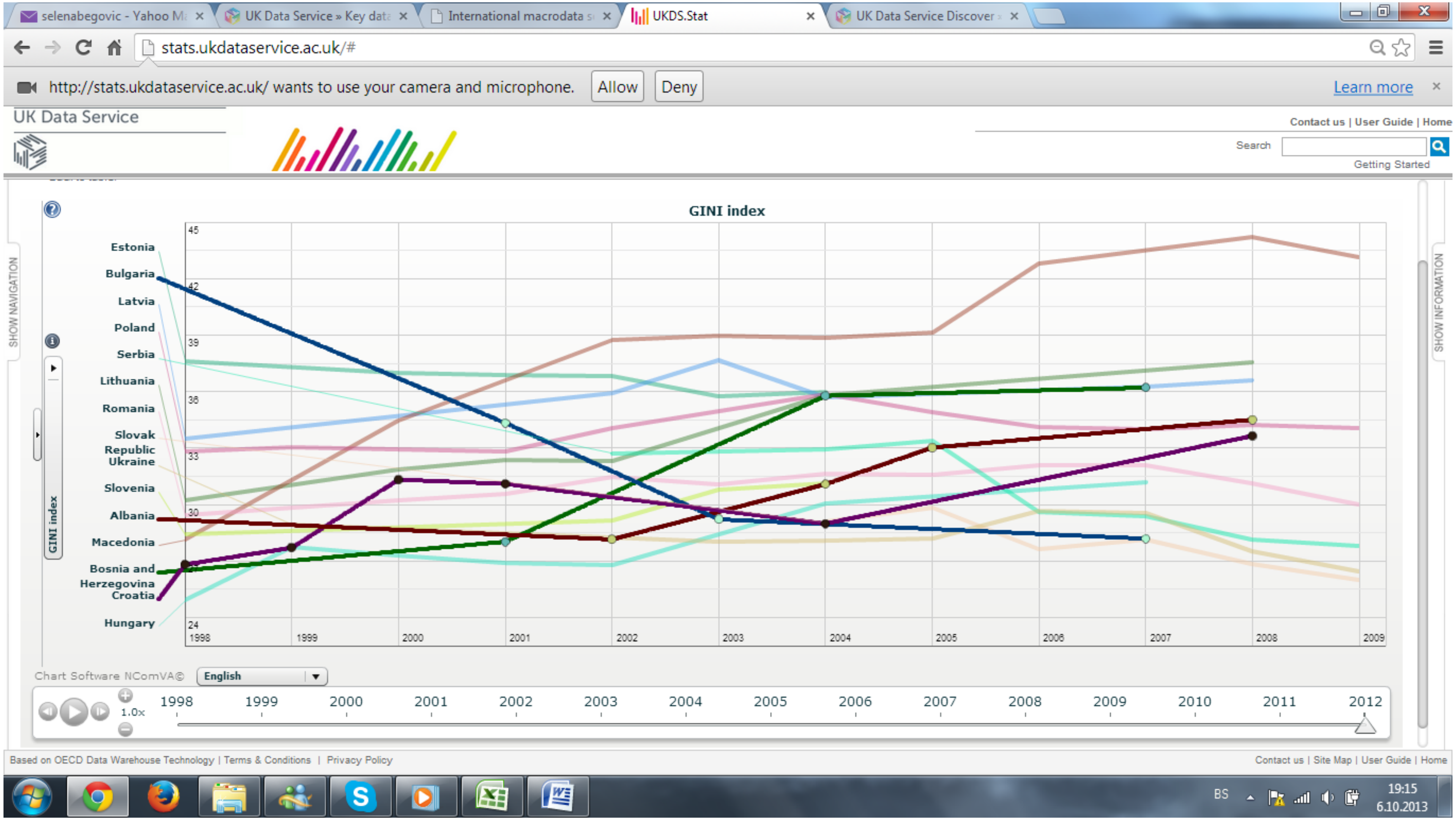

GINI index
Estonia
Bulgaria
Latvia
Poland
Serbia
Lithuania
Romania
Slovak Republic
Ukraine
Slovenia
Albania
Macedonia
Bosnia and Herzegovina
Croatia
Hungary
GINI index
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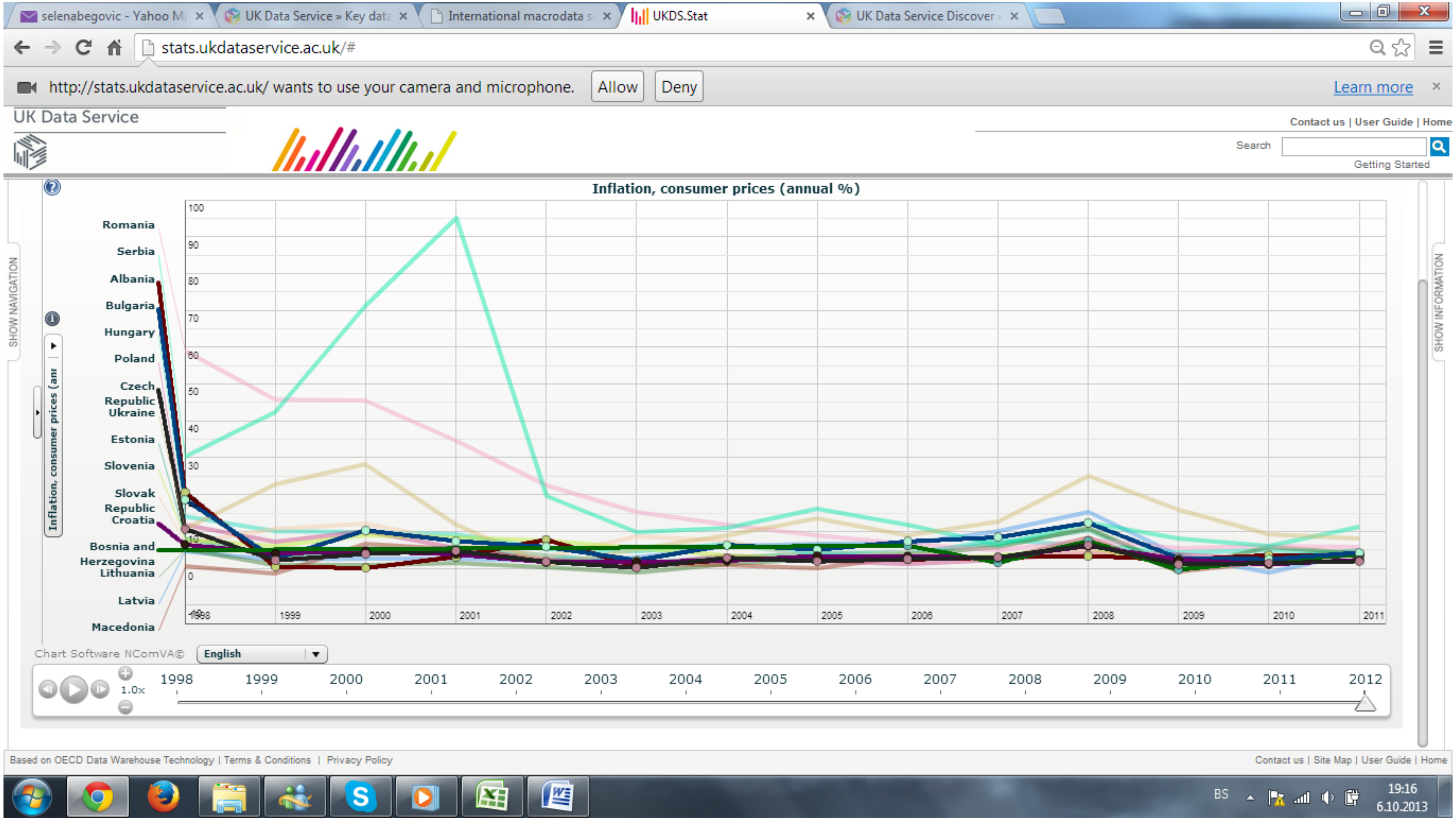
English



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Inflation, consumer prices (annual %)
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Albania
Bulgaria
Hungary
Poland
Czech Republic
Ukraine
Estonia
Slovenia
Slovak Republic
Croatia
Bosnia and Herzegovina
Lithuania
Latvia
Macedonia
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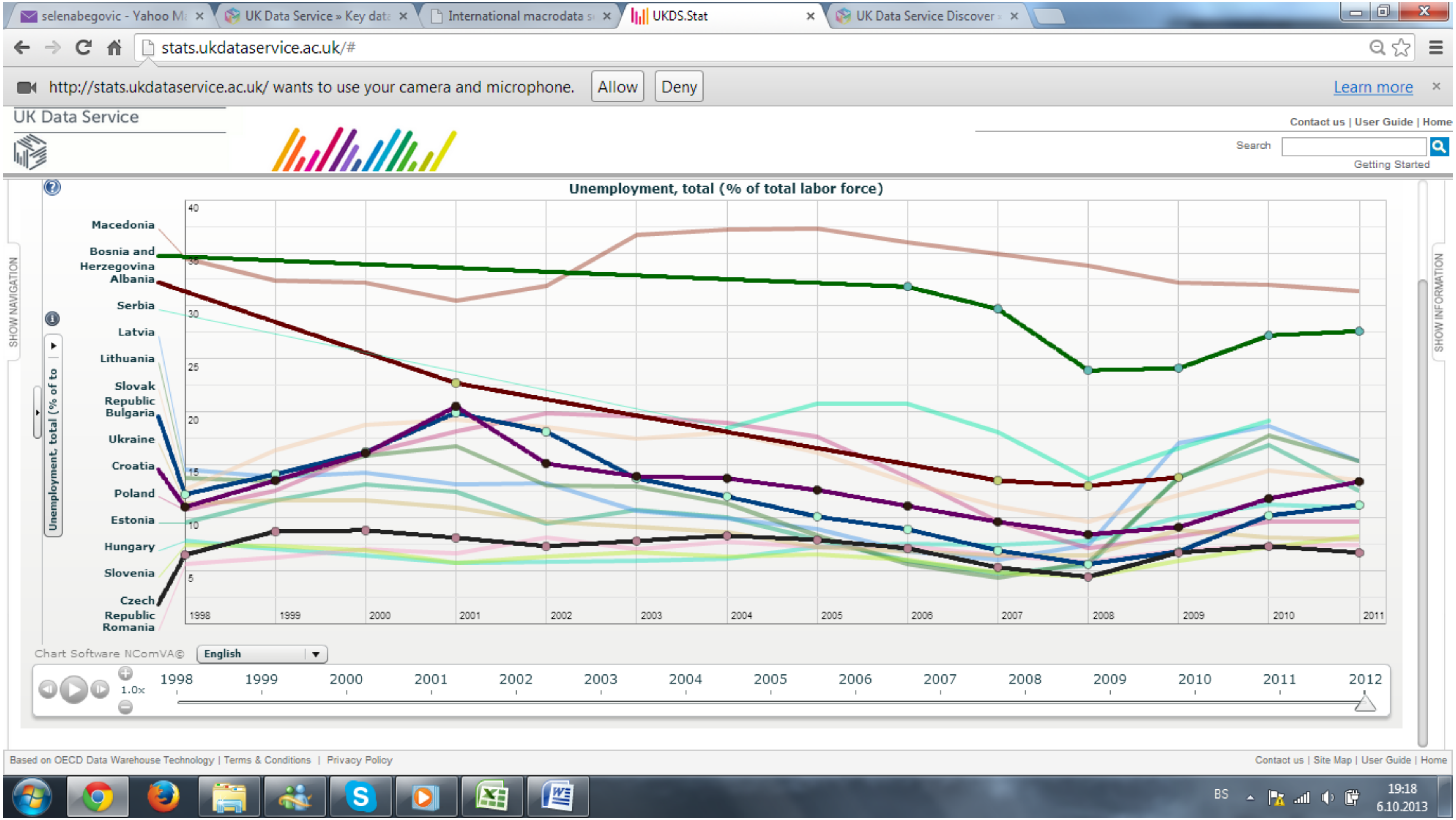
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Getting Started
Unemployment, total (% of total labor force)
Macedonia
Bosnia and Herzegovina
Albania
Serbia
Latvia
Lithuania
Slovak Republic
Bulgaria
Ukraine
Croatia
Poland
Estonia
Hungary
Slovenia
Czech Republic
Romania
Unemployment, total (% of to
Chart Software NComVA©
English
1998
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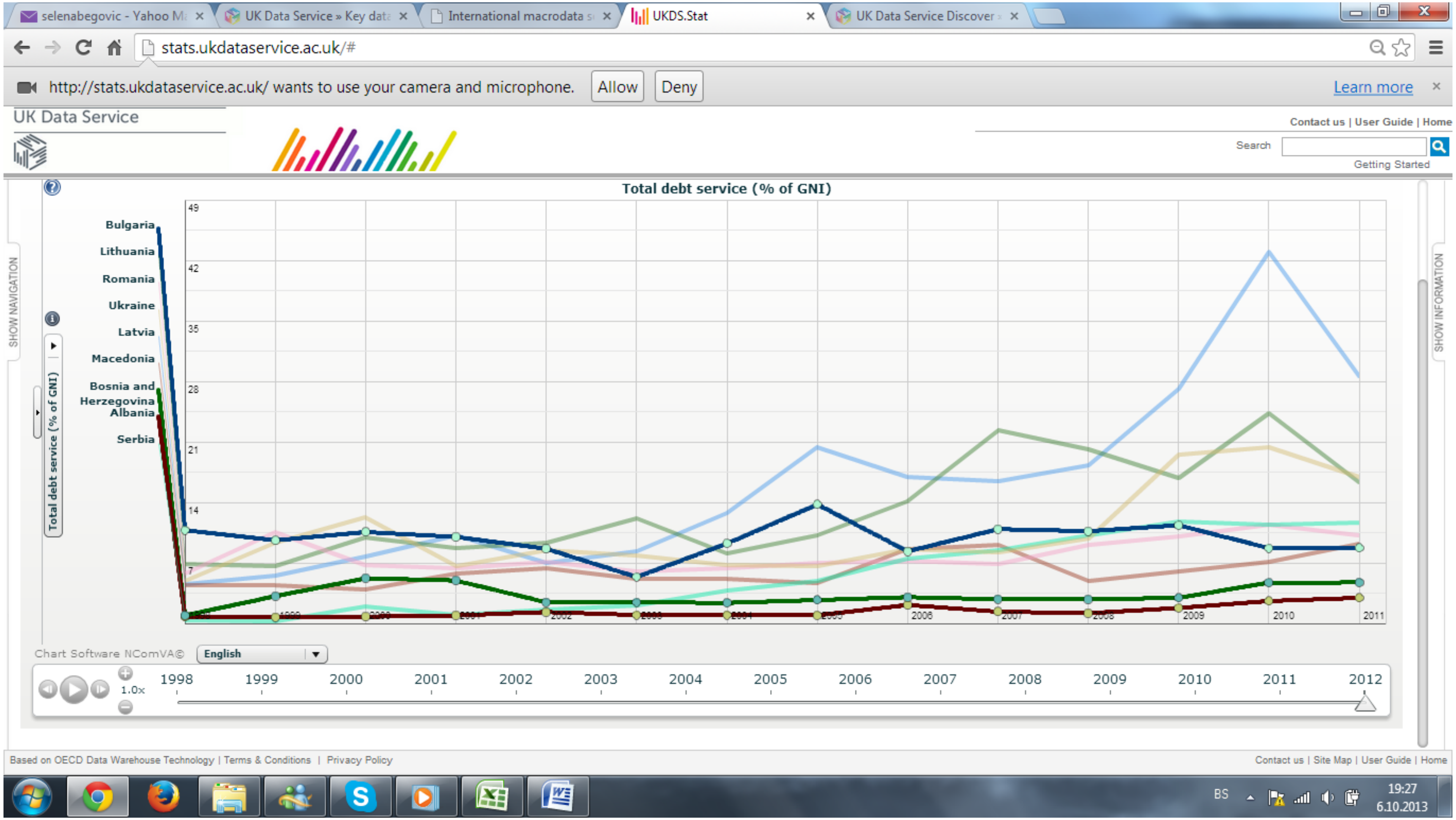

Total debt service (% of GNI)
Bulgaria
Lithuania
Romania
Ukraine
Latvia
Macedonia
Bosnia and Herzegovina
Albania
Serbia
Total debt service (% of GNI)
49
42
35
28
21
14
7
1998
1999
2000
2001
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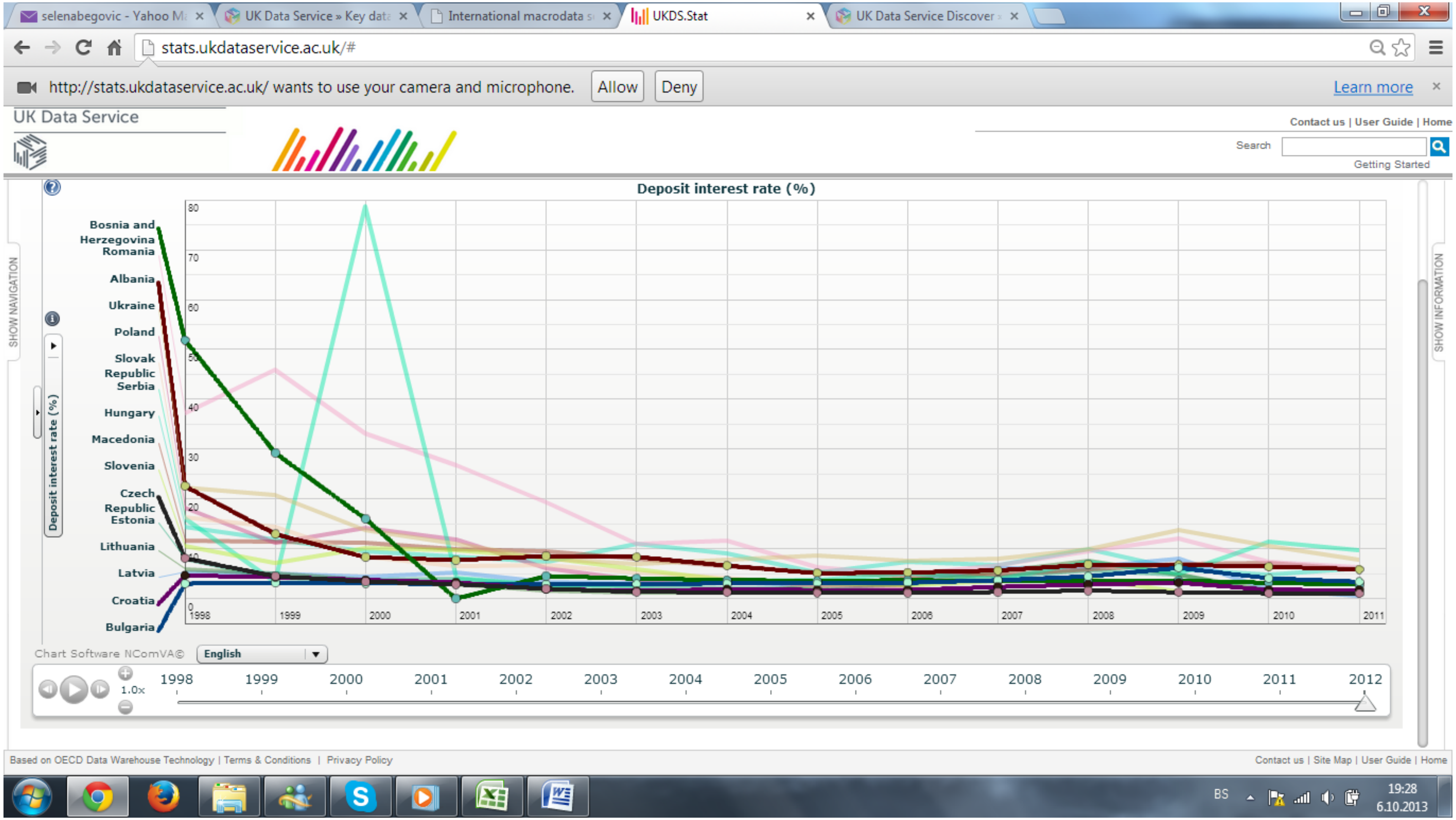
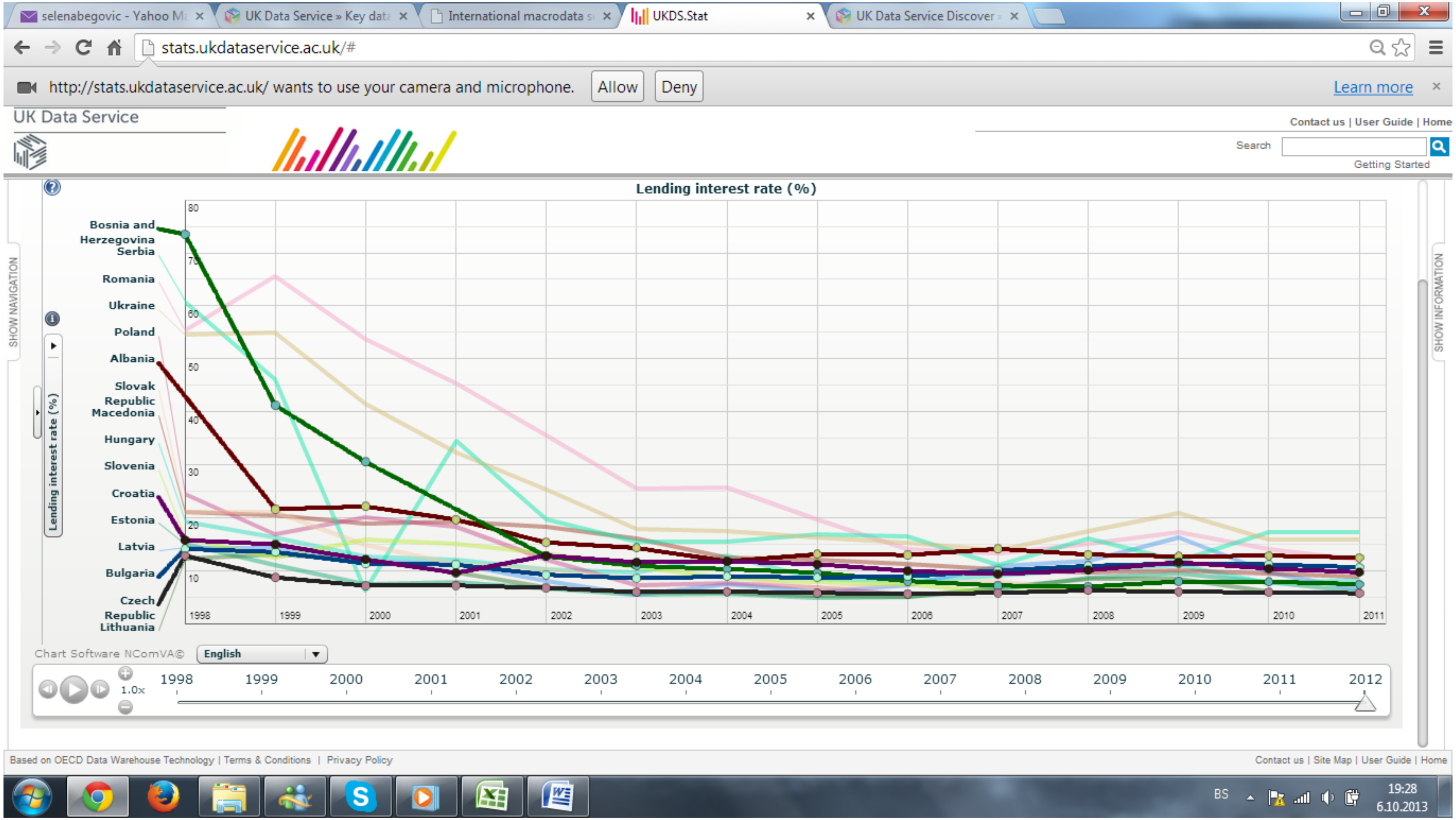
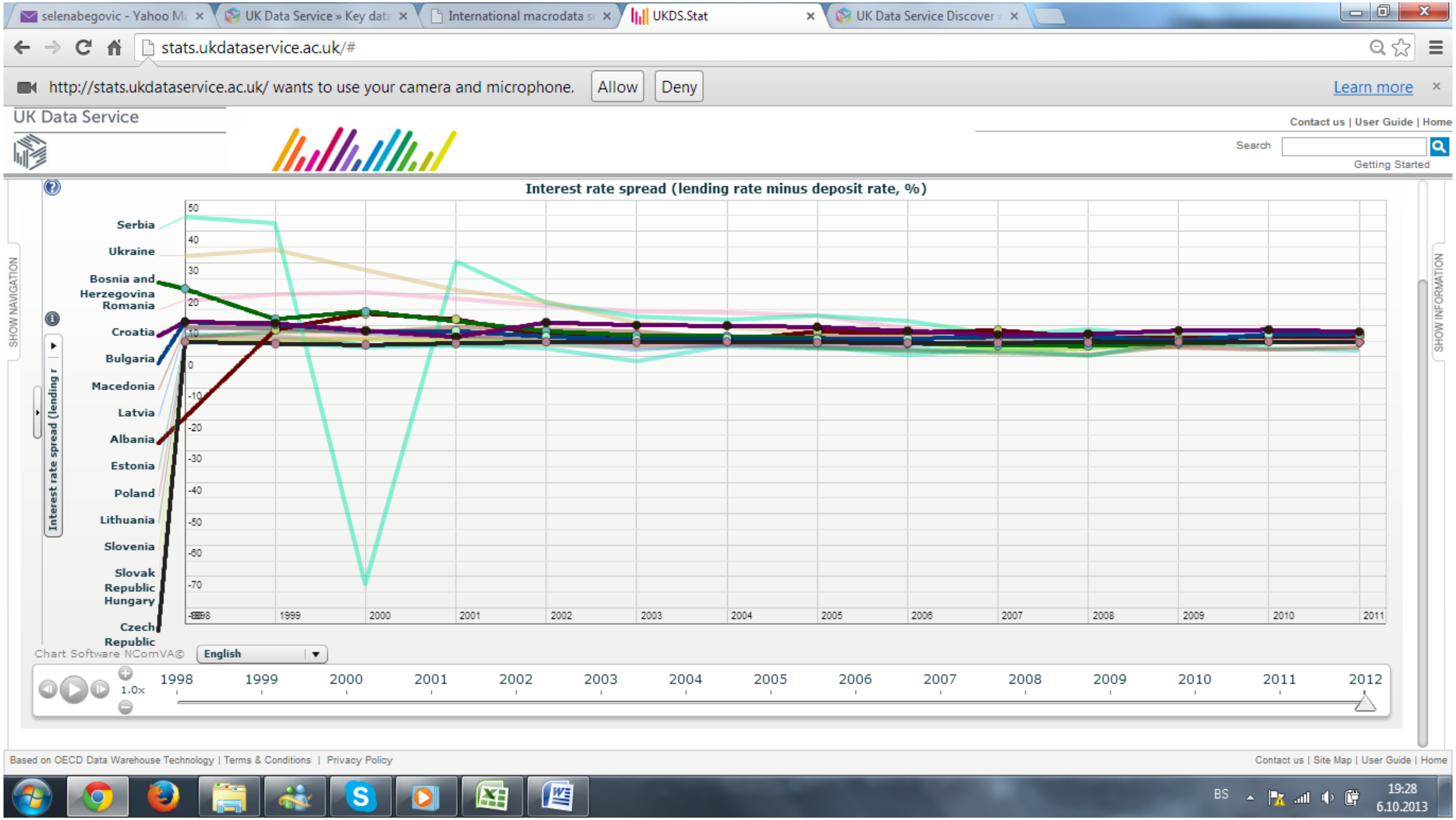


Deposit interest rate (%)
Bosnia and Herzegovina
Romania
Albania
Ukraine
Poland
Slovak Republic
Serbia
Hungary
Macedonia
Slovenia
Czech Republic
Estonia
Lithuania
Latvia
Croatia
Bulgaria
Deposit interest rate (%)
1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012



Lending interest rate (%)
Bosnia and Herzegovina
Serbia
Romania
Ukraine
Poland
Albania
Slovak Republic
Macedonia
Hungary
Slovenia
Croatia
Estonia
Latvia
Bulgaria
Czech Republic
Lithuania
Lending interest rate (%)


Interest rate spread (lending rate minus deposit rate, %)
Serbia
Ukraine
Bosnia and Herzegovina
Romania
Croatia
Bulgaria
Macedonia
Latvia
Albania
Estonia
Poland
Lithuania
Slovenia
Slovak Republic
Hungary
Czech Republic
Chart Software NComVA©
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2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

**Appendices Chapter 3**

**Appendix 3.1: Interest rates on short-term and long-term loans in BH, Croatia, Estonia and Latvia and Macedonia**

In order to be comparable interest rates on short-term and long-term loans are used in all selected countries and differences between those in the local currency and those indexed in the foreign currency are compared. Data is available on a monthly basis, herein presented are on (the last day in) the last month of the year.

| Variable | | Year | 2007 | | | | 2008 | | | | 2009 | | | | | 2010 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Country | BOS | CRO | EST | LAT | BOS | CRO | EST | LAT | BOS | CRO | EST | LAT | MAC | BOS | CRO | EST | LAT | MAC |
| Interest rate diff. on loans | Short-term | Enterprises | -0.77 | 0.53 | -0.21 | 4.12 | -1.51 | 0.80 | 1.54 | 4.93 | -0.52 | 0.88 | 1.15 | 3.79 | 2.14 | -0.31 | -0.93 | 0.76 | 2.51 | 1.60 |
| | | Households | 0.48 | 5.50 | 24.21 | 12.27 | -0.74 | 3.68 | 16.08 | 9.88 | 0.07 | 2.45 | 1.86 | 13.82 | 3.75 | 0.16 | 3.78 | -6.78 | 6.04 | 4.02 |
| | Long-term | Enterprises | -0.73 | 0.15 | 1.70 | 3.77 | -1.39 | 1.18 | 2.17 | 2.84 | -0.94 | 0.96 | 3.60 | 0.49 | 2.36 | 0.41 | -0.74 | 1.19 | -1.26 | 1.94 |
| | | Households | 1.55 | 1.21 | 8.85 | 10.24 | 0.89 | 2.46 | 14.41 | 2.45 | -1.69 | 2.31 | 11.30 | -7.77 | 4.60 | 0.40 | 3.13 | 12.12 | -2.02 | 4.88 |
| Interest rate on loans in the local currency | Short-term | Enterprises | 7.03 | 7.39 | 6.40 | 12.32 | 7.42 | 8.98 | 8.45 | 14.30 | 8.1 | 9.29 | 5.86 | 10.74 | 9.45 | 7.84 | 6.98 | 6.23 | 8.21 | 9.29 |
| | | Households | 10.54 | 12.34 | 31.05 | 20.05 | 9.14 | 12.33 | 23.28 | 20.12 | 9.88 | 12.68 | 11.02 | 21.13 | 13.64 | 9.67 | 12.64 | 10.62 | 22.81 | 12.73 |
| | Long-term | Enterprises | 7.1 | 6.66 | 8.13 | 11.70 | 7.16 | 8.1 | 8.52 | 11.98 | 6.8 | 8.27 | 7.33 | 8.95 | 9.57 | 8.25 | 6.45 | 5.63 | 7.22 | 9.17 |
| | | Households | 9.97 | 8.01 | 14.95 | 17.35 | 11.09 | 10.35 | 19.54 | 15.60 | 7.87 | 11.33 | 16.68 | 13.09 | 14.13 | 9.1 | 11.29 | 16.43 | 15.89 | 13.08 |
| Inflation, CPI | | | 1.52 | 2.87 | 6.60 | 10.11 | 7.42 | 6.07 | 10.37 | 15.40 | -0.39 | 2.38 | -0.08 | 3.53 | -0.74 | 2.19 | 1.05 | 2.97 | -1.09 | 1.61 |

| Year | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|
| HIPC Eurozone (June) | 1.9 | 3.97 | -0.13 | 1.49 |
| Benchmark interest rate | 4 | 2.5 | 1 | 1 |

*For Bosnia and Herzegovina (BH) indexed in euro, for Croatia (CRO) index in foreign currency (mainly euro), for Estonia (EST), Latvia (LAT) and Macedonia (MAC) loans in euro

Source: Countries' national banks (for interest rates), WDI (for inflation rates), http://www.tradingeconomics.com/euro-area/interest-rate (Eurozone interest rates), http://www.global-rates.com/economic-indicators/inflation/consumer-prices/hicp/eurozone.aspx (Eurozone inflation rate) (last accessed on: 13/10/2014)

## Appendices Chapter 4

### Appendix 4.1: General description of the survey data (socio-demographic characteristics)

Appendix 4.1a: Table 4.1a: Number of respondents, months in which surveys were conducted and number of regions (per country)

| | 200702 | 200801 | 200802 | 200901 | 200902 | 201001 | 201002 | 201101 | Total | No. of regions* |
|---|---|---|---|---|---|---|---|---|---|---|
| Albania | 1,088 | 1,057 | 1,035 | 1,091 | 1,005 | 1,042 | 1,061 | 1,096 | 8,475 | 3 |
| | n.a. | n.a. | Nov | May | Oct, Nov | May | Oct, Nov | May | | |
| Bosnia | 1,004 | 1,000 | 1,007 | 1,000 | 1,000 | 1,000 | 1,045 | 1,017 | 8,073 | 12 |
| | n.a. | n.a. | Nov | May | Nov | May | Nov | May | | |
| Bulgaria | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 8,000 | 9 |
| | n.a. | n.a. | Oct | n.a | Oct | May | Oct | May | | |
| Croatia | 1,032 | 1,029 | 1,033 | 1,020 | 1,032 | 1,032 | 1,032 | 1,032 | 8,242 | 6 |
| | n.a. | n.a. | Oct | May | Oct | May | Oct | Apr, May | | |
| Czech | 1,033 | 1,010 | 1,052 | 1,052 | 1,054 | 1,052 | 1,056 | 1,030 | 8,339 | 8 |
| | n.a. | n.a. | Oct | May | Oct | May | Oct | May | | |
| Hungary | 1,031 | 1,010 | 1,009 | 1,009 | 1,010 | 1,013 | 1,008 | 1,013 | 8,103 | 7 |
| | n.a. | n.a. | Oct | May | 10 | May | Oct | May | | |
| Macedonia | 1,027 | 1,076 | 1,001 | 1,048 | 1,012 | 1,127 | 1,053 | 1,000 | 8,344 | 4 |
| | n.a. | n.a. | Nov | May | Nov | Apr,May | Nov, Dec | May | | |
| Poland | 1,039 | 1,024 | 1,042 | 1,054 | 1,034 | 1,025 | 1,052 | 1,060 | 8,330 | 10 |
| | n.a. | n.a. | Oct | May,June | Oct | Apr,May | Nov | Apr, May | | |
| Romania | 1,000 | 1,036 | 1,018 | 1,082 | 1,107 | 1,134 | 1,124 | 1,104 | 8,605 | 8 |
| | n.a. | n.a. | Oct,Nov | Apr,May | Oct | May | Oct | May | | |
| Serbia | 1,002 | 1,024 | 1,084 | 1,071 | 1,073 | 1,069 | 1,070 | 1,071 | 8,464 | 4 |
| | n.a. | n.a. | Oct | May | Oct | May | Oct | May | | |

* For the regions from each country see Appendix 4.1d

Appendix 4.1b: Table A.4.1b: Sample characteristics per country, all survey waves included

| | Gender | | Age | | | | Employment status | | | | No of |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | 15-18 | 19-34 | 35-54 | 55+ | Student | Retired | Unemployed | Employed | observations |
| All countries (absolute) | 39122 | 43845 | 3998 | 25151 | 31216 | 22610 | 7866 | 15668 | 15011 | 44304 | 82975 |
| All countries (percent) | 47% | 53% | 5% | 30% | 38% | 27% | 9% | 19% | 18% | 53% | |
| Albania | 49% | 51% | 7% | 35% | 41% | 17% | 12% | 8% | 22% | 58% | 8475 |
| Bosnia | 45% | 55% | 4% | 31% | 34% | 31% | 11% | 22% | 28% | 39% | 8073 |
| Bulgaria | 49% | 51% | 7% | 30% | 37% | 25% | 11% | 16% | 13% | 60% | 8000 |
| Croatia | 45% | 55% | 4% | 31% | 36% | 29% | 9% | 23% | 16% | 52% | 8242 |
| Czech Republic | 50% | 50% | 7% | 29% | 34% | 31% | 9% | 17% | 7% | 67% | 8339 |
| Hungary | 46% | 54% | 1% | 26% | 37% | 36% | 5% | 32% | 14% | 49% | 8103 |
| Macedonia | 46% | 54% | 5% | 29% | 40% | 26% | 9% | 15% | 36% | 41% | 8344 |
| Poland | 48% | 52% | 4% | 37% | 40% | 19% | 11% | 12% | 9% | 68% | 8330 |
| Romania | 45% | 55% | 4% | 26% | 36% | 35% | 7% | 30% | 12% | 51% | 8605 |
| Serbia | 50% | 50% | 5% | 28% | 42% | 25% | 10% | 16% | 25% | 50% | 8464 |

Appendix 4.1c: Table A.4.1c: Variables used for weighting of the sample

| | Gender | Age | Gender* Age | Education | Region | Size of town | Region*Size of town | Size of household | Type of community | Ethnicity |
|---|---|---|---|---|---|---|---|---|---|---|
| Albania | x' | | x' | x' | x' | x' | x' | x' | x' | |
| Bosnia | x' | x' | x' | x' | x | x' | | x' | x' | |
| Bulgaria* | | | | | | | | | | |
| Croatia | x' | x' | x' | x | x | | x' | x' | | |
| Czech | x | x | | x' | x | x | | | | |
| Hungary | x | x | | x' | x' | x' | | | x' | |
| Macedonia | x' | | x' | x' | x' | x' | x' | x' | x' | x' |
| Poland | x | x | | | | | | | | |
| Romania | x' | x' | x' | | x | x | | | | |
| Serbia | | x | | x | | | | | | |

x- indicates that variable has been taken into account for weighting purposes

x' - indicates that variable has been taken into account for weighting purposes in some, but not all waves

* quota sampling applied

Appendix 4.1d: Percentage of respondents per regions in countries

```
bysort country: tab h_region [aw=h_weight]
----------------------------------------------------------------------------
-> country = Albania

                   h_region |      Freq.     Percent        Cum.
----------------------------+-----------------------------------
                   AL North | 1,398.3899       18.93       18.93
                 AL Central | 3,139.1594       42.50       61.43
                   AL South |2,849.45065       38.57      100.00
----------------------------+-----------------------------------
                      Total |      7,387      100.00

----------------------------------------------------------------------------
---------------------------------------------------
-> country = Bosnia

                   h_region |      Freq.     Percent        Cum.
----------------------------+-----------------------------------
            Una-Sana Canton | 579.068045        8.19        8.19
               Tuzla Canton |  812.14888       11.49       19.68
        Zenica-Doboj Canton |  741.44902       10.49       30.17
      Central Bosnia Canton | 543.713615        7.69       37.86
Herzegovina-Neretna Canton | 430.812241        6.09       43.96
   West Herzegovina Canton | 141.249718        2.00       45.95
           Sarajevo Canton | 826.307053       11.69       57.64
                  Canton 10 |190.6493194        2.70       60.34
    RS North District Brcko | 1,751.7973       24.78       85.12
                    RS East | 928.983302       13.14       98.26
           Posavski Canton | 73.0308885        1.03       99.30
 Bosanskopodrinskij Canton | 49.7906057        0.70      100.00
----------------------------+-----------------------------------
                      Total |      7,069      100.00

----------------------------------------------------------------------------
-> country = Macedonia

                   h_region |      Freq.     Percent        Cum.
----------------------------+-----------------------------------
                     Skopje |  2,092.724       28.60       28.60
                  Northwest | 1,894.9441       25.90       54.50
                  Southwest | 1,514.6824       20.70       75.20
                       East |1,814.64947       24.80      100.00
----------------------------+-----------------------------------
                      Total |      7,317      100.00
```

-> country = Bulgaria

| h_region | Freq. | Percent | Cum. |
|---|---|---|---|
| Sofia | 1,352.5584 | 19.32 | 19.32 |
| Blagoevgrad | 560.547643 | 8.01 | 27.33 |
| Plovdiv | 988.002658 | 14.11 | 41.44 |
| Stara Zagora | 686.685237 | 9.81 | 51.25 |
| Varna | 700.693303 | 10.01 | 61.26 |
| Burgas | 770.801634 | 11.01 | 72.28 |
| Ruse | 595.637808 | 8.51 | 80.78 |
| Pleven | 840.839964 | 12.01 | 92.80 |
| Montana | 504.2333771 | 7.20 | 100.00 |
| Total | 7,000 | 100.00 | |

-> country = Croatia

| h_region | Freq. | Percent | Cum. |
|---|---|---|---|
| Zagreb | 1,802.9215 | 25.01 | 25.01 |
| Slavonia | 1,125.8522 | 15.62 | 40.63 |
| North Croatia | 1,382.8526 | 19.18 | 59.81 |
| Lika | 656.539028 | 9.11 | 68.92 |
| Istra & Pomorje | 894.143204 | 12.40 | 81.32 |
| Dalmatia | 1,346.6915 | 18.68 | 100.00 |
| Total | 7,209 | 100.00 | |

-> country = Poland

| h_region | Freq. | Percent | Cum. |
|---|---|---|---|
| Warsaw | 2,308.9643 | 31.68 | 31.68 |
| Lodz | 545.119735 | 7.48 | 39.16 |
| Trojmiasto | 493.422975 | 6.77 | 45.93 |
| Szczecin | 485.373078 | 6.66 | 52.59 |
| Silesian Agglomoration | 1,380.4528 | 18.94 | 71.53 |
| Cracow | 461.898463 | 6.34 | 77.87 |
| Poznan | 381.701528 | 5.24 | 83.11 |
| Wroclaw | 432.70621 | 5.94 | 89.05 |
| Bydgoszcz | 374.889769 | 5.14 | 94.19 |
| Lublin | 423.471181 | 5.81 | 100.00 |
| Total | 7,288 | 100.00 | |

-> country = Romania

| h_region | Freq. | Percent | Cum. |
|---|---|---|---|
| North-East | 1,249.9856 | 16.44 | 16.44 |
| South-East | 993.816155 | 13.07 | 29.51 |
| South | 1,238.943 | 16.30 | 45.81 |
| South-West | 817.935925 | 10.76 | 56.57 |
| West | 699.235695 | 9.20 | 65.76 |
| North-West | 954.512092 | 12.55 | 78.32 |
| Centre | 870.009657 | 11.44 | 89.76 |
| Bucharest | 778.561858 | 10.24 | 100.00 |
| Total | 7,603 | 100.00 | |

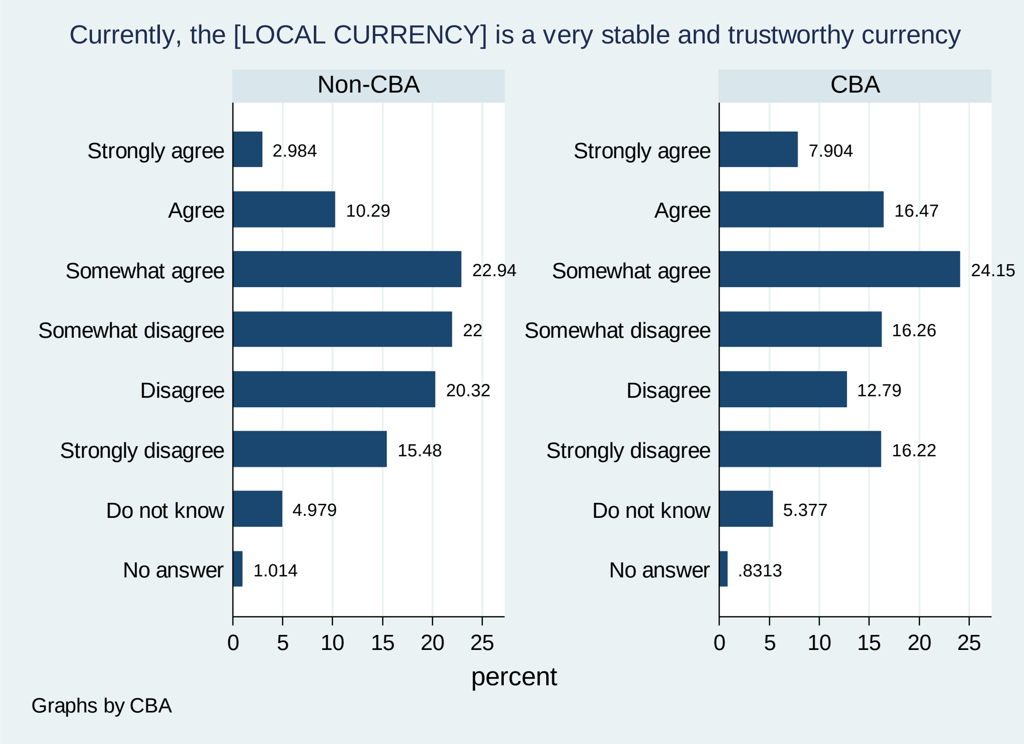
```
-> country = Serbia

              h_region |      Freq.     Percent        Cum.
-----------------------+-----------------------------------
              Belgrade | 1,678.2645       22.51       22.51
             Vojvodina |  2,099.783       28.16       50.66
    Central-West Serbia | 1,551.8952       20.81       71.48
      South-East Serbia | 2,127.0574       28.52      100.00
-----------------------+-----------------------------------
                  Total |      7,457      100.00

---------------------------------------------------------------------------
---------------------------------------------------


-> country = Czech Republic

              h_region |      Freq.     Percent        Cum.
-----------------------+-----------------------------------
                Prague | 945.017014       12.94       12.94
         Middle Bohemia | 788.729336       10.80       23.73
              Southwest | 836.049883       11.44       35.18
              Northwest |  834.03474       11.42       46.60
              Northeast | 1,050.2466       14.38       60.97
              Southeast | 1,116.8548       15.29       76.26
         Middle Moravia | 836.005875       11.44       87.71
         Moravskoslezko | 898.061833       12.29      100.00
-----------------------+-----------------------------------
                  Total |      7,305      100.00

---------------------------------------------------------------------------
---------------------------------------------------
-> country = Hungary

              h_region |      Freq.     Percent        Cum.
-----------------------+-----------------------------------
         Middle Hungary | 2,159.4971       30.54       30.54
   Middle Transdanubia | 764.796666       10.81       41.35
     West Transdanubia | 684.019549        9.67       51.02
    South Transdanubia | 667.244855        9.44       60.46
          North Hungary | 823.015808       11.64       72.10
      North Great Plain |1,031.66549       14.59       86.68
      South Great Plain | 941.760546       13.32      100.00
-----------------------+-----------------------------------
                  Total |      7,072      100.00
```

**Appendix 4.2: Responses to the questions about the local currency stability and the stability of euro**

Appendix 4.2a: Percentages of responses to selected questions

```
. tab q1_03 [aw=weight], missing

   Currently, the |
 [LOCAL CURRENCY] |
 is a very stable |
  and trustworthy |
         currency |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree | 2,053.7515        3.94        3.94
            Agree | 5,991.7487       11.49       15.42
   Somewhat agree |  12,087.22       23.17       38.59
Somewhat disagree | 10,896.007       20.89       59.48
         Disagree |  9,839.684       18.86       78.34
Strongly disagree | 8,149.4393       15.62       93.97
      Do not know | 2,637.5275        5.06       99.02
        No answer | 510.622547        0.98      100.00
------------------+-----------------------------------
            Total |     52,166      100.00

. bysort CBA: tab q1_03 [aw=weight], missing

----------------------------------------------------------------------------
-------------------
-> CBA = 0

   Currently, the |
 [LOCAL CURRENCY] |
 is a very stable |
  and trustworthy |
         currency |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree | 1,256.3363        2.98        2.98
            Agree | 4,331.9589       10.29       13.27
   Somewhat agree |9,656.61918       22.94       36.21
Somewhat disagree | 9,262.2809       22.00       58.21
         Disagree | 8,556.0651       20.32       78.53
Strongly disagree |  6,517.326       15.48       94.01
      Do not know | 2,096.3615        4.98       98.99
        No answer | 427.052081        1.01      100.00
------------------+-----------------------------------
            Total |     42,104      100.00

----------------------------------------------------------------------------
-------------------
-> CBA = 1

   Currently, the |
 [LOCAL CURRENCY] |
 is a very stable |
  and trustworthy |
         currency |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree | 795.318067        7.90        7.90
            Agree | 1,657.1554       16.47       24.37
   Somewhat agree | 2,430.0823       24.15       48.52
Somewhat disagree | 1,636.1714       16.26       64.79
         Disagree | 1,286.8293       12.79       77.57
Strongly disagree | 1,631.7987       16.22       93.79
      Do not know | 540.996528        5.38       99.17
        No answer | 83.6484418        0.83      100.00
------------------+-----------------------------------
            Total |     10,062      100.00
```

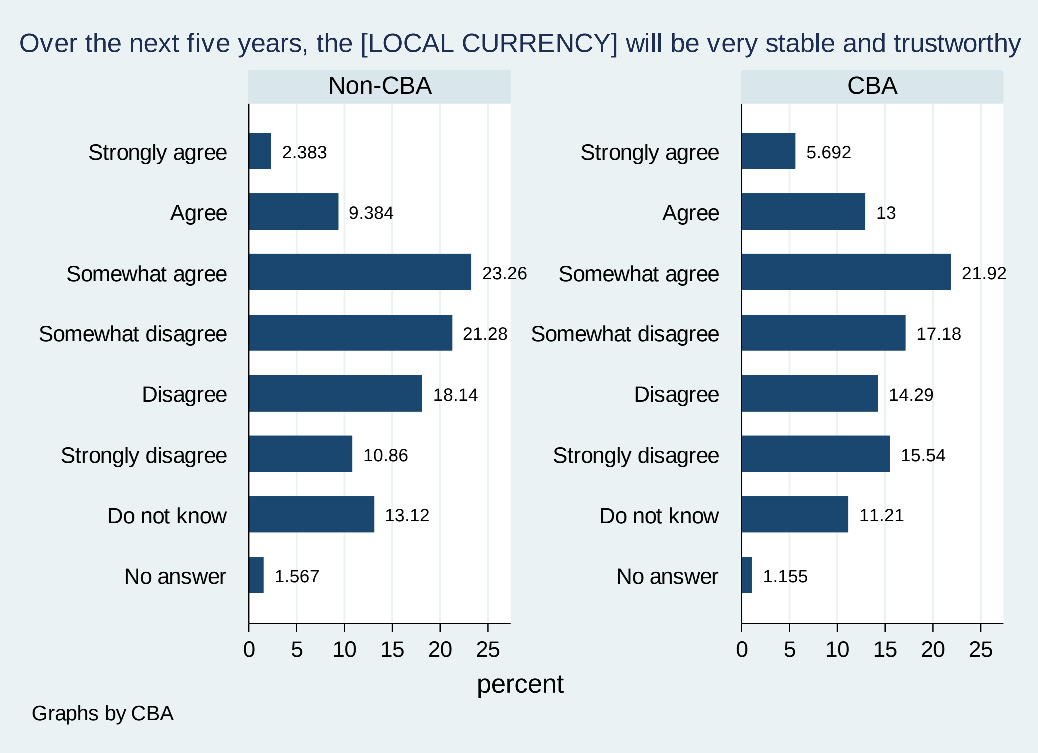
```
. catplot q1_03, percent(CBA) blabel(bar) by(CBA), [aw=weight]
```




```
. tab q1_03  h_edu_medium

   Currently, the |
 [LOCAL CURRENCY] |
 is a very stable |
 and trustworthy |    Medium Education
         currency |         0          1 |     Total
------------------+----------------------+----------
   Strongly agree |       813      1,247 |     2,060
            Agree |     2,312      3,784 |     6,096
   Somewhat agree |     4,265      7,951 |    12,216
Somewhat disagree |     3,835      7,006 |    10,841
         Disagree |     3,663      6,197 |     9,860
Strongly disagree |     3,099      4,943 |     8,042
      Do not know |     1,152      1,310 |     2,462
        No answer |       216        269 |       485
------------------+----------------------+----------
            Total |    19,355     32,707 |    52,062

. tab q1_03  h_edu_low

   Currently, the |
 [LOCAL CURRENCY] |
 is a very stable |
 and trustworthy |      Low Education
         currency |         0          1 |     Total
------------------+----------------------+----------
   Strongly agree |     1,625        435 |     2,060
            Agree |     4,830      1,266 |     6,096
   Somewhat agree |    10,098      2,118 |    12,216
Somewhat disagree |     8,765      2,076 |    10,841
         Disagree |     7,938      1,922 |     9,860
Strongly disagree |     6,356      1,686 |     8,042
      Do not know |     1,542        920 |     2,462
        No answer |       343        142 |       485
------------------+----------------------+----------
            Total |    41,497     10,565 |    52,062
```

```
. tab q1_04 [aw=weight], missing

    Over the next |
  five years, the |
 [LOCAL CURRENCY] |
     will be very |
stable and trustw |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree | 1,577.4569        3.02        3.02
            Agree |  5,260.945       10.09       13.11
   Somewhat agree | 11,998.074       23.00       36.11
Somewhat disagree | 10,687.667       20.49       56.60
         Disagree | 9,075.6999       17.40       73.99
Strongly disagree |  6,137.451       11.77       85.76
      Do not know | 6,652.6906       12.75       98.51
        No answer | 776.015626        1.49      100.00
------------------+-----------------------------------
            Total |     52,166      100.00

. bysort CBA: tab q1_04 [aw=weight], missing

----------------------------------------------------------------------------
-------------------
-> CBA = 0

    Over the next |
  five years, the |
 [LOCAL CURRENCY] |
     will be very |
stable and trustw |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree |1,003.34231        2.38        2.38
            Agree | 3,951.0488        9.38       11.77
   Somewhat agree |9,792.68902       23.26       35.03
Somewhat disagree | 8,960.3907       21.28       56.31
         Disagree |7,639.58231       18.14       74.45
Strongly disagree | 4,571.5505       10.86       85.31
      Do not know | 5,525.4433       13.12       98.43
        No answer | 659.952987        1.57      100.00
------------------+-----------------------------------
            Total |     42,104      100.00

----------------------------------------------------------------------------
-------------------
-> CBA = 1

    Over the next |
  five years, the |
 [LOCAL CURRENCY] |
     will be very |
stable and trustw |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree | 572.704322        5.69        5.69
            Agree | 1,308.3537       13.00       18.69
   Somewhat agree | 2,205.9535       21.92       40.62
Somewhat disagree | 1,729.0231       17.18       57.80
         Disagree | 1,437.7609       14.29       72.09
Strongly disagree | 1,563.9037       15.54       87.63
      Do not know | 1,128.0624       11.21       98.84
        No answer |116.2383324        1.16      100.00
------------------+-----------------------------------
            Total |     10,062      100.00
```

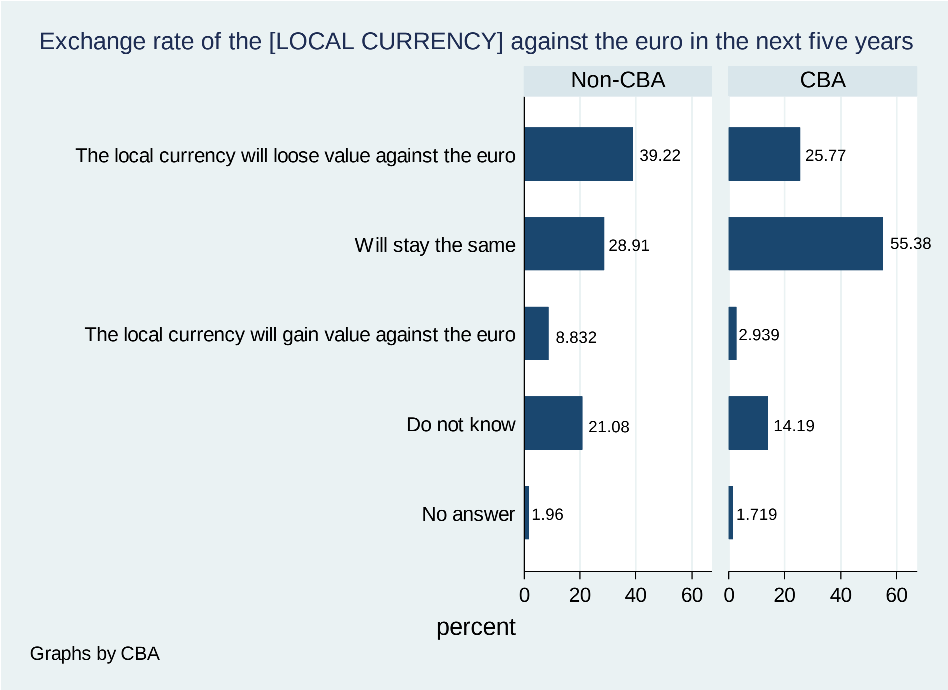
```
. catplot q1_04, percent(CBA) blabel(bar) by(CBA), [aw=weight]
```




```
. tab q1_04 h_edu_medium

    Over the next |
  five years, the |
 [LOCAL CURRENCY] |
     will be very |   Medium Education
stable and trustw |         0          1 |     Total
------------------+----------------------+----------
   Strongly agree |       601        963 |     1,564
            Agree |     2,091      3,226 |     5,317
   Somewhat agree |     4,323      7,804 |    12,127
Somewhat disagree |     3,709      6,997 |    10,706
         Disagree |     3,328      5,758 |     9,086
Strongly disagree |     2,270      3,797 |     6,067
      Do not know |     2,719      3,739 |     6,458
        No answer |       314        423 |       737
------------------+----------------------+----------
            Total |    19,355     32,707 |    52,062

. tab q1_04 h_edu_low

    Over the next |
  five years, the |
 [LOCAL CURRENCY] |
     will be very |     Low Education
stable and trustw |         0          1 |     Total
------------------+----------------------+----------
   Strongly agree |     1,223        341 |     1,564
            Agree |     4,201      1,116 |     5,317
   Somewhat agree |     9,992      2,135 |    12,127
Somewhat disagree |     8,762      1,944 |    10,706
         Disagree |     7,341      1,745 |     9,086
Strongly disagree |     4,842      1,225 |     6,067
      Do not know |     4,606      1,852 |     6,458
        No answer |       530        207 |       737
------------------+----------------------+----------
            Total |    41,497     10,565 |    52,062
```

```
. tab q4 [aw=weight], missing

  Exchange rate of the [LOCAL CURRENCY] |
    against the euro in next five years |      Freq.     Percent        Cum.
----------------------------------------+-----------------------------------
The local currency will loose value aga | 19,099.244       36.61       36.61
                     Will stay the same | 17,756.655       34.04       70.65
The local currency will gain value agai | 4,011.8019        7.69       78.34
                            Do not know | 10,300.153       19.74       98.09
                              No answer | 998.146653        1.91      100.00
----------------------------------------+-----------------------------------
                                  Total |     52,166      100.00

. bysort CBA: tab q4 [aw=weight], missing

----------------------------------------------------------------------------

-> CBA = 0

  Exchange rate of the [LOCAL CURRENCY] |
    against the euro in next five years |      Freq.     Percent        Cum.
----------------------------------------+-----------------------------------
The local currency will loose value aga | 16,512.163       39.22       39.22
                     Will stay the same | 12,172.962       28.91       68.13
The local currency will gain value agai |3,718.63533        8.83       76.96
                            Do not know | 8,875.0057       21.08       98.04
                              No answer | 825.233954        1.96      100.00
----------------------------------------+-----------------------------------
                                  Total |     42,104      100.00

----------------------------------------------------------------------------

> CBA = 1

  Exchange rate of the [LOCAL CURRENCY] |
    against the euro in next five years |      Freq.     Percent        Cum.
----------------------------------------+-----------------------------------
The local currency will loose value aga | 2,592.8133       25.77       25.77
                     Will stay the same | 5,572.4113       55.38       81.15
The local currency will gain value agai | 295.678432        2.94       84.09
                            Do not know | 1,428.0817       14.19       98.28
                              No answer | 173.015204        1.72      100.00
----------------------------------------+-----------------------------------
                                  Total |     10,062      100.00
```

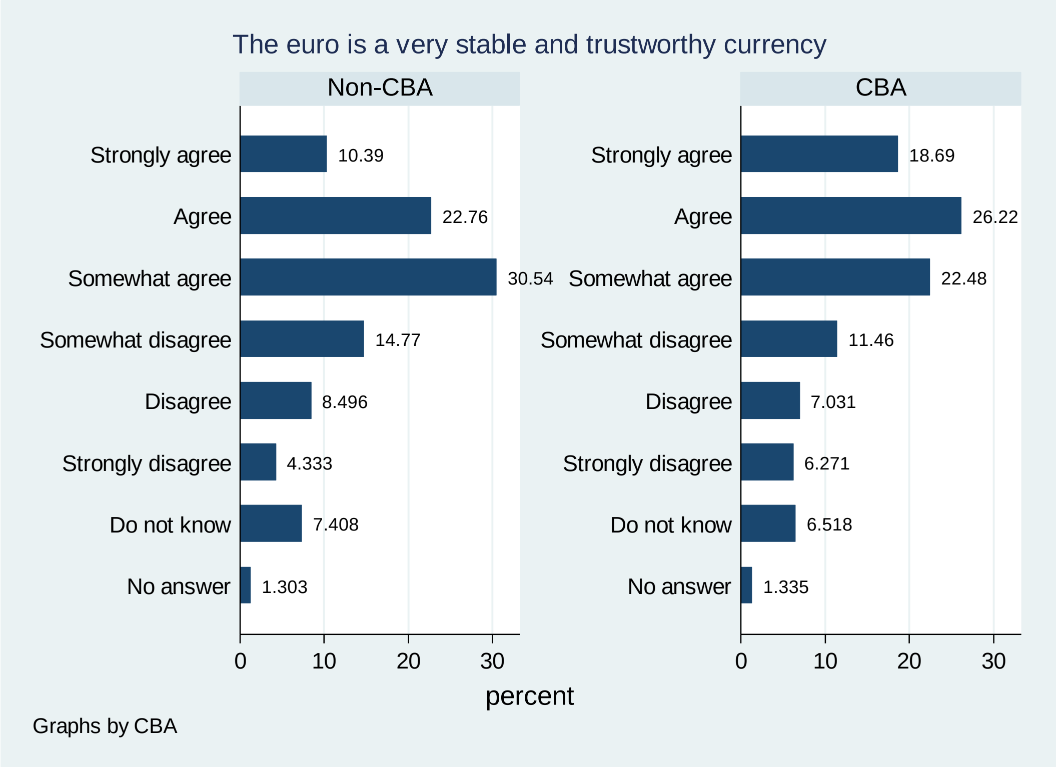
```
. catplot q4, percent(CBA) blabel(bar) by(CBA), [aw=weight
```




```
. tab q4 h_edu_medium

 Exchange rate of the |
     [LOCAL CURRENCY] |
  against the euro in |   Medium Education
      next five years |         0          1 |     Total
----------------------+----------------------+----------
The local currency wi |     7,224     11,963 |    19,187
   Will stay the same |     6,313     11,548 |    17,861
The local currency wi |     1,337      2,650 |     3,987
          Do not know |     4,072      5,963 |    10,035
            No answer |       409        583 |       992
----------------------+----------------------+----------
                Total |    19,355     32,707 |    52,062


 Exchange rate of the |
     [LOCAL CURRENCY] |
  against the euro in |     Low Education
      next five years |         0          1 |     Total
----------------------+----------------------+----------
The local currency wi |    15,482      3,705 |    19,187
   Will stay the same |    14,580      3,281 |    17,861
The local currency wi |     3,339        648 |     3,987
          Do not know |     7,351      2,684 |    10,035
            No answer |       745        247 |       992
----------------------+----------------------+----------
                Total |    41,497     10,565 |    52,062


. tab q1_09 [aw=weight], missing

    The euro is a |
  very stable and |
      trustworthy |
         currency |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree | 6,258.3267       12.00       12.00
            Agree | 12,224.025       23.43       35.43
```

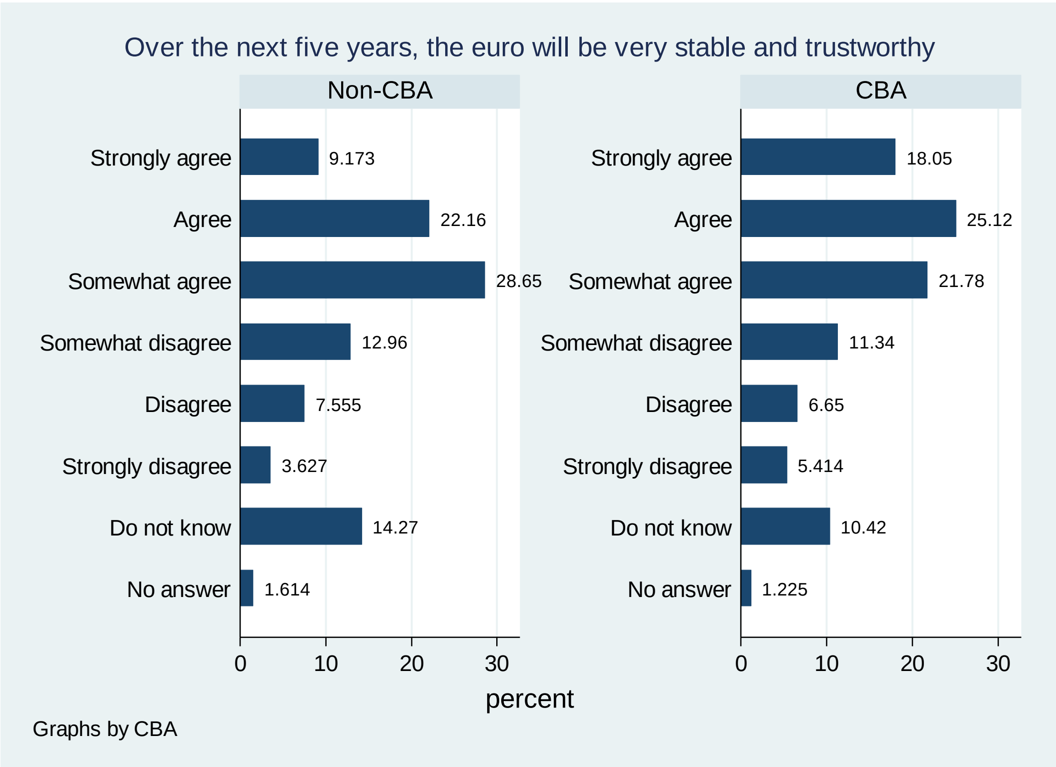
```
   Somewhat agree | 15,115.191       28.98       64.41
Somewhat disagree | 7,370.4725       14.13       78.53
         Disagree | 4,283.8708        8.21       86.75
Strongly disagree |2,456.28022        4.71       91.45
      Do not know | 3,774.6941        7.24       98.69
        No answer | 683.139932        1.31      100.00
------------------+-----------------------------------
            Total |     52,166      100.00

. bysort CBA: tab q1_09 [aw=weight], missing

----------------------------------------------------------------------------
----------------------
-> CBA = 0

    The euro is a |
  very stable and |
      trustworthy |
         currency |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree | 4,374.3967       10.39       10.39
            Agree | 9,584.6609       22.76       33.15
   Somewhat agree |12,856.8476       30.54       63.69
Somewhat disagree | 6,218.5775       14.77       78.46
         Disagree | 3,577.0263        8.50       86.95
Strongly disagree | 1,824.4281        4.33       91.29
      Do not know | 3,119.2709        7.41       98.70
        No answer |548.7920738        1.30      100.00
------------------+-----------------------------------
            Total |     42,104      100.00

----------------------------------------------------------------------------
----------------------
-> CBA = 1

    The euro is a |
  very stable and |
      trustworthy |
         currency |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree |  1,880.393       18.69       18.69
            Agree | 2,637.8925       26.22       44.90
   Somewhat agree | 2,261.7776       22.48       67.38
Somewhat disagree |1,153.30481       11.46       78.84
         Disagree | 707.468745        7.03       85.88
Strongly disagree | 631.025995        6.27       92.15
      Do not know |  655.80296        6.52       98.66
        No answer |  134.33437        1.34      100.00
------------------+-----------------------------------
            Total |     10,062      100.00
```

```
. catplot q1_09, percent(CBA) blabel(bar) by(CBA), [aw=weight]
```




```
. tab q1_10 [aw=weight], missing

    Over the next |
  five years, the |
euro will be very |
       stable and |
     trustworthy  |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree | 5,681.6116       10.89       10.89
            Agree | 11,858.664       22.73       33.62
   Somewhat agree | 14,251.336       27.32       60.94
Somewhat disagree | 6,596.4414       12.65       73.59
         Disagree |  3,849.529        7.38       80.97
Strongly disagree |2,072.86942        3.97       84.94
      Do not know | 7,053.0927       13.52       98.46
        No answer | 802.455999        1.54      100.00
------------------+-----------------------------------
            Total |     52,166      100.00

. bysort CBA: tab q1_10 [aw=weight], missing

----------------------------------------------------------------------------
----------------------
-> CBA = 0

    Over the next |
  five years, the |
euro will be very |
       stable and |
     trustworthy  |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree | 3,862.1254        9.17        9.17
            Agree | 9,329.4631       22.16       31.33
   Somewhat agree | 12,062.725       28.65       59.98
Somewhat disagree | 5,455.9969       12.96       72.94
         Disagree | 3,180.7921        7.55       80.49
```

```
Strongly disagree | 1,527.3086        3.63       84.12
       Do not know | 6,006.1872       14.27       98.39
         No answer | 679.401654        1.61      100.00
------------------+-----------------------------------
             Total |     42,104      100.00

-----------------------------------------------------------------------------
----------------------
-> CBA = 1

    Over the next |
  five years, the |
euro will be very |
       stable and |
     trustworthy  |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree | 1,815.7046       18.05       18.05
            Agree | 2,527.9369       25.12       43.17
   Somewhat agree | 2,191.5389       21.78       64.95
Somewhat disagree | 1,141.1338       11.34       76.29
         Disagree | 669.122374        6.65       82.94
Strongly disagree | 544.799225        5.41       88.35
      Do not know |  1,048.544       10.42       98.78
        No answer |123.2201518        1.22      100.00
------------------+-----------------------------------
            Total |     10,062      100.00

. catplot q1_10, percent(CBA) blabel(bar) by(CBA), [aw=weight]
```



Appendix 4.2b: Significance of the differences in the responses to selected questions

```
. tab q1_03 CBA, missing column row chi2 lrchi2 gamma taub

+-------------------+
| Key               |
|-------------------|
|     frequency     |
|  row percentage   |
| column percentage |
+-------------------+

   Currently, the |
 [LOCAL CURRENCY] |
 is a very stable |
  and trustworthy |         CBA
         currency |         0          1 |     Total
------------------+----------------------+----------
   Strongly agree |     1,282        783 |     2,065 
                  |     62.08      37.92 |    100.00 
                  |      3.04       7.78 |      3.96 
------------------+----------------------+----------
            Agree |     4,430      1,683 |     6,113 
                  |     72.47      27.53 |    100.00 
                  |     10.52      16.73 |     11.72 
------------------+----------------------+----------
   Somewhat agree |     9,796      2,444 |    12,240 
                  |     80.03      19.97 |    100.00 
                  |     23.27      24.29 |     23.46 
------------------+----------------------+----------
Somewhat disagree |     9,232      1,633 |    10,865 
                  |     84.97      15.03 |    100.00 
                  |     21.93      16.23 |     20.83 
------------------+----------------------+----------
         Disagree |     8,580      1,301 |     9,881 
                  |     86.83      13.17 |    100.00 
                  |     20.38      12.93 |     18.94 
------------------+----------------------+----------
Strongly disagree |     6,425      1,627 |     8,052 
                  |     79.79      20.21 |    100.00 
                  |     15.26      16.17 |     15.44 
------------------+----------------------+----------
      Do not know |     1,952        512 |     2,464 
                  |     79.22      20.78 |    100.00 
                  |      4.64       5.09 |      4.72 
------------------+----------------------+----------
        No answer |       407         79 |       486 
                  |     83.74      16.26 |    100.00 
                  |      0.97       0.79 |      0.93 
------------------+----------------------+----------
            Total |    42,104     10,062 |    52,166 
                  |     80.71      19.29 |    100.00 
                  |    100.00     100.00 |    100.00 

          Pearson chi2(7) =  1.1e+03   Pr = 0.000
 likelihood-ratio chi2(7) =  1.0e+03   Pr = 0.000
                    gamma =  -0.1430  ASE = 0.008
          Kendall's tau-b =  -0.0733  ASE = 0.004
```

```
. tab q1_04 CBA, missing column row chi2 lrchi2 gamma taub

+-------------------+
| Key               |
|-------------------|
|     frequency     |
|  row percentage   |
| column percentage |
+-------------------+

    Over the next |
  five years, the |
 [LOCAL CURRENCY] |
     will be very |          CBA
stable and trustw |         0          1 |     Total
------------------+----------------------+----------
   Strongly agree |       992        573 |     1,565 
                  |     63.39      36.61 |    100.00 
                  |      2.36       5.69 |      3.00 
------------------+----------------------+----------
            Agree |     4,020      1,315 |     5,335 
                  |     75.35      24.65 |    100.00 
                  |      9.55      13.07 |     10.23 
------------------+----------------------+----------
   Somewhat agree |     9,933      2,217 |    12,150 
                  |     81.75      18.25 |    100.00 
                  |     23.59      22.03 |     23.29 
------------------+----------------------+----------
Somewhat disagree |     8,992      1,736 |    10,728 
                  |     83.82      16.18 |    100.00 
                  |     21.36      17.25 |     20.57 
------------------+----------------------+----------
         Disagree |     7,660      1,446 |     9,106 
                  |     84.12      15.88 |    100.00 
                  |     18.19      14.37 |     17.46 
------------------+----------------------+----------
Strongly disagree |     4,515      1,562 |     6,077 
                  |     74.30      25.70 |    100.00 
                  |     10.72      15.52 |     11.65 
------------------+----------------------+----------
      Do not know |     5,363      1,105 |     6,468 
                  |     82.92      17.08 |    100.00 
                  |     12.74      10.98 |     12.40 
------------------+----------------------+----------
        No answer |       629        108 |       737 
                  |     85.35      14.65 |    100.00 
                  |      1.49       1.07 |      1.41 
------------------+----------------------+----------
            Total |    42,104     10,062 |    52,166 
                  |     80.71      19.29 |    100.00 
                  |    100.00     100.00 |    100.00 

          Pearson chi2(7) = 734.1232   Pr = 0.000
 likelihood-ratio chi2(7) = 677.7127   Pr = 0.000
                    gamma =  -0.0635  ASE = 0.008
          Kendall's tau-b =  -0.0327  ASE = 0.004
```

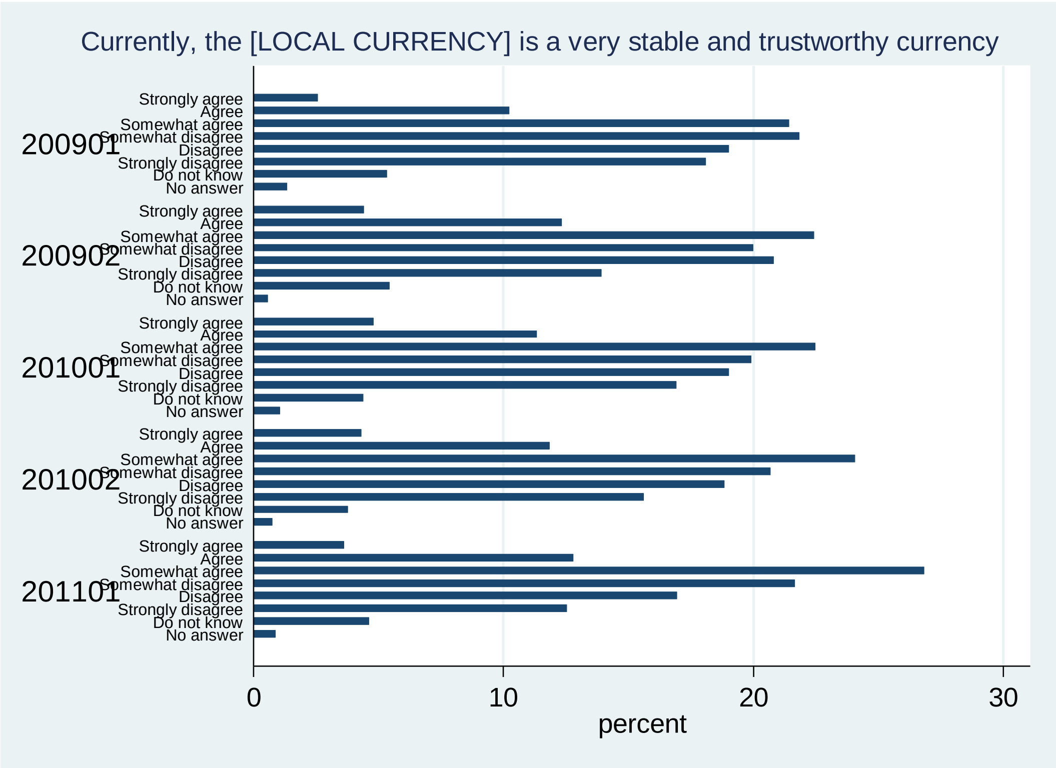
```
. tab q4 CBA, missing column row chi2 lrchi2 gamma taub

+-------------------+
| Key               |
|-------------------|
|     frequency     |
|  row percentage   |
| column percentage |
+-------------------+

 Exchange rate of the |
     [LOCAL CURRENCY] |
  against the euro in |          CBA
      next five years |         0          1 |     Total
----------------------+----------------------+----------
The local currency wi |    16,626      2,600 |    19,226 
                      |     86.48      13.52 |    100.00 
                      |     39.49      25.84 |     36.86 
----------------------+----------------------+----------
   Will stay the same |    12,327      5,575 |    17,902 
                      |     68.86      31.14 |    100.00 
                      |     29.28      55.41 |     34.32 
----------------------+----------------------+----------
The local currency wi |     3,702        297 |     3,999 
                      |     92.57       7.43 |    100.00 
                      |      8.79       2.95 |      7.67 
----------------------+----------------------+----------
          Do not know |     8,625      1,420 |    10,045 
                      |     85.86      14.14 |    100.00 
                      |     20.48      14.11 |     19.26 
----------------------+----------------------+----------
            No answer |       824        170 |       994 
                      |     82.90      17.10 |    100.00 
                      |      1.96       1.69 |      1.91 
----------------------+----------------------+----------
                Total |    42,104     10,062 |    52,166 
                      |     80.71      19.29 |    100.00 
                      |    100.00     100.00 |    100.00 

          Pearson chi2(4) =  2.6e+03   Pr = 0.000
 likelihood-ratio chi2(4) =  2.5e+03   Pr = 0.000
                    gamma =   0.0374  ASE = 0.008
          Kendall's tau-b =   0.0175  ASE = 0.004

. tab q1_09 CBA, missing column row chi2 lrchi2 gamma taub

+-------------------+
| Key               |
|-------------------|
|     frequency     |
|  row percentage   |
| column percentage |
+-------------------+

   The euro is a |
  very stable and |
      trustworthy |          CBA
         currency |         0          1 |     Total
------------------+----------------------+----------
   Strongly agree |     4,391      1,863 |     6,254 
                  |     70.21      29.79 |    100.00 
                  |     10.43      18.52 |     11.99 
------------------+----------------------+----------
            Agree |     9,559      2,635 |    12,194 
                  |     78.39      21.61 |    100.00 
                  |     22.70      26.19 |     23.38 
------------------+----------------------+----------
   Somewhat agree |    12,990      2,290 |    15,280 
```

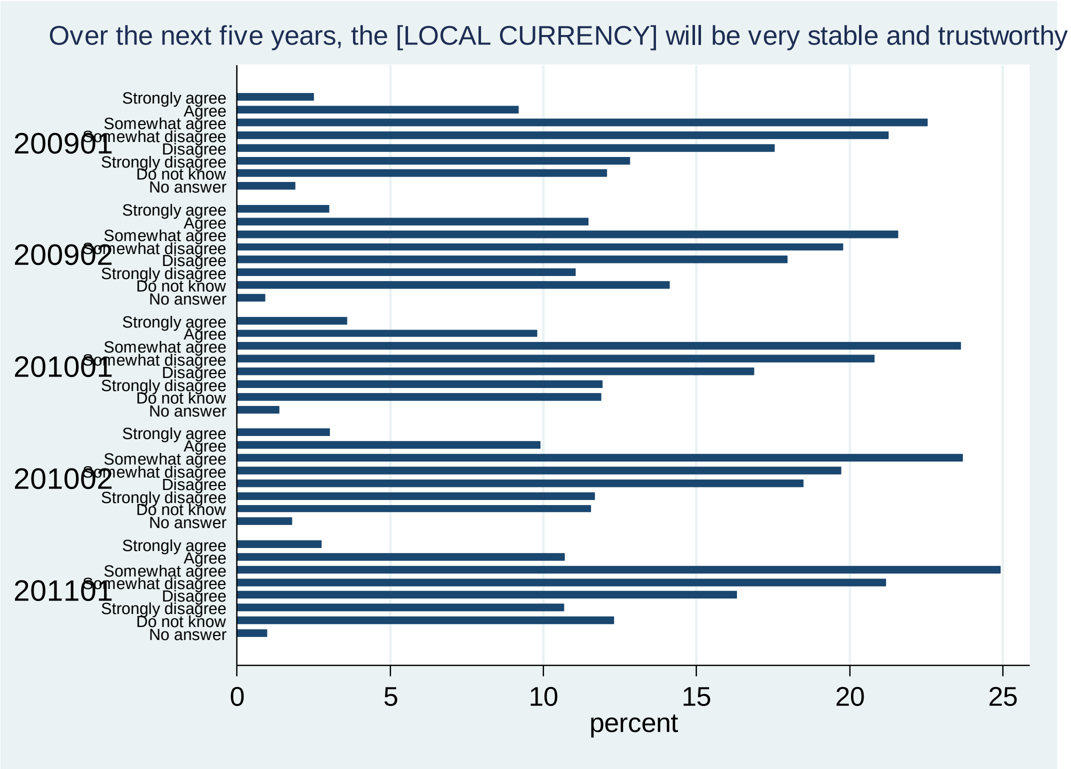
```
                   |     85.01      14.99 |    100.00 
                   |     30.85      22.76 |     29.29 
-------------------+----------------------+----------
Somewhat disagree |      6,280      1,167 |     7,447 
                   |     84.33      15.67 |    100.00 
                   |     14.92      11.60 |     14.28 
-------------------+----------------------+----------
          Disagree |     3,608        721 |     4,329 
                   |     83.34      16.66 |    100.00 
                   |      8.57       7.17 |      8.30 
-------------------+----------------------+----------
Strongly disagree |      1,817        628 |     2,445 
                   |     74.31      25.69 |    100.00 
                   |      4.32       6.24 |      4.69 
-------------------+----------------------+----------
       Do not know |     2,926        629 |     3,555 
                   |     82.31      17.69 |    100.00 
                   |      6.95       6.25 |      6.81 
-------------------+----------------------+----------
         No answer |       533        129 |       662 
                   |     80.51      19.49 |    100.00 
                   |      1.27       1.28 |      1.27 
-------------------+----------------------+----------
             Total |    42,104     10,062 |    52,166 
                   |     80.71      19.29 |    100.00 
                   |    100.00     100.00 |    100.00 

          Pearson chi2(7) = 818.7032   Pr = 0.000
 likelihood-ratio chi2(7) = 781.2549   Pr = 0.000
                    gamma =  -0.1270  ASE = 0.008
          Kendall's tau-b =  -0.0646  ASE = 0.004

. tab q1_10 CBA, missing column row chi2 lrchi2 gamma taub

+-------------------+
| Key               |
|-------------------|
|     frequency     |
|  row percentage   |
| column percentage |
+-------------------+

    Over the next |
  five years, the |
euro will be very |
       stable and |         CBA
      trustworthy |         0          1 |     Total
-------------------+----------------------+----------
   Strongly agree |      3,825      1,799 |     5,624 
                   |     68.01      31.99 |    100.00 
                   |      9.08      17.88 |     10.78 
-------------------+----------------------+----------
             Agree |     9,349      2,523 |    11,872 
                   |     78.75      21.25 |    100.00 
                   |     22.20      25.07 |     22.76 
-------------------+----------------------+----------
   Somewhat agree |     12,221      2,211 |    14,432 
                   |     84.68      15.32 |    100.00 
                   |     29.03      21.97 |     27.67 
-------------------+----------------------+----------
Somewhat disagree |      5,534      1,168 |     6,702 
                   |     82.57      17.43 |    100.00 
                   |     13.14      11.61 |     12.85 
-------------------+----------------------+----------
          Disagree |     3,196        671 |     3,867 
                   |     82.65      17.35 |    100.00 
                   |      7.59       6.67 |      7.41 
-------------------+----------------------+----------
```

| | | | |
|---|---|---|---|
| Strongly disagree | 1,519 | 550 | 2,069 |
| | 73.42 | 26.58 | 100.00 |
| | 3.61 | 5.47 | 3.97 |
| Do not know | 5,809 | 1,020 | 6,829 |
| | 85.06 | 14.94 | 100.00 |
| | 13.80 | 10.14 | 13.09 |
| No answer | 651 | 120 | 771 |
| | 84.44 | 15.56 | 100.00 |
| | 1.55 | 1.19 | 1.48 |
| Total | 42,104 | 10,062 | 52,166 |
| | 80.71 | 19.29 | 100.00 |
| | 100.00 | 100.00 | 100.00 |

```
          Pearson chi2(7) =  942.8871   Pr = 0.000
 likelihood-ratio chi2(7) =  879.3169   Pr = 0.000
                    gamma =   -0.1486  ASE = 0.008
          Kendall's tau-b =   -0.0759  ASE = 0.004
```

Appendix 4.2c: Differences in the question about the currency stability through waves






**Appendidx 4.2d Level of eduation**

```
tab h_edu, missing

    education of |
      respondent |      Freq.     Percent        Cum.
-----------------+-----------------------------------
       no answer |         19        0.04        0.04
   low education |     10,410       20.23       20.27
medium education |     32,369       62.90       83.17
  high education |      8,661       16.83      100.00
-----------------+-----------------------------------
           Total |     51,459      100.00
```

**Appendix 4.3: Correlation matrix between the questions of interest**

```
. corr q1_01 q1_02 q1_03 q1_04 q1_09 q1_10 q22f_1
(obs=52166)

             |    q1_01    q1_02    q1_03    q1_04    q1_09    q1_10   q22f_1
-------------+---------------------------------------------------------------
       q1_01 |   1.0000
       q1_02 |   0.4851   1.0000
       q1_03 |   0.3873   0.4029   1.0000
       q1_04 |   0.3429   0.4814   0.5584   1.0000
       q1_09 |   0.1855   0.2687   0.3329   0.2986   1.0000
       q1_10 |   0.1775   0.3158   0.2892   0.3834   0.6696   1.0000
      q22f_1 |   0.2686   0.2629   0.2042   0.2024   0.1361   0.1387   1.0000


. corr q1_01 q1_02 q1_03 q1_04 q1_09 q1_10 q22f_1 if CBA==1
(obs=10062)

             |    q1_01    q1_02    q1_03    q1_04    q1_09    q1_10   q22f_1
-------------+---------------------------------------------------------------
       q1_01 |   1.0000
```

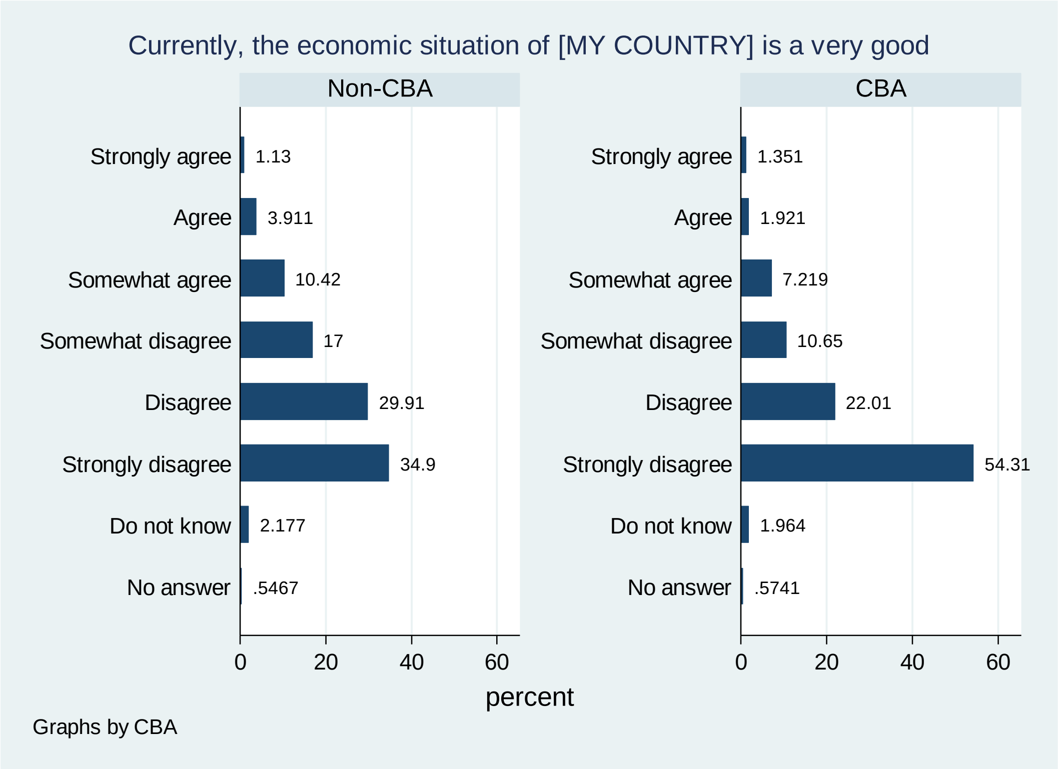
```
     q1_02 |   0.4726   1.0000
     q1_03 |   0.2704   0.3714   1.0000
     q1_04 |   0.2929   0.4019   0.6191   1.0000
     q1_09 |   0.1468   0.2435   0.3047   0.2732   1.0000
     q1_10 |   0.1536   0.2868   0.3101   0.3379   0.7153   1.0000
    q22f_1 |   0.1920   0.2427   0.1395   0.1514   0.1048   0.1242   1.0000
```

**Appendix 4.4: Responses to the questions about the economic situation in a country and trust in government**

Appendix 4.4a percentage of responses to questions about the economic situation in a country

```
. tab q1_01 [aw=weight], missing

   Currently, the |
         economic |
  situation of [MY |
  COUNTRY] is very |
             good |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree | 611.632021        1.17        1.17
            Agree | 1,839.2704        3.53        4.70
   Somewhat agree |5,112.92482        9.80       14.50
Somewhat disagree |8,226.90875       15.77       30.27
         Disagree | 14,804.694       28.38       58.65
Strongly disagree | 20,168.347       38.66       97.31
      Do not know | 1,114.2688        2.14       99.45
        No answer | 287.953831        0.55      100.00
------------------+-----------------------------------
            Total |     52,166      100.00

. bysort CBA: tab q1_01 [aw=weight], missing

----------------------------------------------------------------------------
----------------------
-> CBA = 0

   Currently, the |
         economic |
  situation of [MY |
  COUNTRY] is very |
             good |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree |475.5686734        1.13        1.13
            Agree | 1,646.7795        3.91        5.04
   Somewhat agree | 4,387.9513       10.42       15.46
Somewhat disagree |7,158.35891       17.00       32.46
         Disagree | 12,593.465       29.91       62.37
Strongly disagree |  14,694.96       34.90       97.28
      Do not know |916.7390192        2.18       99.45
        No answer |230.1779867        0.55      100.00
------------------+-----------------------------------
            Total |     42,104      100.00

----------------------------------------------------------------------------
----------------------
-> CBA = 1

   Currently, the |
         economic |
  situation of [MY |
  COUNTRY] is very |
             good |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree | 135.968812        1.35        1.35
            Agree |193.3389679        1.92        3.27
```

```
   Somewhat agree | 726.338749        7.22       10.49
Somewhat disagree | 1,071.2585       10.65       21.14
         Disagree | 2,214.5969       22.01       43.15
Strongly disagree | 5,465.1132       54.31       97.46
      Do not know | 197.620738        1.96       99.43
        No answer | 57.7641687        0.57      100.00
------------------+-----------------------------------
            Total |     10,062      100.00

. catplot q1_01, percent(CBA) blabel(bar) by(CBA), [aw=weight]
```




```
. tab q1_02 [aw=weight], missing

    Over the next |
  five years, the |
         economic |
 situation of [MY |
    COUNTRY] will |
          improve |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree | 1,344.7211        2.58        2.58
            Agree | 5,128.4554        9.83       12.41
   Somewhat agree | 12,122.802       23.24       35.65
Somewhat disagree | 9,570.4925       18.35       53.99
         Disagree | 10,392.391       19.92       73.92
Strongly disagree | 8,698.7122       16.68       90.59
      Do not know | 4,418.2932        8.47       99.06
        No answer | 490.133187        0.94      100.00
------------------+-----------------------------------
            Total |     52,166      100.00

. bysort CBA: tab q1_02 [aw=weight], missing

----------------------------------------------------------------------------
----------------------
-> CBA = 0

    Over the next |
```

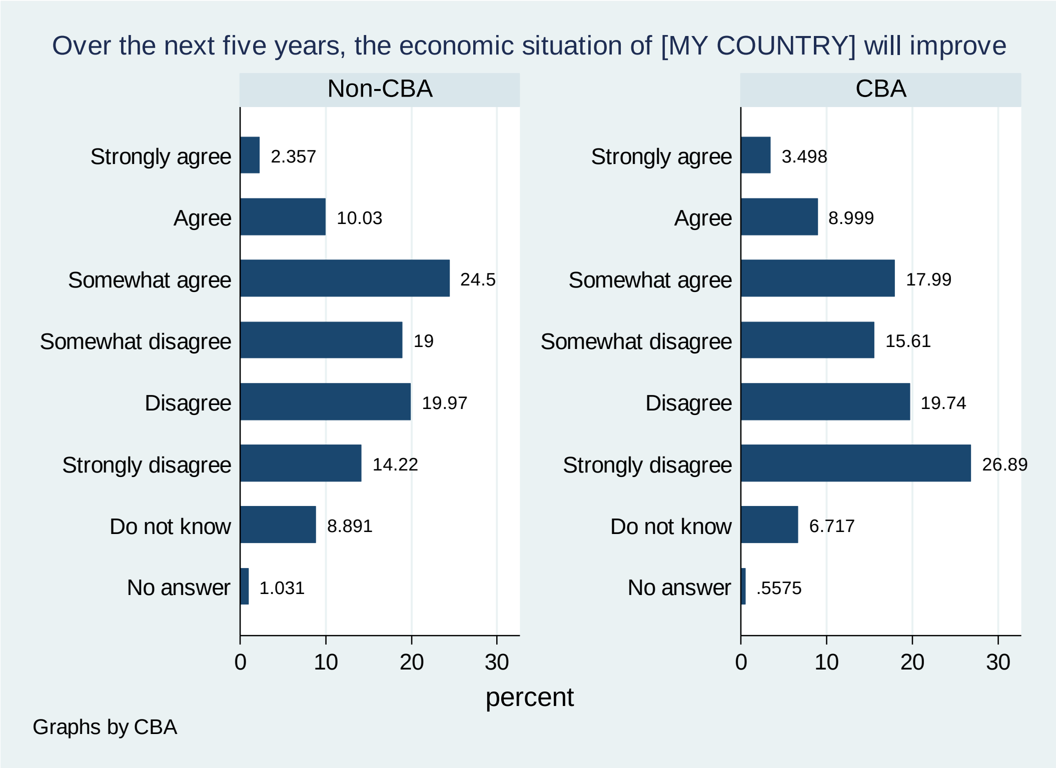
| five years, the economic situation of [MY COUNTRY] will improve | Freq. | Percent | Cum. |
|---|---|---|---|
| Strongly agree | 992.246665 | 2.36 | 2.36 |
| Agree | 4,223.4125 | 10.03 | 12.39 |
| Somewhat agree | 10,315.589 | 24.50 | 36.89 |
| Somewhat disagree | 8,000.7748 | 19.00 | 55.89 |
| Disagree | 8,406.5203 | 19.97 | 75.86 |
| Strongly disagree | 5,987.8482 | 14.22 | 90.08 |
| Do not know | 3,743.3642 | 8.89 | 98.97 |
| No answer | 434.244078 | 1.03 | 100.00 |
| Total | 42,104 | 100.00 | |

-------------------------------------------------------------------------------------------------

-> CBA = 1

| Over the next five years, the economic situation of [MY COUNTRY] will improve | Freq. | Percent | Cum. |
|---|---|---|---|
| Strongly agree | 351.98789 | 3.50 | 3.50 |
| Agree | 905.482696 | 9.00 | 12.50 |
| Somewhat agree | 1,809.9881 | 17.99 | 30.49 |
| Somewhat disagree | 1,571.1616 | 15.61 | 46.10 |
| Disagree | 1,985.9678 | 19.74 | 65.84 |
| Strongly disagree | 2,705.4653 | 26.89 | 92.73 |
| Do not know | 675.855452 | 6.72 | 99.44 |
| No answer | 56.0910969 | 0.56 | 100.00 |
| Total | 10,062 | 100.00 | |

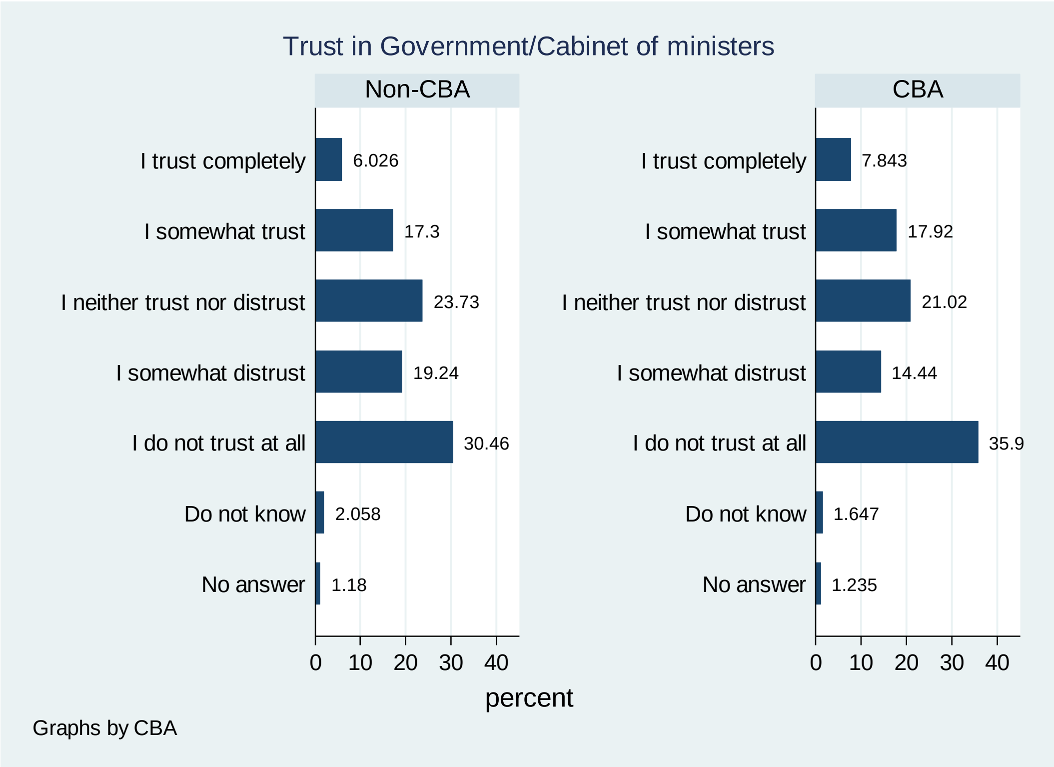
```
. catplot q1_02, percent(CBA) blabel(bar) by(CBA), [aw=weight]

.
```




```
. tab q22f_1 [aw=weight], missing

 Trust in Government/cabinet |
              of ministers |      Freq.     Percent        Cum.
-----------------------------+-----------------------------------
          I trust completely | 3,327.2314        6.38        6.38
            I somewhat trust | 9,088.3189       17.42       23.80
I neither trust nor distrust | 12,103.678       23.20       47.00
         I somewhat distrust | 9,553.6678       18.31       65.32
       I do not trust at all | 16,439.892       31.51       96.83
                 Do not know | 1,032.1554        1.98       98.81
                   No answer | 621.056477        1.19      100.00
-----------------------------+-----------------------------------
                       Total |     52,166      100.00

. bysort CBA: tab q22f_1 [aw=weight], missing

----------------------------------------------------------------------------
----------------------
-> CBA = 0

 Trust in Government/cabinet |
              of ministers |      Freq.     Percent        Cum.
-----------------------------+-----------------------------------
          I trust completely | 2,537.2489        6.03        6.03
            I somewhat trust | 7,285.4045       17.30       23.33
I neither trust nor distrust | 9,989.8537       23.73       47.06
         I somewhat distrust | 8,102.8022       19.24       66.30
       I do not trust at all | 12,825.344       30.46       96.76
                 Do not know | 866.613281        2.06       98.82
                   No answer | 496.733729        1.18      100.00
-----------------------------+-----------------------------------
                       Total |     42,104      100.00
```

```
----------------------------------------------------------------------------
----------------------
-> CBA = 1

 Trust in Government/cabinet |
               of ministers |      Freq.     Percent        Cum.
----------------------------+-----------------------------------
          I trust completely | 789.207884        7.84        7.84
            I somewhat trust | 1,802.6535       17.92       25.76
I neither trust nor distrust | 2,114.9779       21.02       46.78
         I somewhat distrust |1,452.91364       14.44       61.22
       I do not trust at all | 3,612.2306       35.90       97.12
                 Do not know | 165.717432        1.65       98.76
                   No answer | 124.299069        1.24      100.00
----------------------------+-----------------------------------
                       Total |     10,062      100.00
```

```
. catplot q22f_1, percent(CBA) blabel(bar) by(CBA), [aw=weight]
```




Appendix 4.4b: Statistical significance of the differences in responses to selected questions (from 4.4.a)

```
. tab q1_01 CBA, missing column row chi2 lrchi2 gamma taub

+-------------------+
| Key               |
|-------------------|
|     frequency     |
|  row percentage   |
| column percentage |
+-------------------+

   Currently, the |
         economic |
 situation of [MY |
 COUNTRY] is very |          CBA
```

```
             good |         0          1 |     Total
------------------+----------------------+----------
   Strongly agree |       476        133 |       609 
                  |     78.16      21.84 |    100.00 
                  |      1.13       1.32 |      1.17 
------------------+----------------------+----------
            Agree |     1,662        197 |     1,859 
                  |     89.40      10.60 |    100.00 
                  |      3.95       1.96 |      3.56 
------------------+----------------------+----------
   Somewhat agree |     4,486        727 |     5,213 
                  |     86.05      13.95 |    100.00 
                  |     10.65       7.23 |      9.99 
------------------+----------------------+----------
Somewhat disagree |     7,205      1,095 |     8,300 
                  |     86.81      13.19 |    100.00 
                  |     17.11      10.88 |     15.91 
------------------+----------------------+----------
         Disagree |    12,568      2,242 |    14,810 
                  |     84.86      15.14 |    100.00 
                  |     29.85      22.28 |     28.39 
------------------+----------------------+----------
Strongly disagree |    14,624      5,429 |    20,053 
                  |     72.93      27.07 |    100.00 
                  |     34.73      53.96 |     38.44 
------------------+----------------------+----------
      Do not know |       856        185 |     1,041 
                  |     82.23      17.77 |    100.00 
                  |      2.03       1.84 |      2.00 
------------------+----------------------+----------
        No answer |       227         54 |       281 
                  |     80.78      19.22 |    100.00 
                  |      0.54       0.54 |      0.54 
------------------+----------------------+----------
            Total |    42,104     10,062 |    52,166 
                  |     80.71      19.29 |    100.00 
                  |    100.00     100.00 |    100.00 

          Pearson chi2(7) =  1.3e+03   Pr = 0.000
 likelihood-ratio chi2(7) =  1.3e+03   Pr = 0.000
                    gamma =   0.2686  ASE = 0.008
          Kendall's tau-b =   0.1257  ASE = 0.004

. tab q1_02 CBA, missing column row chi2 lrchi2 gamma taub

+-------------------+
| Key               |
|-------------------|
|     frequency     |
|  row percentage   |
| column percentage |
+-------------------+

    Over the next |
  five years, the |
         economic |
 situation of [MY |
    COUNTRY] will |          CBA
          improve |         0          1 |     Total
------------------+----------------------+----------
   Strongly agree |     1,001        355 |     1,356 
                  |     73.82      26.18 |    100.00 
                  |      2.38       3.53 |      2.60 
------------------+----------------------+----------
            Agree |     4,281        896 |     5,177 
                  |     82.69      17.31 |    100.00 
                  |     10.17       8.90 |      9.92 
------------------+----------------------+----------
```

```
   Somewhat agree |    10,474      1,836 |    12,310 
                  |     85.09      14.91 |    100.00 
                  |     24.88      18.25 |     23.60 
------------------+----------------------+----------
Somewhat disagree |     8,045      1,603 |     9,648 
                  |     83.39      16.61 |    100.00 
                  |     19.11      15.93 |     18.49 
------------------+----------------------+----------
         Disagree |     8,383      1,994 |    10,377 
                  |     80.78      19.22 |    100.00 
                  |     19.91      19.82 |     19.89 
------------------+----------------------+----------
Strongly disagree |     5,886      2,665 |     8,551 
                  |     68.83      31.17 |    100.00 
                  |     13.98      26.49 |     16.39 
------------------+----------------------+----------
      Do not know |     3,622        660 |     4,282 
                  |     84.59      15.41 |    100.00 
                  |      8.60       6.56 |      8.21 
------------------+----------------------+----------
        No answer |       412         53 |       465 
                  |     88.60      11.40 |    100.00 
                  |      0.98       0.53 |      0.89 
------------------+----------------------+----------
            Total |    42,104     10,062 |    52,166 
                  |     80.71      19.29 |    100.00 
                  |    100.00     100.00 |    100.00 

          Pearson chi2(7) =  1.1e+03   Pr = 0.000
 likelihood-ratio chi2(7) =  1.0e+03   Pr = 0.000
                    gamma =   0.1144  ASE = 0.008
          Kendall's tau-b =   0.0584  ASE = 0.004

. tab q22f_1 CBA, missing column row chi2 lrchi2 gamma taub

+-------------------+
| Key               |
|-------------------|
|     frequency     |
|  row percentage   |
| column percentage |
+-------------------+

             Trust in |
Government/cabinet of |         CBA
            ministers |         0          1 |     Total
----------------------+----------------------+----------
   I trust completely |     2,611        790 |     3,401 
                      |     76.77      23.23 |    100.00 
                      |      6.20       7.85 |      6.52 
----------------------+----------------------+----------
     I somewhat trust |     7,322      1,832 |     9,154 
                      |     79.99      20.01 |    100.00 
                      |     17.39      18.21 |     17.55 
----------------------+----------------------+----------
I neither trust nor d |    10,044      2,132 |    12,176 
                      |     82.49      17.51 |    100.00 
                      |     23.86      21.19 |     23.34 
----------------------+----------------------+----------
  I somewhat distrust |     8,174      1,467 |     9,641 
                      |     84.78      15.22 |    100.00 
                      |     19.41      14.58 |     18.48 
----------------------+----------------------+----------
I do not trust at all |    12,654      3,556 |    16,210 
                      |     78.06      21.94 |    100.00 
                      |     30.05      35.34 |     31.07 
----------------------+----------------------+----------
          Do not know |       815        162 |       977 
```

```
                         |     83.42      16.58 |    100.00 
                         |      1.94       1.61 |      1.87 
-------------------------+----------------------+----------
               No answer |       484        123 |       607 
                         |     79.74      20.26 |    100.00 
                         |      1.15       1.22 |      1.16 
-------------------------+----------------------+----------
                   Total |    42,104     10,062 |    52,166 
                         |     80.71      19.29 |    100.00 
                         |    100.00     100.00 |    100.00 

          Pearson chi2(6) = 242.4514   Pr = 0.000
 likelihood-ratio chi2(6) = 245.4633   Pr = 0.000
                    gamma =   0.0140  ASE = 0.008
          Kendall's tau-b =   0.0069  ASE = 0.004
```

**SUR**

```
. *always margins saved due to use of interation terms in all specifications
. *age base group 15-43
.
. *Gtrust (ONLY FOR THE SMALL DATASET)
. drop if q22f_1==.
(0 observations deleted)

. drop if q22f_1==9
(0 observations deleted)

.
```

## Appendix 4.5: SUR results of the 'credibility' model (country as cluster)

### Appendix 4.5a: SUR results of the 'credibility' model (country as cluster, unweighted)

```
. *with EU, ExYu and high level of development dummies (with trust in government) - T
> HE PREFERRED
. biprobit (CSagree = i.CBA i.q22f_1 i.CBA#i.q22f_1 ECSagree i.q1_01 i.CBA#i.q1_01
h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed
fall2009 spring2010 fall2010 spring2011 EU ExYu high_lev_dev) (ExpCSagree = i.CBA
i.q22f_1 i.CBA#i.q22f_1 ExpECSagree i.q1_02 i.CBA#i.q1_02 h_aged2 h_aged3 h_female
h_edu_high h_edu_medium h_retired h_student h_unemployed fall2009 spring2010 fall2010
spring2011 EU ExYu high_lev_dev), vce(cluster country) nolog

Seemingly unrelated bivariate probit              Number of obs   =      37908
                                                  Wald chi2(6)    =          .
Log pseudolikelihood = -39927.996                 Prob > chi2     =          .

                               (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
CSagree      |
       1.CBA |  -.1667734   .2259507    -0.74   0.460    -.6096287    .2760819
             |
      q22f_1 |
          2  |  -.1389598   .0535575    -2.59   0.009    -.2439306    -.033989
          3  |  -.3424918   .0691528    -4.95   0.000    -.4780289   -.2069548
          4  |  -.4137683   .0972747    -4.25   0.000    -.6044233   -.2231133
          5  |     -.5173   .0896251    -5.77   0.000    -.6929619    -.341638
          8  |  -.4443723   .1565064    -2.84   0.005    -.7511193   -.1376253
             |
  CBA#q22f_1 |
        1 2  |   .1592245     .06531     2.44   0.015     .0312193    .2872297
        1 3  |   .1967043    .091192     2.16   0.031     .0179713    .3754372
        1 4  |    .115451   .1153866     1.00   0.317    -.1107025    .3416046
        1 5  |   .2382538   .0989456     2.41   0.016     .0443239    .4321837
        1 8  |  -.2267072   .1897834    -1.19   0.232    -.5986757    .1452614
             |
    ECSagree |    .429579   .0761523     5.64   0.000     .2803233    .5788347
             |
```

| | | | | | | |
|---|---|---|---|---|---|---|
| q1_01 | | | | | | |
| 2 | -.1690199 | .1241431 | -1.36 | 0.173 | -.4123359 | .0742961 |
| 3 | -.5058682 | .1487516 | -3.40 | 0.001 | -.797416 | -.2143204 |
| 4 | -.9081869 | .1541618 | -5.89 | 0.000 | -1.210338 | -.6060354 |
| 5 | -1.149031 | .1751456 | -6.56 | 0.000 | -1.49231 | -.8057521 |
| 6 | -1.379297 | .1872718 | -7.37 | 0.000 | -1.746343 | -1.012251 |
| 8 | -1.078279 | .1653264 | -6.52 | 0.000 | -1.402313 | -.7542456 |
| CBA#q1_01 | | | | | | |
| 1 2 | .1106121 | .1723523 | 0.64 | 0.521 | -.2271922 | .4484164 |
| 1 3 | .2190222 | .1436302 | 1.52 | 0.127 | -.0624878 | .5005323 |
| 1 4 | .3108567 | .1720757 | 1.81 | 0.071 | -.0264054 | .6481188 |
| 1 5 | .6221899 | .1610325 | 3.86 | 0.000 | .3065721 | .9378078 |
| 1 6 | .7093514 | .1645316 | 4.31 | 0.000 | .3868754 | 1.031827 |
| 1 8 | .5944797 | .1632059 | 3.64 | 0.000 | .274602 | .9143574 |
| h_aged2 | -.0224442 | .022427 | -1.00 | 0.317 | -.0664003 | .0215118 |
| h_aged3 | .077724 | .0408985 | 1.90 | 0.057 | -.0024355 | .1578836 |
| h_female | -.0182666 | .0184133 | -0.99 | 0.321 | -.0543561 | .0178229 |
| h_edu_high | .1037622 | .0268284 | 3.87 | 0.000 | .0511794 | .1563449 |
| h_edu_medium | .0534329 | .0469637 | 1.14 | 0.255 | -.0386142 | .14548 |
| h_retired | -.0436992 | .0772912 | -0.57 | 0.572 | -.1951872 | .1077888 |
| h_student | -.0148439 | .0581217 | -0.26 | 0.798 | -.1287603 | .0990725 |
| h_unemployed | .0269772 | .048424 | 0.56 | 0.577 | -.0679322 | .1218866 |
| fall2009 | .1340979 | .0511988 | 2.62 | 0.009 | .03375 | .2344457 |
| spring2010 | .2021588 | .0422608 | 4.78 | 0.000 | .1193293 | .2849884 |
| fall2010 | .1872815 | .0625615 | 2.99 | 0.003 | .0646633 | .3098997 |
| spring2011 | .3193893 | .0475177 | 6.72 | 0.000 | .2262563 | .4125224 |
| EU | -.1971427 | .2198096 | -0.90 | 0.370 | -.6279616 | .2336761 |
| ExYu | .357833 | .3245117 | 1.10 | 0.270 | -.2781983 | .9938643 |
| high_lev_dev | .3683192 | .2879689 | 1.28 | 0.201 | -.1960895 | .9327279 |
| _cons | .3508507 | .1910936 | 1.84 | 0.066 | -.0236858 | .7253872 |
| ExpCSagree | | | | | | |
| 1.CBA | -.2665004 | .2819066 | -0.95 | 0.344 | -.8190272 | .2860264 |
| q22f_1 | | | | | | |
| 2 | -.056096 | .0834276 | -0.67 | 0.501 | -.2196111 | .107419 |
| 3 | -.2504575 | .1307149 | -1.92 | 0.055 | -.506654 | .0057391 |
| 4 | -.402186 | .1372357 | -2.93 | 0.003 | -.671163 | -.133209 |
| 5 | -.5172362 | .1078486 | -4.80 | 0.000 | -.7286156 | -.3058568 |
| 8 | -.520284 | .1210606 | -4.30 | 0.000 | -.7575585 | -.2830095 |
| CBA#q22f_1 | | | | | | |
| 1 2 | .2435898 | .0856029 | 2.85 | 0.004 | .0758112 | .4113684 |
| 1 3 | .3507656 | .1301127 | 2.70 | 0.007 | .0957495 | .6057818 |
| 1 4 | .3324117 | .1524028 | 2.18 | 0.029 | .0337077 | .6311158 |
| 1 5 | .4845257 | .1190436 | 4.07 | 0.000 | .2512046 | .7178468 |
| 1 8 | .3529001 | .2414431 | 1.46 | 0.144 | -.1203198 | .8261199 |
| ExpECSagree | .3829083 | .0509383 | 7.52 | 0.000 | .283071 | .4827455 |
| q1_02 | | | | | | |
| 2 | -.1164063 | .0865746 | -1.34 | 0.179 | -.2860895 | .0532769 |
| 3 | -.4133238 | .0872601 | -4.74 | 0.000 | -.5843504 | -.2422972 |
| 4 | -.9630475 | .0920972 | -10.46 | 0.000 | -1.143555 | -.7825403 |
| 5 | -1.260605 | .1054158 | -11.96 | 0.000 | -1.467216 | -1.053994 |
| 6 | -1.400986 | .1323954 | -10.58 | 0.000 | -1.660476 | -1.141495 |
| 8 | -.8345363 | .0871659 | -9.57 | 0.000 | -1.005378 | -.6636941 |
| CBA#q1_02 | | | | | | |
| 1 2 | -.2388729 | .1694523 | -1.41 | 0.159 | -.5709933 | .0932475 |
| 1 3 | .0010624 | .1893076 | 0.01 | 0.996 | -.3699737 | .3720986 |
| 1 4 | .3377375 | .2030683 | 1.66 | 0.096 | -.060269 | .735744 |
| 1 5 | .4632517 | .2090183 | 2.22 | 0.027 | .0535833 | .8729201 |
| 1 6 | .4394058 | .1998024 | 2.20 | 0.028 | .0478002 | .8310114 |
| 1 8 | -.1575023 | .2164904 | -0.73 | 0.467 | -.5818158 | .2668111 |
| h_aged2 | -.0173605 | .0282355 | -0.61 | 0.539 | -.0727012 | .0379801 |
| h_aged3 | -.0181263 | .0204759 | -0.89 | 0.376 | -.0582584 | .0220058 |
| h_female | .0036884 | .0156358 | 0.24 | 0.814 | -.0269571 | .034334 |
| h_edu_high | .0131233 | .0329728 | 0.40 | 0.691 | -.0515021 | .0777488 |
| h_edu_medium | -.0028555 | .0378686 | -0.08 | 0.940 | -.0770766 | .0713655 |
| h_retired | .0470598 | .0573017 | 0.82 | 0.411 | -.0652494 | .159369 |
| h_student | .0222829 | .0443978 | 0.50 | 0.616 | -.0647352 | .1093009 |
| h_unemployed | .0319349 | .0447834 | 0.71 | 0.476 | -.0558389 | .1197088 |
| fall2009 | -.0060109 | .0601755 | -0.10 | 0.920 | -.1239528 | .1119309 |

```
  spring2010 |   .0859068   .0559014     1.54   0.124    -.023658    .1954716
    fall2010 |    .086205   .0729381     1.18   0.237   -.0567511    .2291611
  spring2011 |   .1935944   .0550383     3.52   0.000    .0857213    .3014675
          EU |    .030683    .149164     0.21   0.837    -.261673    .3230391
        ExYu |   .3413127   .2262022     1.51   0.131   -.1020354    .7846609
high_lev_dev |   .2428495   .1943113     1.25   0.211   -.1379937    .6236928
       _cons |   .2603832   .1082987     2.40   0.016    .0481216    .4726447
-------------+----------------------------------------------------------------
     /athrho |   .8016783    .043028    18.63   0.000     .717345    .8860115
-------------+----------------------------------------------------------------
         rho |    .664974   .0240014                      .6152621    .7094182
------------------------------------------------------------------------------
Wald test of rho=0:                 chi2(1) =  347.135    Prob > chi2 = 0.0000

. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      37908
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 8.q22f_1 ECSagree 2.q1_01
               3.q1_01 4.q1_01 5.q1_01 6.q1_01 8.q1_01 h_aged2 h_aged3 h_female
               h_edu_high h_edu_medium h_retired h_student h_unemployed fall2009
               spring2010 fall2010 spring2011 EU ExYu high_lev_dev ExpECSagree
               2.q1_02 3.q1_02 4.q1_02 5.q1_02 6.q1_02 8.q1_02

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   .1373562   .0791573     1.74   0.083   -.0177893    .2925017
             |
      q22f_1 |
          2  |  -.0184149   .0160369    -1.15   0.251   -.0498467    .0130169
          3  |   -.080672   .0260518    -3.10   0.002   -.1317326   -.0296114
          4  |  -.1194101   .0315213    -3.79   0.000   -.1811908   -.0576294
          5  |  -.1421111   .0289239    -4.91   0.000   -.1988009   -.0854213
          8  |  -.1523869   .0356036    -4.28   0.000   -.2221687    -.082605
             |
    ECSagree |   .0689336   .0134944     5.11   0.000    .0424851    .0953821
             |
       q1_01 |
          2  |  -.0101099   .0071165    -1.42   0.155    -.024058    .0038381
          3  |  -.0410068   .0102731    -3.99   0.000   -.0611416   -.0208719
          4  |  -.0952835   .0123117    -7.74   0.000    -.119414   -.0711531
          5  |   -.125832   .0160771    -7.83   0.000   -.1573424   -.0943215
          6  |  -.1638014      .0168    -9.75   0.000   -.1967287   -.1308741
          8  |  -.1145672   .0176221    -6.50   0.000   -.1491059   -.0800286
             |
     h_aged2 |  -.0063052   .0071018    -0.89   0.375   -.0202246    .0076141
     h_aged3 |   .0096493   .0092421     1.04   0.296   -.0084648    .0277634
    h_female |  -.0023568   .0043854    -0.54   0.591    -.010952    .0062385
  h_edu_high |   .0186943   .0077287     2.42   0.016    .0035464    .0338422
h_edu_medium |   .0081295   .0130623     0.62   0.534   -.0174722    .0337313
   h_retired |   .0003166   .0208644     0.02   0.988   -.0405769    .0412102
   h_student |   .0010883   .0154725     0.07   0.944   -.0292373    .0314139
h_unemployed |   .0093024   .0141636     0.66   0.511   -.0184577    .0370625
    fall2009 |   .0205823   .0154677     1.33   0.183   -.0097339    .0508984
  spring2010 |   .0458188   .0151539     3.02   0.002    .0161177      .07552
    fall2010 |   .0434779   .0216573     2.01   0.045    .0010304    .0859255
  spring2011 |   .0814014   .0151639     5.37   0.000    .0516808     .111122
          EU |  -.0268566   .0565505    -0.47   0.635   -.1376935    .0839803
        ExYu |   .1105755   .0910899     1.21   0.225   -.0679574    .2891085
high_lev_dev |   .0969239   .0740559     1.31   0.191    -.048223    .2420708
 ExpECSagree |   .0596328   .0097948     6.09   0.000    .0404352    .0788303
             |
       q1_02 |
          2  |  -.0170281   .0051713    -3.29   0.001   -.0271637   -.0068925
          3  |  -.0424237   .0069205    -6.13   0.000   -.0559877   -.0288597
          4  |   -.115775   .0067027   -17.27   0.000    -.128912    -.102638
          5  |  -.1655083   .0084811   -19.52   0.000   -.1821309   -.1488858
          6  |  -.1931815   .0088677   -21.78   0.000   -.2105619   -.1758011
          8  |  -.1157519   .0059521   -19.45   0.000   -.1274177   -.1040861
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

Appendix 4.5b: SUR results of the 'credibility' model (country as cluster, weighted)

```
. biprobit (CSagree = i.CBA i.q22f_1 i.CBA#i.q22f_1 ECSagree i.q1_01 i.CBA#i.q1_01
h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed
fall2009 spring2010 fall2010 spring2011 EU ExYu high_lev_dev) (ExpCSagree = i.CBA
i.q22f_1 i.CBA#i.q22f_1 ExpECSagree i.q1_02 i.CBA#i.q1_02 h_aged2 h_aged3 h_female
h_edu_high h_edu_medium h_retired h_student h_unemployed fall2009 spring2010 fall2010
spring2011 EU ExYu high_lev_dev) [pweight = weight], vce(cluster country) nolog

Seemingly unrelated bivariate probit              Number of obs   =      37908
                                                  Wald chi2(6)    =          .
Log pseudolikelihood = -38633.398                 Prob > chi2     =          .

                              (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
CSagree      |
       1.CBA |  -.2813552   .2207727    -1.27   0.203    -.7140617    .1513514
             |
      q22f_1 |
          2  |    -.14705   .0563597    -2.61   0.009    -.2575129   -.0365871
          3  |   -.346468   .0693847    -4.99   0.000    -.4824595   -.2104764
          4  |  -.4222047   .0990435    -4.26   0.000    -.6163264    -.228083
          5  |  -.5271681   .0879037    -6.00   0.000    -.6994562   -.3548799
          8  |  -.4935988   .1674479    -2.95   0.003    -.8217907    -.165407
             |
  CBA#q22f_1 |
        1 2  |   .2127486   .0675424     3.15   0.002      .080368    .3451293
        1 3  |   .2373565     .08234     2.88   0.004     .0759729      .39874
        1 4  |   .1561711   .1251912     1.25   0.212    -.0891991    .4015413
        1 5  |   .2744205   .0988204     2.78   0.005      .080736    .4681051
        1 8  |  -.1176747   .1790415    -0.66   0.511    -.4685897    .2332402
             |
    ECSagree |   .4357034   .0841075     5.18   0.000     .2708556    .6005511
             |
       q1_01 |
          2  |  -.1984457   .1198909    -1.66   0.098    -.4334276    .0365362
          3  |   -.545137   .1549139    -3.52   0.000    -.8487626   -.2415114
          4  |  -.9574178   .1540046    -6.22   0.000    -1.259261   -.6555744
          5  |  -1.214825   .1726699    -7.04   0.000    -1.553252   -.8763983
          6  |  -1.442863   .1839747    -7.84   0.000    -1.803447    -1.08228
          8  |  -1.131691   .1878299    -6.03   0.000    -1.499831   -.7635513
             |
   CBA#q1_01 |
        1 2  |   .2199397   .1550368     1.42   0.156    -.0839268    .5238061
        1 3  |   .2835152   .1484064     1.91   0.056     -.007356    .5743864
        1 4  |   .4052058   .1675781     2.42   0.016     .0767587    .7336528
        1 5  |   .7234614   .1557544     4.64   0.000     .4181884    1.028734
        1 6  |   .8101431   .1634515     4.96   0.000     .4897839    1.130502
        1 8  |   .6277383   .1970988     3.18   0.001     .2414318    1.014045
             |
     h_aged2 |  -.0219936   .0197308    -1.11   0.265    -.0606653     .016678
     h_aged3 |   .0588254   .0397438     1.48   0.139    -.0190711    .1367219
    h_female |  -.0211951   .0238095    -0.89   0.373    -.0678609    .0254707
  h_edu_high |   .0756203   .0434387     1.74   0.082    -.0095179    .1607586
h_edu_medium |   .0278279   .0467389     0.60   0.552    -.0637787    .1194345
   h_retired |  -.0569386   .0749265    -0.76   0.447    -.2037919    .0899148
   h_student |   -.013741    .060685    -0.23   0.821    -.1326814    .1051994
h_unemployed |   .0278423   .0467494     0.60   0.551    -.0637849    .1194695
    fall2009 |   .1311455   .0469281     2.79   0.005     .0391682    .2231228
  spring2010 |   .2039976   .0441984     4.62   0.000     .1173703    .2906249
    fall2010 |   .1920254   .0643865     2.98   0.003     .0658301    .3182206
  spring2011 |   .3289018   .0473353     6.95   0.000     .2361263    .4216773
          EU |  -.1723881   .2099589    -0.82   0.412       -.5839    .2391238
        ExYu |   .3553076   .3169998     1.12   0.262    -.2660006    .9766158
high_lev_dev |   .3640911   .2793533     1.30   0.192    -.1834313    .9116136
       _cons |   .4137104   .1953138     2.12   0.034     .0309023    .7965184
-------------+----------------------------------------------------------------
ExpCSagree   |
       1.CBA |  -.2729013   .2673059    -1.02   0.307    -.7968112    .2510086
             |
      q22f_1 |
          2  |  -.0303254    .084658    -0.36   0.720    -.1962521    .1356014
```

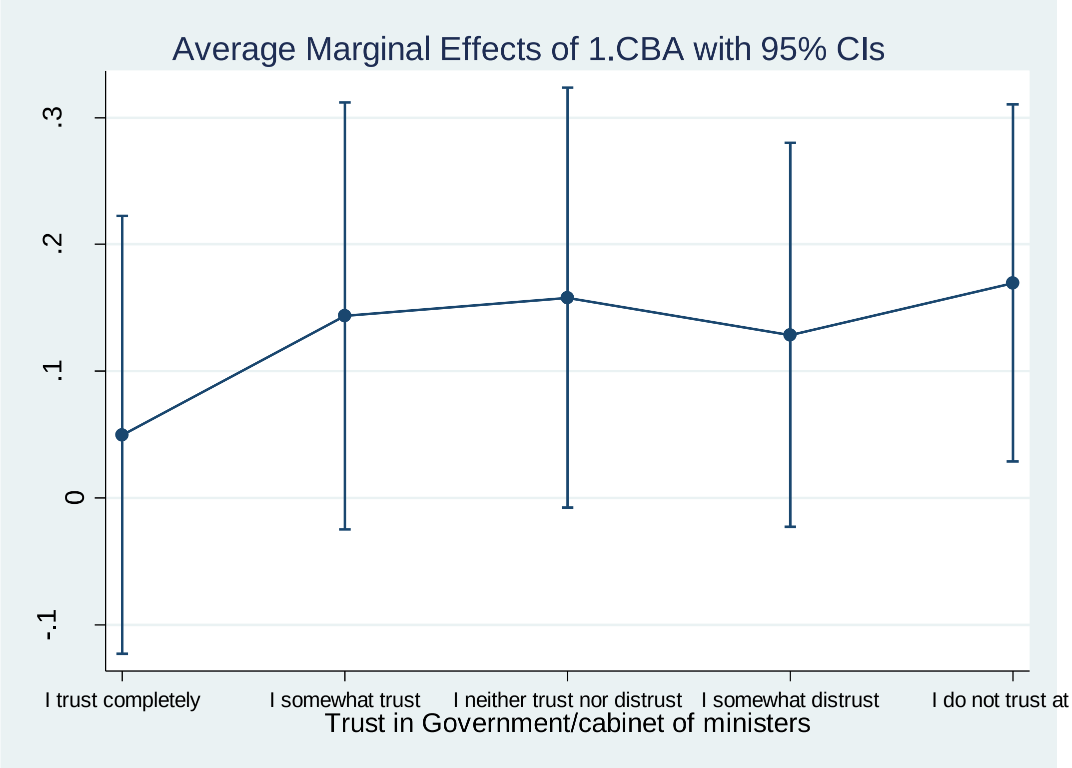
```
           3  |  -.2330045   .1276525    -1.83   0.068    -.4831988    .0171898
           4  |  -.3849023   .1321073    -2.91   0.004    -.6438278   -.1259768
           5  |  -.5080617   .1067246    -4.76   0.000    -.7172382   -.2988853
           8  |  -.5241886   .1391767    -3.77   0.000      -.79697   -.2514073
              |
  CBA#q22f_1  |
         1 2  |    .244248   .0938262     2.60   0.009      .060352    .4281439
         1 3  |   .3509446   .1267772     2.77   0.006     .1024658    .5994235
         1 4  |   .3349502   .1543946     2.17   0.030     .0323424    .6375581
         1 5  |   .4950568   .1247604     3.97   0.000     .2505309    .7395826
         1 8  |   .4133488   .2103255     1.97   0.049     .0011184    .8255791
              |
  ExpECSagree |   .3797176   .0515446     7.37   0.000      .278692    .4807432
              |
        q1_02 |
           2  |   -.092667   .0924984    -1.00   0.316    -.2739606    .0886266
           3  |  -.3974543   .0972475    -4.09   0.000     -.588056   -.2068527
           4  |   -.973283   .0918232   -10.60   0.000    -1.153253   -.7933129
           5  |   -1.26321   .1085944   -11.63   0.000    -1.476051   -1.050369
           6  |  -1.414295   .1282781   -11.03   0.000    -1.665715   -1.162875
           8  |  -.8506775   .0848377   -10.03   0.000    -1.016956   -.6843987
              |
    CBA#q1_02 |
         1 2  |  -.2462528    .161975    -1.52   0.128     -.563718    .0712124
         1 3  |   .0070808   .1799608     0.04   0.969    -.3456359    .3597974
         1 4  |   .3428358   .2018575     1.70   0.089    -.0527977    .7384693
         1 5  |   .4782302   .2029656     2.36   0.018      .080425    .8760355
         1 6  |   .4716131   .1865479     2.53   0.011     .1059859    .8372403
         1 8  |  -.1231804   .2001402    -0.62   0.538    -.5154479    .2690871
              |
      h_aged2 |  -.0117537   .0291206    -0.40   0.686    -.0688291    .0453217
      h_aged3 |  -.0195565   .0312762    -0.63   0.532    -.0808567    .0417437
     h_female |  -.0011527   .0149722    -0.08   0.939    -.0304977    .0281923
   h_edu_high |   .0060045   .0403767     0.15   0.882    -.0731323    .0851413
 h_edu_medium |  -.0034094   .0356111    -0.10   0.924    -.0732058     .066387
    h_retired |   .0314124   .0627196     0.50   0.616    -.0915158    .1543406
    h_student |    .020379   .0505638     0.40   0.687    -.0787242    .1194822
 h_unemployed |   .0256666   .0501607     0.51   0.609    -.0726465    .1239797
     fall2009 |   .0074902   .0608274     0.12   0.902    -.1117293    .1267097
   spring2010 |   .0899692   .0575456     1.56   0.118    -.0228181    .2027566
     fall2010 |   .0818546   .0713195     1.15   0.251     -.057929    .2216382
   spring2011 |   .1876446   .0555301     3.38   0.001     .0788075    .2964817
           EU |   .0430981   .1458457     0.30   0.768    -.2427543    .3289505
         ExYu |   .3472788   .2256333     1.54   0.124    -.0949543    .7895118
 high_lev_dev |   .2399773   .1935973     1.24   0.215    -.1394664    .6194211
        _cons |   .2361363   .1203013     1.96   0.050     .0003501    .4719225
--------------+----------------------------------------------------------------
      /athrho |   .8028261   .0426724    18.81   0.000     .7191897    .8864625
--------------+----------------------------------------------------------------
          rho |   .6656138   .0237668                      .6164071    .7096421
-------------------------------------------------------------------------------
Wald test of rho=0:                 chi2(1) =  353.955    Prob > chi2 = 0.0000

. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      37908
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 8.q22f_1 ECSagree 2.q1_01
               3.q1_01 4.q1_01 5.q1_01 6.q1_01 8.q1_01 h_aged2 h_aged3 h_female
               h_edu_high h_edu_medium h_retired h_student h_unemployed fall2009
               spring2010 fall2010 spring2011 EU ExYu high_lev_dev ExpECSagree
               2.q1_02 3.q1_02 4.q1_02 5.q1_02 6.q1_02 8.q1_02

-------------------------------------------------------------------------------
              |            Delta-method
              |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
--------------+----------------------------------------------------------------
        1.CBA |   .1423902   .0768443     1.85   0.064    -.0082218    .2930023
              |
       q22f_1 |
           2  |   -.013148    .015993    -0.82   0.411    -.0444937    .0181977
           3  |  -.0758984   .0247682    -3.06   0.002    -.1244432   -.0273535
           4  |  -.1149224   .0306788    -3.75   0.000    -.1750518    -.054793
           5  |  -.1382688   .0277957    -4.97   0.000    -.1927474   -.0837902
           8  |  -.1523797   .0380527    -4.00   0.000    -.2269615   -.0777978
```

```
             |
    ECSagree |   .0695096   .0145571     4.77   0.000     .0409782     .098041
             |
       q1_01 |
          2  |  -.0098262   .0063635    -1.54   0.123    -.0222985    .0026461
          3  |  -.0421243   .0102396    -4.11   0.000    -.0621935   -.0220552
          4  |   -.096648   .0114405    -8.45   0.000     -.119071   -.0742251
          5  |  -.1294388   .0150586    -8.60   0.000    -.1589531   -.0999245
          6  |  -.1666513   .0153553   -10.85   0.000    -.1967472   -.1365555
          8  |  -.1182752   .0192169    -6.15   0.000    -.1559397   -.0806107
             |
     h_aged2 |  -.0053082   .0068386    -0.78   0.438    -.0187116    .0080953
     h_aged3 |   .0063907   .0107782     0.59   0.553    -.0147343    .0275156
    h_female |  -.0035578    .005158    -0.69   0.490    -.0136672    .0065516
  h_edu_high |   .0129833   .0121147     1.07   0.284     -.010761    .0367276
h_edu_medium |   .0039175   .0126365     0.31   0.757    -.0208495    .0286845
   h_retired |  -.0042746   .0209494    -0.20   0.838    -.0453346    .0367854
   h_student |   .0009278   .0164877     0.06   0.955    -.0313875     .033243
h_unemployed |   .0083712   .0143319     0.58   0.559    -.0197188    .0364612
    fall2009 |   .0220689   .0143811     1.53   0.125    -.0061176    .0502554
  spring2010 |   .0463184   .0156358     2.96   0.003     .0156727     .076964
    fall2010 |   .0431661   .0214803     2.01   0.044     .0010655    .0852667
  spring2011 |   .0811984   .0148328     5.47   0.000     .0521266    .1102701
          EU |  -.0209037   .0540847    -0.39   0.699    -.1269079    .0851004
        ExYu |   .1098501   .0890823     1.23   0.218     -.064748    .2844481
high_lev_dev |   .0948241   .0717664     1.32   0.186    -.0458355    .2354838
 ExpECSagree |   .0581326   .0095827     6.07   0.000     .0393507    .0769144
             |
       q1_02 |
          2  |  -.0150794   .0052519    -2.87   0.004    -.0253729   -.0047858
          3  |   -.039752   .0069761    -5.70   0.000     -.053425   -.0260791
          4  |  -.1154468   .0066422   -17.38   0.000    -.1284653   -.1024284
          5  |  -.1623512   .0081645   -19.89   0.000    -.1783533   -.1463491
          6  |  -.1906811   .0081245   -23.47   0.000    -.2066048   -.1747574
          8  |  -.1157131   .0058662   -19.73   0.000    -.1272107   -.1042155
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

Appendix 4.5c: CBA conditional on trust in government (after the SUR results of the 'credibility' model, cluster country, wighted)

```
. margins, dydx(CBA) at(q22f_1=(1(1)5)) vsquish

Average marginal effects                          Number of obs   =      37908
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()
dy/dx w.r.t. : 1.CBA
1._at        : q22f_1          =           1
2._at        : q22f_1          =           2
3._at        : q22f_1          =           3
4._at        : q22f_1          =           4
5._at        : q22f_1          =           5

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |   .0497033   .0881515     0.56   0.573    -.1230705    .2224771
          2  |   .1436595   .0859389     1.67   0.095    -.0247777    .3120966
          3  |   .1579959   .0844677     1.87   0.061    -.0075577    .3235494
          4  |   .1286254   .0773143     1.66   0.096    -.0229079    .2801587
          5  |   .1695044   .0718501     2.36   0.018     .0286807     .310328
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

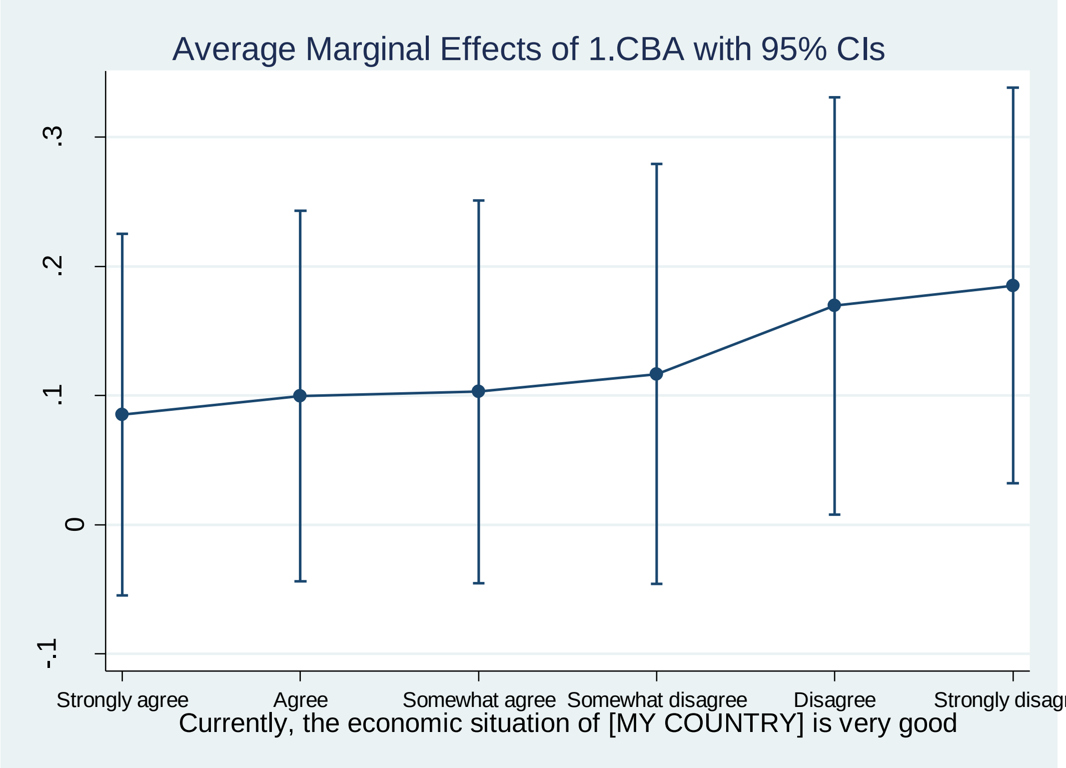
```
. marginsplot

  Variables that uniquely identify margins: q22f_1
```




**Appendix 4.5d: CBA conditional on perceptions about the economic stability in a country (after the SUR results of the 'credibility' model, cluster country, wighted)**

```
. margins, dydx(CBA) at(q1_01=(1(1)6))  vsquish

Average marginal effects                          Number of obs   =      37908
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()
dy/dx w.r.t. : 1.CBA
1._at        : q1_01           =           1
2._at        : q1_01           =           2
3._at        : q1_01           =           3
4._at        : q1_01           =           4
5._at        : q1_01           =           5
6._at        : q1_01           =           6

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |   .0851595   .0713891     1.19   0.233    -.0547606    .2250796
          2  |   .0995831    .073106     1.36   0.173     -.043702    .2428681
          3  |   .1028625   .0755743     1.36   0.173    -.0452605    .2509855
          4  |   .1166307   .0828718     1.41   0.159     -.045795    .2790565
          5  |   .1693551   .0823912     2.06   0.040     .0078714    .3308388
          6  |   .1850273   .0781243     2.37   0.018     .0319065     .338148
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

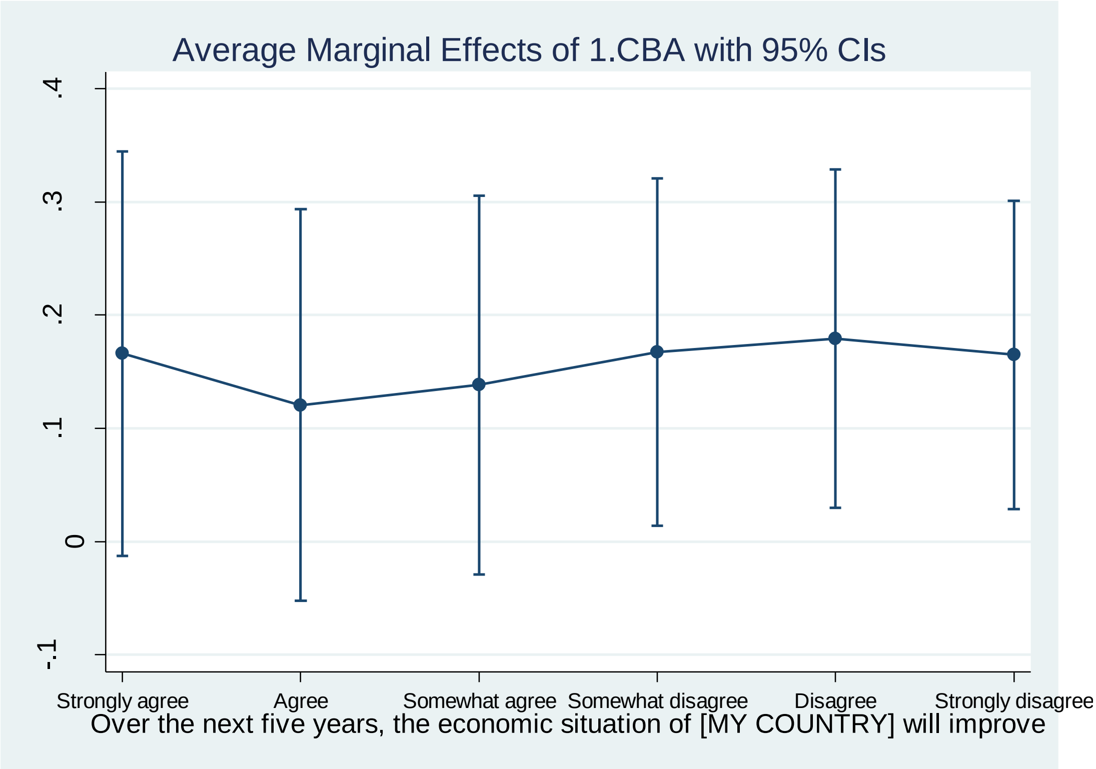
```
. marginsplot

  Variables that uniquely identify margins: q1_01
```




**Appendix 4.5e: CBA conditional on expectations about the economic stability in a country (after the SUR results of the 'credibility' model, cluster country, wighted)**

```
margins, dydx(CBA) at(q1_02=(1(1)6)) vsquish

Average marginal effects                          Number of obs   =      37908
Model VCE     : Robust

Expression    : Pr(CSagree=1,ExpCSagree=1), predict()
dy/dx w.r.t. : 1.CBA
1._at         : q1_02          =           1
2._at         : q1_02          =           2
3._at         : q1_02          =           3
4._at         : q1_02          =           4
5._at         : q1_02          =           5
6._at         : q1_02          =           6

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |   .1660164   .0912595     1.82   0.069     -.012849    .3448817
          2  |   .1206685   .0881387     1.37   0.171    -.0520801    .2934171
          3  |   .1384653   .0853931     1.62   0.105    -.0289021    .3058326
          4  |   .1675544    .078261     2.14   0.032     .0141657    .3209432
          5  |   .1792832   .0762401     2.35   0.019     .0298554     .328711
          6  |   .1649461   .0694353     2.38   0.018     .0288555    .3010368
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

```
. marginsplot

  Variables that uniquely identify margins: q1_02
```




**Appendix 4.5f: Marginal effect of the CBA in CBA and non-CBA subsamples (after the SUR results of the 'credibility' model, cluster country, wighted)**

```
. margins if CBA==0, at(CBA=(0 1))

Predictive margins                                Number of obs     =      30237
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()

1._at        : CBA             =           0

2._at        : CBA             =           1

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         _at |
          1  |   .2677343   .0384871     6.96   0.000      .192301    .3431677
          2  |   .4078891   .0595829     6.85   0.000     .2911088    .5246695
------------------------------------------------------------------------------
```

```
. margins if CBA==1, at(CBA=(0 1))

Predictive margins                                Number of obs   =       7671
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()

1._at        : CBA             =           0
2._at        : CBA             =           1
------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         _at |
          1  |   .2156819   .0671553     3.21   0.001     .0840599    .3473038
          2  |   .3667313   .0050819    72.16   0.000      .356771    .3766916
------------------------------------------------------------------------------

. margins, over(CBA) at(CBA=(0 1)) contrast (atcontrast(r._at) wald) vsquish

Contrasts of predictive margins
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()
over         : CBA
1._at        : 0.CBA
                   CBA             =           0
               1.CBA
                   CBA             =           0
2._at        : 0.CBA
                   CBA             =           1
               1.CBA
                   CBA             =           1

------------------------------------------------
             |         df        chi2     P>chi2
-------------+----------------------------------
     _at@CBA |
 (2 vs 1) 0  |          1        3.07     0.0797
 (2 vs 1) 1  |          1        5.41     0.0200
      Joint  |          2       39.41     0.0000
------------------------------------------------

--------------------------------------------------------------
             |            Delta-method
             |   Contrast   Std. Err.     [95% Conf. Interval]
-------------+------------------------------------------------
     _at@CBA |
 (2 vs 1) 0  |   .1401548   .0799783     -.0165998    .2969094
 (2 vs 1) 1  |   .1510494   .0649546      .0237406    .2783582
--------------------------------------------------------------
```

**Appendix 4.5g: Contrasts (testing for the significance of the difference between groups) (after SUR results of the 'credibility' model, cluster country, wighted)**

```
. contrast r.q22f_1, asobserved effects

Contrasts of marginal linear predictions

Margins      : asobserved

------------------------------------------------
             |         df        chi2     P>chi2
-------------+----------------------------------
CSagree      |
      q22f_1 |
   (2 vs 1)  |          1        5.67     0.0173
   (3 vs 1)  |          1       30.71     0.0000
   (4 vs 1)  |          1       25.09     0.0000
   (5 vs 1)  |          1       47.14     0.0000
   (8 vs 1)  |          1       15.21     0.0001
      Joint  |          5      120.38     0.0000
------------------------------------------------
```

```
------------------------------------------------------------------------------
             |   Contrast   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
CSagree      |
      q22f_1 |
   (2 vs 1)  |  -.1033968   .0434408    -2.38   0.017    -.1885392   -.0182543
   (3 vs 1)  |  -.2977655   .0537344    -5.54   0.000    -.4030831   -.1924479
   (4 vs 1)  |  -.3901604   .0778875    -5.01   0.000     -.542817   -.2375038
   (5 vs 1)  |  -.4708606   .0685765    -6.87   0.000    -.6052681   -.3364531
   (8 vs 1)  |  -.5177442   .1327564    -3.90   0.000     -.777942   -.2575463
------------------------------------------------------------------------------

. contrast ar.q22f_1, asobserved effects

Contrasts of marginal linear predictions

Margins      : asobserved

------------------------------------------------
             |         df        chi2     P>chi2
-------------+----------------------------------
CSagree      |
      q22f_1 |
   (2 vs 1)  |          1        5.67     0.0173
   (3 vs 2)  |          1       31.30     0.0000
   (4 vs 3)  |          1        5.53     0.0187
   (5 vs 4)  |          1        7.67     0.0056
   (8 vs 5)  |          1        0.34     0.5585
      Joint  |          5      120.38     0.0000
------------------------------------------------

------------------------------------------------------------------------------
             |   Contrast   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
CSagree      |
      q22f_1 |
   (2 vs 1)  |  -.1033968   .0434408    -2.38   0.017    -.1885392   -.0182543
   (3 vs 2)  |  -.1943688   .0347422    -5.59   0.000    -.2624621   -.1262754
   (4 vs 3)  |  -.0923949   .0392904    -2.35   0.019    -.1694027   -.0153871
   (5 vs 4)  |  -.0807002   .0291441    -2.77   0.006    -.1378216   -.0235788
   (8 vs 5)  |  -.0468836    .080139    -0.59   0.559    -.2039531    .1101859
------------------------------------------------------------------------------

. contrast r.q1_01, asobserved effects

Contrasts of marginal linear predictions

Margins      : asobserved

------------------------------------------------
             |         df        chi2     P>chi2
-------------+----------------------------------
CSagree      |
       q1_01 |
   (2 vs 1)  |          1        2.39     0.1223
   (3 vs 1)  |          1       14.91     0.0001
   (4 vs 1)  |          1       48.26     0.0000
   (5 vs 1)  |          1       56.50     0.0000
   (6 vs 1)  |          1       70.27     0.0000
   (8 vs 1)  |          1       43.44     0.0000
      Joint  |          6      138.36     0.0000
------------------------------------------------

------------------------------------------------------------------------------
             |   Contrast   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
CSagree      |
       q1_01 |
   (2 vs 1)  |  -.1533169   .0992273    -1.55   0.122    -.3477988    .0411649
   (3 vs 1)  |  -.4869634   .1261329    -3.86   0.000    -.7341794   -.2397473
   (4 vs 1)  |  -.8742749    .125853    -6.95   0.000    -1.120942   -.6276075
   (5 vs 1)  |   -1.06638    .141863    -7.52   0.000    -1.344427   -.7883338
   (6 vs 1)  |  -1.276633   .1522972    -8.38   0.000     -1.57513   -.9781356
   (8 vs 1)  |  -1.002888   .1521659    -6.59   0.000    -1.301127   -.7046478
------------------------------------------------------------------------------
```

```
. contrast ar.q1_01, asobserved effects

Contrasts of marginal linear predictions

Margins      : asobserved

------------------------------------------------
             |         df        chi2     P>chi2
-------------+----------------------------------
CSagree      |
       q1_01 |
   (2 vs 1)  |          1        2.39     0.1223
   (3 vs 2)  |          1       37.75     0.0000
   (4 vs 3)  |          1       35.87     0.0000
   (5 vs 4)  |          1        9.41     0.0022
   (6 vs 5)  |          1       61.76     0.0000
   (8 vs 6)  |          1        2.87     0.0900
      Joint  |          6      138.36     0.0000
------------------------------------------------

------------------------------------------------------------------------------
             |   Contrast   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
CSagree      |
       q1_01 |
   (2 vs 1)  |  -.1533169   .0992273    -1.55   0.122    -.3477988    .0411649
   (3 vs 2)  |  -.3336464      .0543    -6.14   0.000    -.4400726   -.2272203
   (4 vs 3)  |  -.3873115   .0646664    -5.99   0.000    -.5140554   -.2605677
   (5 vs 4)  |  -.1921053   .0626128    -3.07   0.002    -.3148242   -.0693865
   (6 vs 5)  |  -.2102524   .0267538    -7.86   0.000    -.2626889    -.157816
   (8 vs 6)  |   .2737451   .1614653     1.70   0.090    -.0427211    .5902114
------------------------------------------------------------------------------

.
. margins r.CBA, at(q1_01=(1(1)6)) contrast(atcontrast(r)) vsquish

Contrasts of predictive margins
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()
1._at        : q1_01           =           1
2._at        : q1_01           =           2
3._at        : q1_01           =           3
4._at        : q1_01           =           4
5._at        : q1_01           =           5
6._at        : q1_01           =           6

------------------------------------------------------
                   |         df        chi2     P>chi2
-------------------+----------------------------------
           _at#CBA |
(2 vs 1) (1 vs 0)  |          1        1.74     0.1872
(3 vs 1) (1 vs 0)  |          1        1.43     0.2320
(4 vs 1) (1 vs 0)  |          1        1.32     0.2513
(5 vs 1) (1 vs 0)  |          1       17.89     0.0000
(6 vs 1) (1 vs 0)  |          1       50.44     0.0000
             Joint |          5       69.01     0.0000
------------------------------------------------------

---------------------------------------------------------------------
                   |            Delta-method
                   |   Contrast   Std. Err.     [95% Conf. Interval]
-------------------+-------------------------------------------------
           _at#CBA |
(2 vs 1) (1 vs 0)  |   .0144236   .0109363     -.0070112    .0358584
(3 vs 1) (1 vs 0)  |    .017703   .0148108     -.0113256    .0467317
(4 vs 1) (1 vs 0)  |   .0314713   .0274356     -.0223015    .0852441
(5 vs 1) (1 vs 0)  |   .0841956   .0199054      .0451818    .1232094
(6 vs 1) (1 vs 0)  |   .0998678    .014062      .0723067    .1274289
---------------------------------------------------------------------
```

```
. margins r.CBA, at(q1_02=(1(1)6)) contrast(atcontrast(r)) vsquish

Contrasts of predictive margins
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()
1._at        : q1_02          =           1
2._at        : q1_02          =           2
3._at        : q1_02          =           3
4._at        : q1_02          =           4
5._at        : q1_02          =           5
6._at        : q1_02          =           6

------------------------------------------------------
                   |         df        chi2     P>chi2
-------------------+----------------------------------
           _at#CBA |
(2 vs 1) (1 vs 0)  |          1       17.16     0.0000
(3 vs 1) (1 vs 0)  |          1        3.83     0.0503
(4 vs 1) (1 vs 0)  |          1        0.01     0.9345
(5 vs 1) (1 vs 0)  |          1        0.45     0.5025
(6 vs 1) (1 vs 0)  |          1        0.00     0.9667
            Joint  |          5       44.32     0.0000
------------------------------------------------------

--------------------------------------------------------------------
                   |            Delta-method
                   |   Contrast   Std. Err.     [95% Conf. Interval]
-------------------+------------------------------------------------
           _at#CBA |
(2 vs 1) (1 vs 0)  |  -.0453479   .0109465     -.0668026   -.0238931
(3 vs 1) (1 vs 0)  |  -.0275511   .0140743     -.0551361    .0000339
(4 vs 1) (1 vs 0)  |   .0015381   .0187135     -.0351396    .0382158
(5 vs 1) (1 vs 0)  |   .0132668   .0197838     -.0255087    .0520424
(6 vs 1) (1 vs 0)  |  -.0010702   .0256156     -.0512758    .0491354
--------------------------------------------------------------------

. margins r.CBA, at(q22f_1=(1(1)5)) contrast(atcontrast(r)) vsquish

Contrasts of predictive margins
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()
1._at        : q22f_1         =           1
2._at        : q22f_1         =           2
3._at        : q22f_1         =           3
4._at        : q22f_1         =           4
5._at        : q22f_1         =           5

------------------------------------------------------
                   |         df        chi2     P>chi2
-------------------+----------------------------------
           _at#CBA |
(2 vs 1) (1 vs 0)  |          1       15.58     0.0001
(3 vs 1) (1 vs 0)  |          1       11.25     0.0008
(4 vs 1) (1 vs 0)  |          1        3.02     0.0821
(5 vs 1) (1 vs 0)  |          1       10.27     0.0014
            Joint  |          4       82.62     0.0000
------------------------------------------------------

--------------------------------------------------------------------
                   |            Delta-method
                   |   Contrast   Std. Err.     [95% Conf. Interval]
-------------------+------------------------------------------------
           _at#CBA |
(2 vs 1) (1 vs 0)  |   .0939562   .0238029      .0473033     .140609
(3 vs 1) (1 vs 0)  |   .1082926   .0322837      .0450178    .1715674
(4 vs 1) (1 vs 0)  |   .0789221   .0453908     -.0100422    .1678863
(5 vs 1) (1 vs 0)  |    .119801     .03738      .0465375    .1930646
--------------------------------------------------------------------
```

## Appendix 4.6: Testing for the joint significance of the variables used in the 'credibility' model

```
. test CBA q22f_1 ECSagree ExpECSagree q1_01 q1_02 h_aged2 h_aged3 h_female
h_edu_high h_edu_medium h_retired h_student h_unemployed fall2009 spring2010 fall2010
spring2011 EU ExYu high_lev_dev

 ( 1)  [CSagree]CBA = 0
 ( 2)  [ExpCSagree]CBA = 0
 ( 3)  [CSagree]q22f_1 = 0
 ( 4)  [ExpCSagree]q22f_1 = 0
 ( 5)  [CSagree]ECSagree = 0
 ( 6)  [ExpCSagree]ExpECSagree = 0
 ( 7)  [CSagree]q1_01 = 0
 ( 8)  [ExpCSagree]q1_02 = 0
 ( 9)  [CSagree]h_aged2 = 0
 (10)  [ExpCSagree]h_aged2 = 0
 (11)  [CSagree]h_aged3 = 0
 (12)  [ExpCSagree]h_aged3 = 0
 (13)  [CSagree]h_female = 0
 (14)  [ExpCSagree]h_female = 0
 (15)  [CSagree]h_edu_high = 0
 (16)  [ExpCSagree]h_edu_high = 0
 (17)  [CSagree]h_edu_medium = 0
 (18)  [ExpCSagree]h_edu_medium = 0
 (19)  [CSagree]h_retired = 0
 (20)  [ExpCSagree]h_retired = 0
 (21)  [CSagree]h_student = 0
 (22)  [ExpCSagree]h_student = 0
 (23)  [CSagree]h_unemployed = 0
 (24)  [ExpCSagree]h_unemployed = 0
 (25)  [CSagree]fall2009 = 0
 (26)  [ExpCSagree]fall2009 = 0
 (27)  [CSagree]spring2010 = 0
 (28)  [ExpCSagree]spring2010 = 0
 (29)  [CSagree]fall2010 = 0
 (30)  [ExpCSagree]fall2010 = 0
 (31)  [CSagree]spring2011 = 0
 (32)  [ExpCSagree]spring2011 = 0
 (33)  [CSagree]EU = 0
 (34)  [ExpCSagree]EU = 0
 (35)  [CSagree]ExYu = 0
 (36)  [ExpCSagree]ExYu = 0
 (37)  [CSagree]high_lev_dev = 0
 (38)  [ExpCSagree]high_lev_dev = 0
       Constraint 3 dropped
       Constraint 4 dropped
       Constraint 6 dropped
       Constraint 7 dropped
       Constraint 8 dropped
       Constraint 9 dropped
       Constraint 10 dropped
       Constraint 11 dropped
       Constraint 12 dropped
       Constraint 13 dropped
       Constraint 14 dropped
       Constraint 15 dropped
       Constraint 17 dropped
       Constraint 18 dropped
       Constraint 20 dropped
       Constraint 21 dropped
       Constraint 22 dropped
       Constraint 24 dropped
       Constraint 25 dropped
       Constraint 26 dropped
       Constraint 27 dropped
       Constraint 28 dropped
       Constraint 29 dropped
       Constraint 30 dropped
       Constraint 31 dropped
       Constraint 32 dropped
       Constraint 34 dropped
       Constraint 36 dropped
       Constraint 38 dropped
           chi2(  9) =  749.60
         Prob > chi2 =    0.0000
```

**Appendix 4.7: SUR results of the 'credibility' model (region as cluster)**

**Appendix 4.7a: SUR results of the 'credibility' model (region as cluster, unweighted)**

```
*with region as cluster

Unweighted

. biprobit (CSagree = i.CBA i.q22f_1 i.CBA#i.q22f_1 ECSagree i.q1_01 i.CBA#i.q1_01
h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed
fall2009 spring2010 fall2010 spring2011 EU ExYu high_lev_dev) (ExpCSagree = i.CBA
i.q22f_1 i.CBA#i.q22f_1 ExpECSagree i.q1_02 i.CBA#i.q1_02 h_aged2 h_aged3 h_female
h_edu_high h_edu_medium h_retired h_student h_unemployed fall2009 spring2010 fall2010
spring2011 EU ExYu high_lev_dev), vce(cluster h_region) nolog

Seemingly unrelated bivariate probit             Number of obs   =      37908
                                                 Wald chi2(67)   =          .
Log pseudolikelihood = -39927.996                Prob > chi2     =          .

                              (Std. Err. adjusted for 71 clusters in h_region)
------------------------------------------------------------------------------
             |               Robust
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
CSagree      |
       1.CBA |  -.1667734   .2475449    -0.67   0.500    -.6519525    .3184057
             |
      q22f_1 |
          2  |  -.1389598   .0577113    -2.41   0.016    -.2520718   -.0258478
          3  |  -.3424918     .06535    -5.24   0.000    -.4705755   -.2144081
          4  |  -.4137683   .0677211    -6.11   0.000    -.5464992   -.2810374
          5  |    -.5173   .0597395    -8.66   0.000    -.6343872   -.4002128
          8  |  -.4443723    .123557    -3.60   0.000    -.6865395   -.2022051
             |
  CBA#q22f_1 |
        1 2  |   .1592245   .1227718     1.30   0.195    -.0814038    .3998529
        1 3  |   .1967043   .1106396     1.78   0.075    -.0201453    .4135538
        1 4  |    .115451   .1493887     0.77   0.440    -.1773455    .4082476
        1 5  |   .2382538   .1207059     1.97   0.048     .0016745    .4748331
        1 8  |  -.2267072   .2572031    -0.88   0.378    -.7308159    .2774016
             |
    ECSagree |    .429579   .0460417     9.33   0.000     .3393389    .5198191
             |
       q1_01 |
          2  |  -.1690199   .1268161    -1.33   0.183    -.4175748     .079535
          3  |  -.5058682   .1098627    -4.60   0.000    -.7211951   -.2905413
          4  |  -.9081869   .0995542    -9.12   0.000     -1.10331   -.7130642
          5  |  -1.149031   .1121791   -10.24   0.000    -1.368898   -.9291642
          6  |  -1.379297    .119324   -11.56   0.000    -1.613168   -1.145426
          8  |  -1.078279   .1502076    -7.18   0.000    -1.372681   -.7838779
             |
   CBA#q1_01 |
        1 2  |   .1106121   .3070649     0.36   0.719     -.491224    .7124482
        1 3  |   .2190222   .2601213     0.84   0.400    -.2908062    .7288506
        1 4  |   .3108567   .2699596     1.15   0.250    -.2182544    .8399677
        1 5  |   .6221899   .2329644     2.67   0.008     .1655882    1.078792
        1 6  |   .7093514   .2207775     3.21   0.001     .2766354    1.142067
        1 8  |   .5944797   .2750252     2.16   0.031     .0554401    1.133519
             |
     h_aged2 |  -.0224442   .0233946    -0.96   0.337    -.0682968    .0234084
     h_aged3 |    .077724   .0352739     2.20   0.028     .0085884    .1468597
    h_female |  -.0182666    .014228    -1.28   0.199     -.046153    .0096198
  h_edu_high |   .1037622   .0513178     2.02   0.043     .0031812    .2043432
h_edu_medium |   .0534329   .0373586     1.43   0.153    -.0197886    .1266544
   h_retired |  -.0436992   .0393511    -1.11   0.267    -.1208259    .0334275
   h_student |  -.0148439   .0426803    -0.35   0.728    -.0984958     .068808
h_unemployed |   .0269772   .0312524     0.86   0.388    -.0342764    .0882308
    fall2009 |   .1340979   .0491067     2.73   0.006     .0378505    .2303453
  spring2010 |   .2021588   .0359135     5.63   0.000     .1317697     .272548
    fall2010 |   .1872815   .0483863     3.87   0.000      .092446    .2821169
  spring2011 |   .3193893    .046728     6.84   0.000     .2278041    .4109746
          EU |  -.1971427   .1401078    -1.41   0.159     -.471749    .0774636
        ExYu |    .357833   .1833593     1.95   0.051    -.0015446    .7172106
high_lev_dev |   .3683192   .1402871     2.63   0.009     .0933615    .6432769
```

| | | | | | | |
|---|---|---|---|---|---|---|
| _cons | .3508507 | .1615964 | 2.17 | 0.030 | .0341276 | .6675738 |
| ExpCSagree | | | | | | |
| 1.CBA | -.2665004 | .1658035 | -1.61 | 0.108 | -.5914694 | .0584686 |
| q22f_1 | | | | | | |
| 2 | -.056096 | .0661142 | -0.85 | 0.396 | -.1856775 | .0734855 |
| 3 | -.2504575 | .0844516 | -2.97 | 0.003 | -.4159795 | -.0849355 |
| 4 | -.402186 | .0837322 | -4.80 | 0.000 | -.566298 | -.238074 |
| 5 | -.5172362 | .0727686 | -7.11 | 0.000 | -.6598601 | -.3746124 |
| 8 | -.520284 | .1146148 | -4.54 | 0.000 | -.7449249 | -.295643 |
| CBA#q22f_1 | | | | | | |
| 1 2 | .2435898 | .1027535 | 2.37 | 0.018 | .0421967 | .444983 |
| 1 3 | .3507656 | .1177539 | 2.98 | 0.003 | .1199723 | .581559 |
| 1 4 | .3324117 | .1291755 | 2.57 | 0.010 | .0792324 | .5855911 |
| 1 5 | .4845257 | .1006431 | 4.81 | 0.000 | .2872689 | .6817824 |
| 1 8 | .3529001 | .2477557 | 1.42 | 0.154 | -.1326923 | .8384924 |
| ExpECSagree | .3829083 | .0369558 | 10.36 | 0.000 | .3104762 | .4553404 |
| q1_02 | | | | | | |
| 2 | -.1164063 | .0705679 | -1.65 | 0.099 | -.2547169 | .0219043 |
| 3 | -.4133238 | .0729775 | -5.66 | 0.000 | -.5563571 | -.2702905 |
| 4 | -.9630475 | .0726436 | -13.26 | 0.000 | -1.105426 | -.8206687 |
| 5 | -1.260605 | .0711039 | -17.73 | 0.000 | -1.399966 | -1.121244 |
| 6 | -1.400986 | .0806204 | -17.38 | 0.000 | -1.558999 | -1.242972 |
| 8 | -.8345363 | .0901804 | -9.25 | 0.000 | -1.011287 | -.657786 |
| CBA#q1_02 | | | | | | |
| 1 2 | -.2388729 | .1471335 | -1.62 | 0.104 | -.5272494 | .0495035 |
| 1 3 | .0010624 | .1696273 | 0.01 | 0.995 | -.331401 | .3335259 |
| 1 4 | .3377375 | .1674435 | 2.02 | 0.044 | .0095543 | .6659207 |
| 1 5 | .4632517 | .1652792 | 2.80 | 0.005 | .1393104 | .7871931 |
| 1 6 | .4394058 | .1871695 | 2.35 | 0.019 | .0725603 | .8062512 |
| 1 8 | -.1575023 | .2240997 | -0.70 | 0.482 | -.5967297 | .2817251 |
| h_aged2 | -.0173605 | .0206097 | -0.84 | 0.400 | -.0577548 | .0230338 |
| h_aged3 | -.0181263 | .0314313 | -0.58 | 0.564 | -.0797305 | .0434778 |
| h_female | .0036884 | .0164441 | 0.22 | 0.823 | -.0285414 | .0359183 |
| h_edu_high | .0131233 | .0426657 | 0.31 | 0.758 | -.0705 | .0967467 |
| h_edu_medium | -.0028555 | .0349715 | -0.08 | 0.935 | -.0713983 | .0656873 |
| h_retired | .0470598 | .0357411 | 1.32 | 0.188 | -.0229915 | .1171111 |
| h_student | .0222829 | .038049 | 0.59 | 0.558 | -.0522918 | .0968575 |
| h_unemployed | .0319349 | .027948 | 1.14 | 0.253 | -.0228423 | .0867121 |
| fall2009 | -.0060109 | .0424544 | -0.14 | 0.887 | -.0892201 | .0771982 |
| spring2010 | .0859068 | .0369745 | 2.32 | 0.020 | .0134381 | .1583755 |
| fall2010 | .086205 | .0461095 | 1.87 | 0.062 | -.0041679 | .1765779 |
| spring2011 | .1935944 | .0426409 | 4.54 | 0.000 | .1100198 | .277169 |
| EU | .030683 | .1023585 | 0.30 | 0.764 | -.1699359 | .231302 |
| ExYu | .3413127 | .1332256 | 2.56 | 0.010 | .0801953 | .6024302 |
| high_lev_dev | .2428495 | .0987624 | 2.46 | 0.014 | .0492787 | .4364204 |
| _cons | .2603832 | .1088829 | 2.39 | 0.017 | .0469766 | .4737898 |
| /athrho | .8016783 | .0276482 | 29.00 | 0.000 | .7474888 | .8558678 |
| rho | .664974 | .0154224 | | | .6336484 | .6941225 |

Wald test of rho=0: chi2(1) = 840.748 Prob > chi2 = 0.0000

```
. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      37908
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 8.q22f_1 ECSagree 2.q1_01
3.q1_01 4.q1_01 5.q1_01 6.q1_01 8.q1_01 h_aged2 h_aged3 h_female h_edu_high
h_edu_medium h_retired h_student h_unemployed fall2009 spring2010 fall2010 spring2011
EU ExYu high_lev_dev ExpECSagree 2.q1_02 3.q1_02 4.q1_02 5.q1_02 6.q1_02 8.q1_02

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   .1373562   .0453931     3.03   0.002     .0483873    .2263251
             |
     q22f_1 |
          2  |  -.0184149   .0161772    -1.14   0.255    -.0501217    .0132918
          3  |   -.080672   .0186952    -4.32   0.000     -.117314    -.04403
          4  |  -.1194101   .0205007    -5.82   0.000    -.1595908   -.0792294
          5  |  -.1421111   .0178603    -7.96   0.000    -.1771166   -.1071055
          8  |  -.1523869   .0277634    -5.49   0.000    -.2068022   -.0979715
             |
    ECSagree |   .0689336   .0074993     9.19   0.000     .0542353    .0836319
             |
       q1_01 |
          2  |  -.0101099   .0081652    -1.24   0.216    -.0261135    .0058936
          3  |  -.0410068   .0079766    -5.14   0.000    -.0566405    -.025373
          4  |  -.0952835   .0083534   -11.41   0.000    -.1116559   -.0789112
          5  |   -.125832   .0091018   -13.82   0.000    -.1436712   -.1079927
          6  |  -.1638014   .0097828   -16.74   0.000    -.1829752   -.1446276
          8  |  -.1145672   .0181695    -6.31   0.000    -.1501789   -.0789556
             |
     h_aged2 |  -.0063052   .0057244    -1.10   0.271    -.0175249    .0049144
     h_aged3 |   .0096493   .0096991     0.99   0.320    -.0093606    .0286592
    h_female |  -.0023568   .0043018    -0.55   0.584    -.0107882    .0060746
  h_edu_high |   .0186943   .0136942     1.37   0.172    -.0081458    .0455344
h_edu_medium |   .0081295   .0107492     0.76   0.449    -.0129386    .0291977
   h_retired |   .0003166   .0109651     0.03   0.977    -.0211747    .0218079
   h_student |   .0010883   .0118816     0.09   0.927    -.0221993    .0243759
h_unemployed |   .0093024   .0086106     1.08   0.280     -.007574    .0261788
    fall2009 |   .0205823   .0127337     1.62   0.106    -.0043752    .0455398
  spring2010 |   .0458188   .0104706     4.38   0.000     .0252968    .0663408
    fall2010 |   .0434779   .0143674     3.03   0.002     .0153184    .0716375
  spring2011 |   .0814014   .0127564     6.38   0.000     .0563994    .1064034
          EU |  -.0268566    .037476    -0.72   0.474    -.1003083     .046595
        ExYu |   .1105755   .0514041     2.15   0.031     .0098254    .2113256
high_lev_dev |   .0969239   .0360254     2.69   0.007     .0263154    .1675324
 ExpECSagree |   .0596328   .0060426     9.87   0.000     .0477894    .0714761
             |
       q1_02 |
          2  |  -.0170281   .0050909    -3.34   0.001    -.0270061    -.00705
          3  |  -.0424237   .0062062    -6.84   0.000    -.0545877   -.0302597
          4  |   -.115775   .0065563   -17.66   0.000    -.1286252   -.1029248
          5  |  -.1655083   .0066014   -25.07   0.000    -.1784467   -.1525699
          6  |  -.1931815   .0071789   -26.91   0.000     -.207252    -.179111
          8  |  -.1157519   .0114292   -10.13   0.000    -.1381527    -.093351
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

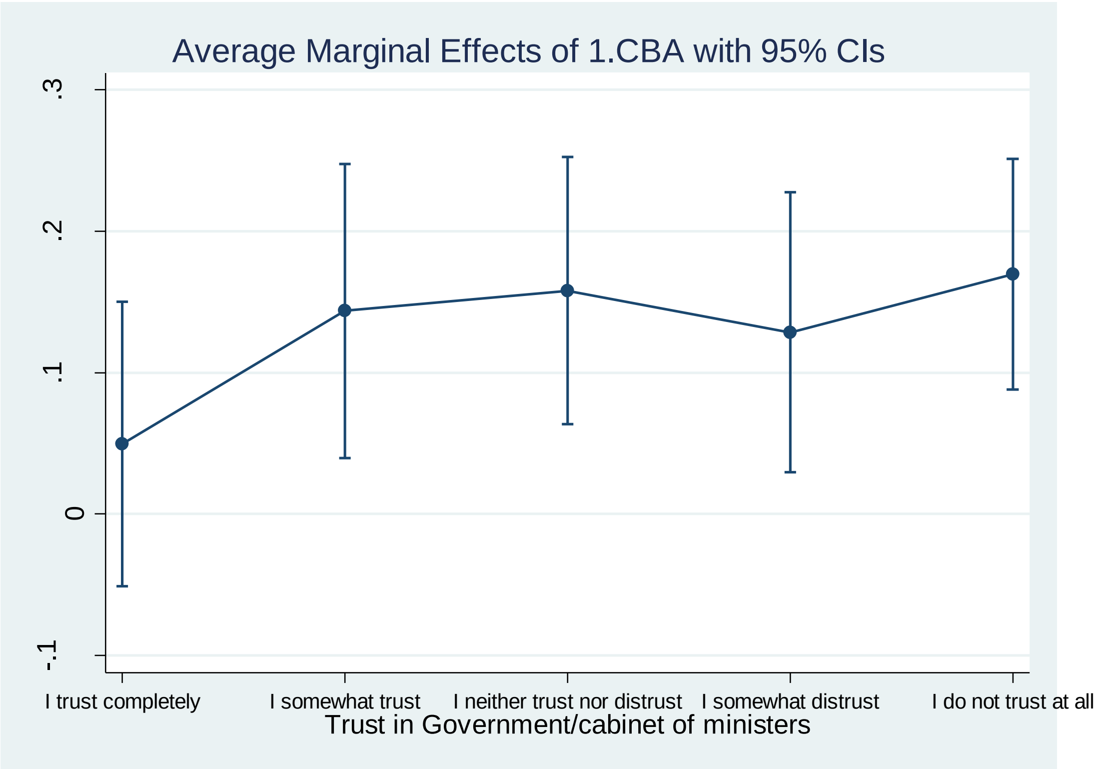
**Appendix 4.7b: SUR results of the 'credibility' model (region as cluster, weighted)**

```
. biprobit (CSagree = i.CBA i.q22f_1 i.CBA#i.q22f_1 ECSagree i.q1_01 i.CBA#i.q1_01
h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed
fall2009 spring2010 fall2010 spring2011 EU ExYu high_lev_dev) (ExpCSagree = i.CBA
i.q22f_1 i.CBA#i.q22f_1 ExpECSagree i.q1_02 i.CBA#i.q1_02 h_aged2 h_aged3 h_female
h_edu_high h_edu_medium h_retired h_student h_unemployed fall2009 spring2010 fall2010
spring2011 EU ExYu high_lev_dev) [pweight = weight], vce(cluster h_region) nolog

Seemingly unrelated bivariate probit            Number of obs   =      37908
                                                Wald chi2(67)   =          .
Log pseudolikelihood = -38633.398               Prob > chi2     =          .

                              (Std. Err. adjusted for 71 clusters in h_region)
------------------------------------------------------------------------------
             |               Robust
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
CSagree      |
       1.CBA |  -.2813552   .2501322    -1.12   0.261    -.7716053     .208895
             |
      q22f_1 |
          2  |    -.14705   .0640562    -2.30   0.022    -.2725979   -.0215021
          3  |   -.346468   .0672272    -5.15   0.000    -.4782309    -.214705
          4  |  -.4222047   .0721191    -5.85   0.000    -.5635556   -.2808538
          5  |  -.5271681   .0608117    -8.67   0.000    -.6463568   -.4079794
          8  |  -.4935988   .1122668    -4.40   0.000    -.7136377     -.27356
             |
  CBA#q22f_1 |
        1 2  |   .2127486   .1314033     1.62   0.105    -.0447971    .4702944
        1 3  |   .2373565   .1141846     2.08   0.038     .0135587    .4611542
        1 4  |   .1561711   .1510585     1.03   0.301    -.1398981    .4522404
        1 5  |   .2744205   .1229857     2.23   0.026      .033373    .5154681
        1 8  |  -.1176747   .2645326    -0.44   0.656    -.6361491    .4007996
             |
    ECSagree |   .4357034   .0494431     8.81   0.000     .3387967    .5326101
             |
       q1_01 |
          2  |  -.1984457   .1177186    -1.69   0.092    -.4291699    .0322786
          3  |   -.545137   .1079914    -5.05   0.000    -.7567962   -.3334777
          4  |  -.9574178   .0965848    -9.91   0.000    -1.146721   -.7681151
          5  |  -1.214825   .1077502   -11.27   0.000    -1.426012   -1.003639
          6  |  -1.442863   .1145943   -12.59   0.000    -1.667464   -1.218263
          8  |  -1.131691   .1591742    -7.11   0.000    -1.443667   -.8197155
             |
   CBA#q1_01 |
        1 2  |   .2199397   .3266504     0.67   0.501    -.4202833    .8601626
        1 3  |   .2835152   .2476657     1.14   0.252    -.2019006     .768931
        1 4  |   .4052058   .2662603     1.52   0.128    -.1166549    .9270664
        1 5  |   .7234614   .2257328     3.20   0.001     .2810333     1.16589
        1 6  |   .8101431   .2112666     3.83   0.000     .3960682    1.224218
        1 8  |   .6277383   .2793084     2.25   0.025     .0803039    1.175173
             |
     h_aged2 |  -.0219936   .0218456    -1.01   0.314    -.0648103    .0208231
     h_aged3 |   .0588254   .0352149     1.67   0.095    -.0101946    .1278454
    h_female |  -.0211951   .0169037    -1.25   0.210    -.0543258    .0119356
  h_edu_high |   .0756203    .053664     1.41   0.159    -.0295592    .1807999
h_edu_medium |   .0278279   .0393992     0.71   0.480    -.0493931    .1050488
   h_retired |  -.0569386   .0402348    -1.42   0.157    -.1357974    .0219203
   h_student |   -.013741   .0458173    -0.30   0.764    -.1035413    .0760593
h_unemployed |   .0278423   .0327711     0.85   0.396    -.0363879    .0920725
    fall2009 |   .1311455   .0484692     2.71   0.007     .0361475    .2261435
  spring2010 |   .2039976   .0382605     5.33   0.000     .1290084    .2789868
    fall2010 |   .1920254   .0492987     3.90   0.000     .0954016    .2886491
  spring2011 |   .3289018   .0493241     6.67   0.000     .2322283    .4255752
          EU |  -.1723881   .1480406    -1.16   0.244    -.4625425    .1177662
        ExYu |   .3553076   .1898579     1.87   0.061    -.0168069    .7274222
high_lev_dev |   .3640911   .1366864     2.66   0.008     .0961907    .6319915
       _cons |   .4137104   .1725788     2.40   0.017     .0754622    .7519585
-------------+----------------------------------------------------------------
ExpCSagree   |
       1.CBA |  -.2729013   .1651637    -1.65   0.098    -.5966163    .0508137
             |
      q22f_1 |
          2  |  -.0303254   .0675745    -0.45   0.654    -.1627689    .1021181
```

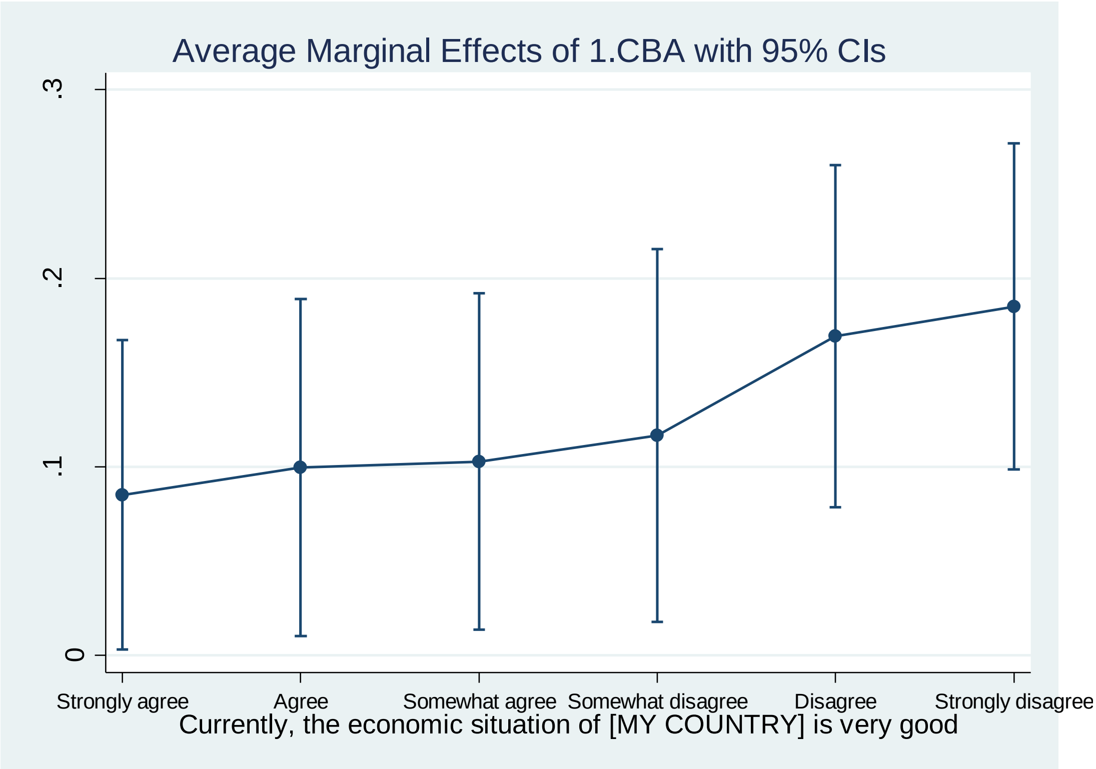
```
           3  |  -.2330045   .0827558    -2.82   0.005    -.3952028   -.0708062
           4  |  -.3849023   .0842955    -4.57   0.000    -.5501184   -.2196862
           5  |  -.5080617   .0729349    -6.97   0.000    -.6510115    -.365112
           8  |  -.5241886    .114387    -4.58   0.000     -.748383   -.2999943
              |
  CBA#q22f_1  |
         1 2  |    .244248   .1049956     2.33   0.020     .0384603    .4500356
         1 3  |   .3509446   .1193961     2.94   0.003     .1169326    .5849567
         1 4  |   .3349502   .1287947     2.60   0.009     .0825173    .5873832
         1 5  |   .4950568   .1032577     4.79   0.000     .2926754    .6974381
         1 8  |   .4133488   .2597416     1.59   0.112    -.0957354    .9224329
              |
 ExpECSagree  |   .3797176    .037231    10.20   0.000     .3067462     .452689
              |
       q1_02  |
           2  |   -.092667   .0711466    -1.30   0.193    -.2321117    .0467777
           3  |  -.3974543    .078802    -5.04   0.000    -.5519033   -.2430053
           4  |   -.973283   .0738147   -13.19   0.000    -1.117957   -.8286088
           5  |   -1.26321   .0732907   -17.24   0.000    -1.406857   -1.119563
           6  |  -1.414295   .0822998   -17.18   0.000      -1.5756   -1.252991
           8  |  -.8506775   .0928776    -9.16   0.000    -1.032714   -.6686407
              |
   CBA#q1_02  |
         1 2  |  -.2462528   .1480484    -1.66   0.096    -.5364224    .0439168
         1 3  |   .0070808   .1703103     0.04   0.967    -.3267212    .3408828
         1 4  |   .3428358   .1687003     2.03   0.042     .0121892    .6734824
         1 5  |   .4782302   .1654332     2.89   0.004     .1539871    .8024734
         1 6  |   .4716131   .1866793     2.53   0.012     .1057284    .8374979
         1 8  |  -.1231804   .2250917    -0.55   0.584     -.564352    .3179912
              |
     h_aged2  |  -.0117537   .0220264    -0.53   0.594    -.0549247    .0314174
     h_aged3  |  -.0195565     .03501    -0.56   0.576    -.0881748    .0490619
    h_female  |  -.0011527   .0163019    -0.07   0.944    -.0331038    .0307984
  h_edu_high  |   .0060045   .0454726     0.13   0.895    -.0831202    .0951292
h_edu_medium  |  -.0034094   .0366909    -0.09   0.926    -.0753223    .0685035
   h_retired  |   .0314124   .0390005     0.81   0.421    -.0450272     .107852
   h_student  |    .020379   .0413855     0.49   0.622    -.0607351    .1014932
h_unemployed  |   .0256666   .0315551     0.81   0.416    -.0361803    .0875135
    fall2009  |   .0074902   .0444838     0.17   0.866    -.0796965    .0946769
  spring2010  |   .0899692   .0416213     2.16   0.031     .0083929    .1715456
    fall2010  |   .0818546   .0460992     1.78   0.076    -.0084982    .1722075
  spring2011  |   .1876446   .0427254     4.39   0.000     .1039044    .2713848
          EU  |   .0430981   .1098845     0.39   0.695    -.1722715    .2584678
        ExYu  |   .3472788   .1398414     2.48   0.013     .0731946    .6213629
high_lev_dev  |   .2399773   .1007453     2.38   0.017     .0425202    .4374345
       _cons  |   .2361363   .1143445     2.07   0.039     .0120253    .4602473
-------------+----------------------------------------------------------------
     /athrho  |   .8028261   .0284994    28.17   0.000     .7469683    .8586839
-------------+----------------------------------------------------------------
         rho  |   .6656138    .015873                       .6333368     .695579
------------------------------------------------------------------------------
Wald test of rho=0:                 chi2(1) =  793.546    Prob > chi2 = 0.0000
```

```
. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      37908
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 8.q22f_1 ECSagree 2.q1_01
               3.q1_01 4.q1_01 5.q1_01 6.q1_01 8.q1_01 h_aged2 h_aged3 h_female
               h_edu_high h_edu_medium h_retired h_student h_unemployed fall2009
               spring2010 fall2010 spring2011 EU ExYu high_lev_dev ExpECSagree
               2.q1_02 3.q1_02 4.q1_02 5.q1_02 6.q1_02 8.q1_02

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   .1423902   .0439957     3.24   0.001     .0561603    .2286201
             |
      q22f_1 |
          2  |   -.013148   .0168313    -0.78   0.435    -.0461366    .0198407
          3  |  -.0758984   .0185011    -4.10   0.000    -.1121599   -.0396368
          4  |  -.1149224    .020609    -5.58   0.000    -.1553154   -.0745294
          5  |  -.1382688   .0175406    -7.88   0.000    -.1726477   -.1038899
          8  |  -.1523797   .0271299    -5.62   0.000    -.2055534   -.0992059
             |
    ECSagree |   .0695096   .0079315     8.76   0.000     .0539641    .0850551
             |
       q1_01 |
          2  |  -.0098262   .0078884    -1.25   0.213    -.0252872    .0056347
          3  |  -.0421243   .0078221    -5.39   0.000    -.0574553   -.0267933
          4  |   -.096648   .0082582   -11.70   0.000    -.1128337   -.0804623
          5  |  -.1294388   .0088155   -14.68   0.000    -.1467169   -.1121606
          6  |  -.1666513   .0094097   -17.71   0.000    -.1850941   -.1482086
          8  |  -.1182752   .0190706    -6.20   0.000     -.155653   -.0808975
             |
     h_aged2 |  -.0053082   .0057332    -0.93   0.355     -.016545    .0059287
     h_aged3 |   .0063907    .010189     0.63   0.531    -.0135794    .0263608
    h_female |  -.0035578   .0045944    -0.77   0.439    -.0125626     .005447
  h_edu_high |   .0129833    .014478     0.90   0.370     -.015393    .0413596
h_edu_medium |   .0039175   .0112174     0.35   0.727    -.0180682    .0259033
   h_retired |  -.0042746   .0113986    -0.38   0.708    -.0266154    .0180663
   h_student |   .0009278   .0127114     0.07   0.942    -.0239861    .0258416
h_unemployed |   .0083712   .0092499     0.91   0.365    -.0097583    .0265007
    fall2009 |   .0220689   .0128179     1.72   0.085    -.0030536    .0471915
  spring2010 |   .0463184    .011554     4.01   0.000     .0236729    .0689639
    fall2010 |   .0431661   .0143303     3.01   0.003     .0150792    .0712529
  spring2011 |   .0811984   .0129502     6.27   0.000     .0558165    .1065803
          EU |  -.0209037   .0396688    -0.53   0.598    -.0986531    .0568456
        ExYu |   .1098501    .052905     2.08   0.038     .0061582     .213542
high_lev_dev |   .0948241   .0353394     2.68   0.007     .0255602    .1640881
 ExpECSagree |   .0581326   .0059205     9.82   0.000     .0465285    .0697366
             |
       q1_02 |
          2  |  -.0150794   .0050503    -2.99   0.003    -.0249779   -.0051809
          3  |   -.039752   .0063674    -6.24   0.000    -.0522319   -.0272722
          4  |  -.1154468   .0065685   -17.58   0.000    -.1283209   -.1025728
          5  |  -.1623512   .0065342   -24.85   0.000    -.1751581   -.1495444
          6  |  -.1906811   .0073438   -25.96   0.000    -.2050747   -.1762875
          8  |  -.1157131   .0118334    -9.78   0.000    -.1389062     -.09252
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

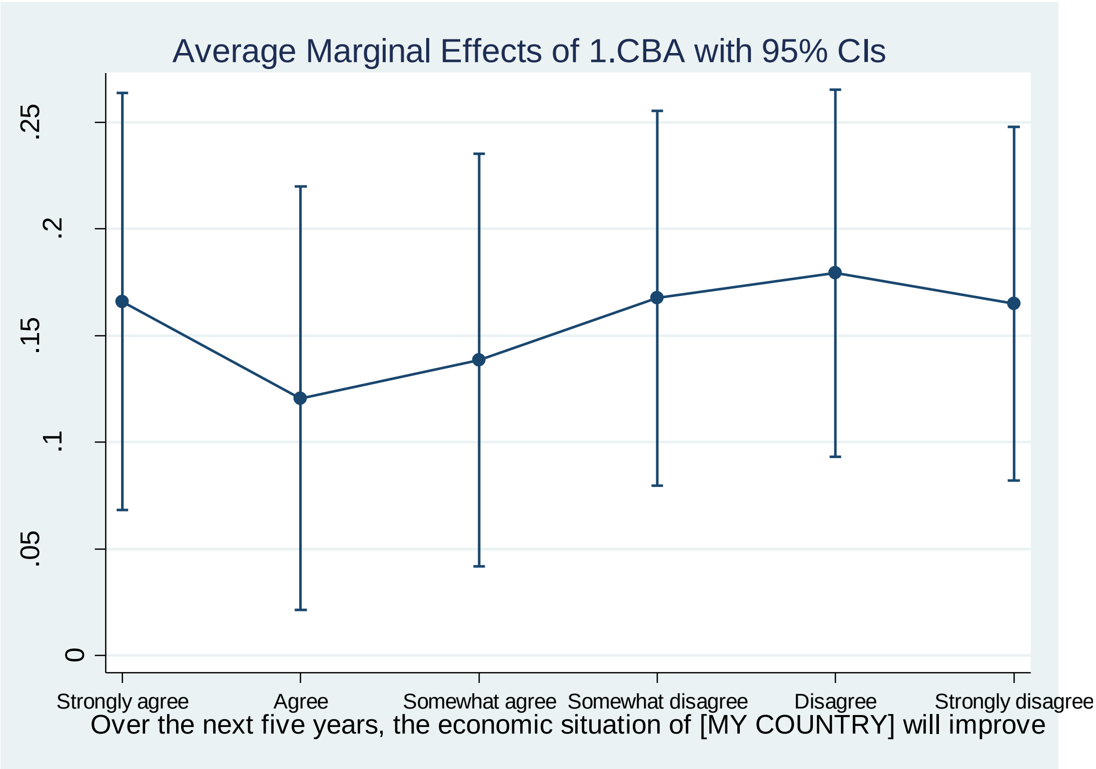
```
margins, dydx(CBA) at(q22f_1=(1(1)5)) vsquish

Average marginal effects                          Number of obs   =      37908
Model VCE     : Robust

Expression    : Pr(CSagree=1,ExpCSagree=1), predict()
dy/dx w.r.t. : 1.CBA
1._at         : q22f_1          =           1
2._at         : q22f_1          =           2
3._at         : q22f_1          =           3
4._at         : q22f_1          =           4
5._at         : q22f_1          =           5

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |   .0497033    .051279     0.97   0.332    -.0508017    .1502083
          2  |   .1436595   .0530988     2.71   0.007     .0395877    .2477312
          3  |   .1579959   .0481343     3.28   0.001     .0636543    .2523374
          4  |   .1286254   .0505372     2.55   0.011     .0295743    .2276765
          5  |   .1695044   .0415816     4.08   0.000     .0880059    .2510028
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.

. marginsplot

  Variables that uniquely identify margins: q22f_1
```



```
margins, dydx(CBA) at(q1_01=(1(1)6))  vsquish

Average marginal effects                        Number of obs    =      37908
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()
dy/dx w.r.t. : 1.CBA
1._at        : q1_01           =           1
2._at        : q1_01           =           2
3._at        : q1_01           =           3
4._at        : q1_01           =           4
5._at        : q1_01           =           5
6._at        : q1_01           =           6

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |   .0851595    .041917     2.03   0.042     .0030038    .1673152
          2  |   .0995831   .0456326     2.18   0.029     .0101448    .1890214
          3  |   .1028625   .0455664     2.26   0.024     .0135541    .1921709
          4  |   .1166307   .0504135     2.31   0.021     .0178221    .2154394
          5  |   .1693551   .0463009     3.66   0.000      .078607    .2601032
          6  |   .1850273   .0441401     4.19   0.000     .0985142    .2715404
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.

. marginsplot

  Variables that uniquely identify margins: q1_01
```



```
margins, dydx(CBA) at(q1_02=(1(1)6)) vsquish

Average marginal effects                          Number of obs    =      37908
Model VCE     : Robust

Expression    : Pr(CSagree=1,ExpCSagree=1), predict()
dy/dx w.r.t. : 1.CBA
1._at         : q1_02           =           1
2._at         : q1_02           =           2
3._at         : q1_02           =           3
4._at         : q1_02           =           4
5._at         : q1_02           =           5
6._at         : q1_02           =           6

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |   .1660164   .0498562     3.33   0.001        .0683    .2637327
          2  |   .1206685   .0507105     2.38   0.017     .0212778    .2200592
          3  |   .1384653    .049352     2.81   0.005     .0417371    .2351934
          4  |   .1675544   .0448916     3.73   0.000     .0795685    .2555404
          5  |   .1792832   .0438739     4.09   0.000     .0932919    .2652744
          6  |   .1649461   .0423191     3.90   0.000     .0820022      .24789
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.

. marginsplot
```



```
. margins if CBA==0, at(CBA=(0 1))

Predictive margins                                Number of obs   =      30237
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()

1._at        : CBA             =           0

2._at        : CBA             =           1

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         _at |
          1  |   .2677343   .0179271    14.93   0.000     .2325979    .3028707
          2  |   .4078891   .0362872    11.24   0.000     .3367675    .4790108
------------------------------------------------------------------------------

. margins if CBA==1, at(CBA=(0 1))

Predictive margins                                Number of obs   =       7671
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()

1._at        : CBA             =           0

2._at        : CBA             =           1

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         _at |
          1  |   .2156819   .0339075     6.36   0.000     .1492243    .2821394
          2  |   .3667313   .0188471    19.46   0.000     .3297915     .403671
------------------------------------------------------------------------------
```

**Appendix 4.8: Robustness check of the 'credibility' model - question about perceptions of financial stability in a country included (SUR, cluster country, weighted)**

```
. drop if q11_7==9
(790 observations deleted)

. drop if q11_7==.
(0 observations deleted)

. tab q11_7, missing

 Currently, banks |
and the financial |
system are stable |
   in [MY COUNTRY |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree |      1,845        4.97        4.97
            Agree |      6,549       17.64       22.61
   Somewhat agree |     12,354       33.28       55.90
Somewhat disagree |      6,806       18.34       74.23
         Disagree |      4,113       11.08       85.31
Strongly disagree |      2,087        5.62       90.94
      Do not know |      3,364        9.06      100.00
------------------+-----------------------------------
            Total |     37,118      100.00
```

```
. biprobit (CSagree = i.CBA i.q22f_1 i.CBA#i.q22f_1 ECSagree i.q1_01 i.CBA#i.q1_01
i.q11_7 h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student
h_unemployed fall2009 spring2010 fall2010 spring2011 EU ExYu high_lev_dev)
(ExpCSagree = i.CBA i.q22f_1 i.CBA#i.q22f_1 ExpECSagree i.q1_02 i.CBA#i.q1_02 i.q11_7
h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed
fall2009 spring2010 fall2010 spring2011 EU ExYu high_lev_dev) [pweight = weight],
vce(cluster country) nolog

Seemingly unrelated bivariate probit              Number of obs   =      37118
                                                  Wald chi2(6)    =          .
Log pseudolikelihood = -36971.473                 Prob > chi2     =          .

                              (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
CSagree      |
       1.CBA |  -.3787689   .1871438    -2.02   0.043     -.745564   -.0119739
             |
      q22f_1 |
          2  |  -.1154859   .0512194    -2.25   0.024    -.2158741   -.0150976
          3  |  -.2720284   .0547679    -4.97   0.000    -.3793715   -.1646852
          4  |  -.3344425    .088404    -3.78   0.000    -.5077112   -.1611737
          5  |  -.4041918   .0788017    -5.13   0.000    -.5586403   -.2497434
          8  |  -.3523602   .1461807    -2.41   0.016    -.6388691   -.0658514
             |
  CBA#q22f_1 |
        1 2  |   .2223023    .064896     3.43   0.001     .0951085     .349496
        1 3  |   .2301751    .090844     2.53   0.011     .0521241     .408226
        1 4  |   .1477211   .1060509     1.39   0.164    -.0601348    .3555769
        1 5  |   .2651288    .094673     2.80   0.005     .0795731    .4506845
        1 8  |  -.1446068   .2099599    -0.69   0.491    -.5561207    .2669071
             |
    ECSagree |   .3502384    .086198     4.06   0.000     .1812934    .5191834
             |
       q1_01 |
          2  |  -.2678489     .16763    -1.60   0.110    -.5963976    .0606998
          3  |  -.6106477   .2023443    -3.02   0.003    -1.007235   -.2140602
          4  |  -.9877858   .1851404    -5.34   0.000    -1.350654   -.6249174
          5  |  -1.245038   .2008953    -6.20   0.000    -1.638785   -.8512902
          6  |  -1.442315   .2075867    -6.95   0.000    -1.849177   -1.035453
          8  |  -1.133691   .2242836    -5.05   0.000    -1.573279   -.6941033
             |
   CBA#q1_01 |
        1 2  |   .3353532   .1895649     1.77   0.077    -.0361872    .7068936
        1 3  |   .4136152   .1924874     2.15   0.032     .0363469    .7908835
        1 4  |   .5354452    .184118     2.91   0.004     .1745807    .8963098
        1 5  |   .8497311   .1808954     4.70   0.000     .4951827    1.204279
        1 6  |   .8937215   .1952935     4.58   0.000     .5109532     1.27649
        1 8  |   .7638037    .227329     3.36   0.001     .3182471     1.20936
             |
       q11_7 |
          2  |  -.1781794   .0469539    -3.79   0.000    -.2702074   -.0861514
          3  |  -.4317594   .0527232    -8.19   0.000     -.535095   -.3284238
          4  |   -.869402   .0690927   -12.58   0.000    -1.004821   -.7339828
          5  |  -.9189851   .0688483   -13.35   0.000    -1.053925   -.7840449
          6  |  -.9337356   .1235584    -7.56   0.000    -1.175906   -.6915656
          8  |   -.794543   .0891731    -8.91   0.000    -.9693192   -.6197669
             |
     h_aged2 |  -.0251718   .0194095    -1.30   0.195    -.0632136    .0128701
     h_aged3 |   .0511239   .0325148     1.57   0.116    -.0126038    .1148517
    h_female |  -.0160344   .0216398    -0.74   0.459    -.0584477    .0263788
  h_edu_high |   .0072638   .0451667     0.16   0.872    -.0812613     .095789
h_edu_medium |   .0008524   .0426137     0.02   0.984     -.082669    .0843738
   h_retired |  -.0314382    .072883    -0.43   0.666    -.1742863    .1114098
   h_student |   .0095092   .0568225     0.17   0.867    -.1018609    .1208793
h_unemployed |   .0468407   .0456895     1.03   0.305     -.042709    .1363904
    fall2009 |   .1256321    .049286     2.55   0.011     .0290333    .2222308
  spring2010 |   .1710936   .0493848     3.46   0.001     .0743011     .267886
    fall2010 |   .1524966   .0647299     2.36   0.018     .0256283    .2793649
  spring2011 |    .273395   .0488117     5.60   0.000     .1777259    .3690641
          EU |  -.1041008   .1874665    -0.56   0.579    -.4715284    .2633269
        ExYu |   .4023542   .2788469     1.44   0.149    -.1441756     .948884
high_lev_dev |   .3597047   .2528767     1.42   0.155    -.1359244    .8553339
       _cons |   .9755197   .2190232     4.45   0.000     .5462421    1.404797
-------------+----------------------------------------------------------------
```

```
ExpCSagree   |
       1.CBA |  -.2849129   .2559258    -1.11   0.266    -.7865182    .2166924
             |
      q22f_1 |
          2  |  -.0025635   .0762849    -0.03   0.973    -.1520792    .1469521
          3  |  -.1801737   .1106651    -1.63   0.104    -.3970734    .0367259
          4  |  -.3143759    .108012    -2.91   0.004    -.5260756   -.1026762
          5  |  -.4055915   .0903352    -4.49   0.000    -.5826453   -.2285377
          8  |  -.4148018   .1104342    -3.76   0.000    -.6312488   -.1983548
             |
  CBA#q22f_1 |
        1 2  |   .2405706   .0854194     2.82   0.005     .0731517    .4079896
        1 3  |   .3443856   .1136568     3.03   0.002     .1216224    .5671489
        1 4  |   .3098646   .1342935     2.31   0.021     .0466543     .573075
        1 5  |   .4677123   .1030406     4.54   0.000     .2657564    .6696681
        1 8  |   .3908685   .2434654     1.61   0.108     -.086315     .868052
             |
 ExpECSagree |   .3346127   .0490006     6.83   0.000     .2385732    .4306521
             |
       q1_02 |
          2  |  -.0852421   .0973607    -0.88   0.381    -.2760656    .1055814
          3  |  -.3681124   .0991234    -3.71   0.000    -.5623906   -.1738341
          4  |  -.9412913   .0946979    -9.94   0.000    -1.126896   -.7556869
          5  |  -1.220315   .1107639   -11.02   0.000    -1.437408   -1.003222
          6  |  -1.359338   .1321732   -10.28   0.000    -1.618393   -1.100283
          8  |    -.80811   .0912274    -8.86   0.000    -.9869125   -.6293075
             |
   CBA#q1_02 |
        1 2  |  -.2336029   .1533163    -1.52   0.128    -.5340972    .0668915
        1 3  |   .0472093   .1778958     0.27   0.791    -.3014602    .3958787
        1 4  |   .3786645   .1884122     2.01   0.044     .0093834    .7479457
        1 5  |   .5144006   .1928349     2.67   0.008     .1364511    .8923501
        1 6  |   .4884304   .1802115     2.71   0.007     .1352224    .8416384
        1 8  |  -.1281749   .2179846    -0.59   0.557    -.5554169     .299067
             |
       q11_7 |
          2  |   -.151611   .0481797    -3.15   0.002    -.2460414   -.0571805
          3  |  -.3490888   .0405245    -8.61   0.000    -.4285154   -.2696622
          4  |  -.6357461   .0631925   -10.06   0.000    -.7596011   -.5118911
          5  |   -.731487   .0553523   -13.22   0.000    -.8399756   -.6229984
          6  |  -.7304206   .0861916    -8.47   0.000    -.8993531   -.5614882
          8  |  -.5975479   .0483952   -12.35   0.000    -.6924009    -.502695
             |
     h_aged2 |  -.0174792   .0271545    -0.64   0.520    -.0707011    .0357426
     h_aged3 |  -.0274353   .0244072    -1.12   0.261    -.0752724    .0204019
    h_female |    .005787   .0133996     0.43   0.666    -.0204758    .0320497
  h_edu_high |  -.0386345   .0460237    -0.84   0.401    -.1288392    .0515702
h_edu_medium |  -.0220597   .0353591    -0.62   0.533    -.0913622    .0472428
   h_retired |   .0556642   .0590153     0.94   0.346    -.0600038    .1713321
   h_student |   .0400092    .044907     0.89   0.373    -.0480069    .1280254
h_unemployed |   .0421451   .0498727     0.85   0.398    -.0556037    .1398938
    fall2009 |   .0066642   .0674667     0.10   0.921    -.1255681    .1388966
  spring2010 |   .0708216   .0612473     1.16   0.248    -.0492209    .1908641
    fall2010 |   .0520014   .0722048     0.72   0.471    -.0895173    .1935201
  spring2011 |    .148457   .0555832     2.67   0.008     .0395159    .2573982
          EU |   .1143892   .1316329     0.87   0.385    -.1436066    .3723849
        ExYu |    .388328   .1963003     1.98   0.048     .0035864    .7730697
high_lev_dev |   .2353437   .1746962     1.35   0.178    -.1070545     .577742
       _cons |   .5867312   .1143273     5.13   0.000     .3626537    .8108087
-------------+----------------------------------------------------------------
     /athrho |   .7899543   .0425435    18.57   0.000     .7065706    .8733381
-------------+----------------------------------------------------------------
         rho |   .6583832   .0241022                      .6085218    .7030662
------------------------------------------------------------------------------
Wald test of rho=0:                 chi2(1) =  344.776    Prob > chi2 = 0.0000
```

```
. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      37118
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 8.q22f_1 ECSagree 2.q1_01
               3.q1_01 4.q1_01 5.q1_01 6.q1_01 8.q1_01 2.q11_7 3.q11_7 4.q11_7
               5.q11_7 6.q11_7 8.q11_7 h_aged2 h_aged3 h_female h_edu_high
               h_edu_medium h_retired h_student h_unemployed fall2009 spring2010
               fall2010 spring2011 EU ExYu high_lev_dev ExpECSagree 2.q1_02 3.q1_02
               4.q1_02 5.q1_02 6.q1_02 8.q1_02

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   .1386755   .0662849     2.09   0.036     .0087594    .2685916
             |
     q22f_1 |
          2  |   -.001976   .0113539    -0.17   0.862    -.0242292    .0202771
          3  |  -.0512252   .0173934    -2.95   0.003    -.0853156   -.0171349
          4  |  -.0852188   .0220025    -3.87   0.000    -.1283429   -.0420947
          5  |  -.0985847   .0198441    -4.97   0.000    -.1374784   -.0596909
          8  |  -.1095159   .0302079    -3.63   0.000    -.1687222   -.0503095
             |
    ECSagree |   .0538159   .0139197     3.87   0.000     .0265338    .0810981
             |
       q1_01 |
          2  |  -.0120676   .0078493    -1.54   0.124    -.0274519    .0033167
          3  |  -.0437449   .0119234    -3.67   0.000    -.0671143   -.0203754
          4  |  -.0918928   .0116543    -7.88   0.000    -.1147349   -.0690508
          5  |  -.1236089   .0151655    -8.15   0.000    -.1533328    -.093885
          6  |   -.155912   .0157627    -9.89   0.000    -.1868063   -.1250176
          8  |  -.1079255   .0202387    -5.33   0.000    -.1475927   -.0682583
             |
       q11_7 |
          2  |  -.0600455   .0144116    -4.17   0.000    -.0882918   -.0317993
          3  |  -.1384153   .0144045    -9.61   0.000    -.1666477    -.110183
          4  |  -.2496844   .0234691   -10.64   0.000     -.295683   -.2036857
          5  |  -.2682532    .019274   -13.92   0.000    -.3060295   -.2304768
          6  |  -.2701455   .0314081    -8.60   0.000    -.3317043   -.2085867
          8  |  -.2336471    .024132    -9.68   0.000     -.280945   -.1863491
             |
     h_aged2 |  -.0064831   .0062945    -1.03   0.303    -.0188202    .0058539
     h_aged3 |   .0037504   .0081093     0.46   0.644    -.0121435    .0196443
    h_female |  -.0015979   .0042373    -0.38   0.706    -.0099029    .0067071
  h_edu_high |  -.0046646   .0126082    -0.37   0.711    -.0293763     .020047
h_edu_medium |  -.0031697   .0114124    -0.28   0.781    -.0255376    .0191981
   h_retired |   .0034982   .0193227     0.18   0.856    -.0343736      .04137
   h_student |   .0074476   .0146895     0.51   0.612    -.0213434    .0362386
h_unemployed |   .0135034   .0137969     0.98   0.328    -.0135381    .0405448
    fall2009 |   .0203012   .0156104     1.30   0.193    -.0102947     .050897
  spring2010 |   .0368862   .0157061     2.35   0.019     .0061029    .0676695
    fall2010 |   .0312127    .020259     1.54   0.123    -.0084942    .0709196
  spring2011 |   .0642217   .0140208     4.58   0.000     .0367414     .091702
          EU |   .0011201   .0477527     0.02   0.981    -.0924736    .0947138
        ExYu |   .1199281   .0755806     1.59   0.113    -.0282072    .2680634
high_lev_dev |   .0904842   .0627895     1.44   0.150    -.0325808    .2135493
 ExpECSagree |   .0500671   .0082992     6.03   0.000      .033801    .0663332
             |
       q1_02 |
          2  |  -.0145889   .0055677    -2.62   0.009    -.0255014   -.0036764
          3  |   -.035558   .0072855    -4.88   0.000    -.0498373   -.0212787
          4  |  -.1096437   .0058991   -18.59   0.000    -.1212056   -.0980817
          5  |  -.1541513   .0067338   -22.89   0.000    -.1673493   -.1409533
          6  |  -.1811536   .0060216   -30.08   0.000    -.1929558   -.1693515
          8  |  -.1100962   .0071016   -15.50   0.000     -.124015   -.0961774
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

**Appendix 4.9: Robustness check of the 'credibility' model - questions about perceptions of financial stability in a country and perceptions and expectations about the financial situation of a household included (SUR, cluster country, weighted)**

```
. drop if q1_15==9
(236 observations deleted)

. drop if q1_15==.
(0 observations deleted)

. tab q1_15, missing

   Currently, the |
        financial |
  situation of my |
household is good |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree |        954        2.59        2.59
            Agree |      3,745       10.15       12.74
   Somewhat agree |      9,336       25.31       38.05
Somewhat disagree |      8,077       21.90       59.95
         Disagree |      7,768       21.06       81.02
Strongly disagree |      6,789       18.41       99.42
      Do not know |        213        0.58      100.00
------------------+-----------------------------------
            Total |     36,882      100.00

. drop if q1_19==9
(184 observations deleted)

. drop if q1_19==.
(0 observations deleted)

. tab q1_19, missing

 Over the next 12 |
 months, I expect |
    the financial |
  situation of my |
 household to get |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree |      1,587        4.32        4.32
            Agree |      4,675       12.74       17.06
   Somewhat agree |      9,371       25.54       42.60
Somewhat disagree |      7,912       21.56       64.16
         Disagree |      6,627       18.06       82.22
Strongly disagree |      5,071       13.82       96.04
      Do not know |      1,455        3.96      100.00
------------------+-----------------------------------
            Total |     36,698      100.00
```

```
. biprobit (CSagree = i.CBA i.q22f_1 i.CBA#i.q22f_1 ECSagree i.q1_01 i.CBA#i.q1_01
i.q11_7 i.q1_15 h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student
h_unemployed fall2009 spring2010 fall2010 spring2011 EU ExYu high_lev_dev)
(ExpCSagree = i.CBA i.q22f_1 i.CBA#i.q22f_1 ExpECSagree i.q1_02 i.CBA#i.q1_02 i.q11_7
i.q1_19 h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student
h_unemployed fall2009 spring2010 fall2010 spring2011 EU ExYu high_lev_dev) [pweight =
weight], vce(cluster country) nolog

Seemingly unrelated bivariate probit              Number of obs   =      36698
                                                  Wald chi2(6)    =          .
Log pseudolikelihood = -36237.638                 Prob > chi2     =          .

                               (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
CSagree      |
       1.CBA |  -.4116985    .179729    -2.29   0.022    -.7639608   -.0594362
             |
      q22f_1 |
          2  |  -.1149297   .0515727    -2.23   0.026    -.2160103   -.0138491
          3  |  -.2615406   .0508876    -5.14   0.000    -.3612784   -.1618028
          4  |  -.3225519   .0843447    -3.82   0.000    -.4878645   -.1572393
          5  |  -.3831914   .0774962    -4.94   0.000    -.5350812   -.2313015
          8  |  -.3138571   .1437705    -2.18   0.029    -.5956421   -.0320721
             |
  CBA#q22f_1 |
        1 2  |   .2391658   .0671981     3.56   0.000       .10746    .3708716
        1 3  |   .2244852   .0939032     2.39   0.017     .0404383     .408532
        1 4  |   .1509789    .102859     1.47   0.142    -.0506211    .3525788
        1 5  |   .2638843   .0971792     2.72   0.007     .0734166     .454352
        1 8  |  -.1782492   .2299011    -0.78   0.438    -.6288471    .2723488
             |
    ECSagree |   .3410642   .0858922     3.97   0.000     .1727186    .5094098
             |
       q1_01 |
          2  |  -.3027579   .1721789    -1.76   0.079    -.6402224    .0347065
          3  |  -.6256969   .2047124    -3.06   0.002    -1.026926   -.2244681
          4  |  -.9794382     .18558    -5.28   0.000    -1.343168   -.6157082
          5  |  -1.209936   .1963212    -6.16   0.000    -1.594719   -.8251536
          6  |  -1.385481   .2010159    -6.89   0.000    -1.779465   -.9914967
          8  |   -1.11322    .222092    -5.01   0.000    -1.548512   -.6779279
             |
   CBA#q1_01 |
        1 2  |   .3739195   .1957492     1.91   0.056    -.0097419     .757581
        1 3  |   .4421027   .1916933     2.31   0.021     .0663907    .8178146
        1 4  |   .5658065   .1780228     3.18   0.001     .2168882    .9147247
        1 5  |    .879655   .1809908     4.86   0.000     .5249195     1.23439
        1 6  |   .9226867   .1981997     4.66   0.000     .5342224    1.311151
        1 8  |   .9395365   .2220882     4.23   0.000     .5042517    1.374821
             |
       q11_7 |
          2  |  -.1716742   .0481768    -3.56   0.000     -.266099   -.0772493
          3  |  -.4049492   .0532581    -7.60   0.000    -.5093331   -.3005653
          4  |  -.8301895   .0660489   -12.57   0.000    -.9596429   -.7007361
          5  |  -.8691367   .0629466   -13.81   0.000    -.9925096   -.7457637
          6  |  -.8683874   .1186945    -7.32   0.000    -1.101024   -.6357504
          8  |  -.7430233   .0866324    -8.58   0.000    -.9128198   -.5732269
             |
       q1_15 |
          2  |   .0574709   .0475257     1.21   0.227    -.0356778    .1506196
          3  |  -.0529632   .0371934    -1.42   0.154     -.125861    .0199345
          4  |  -.2334902   .0428668    -5.45   0.000    -.3175076   -.1494728
          5  |  -.2807253     .06761    -4.15   0.000    -.4132384   -.1482121
          6  |   -.360658   .0694378    -5.19   0.000    -.4967535   -.2245625
          8  |  -.3241943   .0963058    -3.37   0.001    -.5129501   -.1354385
             |
     h_aged2 |  -.0096603   .0207288    -0.47   0.641     -.050288    .0309674
     h_aged3 |   .0686507   .0326542     2.10   0.036     .0046498    .1326517
    h_female |  -.0141891   .0220326    -0.64   0.520    -.0573722    .0289939
  h_edu_high |  -.0480308    .047175    -1.02   0.309     -.140492    .0444304
h_edu_medium |   -.022818   .0409554    -0.56   0.577    -.1030891    .0574531
   h_retired |  -.0145779   .0709584    -0.21   0.837    -.1536539    .1244981
   h_student |   .0084679   .0543874     0.16   0.876    -.0981294    .1150652
h_unemployed |   .0771848   .0409406     1.89   0.059    -.0030574     .157427
    fall2009 |   .1259313   .0470943     2.67   0.007     .0336281    .2182345
```

```
  spring2010 |   .2106315   .0481245     4.38   0.000     .1163092    .3049537
    fall2010 |   .1784499   .0638121     2.80   0.005     .0533804    .3035194
  spring2011 |   .3028505    .051014     5.94   0.000     .2028649    .4028362
          EU |  -.097314     .180376    -0.54   0.590    -.4508444    .2562164
        ExYu |   .4167106   .2691408     1.55   0.122    -.1107957    .9442169
high_lev_dev |   .3667254   .2454013     1.49   0.135    -.1142522    .8477031
       _cons |   1.068237   .2185145     4.89   0.000     .6399561    1.496517
-------------+----------------------------------------------------------------
ExpCSagree   |
       1.CBA |  -.2494746   .2520151    -0.99   0.322    -.7434151    .2444659
             |
      q22f_1 |
          2  |    .002388    .072676     0.03   0.974    -.1400543    .1448303
          3  |  -.1608277   .1039625    -1.55   0.122    -.3645905    .0429351
          4  |  -.2842796   .1015639    -2.80   0.005    -.4833411   -.0852181
          5  |  -.3673338   .0877577    -4.19   0.000    -.5393356   -.1953319
          8  |  -.3842227   .1090034    -3.52   0.000    -.5978654   -.1705799
             |
  CBA#q22f_1 |
        1 2  |   .2315063    .079924     2.90   0.004     .0748581    .3881546
        1 3  |   .3334362   .1067575     3.12   0.002     .1241953    .5426771
        1 4  |   .2946944   .1314741     2.24   0.025     .0370099    .5523788
        1 5  |   .4567078   .0999323     4.57   0.000     .2608441    .6525715
        1 8  |    .344289    .240068     1.43   0.152    -.1262357    .8148136
             |
 ExpECSagree |   .3227366   .0489572     6.59   0.000     .2267822    .4186909
             |
       q1_02 |
          2  |  -.0781225   .0981749    -0.80   0.426    -.2705417    .1142967
          3  |  -.3430888   .0985651    -3.48   0.000    -.5362728   -.1499047
          4  |  -.8883771   .0934642    -9.50   0.000    -1.071564   -.7051906
          5  |  -1.137073   .1099708   -10.34   0.000    -1.352612   -.9215338
          6  |    -1.2571   .1284382    -9.79   0.000    -1.508834   -1.005366
          8  |  -.7459139   .0913306    -8.17   0.000    -.9249185   -.5669092
             |
   CBA#q1_02 |
        1 2  |  -.2590411   .1583724    -1.64   0.102    -.5694453    .0513631
        1 3  |    .010411   .1915641     0.05   0.957    -.3650477    .3858697
        1 4  |   .3322936   .1885282     1.76   0.078    -.0372149    .7018021
        1 5  |   .4752047   .1953641     2.43   0.015     .0922981    .8581114
        1 6  |   .4544581   .1805551     2.52   0.012     .1005765    .8083396
        1 8  |  -.1610755   .2132573    -0.76   0.450    -.5790521    .2569012
             |
       q11_7 |
          2  |   -.133672   .0384834    -3.47   0.001    -.2090981   -.0582458
          3  |  -.3220002   .0384424    -8.38   0.000    -.3973459   -.2466544
          4  |  -.5979561   .0685952    -8.72   0.000    -.7324001   -.4635121
          5  |   -.682065   .0541625   -12.59   0.000    -.7882215   -.5759085
          6  |  -.6784492   .0829754    -8.18   0.000     -.841078   -.5158204
          8  |  -.5515819    .046531   -11.85   0.000    -.6427809   -.4603829
             |
       q1_19 |
          2  |  -.0136373   .0511507    -0.27   0.790    -.1138909    .0866163
          3  |  -.0427247   .0646921    -0.66   0.509    -.1695189    .0840695
          4  |  -.2272896   .0729447    -3.12   0.002    -.3702587   -.0843205
          5  |  -.3298986   .0666712    -4.95   0.000    -.4605716   -.1992255
          6  |  -.3828741   .0717878    -5.33   0.000    -.5235756   -.2421725
          8  |  -.2187153   .0629025    -3.48   0.001    -.3420018   -.0954287
             |
     h_aged2 |   .0025643    .027183     0.09   0.925    -.0507134     .055842
     h_aged3 |   .0075851   .0242696     0.31   0.755    -.0399825    .0551526
    h_female |   .0090452    .013642     0.66   0.507    -.0176927    .0357831
  h_edu_high |  -.0680337   .0443232    -1.53   0.125    -.1549056    .0188382
h_edu_medium |  -.0404085   .0328529    -1.23   0.219    -.1047989    .0239819
   h_retired |   .0734369   .0559266     1.31   0.189    -.0361772     .183051
   h_student |    .031669   .0419359     0.76   0.450    -.0505239    .1138619
h_unemployed |   .0563895   .0489101     1.15   0.249    -.0394724    .1522515
    fall2009 |   .0022967   .0670744     0.03   0.973    -.1291668    .1337602
  spring2010 |   .0916867    .059171     1.55   0.121    -.0242863    .2076597
    fall2010 |   .0650411   .0689008     0.94   0.345     -.070002    .2000842
  spring2011 |   .1652864   .0531688     3.11   0.002     .0610774    .2694953
          EU |   .1463317   .1221126     1.20   0.231    -.0930045    .3856679
        ExYu |   .4082006   .1848708     2.21   0.027     .0458604    .7705407
high_lev_dev |   .2506588   .1669174     1.50   0.133    -.0764932    .5778108
       _cons |   .6213383   .1200213     5.18   0.000     .3861009    .8565757
-------------+----------------------------------------------------------------
     /athrho |   .7790617   .0425407    18.31   0.000     .6956834      .86244
```

```
-------------+----------------------------------------------------------------
         rho |   .6521678   .0244472                      .6016207    .6975127
------------------------------------------------------------------------------
Wald test of rho=0:                 chi2(1) =  335.378    Prob > chi2 = 0.0000

. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      36698
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 8.q22f_1 ECSagree 2.q1_01
               3.q1_01 4.q1_01 5.q1_01 6.q1_01 8.q1_01 2.q11_7 3.q11_7 4.q11_7
               5.q11_7 6.q11_7 8.q11_7 2.q1_15 3.q1_15 4.q1_15 5.q1_15 6.q1_15
               8.q1_15 h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired
               h_student h_unemployed fall2009 spring2010 fall2010 spring2011 EU
               ExYu high_lev_dev ExpECSagree 2.q1_02 3.q1_02 4.q1_02 5.q1_02
               6.q1_02 8.q1_02 2.q1_19 3.q1_19 4.q1_19 5.q1_19 6.q1_19 8.q1_19

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   .1338151   .0625104     2.14   0.032     .0112968    .2563333
             |
      q22f_1 |
          2  |  -.0006705   .0107041    -0.06   0.950    -.0216501    .0203092
          3  |  -.0459654    .016097    -2.86   0.004    -.0775148   -.0144159
          4  |  -.0775768   .0205371    -3.78   0.000    -.1178287   -.0373249
          5  |   -.088241   .0191021    -4.62   0.000    -.1256804   -.0508016
          8  |  -.1000319   .0297724    -3.36   0.001    -.1583849    -.041679
             |
    ECSagree |     .05175   .0137396     3.77   0.000      .024821    .0786791
             |
       q1_01 |
          2  |  -.0146248   .0086242    -1.70   0.090     -.031528    .0022784
          3  |  -.0462799   .0125261    -3.69   0.000    -.0708305   -.0217293
          4  |  -.0917777   .0117822    -7.79   0.000    -.1148702   -.0686851
          5  |  -.1188322   .0145613    -8.16   0.000    -.1473718   -.0902926
          6  |  -.1470214   .0148997    -9.87   0.000    -.1762242   -.1178186
          8  |  -.1016166   .0193586    -5.25   0.000    -.1395586   -.0636745
             |
       q11_7 |
          2  |  -.0544331   .0130266    -4.18   0.000    -.0799648   -.0289015
          3  |  -.1264292   .0140707    -8.99   0.000    -.1540073    -.098851
          4  |   -.232824   .0238341    -9.77   0.000     -.279538   -.1861101
          5  |  -.2484736   .0189481   -13.11   0.000    -.2856112   -.2113359
          6  |  -.2479386   .0303017    -8.18   0.000    -.3073289   -.1885483
          8  |  -.2139896   .0233473    -9.17   0.000    -.2597495   -.1682298
             |
       q1_15 |
          2  |   .0078303    .006619     1.18   0.237    -.0051427    .0208033
          3  |  -.0074986   .0051571    -1.45   0.146    -.0176063    .0026092
          4  |  -.0348843   .0054727    -6.37   0.000    -.0456106    -.024158
          5  |   -.042454   .0099211    -4.28   0.000     -.061899    -.023009
          6  |  -.0555713   .0102022    -5.45   0.000    -.0755673   -.0355754
          8  |  -.0495433   .0152596    -3.25   0.001    -.0794515    -.019635
             |
     h_aged2 |   -.001087   .0062844    -0.17   0.863    -.0134042    .0112302
     h_aged3 |   .0115368   .0080863     1.43   0.154    -.0043119    .0273856
    h_female |  -.0008169   .0043321    -0.19   0.850    -.0093076    .0076739
  h_edu_high |  -.0173369   .0122231    -1.42   0.156    -.0412937    .0066199
h_edu_medium |  -.0094309   .0105546    -0.89   0.372    -.0301175    .0112558
   h_retired |   .0086353   .0183023     0.47   0.637    -.0272366    .0445072
   h_student |   .0059626   .0136434     0.44   0.662     -.020778    .0327032
h_unemployed |   .0200405   .0125637     1.60   0.111    -.0045839     .044665
    fall2009 |   .0194469   .0148339     1.31   0.190     -.009627    .0485208
  spring2010 |   .0455022   .0148934     3.06   0.002     .0163116    .0746928
    fall2010 |   .0366835   .0195129     1.88   0.060    -.0015611    .0749281
  spring2011 |    .070366   .0132792     5.30   0.000     .0443393    .0963927
          EU |   .0068488   .0447708     0.15   0.878    -.0809004     .094598
        ExYu |   .1235225   .0714798     1.73   0.084    -.0165754    .2636204
high_lev_dev |    .092668   .0595452     1.56   0.120    -.0240384    .2093744
 ExpECSagree |   .0476708    .008212     5.80   0.000     .0315755    .0637661
             |
       q1_02 |
          2  |  -.0154755   .0056995    -2.72   0.007    -.0266464   -.0043047
```

```
           3  |  -.0356243   .0073911    -4.82   0.000    -.0501106    -.021138
           4  |  -.1058454   .0058069   -18.23   0.000    -.1172267   -.0944642
           5  |  -.1439844   .0072317   -19.91   0.000    -.1581583   -.1298105
           6  |  -.1669578    .006961   -23.98   0.000    -.1806011   -.1533146
           8  |  -.1042234   .0067058   -15.54   0.000    -.1173666   -.0910802
              |
       q1_19  |
           2  |  -.0018639   .0069847    -0.27   0.790    -.0155536    .0118258
           3  |  -.0059013   .0088174    -0.67   0.503     -.023183    .0113805
           4  |  -.0333198   .0100536    -3.31   0.001    -.0530245   -.0136151
           5  |  -.0497122   .0084817    -5.86   0.000     -.066336   -.0330884
           6  |  -.0584279   .0095664    -6.11   0.000    -.0771777    -.039678
           8  |  -.0319833   .0089785    -3.56   0.000    -.0495807   -.0143858
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

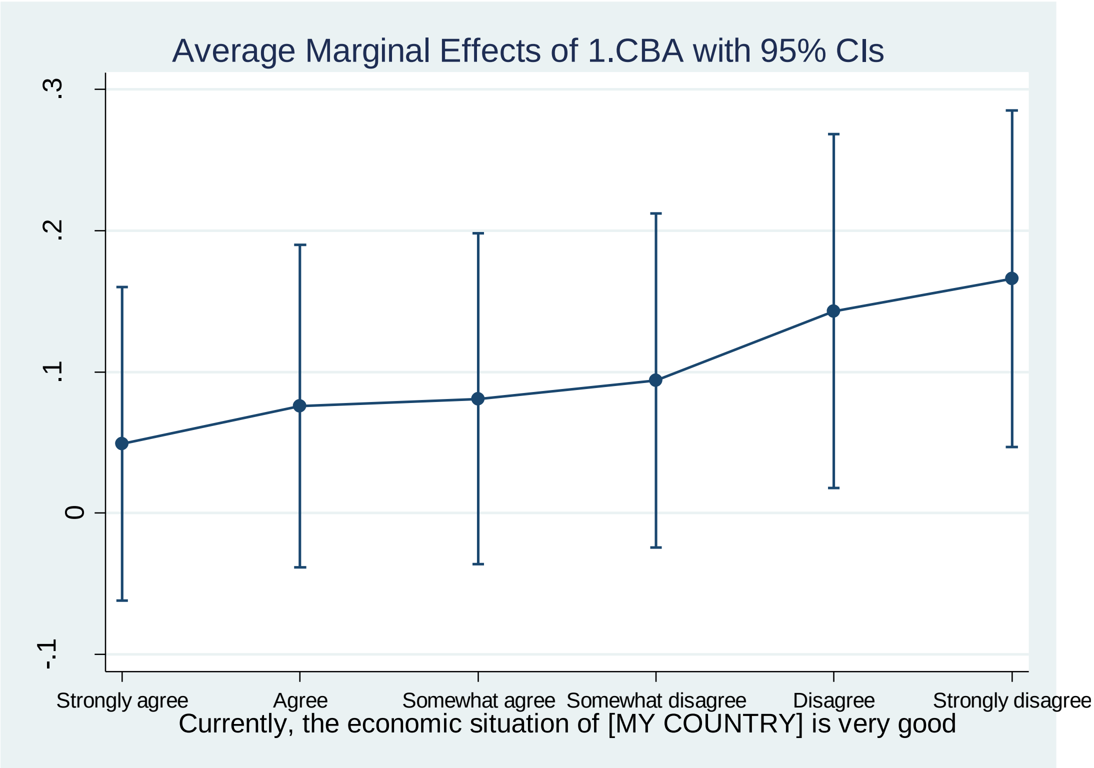
**Appendix 4.10: Robustness check of the 'credibility' model - large database used, 'trust in government' variable excluded (SUR, cluster country, weighted)**

```
. *with EU, ExYu and high level of development dummies (without trust in government, large) for RC
.
biprobit (CSagree = i.CBA ECSagree i.q1_01 i.CBA#i.q1_01 h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed fall2009 spring2010 fall2010 spring2011 EU ExYu high_lev_dev) (ExpCSagree = i.CBA ExpECSagree i.q1_02 i.CBA#i.q1_02 h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed spring2008 fall2008 spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu high_lev_dev) [pweight = weight], vce(cluster country) nolog

Seemingly unrelated bivariate probit              Number of obs   =      59351
                                                  Wald chi2(6)    =          .
Log pseudolikelihood = -61243.934                 Prob > chi2     =          .

                               (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
CSagree      |
       1.CBA |   -.233427   .1800014    -1.30   0.195    -.5862232    .1193693
    ECSagree |   .4320531    .085546     5.05   0.000     .2643861    .5997201
             |
       q1_01 |
          2  |  -.1078921   .0589575    -1.83   0.067    -.2234466    .0076624
          3  |  -.5002018   .0646025    -7.74   0.000    -.6268202   -.3735833
          4  |   -.958737   .0479344   -20.00   0.000    -1.052687   -.8647874
          5  |  -1.286862   .0955389   -13.47   0.000    -1.474115   -1.099609
          6  |  -1.556644   .1114523   -13.97   0.000    -1.775086   -1.338201
          8  |  -1.041216   .1256029    -8.29   0.000    -1.287393   -.7950386
             |
   CBA#q1_01 |
        1 2  |   .3627943   .0763313     4.75   0.000     .2131877     .512401
        1 3  |   .4085702   .0736776     5.55   0.000     .2641647    .5529757
        1 4  |   .4962564   .0480115    10.34   0.000     .4021556    .5903571
        1 5  |   .7760088   .1204914     6.44   0.000       .53985    1.012168
        1 6  |   .9004714   .1484441     6.07   0.000     .6095263    1.191416
        1 8  |   .5365258   .1335407     4.02   0.000     .2747908    .7982608
             |
     h_aged2 |  -.0080809   .0198026    -0.41   0.683    -.0468932    .0307315
     h_aged3 |   .0788656   .0348256     2.26   0.024     .0106086    .1471226
    h_female |  -.0208405   .0200087    -1.04   0.298    -.0600569    .0183758
  h_edu_high |   .0979967   .0439679     2.23   0.026     .0118213    .1841722
h_edu_medium |    .053074    .047823     1.11   0.267    -.0406573    .1468054
   h_retired |  -.0473696   .0643747    -0.74   0.462    -.1735418    .0788025
   h_student |   .0063973   .0503406     0.13   0.899    -.0922685    .1050631
h_unemployed |   .0011172   .0417904     0.03   0.979    -.0807905    .0830249
    fall2009 |  -.0058256   .0666195    -0.09   0.930    -.1363975    .1247463
  spring2010 |   .0618161   .0901918     0.69   0.493    -.1149566    .2385888
    fall2010 |    .046943   .0973941     0.48   0.630     -.143946     .237832
  spring2011 |   .1706283   .0540403     3.16   0.002     .0647112    .2765454
          EU |  -.2383616   .1467658    -1.62   0.104    -.5260172    .0492941
        ExYu |   .3204565    .228245     1.40   0.160    -.1268955    .7678084
high_lev_dev |   .3422049   .2266978     1.51   0.131    -.1021146    .7865244
       _cons |   .3096416   .1306037     2.37   0.018     .0536631    .5656201
```

```
-------------+----------------------------------------------------------------
ExpCSagree   |
       1.CBA |  -.0768688   .1833411    -0.42   0.675    -.4362108    .2824731
 ExpECSagree |    .388206   .0638945     6.08   0.000     .2629751    .5134369
             |
       q1_02 |
          2  |  -.0896218   .0484722    -1.85   0.064    -.1846256     .005382
          3  |  -.4172182   .0628098    -6.64   0.000    -.5403231   -.2941133
          4  |  -1.009466   .0668675   -15.10   0.000    -1.140524   -.8784078
          5  |  -1.366978   .0933408   -14.65   0.000    -1.549923   -1.184033
          6  |   -1.57843   .1190857   -13.25   0.000    -1.811834   -1.345026
          8  |  -.9684526   .0743707   -13.02   0.000    -1.114217   -.8226887
             |
   CBA#q1_02 |
        1 2  |  -.1147599   .0483329    -2.37   0.018    -.2094905   -.0200292
        1 3  |   .0762192   .0711507     1.07   0.284    -.0632336    .2156721
        1 4  |    .363546   .0675201     5.38   0.000      .231209     .495883
        1 5  |   .5397528   .0898176     6.01   0.000     .3637134    .7157921
        1 6  |   .5820199   .1139507     5.11   0.000     .3586807    .8053591
        1 8  |   .1319933   .0762785     1.73   0.084    -.0175098    .2814965
             |
     h_aged2 |  -.0099821   .0221127    -0.45   0.652    -.0533222     .033358
     h_aged3 |   .0234953   .0304755     0.77   0.441    -.0362357    .0832262
    h_female |  -.0016623   .0138031    -0.12   0.904    -.0287158    .0253912
  h_edu_high |   .0338311   .0389875     0.87   0.386     -.042583    .1102451
h_edu_medium |    .021965   .0339098     0.65   0.517     -.044497    .0884269
   h_retired |   .0156953   .0492909     0.32   0.750    -.0809131    .1123037
   h_student |   .0240534    .041058     0.59   0.558    -.0564188    .1045255
h_unemployed |    .005228   .0431218     0.12   0.904    -.0792891    .0897451
  spring2008 |   .0368683    .046909     0.79   0.432    -.0550716    .1288082
    fall2008 |  -.0200706   .0457279    -0.44   0.661    -.1096956    .0695544
  spring2009 |  -.0595387   .0584315    -1.02   0.308    -.1740623    .0549848
    fall2009 |  -.1032323   .0807588    -1.28   0.201    -.2615166    .0550519
  spring2010 |  -.0234493    .093823    -0.25   0.803    -.2073389    .1604403
    fall2010 |  -.0283612   .0762899    -0.37   0.710    -.1778866    .1211642
  spring2011 |    .063669   .0576028     1.11   0.269    -.0492304    .1765683
          EU |  -.0550611   .1224583    -0.45   0.653    -.2950749    .1849526
        ExYu |   .2934575   .1765634     1.66   0.097    -.0526005    .6395154
high_lev_dev |   .2321488   .1901846     1.22   0.222    -.1406062    .6049038
       _cons |    .179962   .0650637     2.77   0.006     .0524396    .3074845
-------------+----------------------------------------------------------------
     /athrho |    .789151    .041758    18.90   0.000     .7073068    .8709951
-------------+----------------------------------------------------------------
         rho |   .6579278   .0236823                      .6089852    .7018794
------------------------------------------------------------------------------
Wald test of rho=0:                 chi2(1) =  357.142    Prob > chi2 = 0.0000

. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      59351
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()
dy/dx w.r.t. : 1.CBA ECSagree 2.q1_01 3.q1_01 4.q1_01 5.q1_01 6.q1_01 8.q1_01
               h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student
               h_unemployed fall2009 spring2010 fall2010 spring2011 EU ExYu
               high_lev_dev ExpECSagree 2.q1_02 3.q1_02 4.q1_02 5.q1_02 6.q1_02
               8.q1_02 spring2008 fall2008 spring2009

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   .1158261    .058883     1.97   0.049     .0004176    .2312346
    ECSagree |    .070949   .0158509     4.48   0.000     .0398819    .1020161
             |
       q1_01 |
          2  |  -.0012038   .0030629    -0.39   0.694     -.007207    .0047993
          3  |   -.035447   .0056694    -6.25   0.000    -.0465588   -.0243352
          4  |   -.097735   .0051307   -19.05   0.000     -.107791   -.0876791
          5  |   -.145938   .0109326   -13.35   0.000    -.1673654   -.1245105
          6  |  -.1913178    .011199   -17.08   0.000    -.2132675   -.1693681
          8  |  -.1103583   .0180485    -6.11   0.000    -.1457327   -.0749839
             |
     h_aged2 |  -.0029207   .0063346    -0.46   0.645    -.0153362    .0094949
     h_aged3 |   .0167019   .0102486     1.63   0.103     -.003385    .0367889
    h_female |  -.0036877   .0044684    -0.83   0.409    -.0124457    .0050703
```

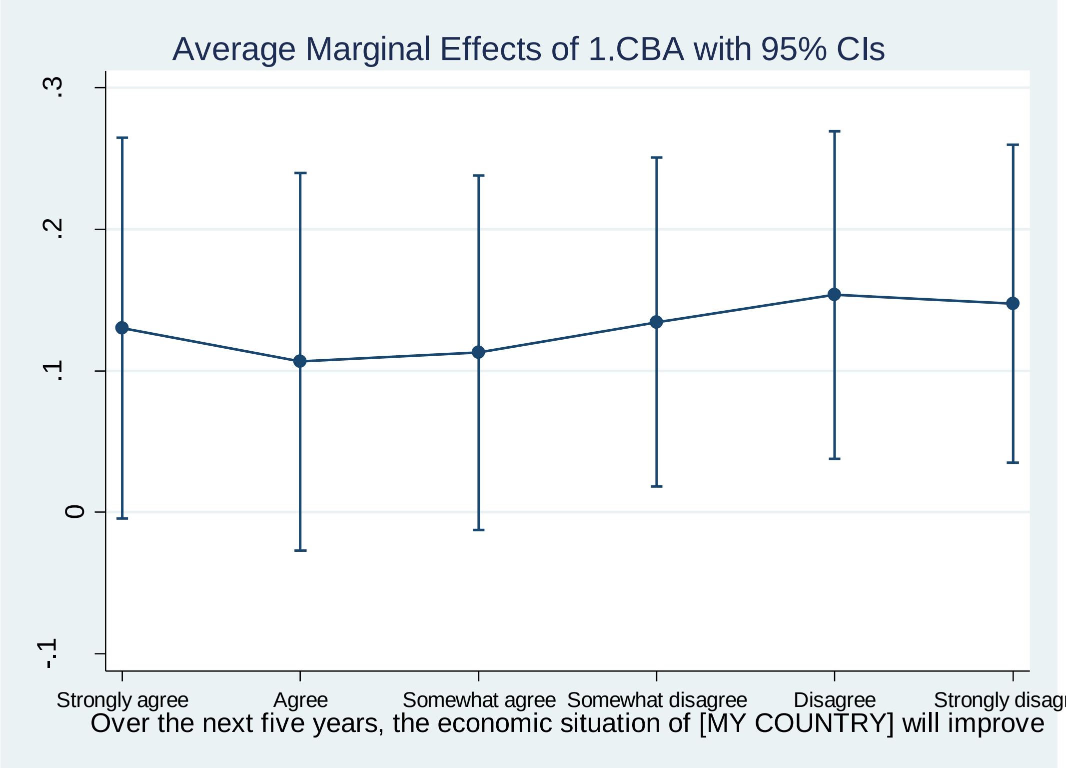
```
  h_edu_high |   .0214937   .0114595     1.88   0.061    -.0009666    .0439539
h_edu_medium |   .0122223   .0122679     1.00   0.319    -.0118224    .0362669
   h_retired |  -.0052729   .0182093    -0.29   0.772    -.0409625    .0304167
   h_student |   .0048907   .0136127     0.36   0.719    -.0217897    .0315711
h_unemployed |   .0010181   .0130883     0.08   0.938    -.0246345    .0266707
    fall2009 |  -.0174381   .0233253    -0.75   0.455    -.0631548    .0282786
  spring2010 |   .0064073   .0275412     0.23   0.816    -.0475726    .0603871
    fall2010 |   .0031807   .0253181     0.13   0.900    -.0464419    .0528033
  spring2011 |   .0381845   .0157431     2.43   0.015     .0073287    .0690403
          EU |  -.0479329   .0405704    -1.18   0.237    -.1274495    .0315836
        ExYu |    .099475   .0679296     1.46   0.143    -.0336645    .2326145
high_lev_dev |   .0932582   .0674985     1.38   0.167    -.0390364    .2255529
 ExpECSagree |   .0619787   .0118367     5.24   0.000     .0387791    .0851783
             |
       q1_02 |
          2  |  -.0107936   .0030011    -3.60   0.000    -.0166757   -.0049116
          3  |  -.0407313   .0046169    -8.82   0.000    -.0497802   -.0316825
          4  |  -.1241875   .0047799   -25.98   0.000    -.1335559   -.1148191
          5  |  -.1841492   .0086245   -21.35   0.000     -.201053   -.1672455
          6  |  -.2220869   .0076923   -28.87   0.000    -.2371636   -.2070102
          8  |  -.1274723   .0074262   -17.17   0.000    -.1420273   -.1129173
             |
  spring2008 |   .0058862   .0072946     0.81   0.420    -.0084111    .0201834
    fall2008 |  -.0032044   .0074125    -0.43   0.666    -.0177326    .0113239
  spring2009 |  -.0095056   .0097027    -0.98   0.327    -.0285226    .0095114
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.


. margins, dydx(CBA) at(q1_01=(1(1)6)) vsquish

Average marginal effects                          Number of obs   =      59351
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()
dy/dx w.r.t. : 1.CBA
1._at        : q1_01           =           1
2._at        : q1_01           =           2
3._at        : q1_01           =           3
4._at        : q1_01           =           4
5._at        : q1_01           =           5
6._at        : q1_01           =           6

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |   .0491501   .0566289     0.87   0.385    -.0618406    .1601408
          2  |   .0759284   .0582335     1.30   0.192    -.0382072     .190064
          3  |   .0810829    .059723     1.36   0.175    -.0359721    .1981378
          4  |   .0938211   .0603138     1.56   0.120    -.0243917     .212034
          5  |   .1430518   .0639564     2.24   0.025     .0176996     .268404
          6  |   .1659611   .0608039     2.73   0.006     .0467877    .2851345
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

```
. marginsplot

  Variables that uniquely identify margins: q1_01
```




```
. margins, dydx(CBA) at(q1_02=(1(1)6)) vsquish

Average marginal effects                          Number of obs   =      59351
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()
dy/dx w.r.t. : 1.CBA
1._at        : q1_02           =           1
2._at        : q1_02           =           2
3._at        : q1_02           =           3
4._at        : q1_02           =           4
5._at        : q1_02           =           5
6._at        : q1_02           =           6

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |   .1302628   .0685476     1.90   0.057     -.004088    .2646136
          2  |   .1066228   .0680581     1.57   0.117    -.0267686    .2400142
          3  |   .1129218   .0638847     1.77   0.077    -.0122899    .2381334
          4  |   .1344048   .0592277     2.27   0.023     .0183205     .250489
          5  |   .1536325    .059116     2.60   0.009     .0377673    .2694977
          6  |   .1474792   .0572294     2.58   0.010     .0353117    .2596468
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

```
. marginsplot

  Variables that uniquely identify margins: q1_02
```




**Appendix 4.11: Robustness check of the 'credibility' model - without interaction terms (SUR, cluster country, weighted)**

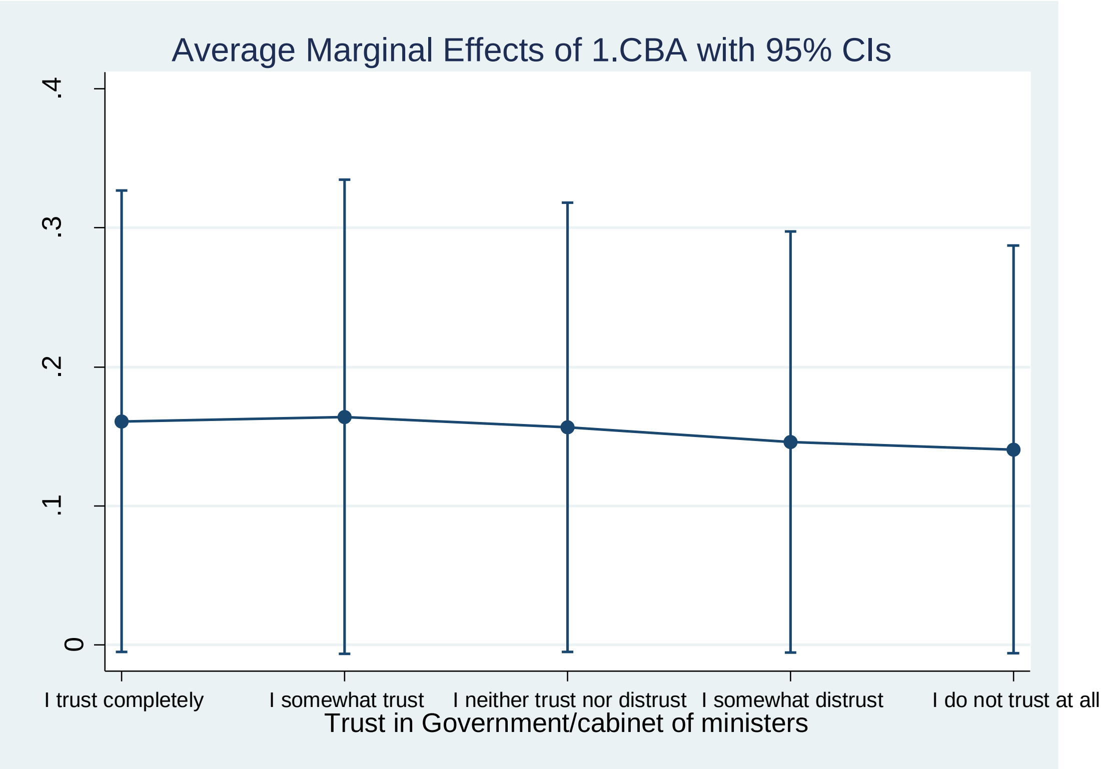
```
. biprobit (CSagree = i.CBA i.q22f_1 ECSagree i.q1_01 h_aged2 h_aged3 h_female
h_edu_high h_edu_medium h_retired h_student h_unemployed fall2009 spring2010 fall2010
spring2011 EU ExYu high_lev_dev) (ExpCSagree = i.CBA i.q22f_1 ExpECSagree i.q1_02
h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed
fall2009 spring2010 fall2010 spring2011 EU ExYu high_lev_dev), vce(cluster country)
nolog

Seemingly unrelated bivariate probit              Number of obs     =      37908
                                                  Wald chi2(6)      =          .
Log pseudolikelihood = -40155.883                 Prob > chi2       =          .

                               (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
CSagree      |
       1.CBA |   .5810782   .2966142     1.96   0.050     -.000275    1.162431
             |
      q22f_1 |
          2  |  -.1014259    .048027    -2.11   0.035    -.1955572   -.0072947
          3  |  -.2974056   .0634192    -4.69   0.000     -.421705   -.1731062
          4  |    -.38625   .0800663    -4.82   0.000    -.5431771    -.229323
          5  |  -.4659293   .0775338    -6.01   0.000    -.6178928   -.3139658
          8  |  -.4734433    .123933    -3.82   0.000    -.7163474   -.2305391
             |
    ECSagree |   .4328878   .0779761     5.55   0.000     .2800574    .5857181
             |
       q1_01 |
          2  |  -.1060001    .112736    -0.94   0.347    -.3269585    .1149583
          3  |  -.4381821   .1343578    -3.26   0.001    -.7015185   -.1748457
          4  |  -.8276483   .1376125    -6.01   0.000    -1.097364   -.5579327
          5  |  -1.016382   .1711175    -5.94   0.000    -1.351766   -.6809979
```

```
           6  |  -1.21188   .1899976    -6.38   0.000    -1.584269   -.8394916
           8  | -.9577482   .1614891    -5.93   0.000    -1.274261   -.6412354
              |
     h_aged2  | -.0223149   .0227994    -0.98   0.328    -.0670009     .022371
     h_aged3  |  .0783686   .0414674     1.89   0.059    -.0029061    .1596432
    h_female  | -.0170187   .0177338    -0.96   0.337    -.0517764    .0177389
  h_edu_high  |  .1046694   .0273524     3.83   0.000     .0510597    .1582791
h_edu_medium  |  .0546857     .04758     1.15   0.250    -.0385693    .1479407
   h_retired  | -.0454352   .0771655    -0.59   0.556    -.1966769    .1058065
   h_student  |  -.020257   .0584551    -0.35   0.729    -.1348269     .094313
h_unemployed  |   .026416   .0487838     0.54   0.588    -.0691984    .1220304
    fall2009  |   .135474    .052979     2.56   0.011     .0316371    .2393109
  spring2010  |  .2010474   .0407316     4.94   0.000     .1212149      .28088
    fall2010  |  .1811827   .0623248     2.91   0.004     .0590284     .303337
  spring2011  |  .3159137   .0471404     6.70   0.000     .2235201    .4083072
          EU  | -.2086655   .2198718    -0.95   0.343    -.6396062    .2222752
        ExYu  |  .3261262   .3290084     0.99   0.322    -.3187185    .9709708
high_lev_dev  |  .3668119   .2887109     1.27   0.204    -.1990511     .932675
       _cons  |  .2091467   .1881776     1.11   0.266    -.1596746    .5779681
-------------+----------------------------------------------------------------
ExpCSagree    |
       1.CBA  |   .318545   .2111277     1.51   0.131    -.0952578    .7323478
              |
     q22f_1   |
           2  |  .0077234   .0831705     0.09   0.926    -.1552878    .1707346
           3  | -.1644375   .1182068    -1.39   0.164    -.3961186    .0672436
           4  | -.3214661   .1207217    -2.66   0.008    -.5580763   -.0848559
           5  | -.3971312   .1126536    -3.53   0.000    -.6179282   -.1763341
           8  | -.4244463   .1167749    -3.63   0.000    -.6533209   -.1955717
              |
 ExpECSagree  |  .3872394   .0528444     7.33   0.000     .2836663    .4908124
              |
       q1_02  |
           2  | -.1421531   .0759185    -1.87   0.061    -.2909506    .0066445
           3  | -.3897677   .0929852    -4.19   0.000    -.5720154   -.2075201
           4  | -.8840174   .1058864    -8.35   0.000    -1.091551   -.6764838
           5  | -1.147444   .1184876    -9.68   0.000    -1.379676   -.9152128
           6  | -1.265612   .1353419    -9.35   0.000    -1.530877   -1.000346
           8  | -.8382113   .0843294    -9.94   0.000    -1.003494   -.6729286
              |
     h_aged2  | -.0179263   .0288725    -0.62   0.535    -.0745154    .0386628
     h_aged3  | -.0157462    .020715    -0.76   0.447    -.0563468    .0248544
    h_female  |  .0052842     .01586     0.33   0.739    -.0258007    .0363692
  h_edu_high  |  .0117289   .0340927     0.34   0.731    -.0550916    .0785493
h_edu_medium  | -.0038999    .037451    -0.10   0.917    -.0773025    .0695027
   h_retired  |  .0481634   .0568273     0.85   0.397     -.063216    .1595427
   h_student  |  .0219004   .0458252     0.48   0.633    -.0679153    .1117161
h_unemployed  |  .0345444   .0455857     0.76   0.449     -.054802    .1238907
    fall2009  | -.0130392   .0565659    -0.23   0.818    -.1239063    .0978279
  spring2010  |  .0803135   .0559465     1.44   0.151    -.0293397    .1899667
    fall2010  |  .0739506   .0751146     0.98   0.325    -.0732714    .2211726
  spring2011  |  .1848963   .0529332     3.49   0.000     .0811492    .2886435
          EU  | -.0031559   .1577746    -0.02   0.984    -.3123885    .3060768
        ExYu  |  .3123837   .2326063     1.34   0.179    -.1435163    .7682838
high_lev_dev  |  .2533578   .1981033     1.28   0.201    -.1349176    .6416332
       _cons  |  .1418263   .1185628     1.20   0.232    -.0905525    .3742051
-------------+----------------------------------------------------------------
     /athrho  |  .7974462   .0424975    18.76   0.000     .7141527    .8807397
-------------+----------------------------------------------------------------
         rho  |  .6626066   .0238391                      .6132743    .7067897
------------------------------------------------------------------------------
Wald test of rho=0:                 chi2(1) =  352.109    Prob > chi2 = 0.0000
```

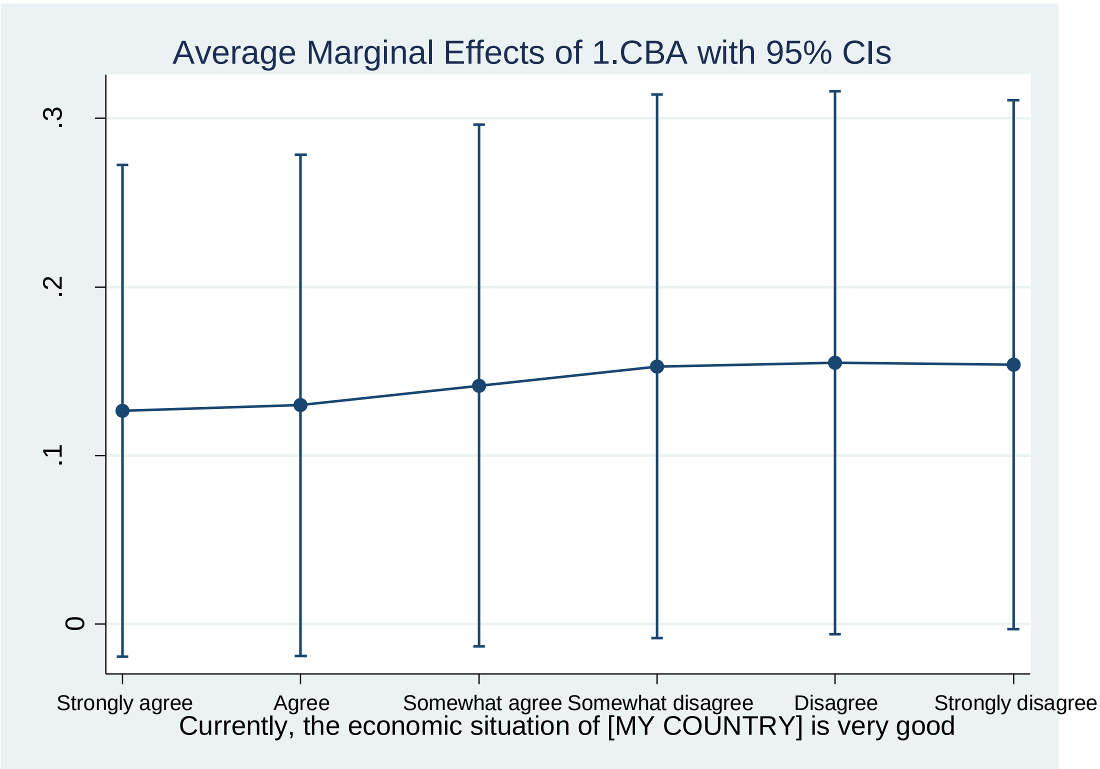
```
. margins, dydx(_all)

Average marginal effects                          Number of obs   =      37908
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 8.q22f_1 ECSagree 2.q1_01
3.q1_01 4.q1_01 5.q1_01 6.q1_01 8.q1_01 h_aged2 h_aged3 h_female h_edu_high
h_edu_medium h_retired h_student h_unemployed fall2009 spring2010 fall2010 spring2011
EU ExYu high_lev_dev ExpECSagree 2.q1_02 3.q1_02 4.q1_02 5.q1_02 6.q1_02 8.q1_02

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   .1491437   .0788116     1.89   0.058    -.0053241    .3036116
             |
      q22f_1 |
          2  |  -.0165824   .0218182    -0.76   0.447    -.0593453    .0261805
          3  |  -.0801592   .0311994    -2.57   0.010    -.1413088   -.0190095
          4  |  -.1192682   .0346891    -3.44   0.001    -.1872575   -.0512788
          5  |  -.1426846   .0337709    -4.23   0.000    -.2088743    -.076495
          8  |  -.1477931   .0359383    -4.11   0.000    -.2182309   -.0773553
             |
    ECSagree |   .0698977    .014197     4.92   0.000     .0420722    .0977232
             |
       q1_01 |
          2  |  -.0073181   .0076585    -0.96   0.339    -.0223284    .0076923
          3  |  -.0387823    .010947    -3.54   0.000    -.0602381   -.0173266
          4  |  -.0926764   .0124332    -7.45   0.000    -.1170449   -.0683078
          5  |  -.1243174   .0177841    -6.99   0.000    -.1591736   -.0894612
          6  |   -.159436   .0197163    -8.09   0.000    -.1980791   -.1207928
          8  |  -.1141897    .018652    -6.12   0.000    -.1507469   -.0776325
             |
     h_aged2 |  -.0064005   .0073065    -0.88   0.381     -.020721      .00792
     h_aged3 |   .0101969   .0094029     1.08   0.278    -.0082324    .0286262
    h_female |  -.0019234   .0042607    -0.45   0.652    -.0102743    .0064275
  h_edu_high |   .0187311   .0081113     2.31   0.021     .0028332    .0346289
h_edu_medium |   .0082214   .0131599     0.62   0.532    -.0175715    .0340144
   h_retired |   .0001794   .0208253     0.01   0.993    -.0406374    .0409963
   h_student |   .0001466   .0158178     0.01   0.993    -.0308557     .031149
h_unemployed |   .0096559   .0143279     0.67   0.500    -.0184262    .0377381
    fall2009 |     .01984   .0152906     1.30   0.194    -.0101289     .049809
  spring2010 |   .0449955   .0146147     3.08   0.002     .0163513    .0736398
    fall2010 |   .0407951   .0215588     1.89   0.058    -.0014594    .0830496
  spring2011 |   .0798627   .0143845     5.55   0.000     .0516696    .1080558
          EU |  -.0341854   .0572126    -0.60   0.550    -.1463201    .0779494
        ExYu |   .1014058    .092881     1.09   0.275    -.0806375    .2834491
high_lev_dev |   .0987644   .0746536     1.32   0.186    -.0475539    .2450827
 ExpECSagree |   .0604278    .010299     5.87   0.000     .0402421    .0806134
             |
       q1_02 |
          2  |  -.0120289   .0060627    -1.98   0.047    -.0239115   -.0001463
          3  |   -.039362   .0081456    -4.83   0.000     -.055327    -.023397
          4  |  -.1169309    .009591   -12.19   0.000    -.1357288    -.098133
          5  |  -.1663759    .013587   -12.25   0.000     -.193006   -.1397458
          6  |  -.1889501   .0142768   -13.23   0.000    -.2169322    -.160968
          8  |  -.1087024   .0064556   -16.84   0.000    -.1213553   -.0960496
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.

. biprobit (CSagree = i.CBA i.q22f_1 ECSagree i.q1_01 h_aged2 h_aged3 h_female
h_edu_high h_edu_medium h_retired h_student h_unemployed fall2009 spring2010 fall2010
spring2011 EU ExYu high_lev_dev) (ExpCSagree = i.CBA i.q22f_1 ExpECSagree i.q1_02
h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed
fall2009 spring2010 fall2010 spring2011 EU ExYu high_lev_dev), vce(cluster country)
nolog

Seemingly unrelated bivariate probit              Number of obs   =      37908
                                                  Wald chi2(6)    =          .
Log pseudolikelihood = -40155.883                 Prob > chi2     =          .

                               (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
```

```
CSagree      |
       1.CBA |   .5810782   .2966142     1.96   0.050     -.000275    1.162431
             |
      q22f_1 |
          2  |  -.1014259    .048027    -2.11   0.035    -.1955572   -.0072947
          3  |  -.2974056   .0634192    -4.69   0.000     -.421705   -.1731062
          4  |    -.38625   .0800663    -4.82   0.000    -.5431771    -.229323
          5  |  -.4659293   .0775338    -6.01   0.000    -.6178928   -.3139658
          8  |  -.4734433    .123933    -3.82   0.000    -.7163474   -.2305391
             |
    ECSagree |   .4328878   .0779761     5.55   0.000     .2800574    .5857181
             |
       q1_01 |
          2  |  -.1060001    .112736    -0.94   0.347    -.3269585    .1149583
          3  |  -.4381821   .1343578    -3.26   0.001    -.7015185   -.1748457
          4  |  -.8276483   .1376125    -6.01   0.000    -1.097364   -.5579327
          5  |  -1.016382   .1711175    -5.94   0.000    -1.351766   -.6809979
          6  |   -1.21188   .1899976    -6.38   0.000    -1.584269   -.8394916
          8  |  -.9577482   .1614891    -5.93   0.000    -1.274261   -.6412354
             |
     h_aged2 |  -.0223149   .0227994    -0.98   0.328    -.0670009     .022371
     h_aged3 |   .0783686   .0414674     1.89   0.059    -.0029061    .1596432
    h_female |  -.0170187   .0177338    -0.96   0.337    -.0517764    .0177389
  h_edu_high |   .1046694   .0273524     3.83   0.000     .0510597    .1582791
h_edu_medium |   .0546857     .04758     1.15   0.250    -.0385693    .1479407
   h_retired |  -.0454352   .0771655    -0.59   0.556    -.1966769    .1058065
   h_student |   -.020257   .0584551    -0.35   0.729    -.1348269     .094313
h_unemployed |    .026416   .0487838     0.54   0.588    -.0691984    .1220304
    fall2009 |    .135474    .052979     2.56   0.011     .0316371    .2393109
  spring2010 |   .2010474   .0407316     4.94   0.000     .1212149      .28088
    fall2010 |   .1811827   .0623248     2.91   0.004     .0590284     .303337
  spring2011 |   .3159137   .0471404     6.70   0.000     .2235201    .4083072
          EU |  -.2086655   .2198718    -0.95   0.343    -.6396062    .2222752
        ExYu |   .3261262   .3290084     0.99   0.322    -.3187185    .9709708
high_lev_dev |   .3668119   .2887109     1.27   0.204    -.1990511     .932675
       _cons |   .2091467   .1881776     1.11   0.266    -.1596746    .5779681
-------------+----------------------------------------------------------------
ExpCSagree   |
       1.CBA |    .318545   .2111277     1.51   0.131    -.0952578    .7323478
             |
      q22f_1 |
          2  |   .0077234   .0831705     0.09   0.926    -.1552878    .1707346
          3  |  -.1644375   .1182068    -1.39   0.164    -.3961186    .0672436
          4  |  -.3214661   .1207217    -2.66   0.008    -.5580763   -.0848559
          5  |  -.3971312   .1126536    -3.53   0.000    -.6179282   -.1763341
          8  |  -.4244463   .1167749    -3.63   0.000    -.6533209   -.1955717
             |
 ExpECSagree |   .3872394   .0528444     7.33   0.000     .2836663    .4908124
             |
       q1_02 |
          2  |  -.1421531   .0759185    -1.87   0.061    -.2909506    .0066445
          3  |  -.3897677   .0929852    -4.19   0.000    -.5720154   -.2075201
          4  |  -.8840174   .1058864    -8.35   0.000    -1.091551   -.6764838
          5  |  -1.147444   .1184876    -9.68   0.000    -1.379676   -.9152128
          6  |  -1.265612   .1353419    -9.35   0.000    -1.530877   -1.000346
          8  |  -.8382113   .0843294    -9.94   0.000    -1.003494   -.6729286
             |
     h_aged2 |  -.0179263   .0288725    -0.62   0.535    -.0745154    .0386628
     h_aged3 |  -.0157462    .020715    -0.76   0.447    -.0563468    .0248544
    h_female |   .0052842     .01586     0.33   0.739    -.0258007    .0363692
  h_edu_high |   .0117289   .0340927     0.34   0.731    -.0550916    .0785493
h_edu_medium |  -.0038999    .037451    -0.10   0.917    -.0773025    .0695027
   h_retired |   .0481634   .0568273     0.85   0.397     -.063216    .1595427
   h_student |   .0219004   .0458252     0.48   0.633    -.0679153    .1117161
h_unemployed |   .0345444   .0455857     0.76   0.449     -.054802    .1238907
    fall2009 |  -.0130392   .0565659    -0.23   0.818    -.1239063    .0978279
  spring2010 |   .0803135   .0559465     1.44   0.151    -.0293397    .1899667
    fall2010 |   .0739506   .0751146     0.98   0.325    -.0732714    .2211726
  spring2011 |   .1848963   .0529332     3.49   0.000     .0811492    .2886435
          EU |  -.0031559   .1577746    -0.02   0.984    -.3123885    .3060768
        ExYu |   .3123837   .2326063     1.34   0.179    -.1435163    .7682838
high_lev_dev |   .2533578   .1981033     1.28   0.201    -.1349176    .6416332
       _cons |   .1418263   .1185628     1.20   0.232    -.0905525    .3742051
-------------+----------------------------------------------------------------
     /athrho |   .7974462   .0424975    18.76   0.000     .7141527    .8807397
-------------+----------------------------------------------------------------
         rho |   .6626066   .0238391                      .6132743    .7067897
```

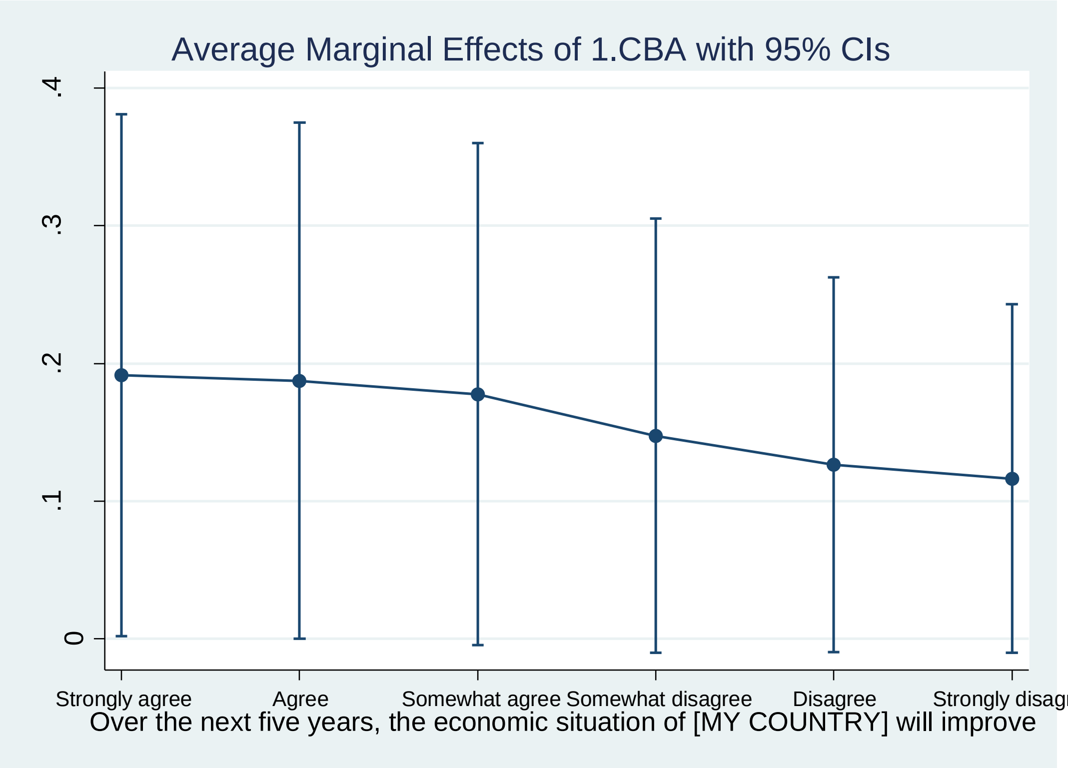
```
-------------------------------------------------------------------------------
Wald test of rho=0:                  chi2(1) =  352.109    Prob > chi2 = 0.0000


. margins, dydx(CBA) at(q22f_1=(1(1)5)) vsquish

Average marginal effects                          Number of obs   =      37908
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()
dy/dx w.r.t. : 1.CBA
1._at        : q22f_1          =           1
2._at        : q22f_1          =           2
3._at        : q22f_1          =           3
4._at        : q22f_1          =           4
5._at        : q22f_1          =           5

-------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+-----------------------------------------------------------------
1.CBA        |
         _at |
          1  |   .1609884   .0847595     1.90   0.058    -.0051371     .327114
          2  |    .164161   .0870399     1.89   0.059    -.0064341     .334756
          3  |     .15659   .0824615     1.90   0.058    -.0050315    .3182114
          4  |   .1462201   .0772743     1.89   0.058    -.0052347    .2976749
          5  |   .1406441   .0748457     1.88   0.060    -.0060508     .287339
-------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.

. marginsplot

  Variables that uniquely identify margins: q22f_1
```



```
margins, dydx(CBA) at(q1_01=(1(1)6))  vsquish

Average marginal effects                          Number of obs     =      37908
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()
dy/dx w.r.t. : 1.CBA
1._at        : q1_01           =           1
2._at        : q1_01           =           2
3._at        : q1_01           =           3
4._at        : q1_01           =           4
5._at        : q1_01           =           5
6._at        : q1_01           =           6

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |   .1264474   .0743987     1.70   0.089    -.0193714    .2722663
          2  |    .129842   .0758749     1.71   0.087      -.01887     .278554
          3  |   .1415261   .0788985     1.79   0.073    -.0131121    .2961642
          4  |   .1528243   .0822808     1.86   0.063    -.0084431    .3140918
          5  |   .1550119    .082111     1.89   0.059    -.0059227    .3159465
          6  |   .1537582   .0799889     1.92   0.055    -.0030171    .3105335
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.

. marginsplot
```



```
. margins, dydx(CBA) at(q1_02=(1(1)6)) vsquish

Average marginal effects                          Number of obs   =      37908
Model VCE    : Robust

Expression   : Pr(CSagree=1,ExpCSagree=1), predict()
dy/dx w.r.t. : 1.CBA
1._at        : q1_02           =           1
2._at        : q1_02           =           2
3._at        : q1_02           =           3
4._at        : q1_02           =           4
5._at        : q1_02           =           5
6._at        : q1_02           =           6

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |   .1917005   .0966689     1.98   0.047     .0022331     .381168
          2  |   .1875424   .0956547     1.96   0.050     .0000626    .3750222
          3  |   .1777346   .0930609     1.91   0.056    -.0046615    .3601307
          4  |   .1475787   .0804927     1.83   0.067    -.0101842    .3053415
          5  |    .126577   .0694274     1.82   0.068    -.0094982    .2626521
          6  |   .1164759    .064521     1.81   0.071    -.0099829    .2429346
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.

. marginsplot

  Variables that uniquely identify margins: q1_02
```



## Appendix 4.12: Single equation (probit) – current local currency stability

```
. corr CSagree CBA ECSagree q1_01 q22f_1 h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemplo
> yed EU ExYu high_lev_dev
(obs=37908)

             |  CSagree      CBA ECSagree    q1_01   q22f_1  h_aged2  h_aged3 h_female h_edu_~h h_edu_~m h_reti~d
-------------+---------------------------------------------------------------------------------------------------
     CSagree |   1.0000
         CBA |   0.1105   1.0000
    ECSagree |   0.1855   0.0198   1.0000
       q1_01 |  -0.2840   0.1280  -0.0697   1.0000
      q22f_1 |  -0.1696   0.0054  -0.0848   0.2896   1.0000
     h_aged2 |  -0.0189  -0.0208   0.0087  -0.0007   0.0040   1.0000
     h_aged3 |   0.0073   0.0210  -0.0109   0.0473   0.0019  -0.4995   1.0000
    h_female |   0.0011   0.0062   0.0011   0.0012  -0.0053  -0.0011  -0.0129   1.0000
  h_edu_high |   0.0092  -0.0174   0.0199  -0.0384  -0.0453   0.0152  -0.0731   0.0293   1.0000
h_edu_medium |   0.0059   0.0250  -0.0245   0.0061   0.0188   0.0546  -0.1319  -0.0750  -0.6629   1.0000
   h_retired |  -0.0082   0.0108  -0.0079   0.0598   0.0100  -0.3023   0.6739  -0.0020  -0.0845  -0.1000   1.0000
   h_student |   0.0088   0.0152   0.0050  -0.0217  -0.0002  -0.1994  -0.1494   0.0209  -0.0754   0.1150  -0.1156
h_unemployed |   0.0095   0.0468   0.0162   0.0386   0.0419   0.0343  -0.1012   0.1713  -0.1042  -0.0506  -0.2224
          EU |  -0.1312  -0.0417  -0.0735   0.0175   0.0192  -0.0074   0.0344  -0.0153   0.0511   0.0324   0.0324
        ExYu |   0.1505   0.1502   0.0534   0.0718   0.0499  -0.0017   0.0123   0.0260  -0.0690   0.0013   0.0209
high_lev_dev |  -0.0080  -0.4117  -0.0737  -0.0586   0.0224  -0.0092   0.0010   0.0057  -0.0600   0.1177   0.0157

             | h_stud~t h_unem~d       EU     ExYu high_l~v
-------------+---------------------------------------------
   h_student |   1.0000
h_unemployed |  -0.1177   1.0000
          EU |  -0.0525  -0.1631   1.0000
        ExYu |   0.0295   0.1521  -0.8082   1.0000
high_lev_dev |  -0.0234  -0.1538   0.4386  -0.2692   1.0000
```

*M1_CURRENT TRUST IN CURRENCY - THE PREFERRED ONE* *Economic stability categorical (q1_01), trust in government categorical (q22f_1) and interaction term between CBA and trust in government (q22f_1) and CBA and economic situation (q1_01)

probit CSagree i.CBA i.q22f_1 i.CBA#i.q22f_1 ECSagree i.q1_01 i.CBA#i.q1_01 h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed fall2009 spring2010 fall2010 spring2011 EU ExYu high_lev_dev, vce(cluster country) nolog

```
Probit regression                                 Number of obs   =      37908
                                                  Wald chi2(8)    =          .
                                                  Prob > chi2     =          .
Log pseudolikelihood = -22074.947                 Pseudo R2       =     0.1443

                                (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
     CSagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   -.029189   .2226439    -0.13   0.896    -.4655631    .4071851
             |
      q22f_1 |
          2  |  -.1282029   .0481531    -2.66   0.008    -.2225812   -.0338246
          3  |   -.311946   .0623595    -5.00   0.000    -.4341684   -.1897236
          4  |  -.3618011   .0874521    -4.14   0.000    -.5332041    -.190398
          5  |  -.4299958   .0841366    -5.11   0.000    -.5949004   -.2650911
          8  |  -.4057534   .1437849    -2.82   0.005    -.6875666   -.1239401
             |
  CBA#q22f_1 |
        1 2  |   .1504067   .0608127     2.47   0.013     .0312161    .2695974
        1 3  |   .1810903   .0827737     2.19   0.029     .0188569    .3433238
        1 4  |   .0855859   .1106515     0.77   0.439    -.1312871    .3024588
        1 5  |   .1879454   .0957741     1.96   0.050     .0002317    .3756592
        1 8  |  -.2774232   .1701502    -1.63   0.103    -.6109115     .056065
             |
    ECSagree |   .5045747   .0901914     5.59   0.000     .3278028    .6813466
             |
       q1_01 |
          2  |  -.1117364   .1905517    -0.59   0.558    -.4852109     .261738
          3  |  -.5171765   .2059594    -2.51   0.012    -.9208494   -.1135035
          4  |  -1.056452   .2060814    -5.13   0.000    -1.460364   -.6525396
          5  |  -1.364869   .2231044    -6.12   0.000    -1.802145   -.9275922
          6  |  -1.649039   .2387555    -6.91   0.000    -2.116992   -1.181087
          8  |   -1.16044    .201318    -5.76   0.000    -1.555016   -.7658641
             |
   CBA#q1_01 |
        1 2  |   .0481576   .2411238     0.20   0.842    -.4244363    .5207516
        1 3  |   .0373316   .2142662     0.17   0.862    -.3826224    .4572856
        1 4  |   .1757396   .2451951     0.72   0.474     -.304834    .6563133
        1 5  |   .5106219   .2172543     2.35   0.019     .0848113    .9364325
        1 6  |   .6406004   .2287144     2.80   0.005     .1923285    1.088872
        1 8  |   .4902546   .1761266     2.78   0.005     .1450528    .8354564
             |
     h_aged2 |  -.0202112   .0216617    -0.93   0.351    -.0626674     .022245
```

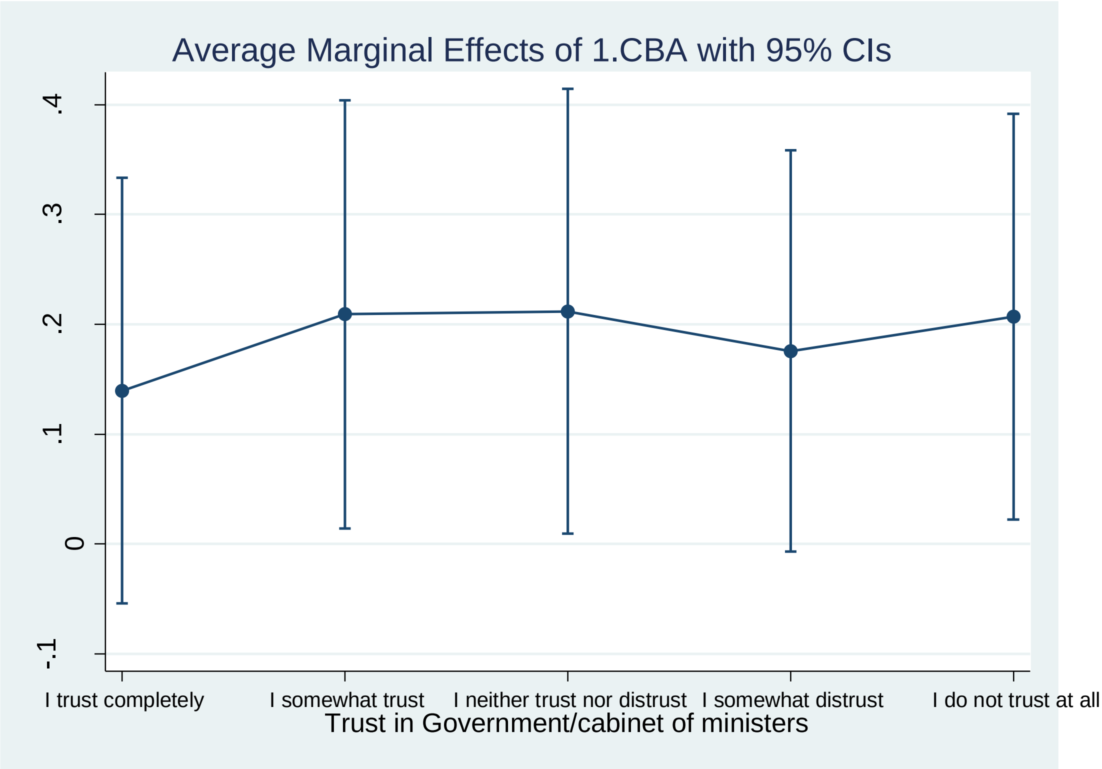
```
       h_aged3 |   .0820872   .0409051     2.01   0.045     .0019147    .1622596
      h_female |  -.0167926    .018488    -0.91   0.364    -.0530285    .0194432
    h_edu_high |   .0984094   .0280624     3.51   0.000     .0434081    .1534107
  h_edu_medium |   .0539457   .0455222     1.19   0.236    -.0352763    .1431676
     h_retired |  -.0337515   .0761095    -0.44   0.657    -.1829235    .1154204
     h_student |  -.0182633   .0566751    -0.32   0.747    -.1293444    .0928179
  h_unemployed |   .0306591   .0457436     0.67   0.503    -.0589968     .120315
      fall2009 |   .1428201   .0492621     2.90   0.004     .0462682     .239372
    spring2010 |   .2272601    .039999     5.68   0.000     .1488634    .3056568
      fall2010 |   .2076606   .0627258     3.31   0.001     .0847202     .330601
    spring2011 |   .3403735   .0471722     7.22   0.000     .2479176    .4328294
            EU |  -.1576765   .2152139    -0.73   0.464    -.5794881     .264135
          ExYu |   .3988741   .3158449     1.26   0.207    -.2201705    1.017919
  high_lev_dev |   .3646598     .28312     1.29   0.198    -.1902452    .9195648
         _cons |   .3816653    .236535     1.61   0.107    -.0819347    .8452654
------------------------------------------------------------------------------

. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      37908
Model VCE    : Robust

Expression   : Pr(CSagree), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 8.q22f_1 ECSagree
2.q1_01 3.q1_01 4.q1_01 5.q1_01 6.q1_01 8.q1_01 h_aged2 h_aged3 h_female h_edu_high
h_edu_medium h_retired h_student h_unemployed fall2009 spring2010 fall2010 spring2011
EU ExYu high_lev_dev

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   .1880203   .0992009     1.90   0.058    -.0064098    .3824505
             |
      q22f_1 |
          2  |  -.0335663   .0127623    -2.63   0.009    -.0585799   -.0085528
          3  |  -.0940362   .0171927    -5.47   0.000    -.1277334   -.0603391
          4  |   -.117794   .0248829    -4.73   0.000    -.1665637   -.0690244
          5  |  -.1327767   .0247672    -5.36   0.000    -.1813196   -.0842338
          8  |  -.1582803   .0389023    -4.07   0.000    -.2345273   -.0820333
             |
    ECSagree |   .1671239   .0315551     5.30   0.000     .1052771    .2289707
             |
       q1_01 |
          2  |    -.02704   .0407013    -0.66   0.506    -.1068131     .052733
          3  |  -.1537363   .0482831    -3.18   0.001    -.2483694   -.0591032
          4  |  -.3391219   .0524234    -6.47   0.000    -.4418698    -.236374
          5  |  -.4250364   .0576765    -7.37   0.000    -.5380802   -.3119927
          6  |  -.5092652    .058658    -8.68   0.000    -.6242327   -.3942978
          8  |  -.3539073   .0543414    -6.51   0.000    -.4604144   -.2474001
             |
     h_aged2 |  -.0066943   .0071212    -0.94   0.347    -.0206516     .007263
     h_aged3 |   .0271887   .0138212     1.97   0.049     .0000996    .0542778
    h_female |   -.005562   .0062372    -0.89   0.373    -.0177867    .0066627
  h_edu_high |   .0325949   .0092229     3.53   0.000     .0145183    .0506715
h_edu_medium |   .0178677   .0149131     1.20   0.231    -.0113613    .0470968
   h_retired |  -.0111791    .025198    -0.44   0.657    -.0605662     .038208
   h_student |  -.0060491   .0186541    -0.32   0.746    -.0426105    .0305123
h_unemployed |   .0101548   .0152604     0.67   0.506    -.0197551    .0400647
    fall2009 |   .0473045   .0152469     3.10   0.002     .0174212    .0771878
  spring2010 |   .0752725   .0143602     5.24   0.000      .047127    .1034179
    fall2010 |   .0687808   .0223132     3.08   0.002     .0250478    .1125138
  spring2011 |   .1127376   .0149454     7.54   0.000     .0834452      .14203
          EU |  -.0522252   .0697538    -0.75   0.454    -.1889402    .0844898
        ExYu |    .132114   .1071439     1.23   0.218    -.0778842    .3421122
high_lev_dev |   .1207816   .0929895     1.30   0.194    -.0614744    .3030377
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

```
probit CSagree i.CBA i.q22f_1 i.CBA#i.q22f_1 ECSagree i.q1_01 i.CBA#i.q1_01 h_aged2
h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed fall2009
spring2010 fall2010 spring2011  EU ExYu high_lev_dev [pweight = weight], vce(cluster
country) nolog

        Probit regression                                 Number of obs   =      37908
                                                          Wald chi2(8)    =          .
                                                          Prob > chi2     =          .
        Log pseudolikelihood = -21358.765                 Pseudo R2       =     0.1468

                                        (Std. Err. adjusted for 10 clusters in country)
        ------------------------------------------------------------------------------
                     |               Robust
             CSagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
        -------------+----------------------------------------------------------------
               1.CBA |  -.1549252   .2238764    -0.69   0.489    -.5937149    .2838645
                     |
              q22f_1 |
                  2  |  -.1374525   .0501256    -2.74   0.006    -.2356969   -.0392081
                  3  |  -.3186284   .0627138    -5.08   0.000    -.4415451   -.1957117
                  4  |  -.3735852    .089175    -4.19   0.000     -.548365   -.1988054
                  5  |  -.4413636   .0817853    -5.40   0.000    -.6016599   -.2810674
                  8  |  -.4556819   .1538696    -2.96   0.003    -.7572607   -.1541031
                     |
          CBA#q22f_1 |
                1 2  |   .2029156   .0648582     3.13   0.002     .0757958    .3300354
                1 3  |   .2218257   .0761423     2.91   0.004     .0725896    .3710619
                1 4  |   .1286026   .1215051     1.06   0.290    -.1095429    .3667482
                1 5  |   .2237129   .0949672     2.36   0.018     .0375805    .4098453
                1 8  |  -.1634062   .1621422    -1.01   0.314    -.4811991    .1543867
                     |
            ECSagree |    .513579   .0968108     5.30   0.000     .3238334    .7033247
                     |
               q1_01 |
                  2  |  -.1492664   .1979602    -0.75   0.451    -.5372613    .2387285
                  3  |  -.5564697   .2243904    -2.48   0.013    -.9962668   -.1166726
                  4  |   -1.10353   .2165589    -5.10   0.000    -1.527978   -.6790822
                  5  |  -1.428688    .233431    -6.12   0.000    -1.886205   -.9711719
                  6  |  -1.712855   .2447577    -7.00   0.000    -2.192571   -1.233138
                  8  |  -1.205771   .2177294    -5.54   0.000    -1.632512   -.7790289
                     |
           CBA#q1_01 |
                1 2  |   .1859653   .2299033     0.81   0.419     -.264637    .6365675
                1 3  |   .1130733   .2266621     0.50   0.618    -.3311764    .5573229
                1 4  |   .2827245   .2457835     1.15   0.250    -.1990022    .7644512
                1 5  |   .6238711   .2242118     2.78   0.005     .1844241    1.063318
                1 6  |   .7519809   .2346028     3.21   0.001     .2921679    1.211794
                1 8  |   .5162529   .1952453     2.64   0.008     .1335791    .8989267
                     |
             h_aged2 |  -.0201449   .0190736    -1.06   0.291    -.0575284    .0172387
             h_aged3 |   .0613338   .0392375     1.56   0.118    -.0155704    .1382379
            h_female |  -.0193449   .0242683    -0.80   0.425      -.06691    .0282202
          h_edu_high |   .0679674   .0439154     1.55   0.122    -.0181051      .15404
        h_edu_medium |   .0254547    .045739     0.56   0.578    -.0641921    .1151014
           h_retired |  -.0450521   .0740708    -0.61   0.543    -.1902283     .100124
           h_student |  -.0182735    .059132    -0.31   0.757    -.1341701     .097623
        h_unemployed |   .0302375   .0443967     0.68   0.496    -.0567785    .1172534
            fall2009 |    .137505    .044277     3.11   0.002     .0507236    .2242864
          spring2010 |   .2270351   .0415935     5.46   0.000     .1455134    .3085569
            fall2010 |   .2107766    .063927     3.30   0.001      .085482    .3360712
          spring2011 |   .3500843   .0473277     7.40   0.000     .2573238    .4428448
                  EU |  -.1336745   .2053409    -0.65   0.515    -.5361352    .2687862
                ExYu |   .3947326   .3078145     1.28   0.200    -.2085727    .9980379
        high_lev_dev |   .3597711   .2744093     1.31   0.190    -.1780613    .8976035
               _cons |   .4486314   .2499914     1.79   0.073    -.0413428    .9386056
        ------------------------------------------------------------------------------
```

```
. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      37908
Model VCE    : Robust

Expression   : Pr(CSagree), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 8.q22f_1 ECSagree
2.q1_01 3.q1_01 4.q1_01 5.q1_01 6.q1_01 8.q1_01 h_aged2 h_aged3 h_female h_edu_high
h_edu_medium h_retired h_student h_unemployed fall2009 spring2010 fall2010 spring2011
EU ExYu high_lev_dev

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   .1953283   .0952595     2.05   0.040     .0086231    .3820335
             |
      q22f_1 |
          2  |  -.0326332   .0137356    -2.38   0.018    -.0595545   -.0057119
          3  |  -.0927603   .0173619    -5.34   0.000    -.1267889   -.0587316
          4  |  -.1180528   .0258731    -4.56   0.000    -.1687632   -.0673425
          5  |  -.1331311   .0243608    -5.46   0.000    -.1808773   -.0853849
          8  |  -.1661108   .0411314    -4.04   0.000    -.2467269   -.0854947
             |
    ECSagree |   .1689539   .0335721     5.03   0.000     .1031538    .2347539
             |
       q1_01 |
          2  |  -.0294531   .0412567    -0.71   0.475    -.1103148    .0514085
          3  |   -.160738   .0516371    -3.11   0.002    -.2619448   -.0595312
          4  |  -.3470822   .0532034    -6.52   0.000     -.451359   -.2428055
          5  |  -.4377729   .0586873    -7.46   0.000    -.5527979   -.3227478
          6  |  -.5209674   .0585076    -8.90   0.000    -.6356401   -.4062947
          8  |  -.3668721   .0560861    -6.54   0.000    -.4767988   -.2569454
             |
     h_aged2 |  -.0066271   .0062471    -1.06   0.289    -.0188712    .0056169
     h_aged3 |   .0201772   .0131159     1.54   0.124    -.0055295    .0458839
    h_female |   -.006364   .0080597    -0.79   0.430    -.0221606    .0094327
  h_edu_high |   .0223595   .0145535     1.54   0.124    -.0061648    .0508838
h_edu_medium |   .0083739   .0150778     0.56   0.579     -.021178    .0379258
   h_retired |   -.014821   .0243736    -0.61   0.543    -.0625924    .0329504
   h_student |  -.0060115   .0193483    -0.31   0.756    -.0439335    .0319105
h_unemployed |   .0099473   .0146676     0.68   0.498    -.0188006    .0386953
    fall2009 |   .0452355   .0136263     3.32   0.001     .0185285    .0719425
  spring2010 |   .0746885   .0149572     4.99   0.000     .0453729    .1040042
    fall2010 |   .0693399   .0227677     3.05   0.002     .0247161    .1139637
  spring2011 |   .1151684   .0147718     7.80   0.000     .0862163    .1441206
          EU |  -.0439754   .0661616    -0.66   0.506    -.1736498    .0856991
        ExYu |   .1298565   .1040476     1.25   0.212     -.074073    .3337861
high_lev_dev |   .1183551   .0893599     1.32   0.185     -.056787    .2934973
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

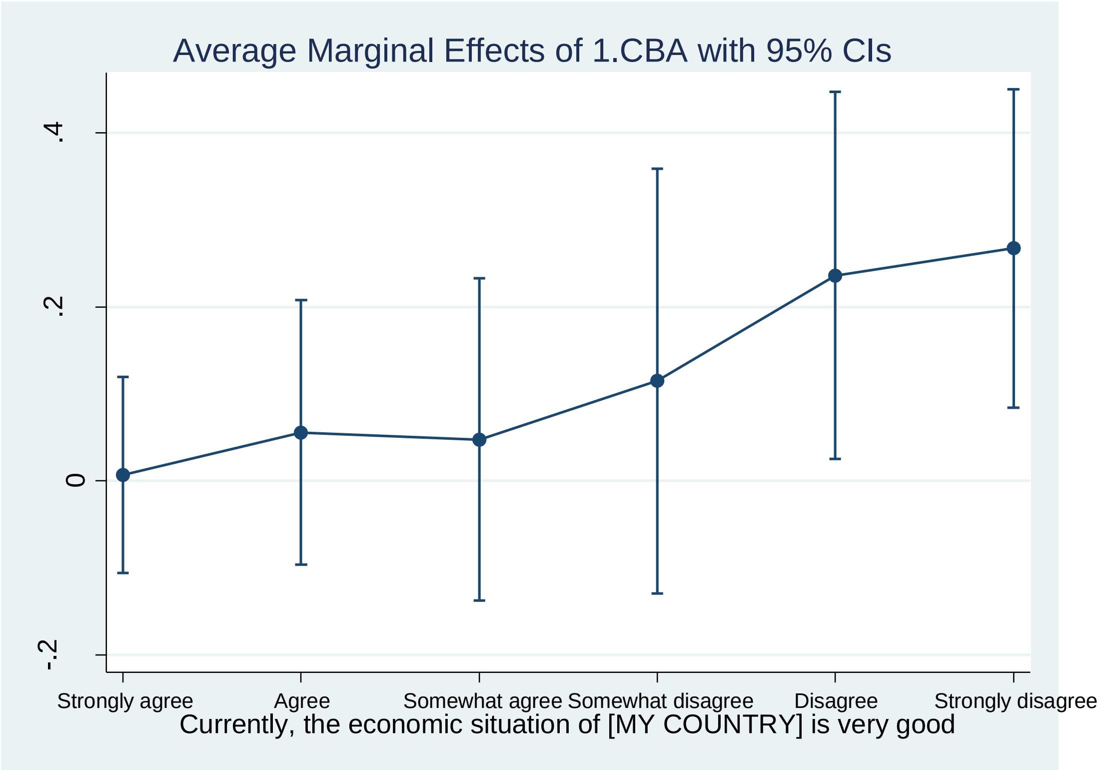
```
margins, dydx(CBA) at(q22f_1=(1(1)5)) vsquish

Average marginal effects                          Number of obs   =      37908
Model VCE    : Robust

Expression   : Pr(CSagree), predict()
dy/dx w.r.t. : 1.CBA
1._at        : q22f_1          =           1
2._at        : q22f_1          =           2
3._at        : q22f_1          =           3
4._at        : q22f_1          =           4
5._at        : q22f_1          =           5

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |   .1396641   .0986849     1.42   0.157    -.0537547     .333083
          2  |   .2091796   .0993151     2.11   0.035     .0145256    .4038336
          3  |   .2119059   .1031865     2.05   0.040     .0096641    .4141478
          4  |   .1758496   .0931481     1.89   0.059    -.0067173    .3584164
          5  |   .2069597    .094257     2.20   0.028     .0222194    .3916999
```

```
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.

. marginsplot

  Variables that uniquely identify margins: q22f_1

.
```




```
margins, dydx(CBA) at(q1_01=(1(1)6)) vsquish

Average marginal effects                          Number of obs   =      37908
Model VCE    : Robust

Expression   : Pr(CSagree), predict()
dy/dx w.r.t. : 1.CBA
1._at        : q1_01           =           1
2._at        : q1_01           =           2
3._at        : q1_01           =           3
4._at        : q1_01           =           4
5._at        : q1_01           =           5
6._at        : q1_01           =           6

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |   .0069966   .0575771     0.12   0.903    -.1058524    .1198457
          2  |   .0558144   .0773627     0.72   0.471    -.0958137    .2074424
          3  |   .0477077   .0943451     0.51   0.613    -.1372054    .2326207
          4  |   .1148095   .1243431     0.92   0.356    -.1288986    .3585176
          5  |   .2358295   .1075709     2.19   0.028     .0249944    .4466646
          6  |   .2670472   .0931739     2.87   0.004     .0844297    .4496647
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

```
. marginsplot

  Variables that uniquely identify margins: q1_01
```




```
**MARGINS for subsamples
. margins if CBA==0, at(CBA=(0 1))

Predictive margins                              Number of obs     =      30237
Model VCE    : Robust

Expression   : Pr(CSagree), predict()

1._at        : CBA             =           0

2._at        : CBA             =           1

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         _at |
          1  |    .384031   .0436782     8.79   0.000     .2984233    .4696386
          2  |    .575028   .0739696     7.77   0.000     .4300502    .7200058
------------------------------------------------------------------------------

. margins if CBA==1, at(CBA=(0 1))

Predictive margins                              Number of obs     =       7671
Model VCE    : Robust

Expression   : Pr(CSagree), predict()

1._at        : CBA             =           0

2._at        : CBA             =           1

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         _at |
```

```
          1  |   .3157015   .0832828     3.79   0.000     .1524702    .4789329
          2  |   .5278074   .0247801    21.30   0.000     .4792392    .5763755
------------------------------------------------------------------------------

. margins, over(CBA) at(CBA=(0 1)) contrast (atcontrast(r._at) wald) vsquish

Contrasts of predictive margins
Model VCE    : Robust

Expression   : Pr(CSagree), predict()
over         : CBA
1._at        : 0.CBA
                   CBA             =           0
               1.CBA
                   CBA             =           0
2._at        : 0.CBA
                   CBA             =           1
               1.CBA
                   CBA             =           1

------------------------------------------------
             |         df        chi2     P>chi2
-------------+----------------------------------
     _at@CBA |
 (2 vs 1) 0  |          1        3.84     0.0501
 (2 vs 1) 1  |          1        5.97     0.0146
      Joint  |          2       36.96     0.0000
------------------------------------------------

--------------------------------------------------------------
             |            Delta-method
             |   Contrast   Std. Err.     [95% Conf. Interval]
-------------+------------------------------------------------
     _at@CBA |
 (2 vs 1) 0  |    .190997   .0975025     -.0001043    .3820984
 (2 vs 1) 1  |   .2121058   .0868286      .0419248    .3822868
--------------------------------------------------------------
```

**. *with region**

```
. probit CSagree i.CBA i.q22f_1 i.CBA#i.q22f_1 ECSagree i.q1_01 i.CBA#i.q1_01
h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed
fall2009 spring2010 fall2010 spring2011  EU ExYu high_lev_dev, vce(cluster h_region)
nolog

Probit regression                                 Number of obs   =      37908
                                                  Wald chi2(39)   =    2215.54
                                                  Prob > chi2     =     0.0000
Log pseudolikelihood = -22074.947                 Pseudo R2       =     0.1443

                              (Std. Err. adjusted for 71 clusters in h_region)
------------------------------------------------------------------------------
             |               Robust
     CSagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   -.029189   .2616856    -0.11   0.911    -.5420834    .4837054
             |
      q22f_1 |
          2  |  -.1282029   .0564748    -2.27   0.023    -.2388914   -.0175144
          3  |   -.311946   .0624466    -5.00   0.000     -.434339    -.189553
          4  |  -.3618011   .0640353    -5.65   0.000    -.4873079   -.2362943
          5  |  -.4299958   .0570661    -7.54   0.000    -.5418433   -.3181482
          8  |  -.4057534   .1187808    -3.42   0.001    -.6385594   -.1729473
             |
  CBA#q22f_1 |
        1 2  |   .1504067   .1189376     1.26   0.206    -.0827067    .3835201
        1 3  |   .1810903     .10683     1.70   0.090    -.0282927    .3904733
        1 4  |   .0855859   .1433054     0.60   0.550    -.1952876    .3664593
        1 5  |   .1879454   .1172743     1.60   0.109    -.0419079    .4177988
        1 8  |  -.2774232   .2544089    -1.09   0.276    -.7760556    .2212091
             |
    ECSagree |   .5045747   .0506806     9.96   0.000     .4052425    .6039069
             |
       q1_01 |
          2  |  -.1117364   .1676215    -0.67   0.505    -.4402686    .2167957
          3  |  -.5171765   .1432808    -3.61   0.000    -.7980017   -.2363512
```

```
           4  |  -1.056452   .1236777    -8.54   0.000    -1.298856   -.8140478
           5  |  -1.364869   .1359311   -10.04   0.000    -1.631289   -1.098449
           6  |  -1.649039   .1427339   -11.55   0.000    -1.928793   -1.369286
           8  |   -1.16044   .1712577    -6.78   0.000    -1.496099   -.8247812
              |
    CBA#q1_01 |
         1 2  |   .0481576    .340988     0.14   0.888    -.6201666    .7164819
         1 3  |   .0373316   .2994998     0.12   0.901    -.5496772    .6243404
         1 4  |   .1757396   .3114379     0.56   0.573    -.4346674    .7861467
         1 5  |   .5106219   .2676952     1.91   0.056     -.014051    1.035295
         1 6  |   .6406004   .2457431     2.61   0.009     .1589528    1.122248
         1 8  |   .4902546   .3185458     1.54   0.124    -.1340837    1.114593
              |
      h_aged2 |  -.0202112   .0234286    -0.86   0.388    -.0661304     .025708
      h_aged3 |   .0820872   .0356232     2.30   0.021     .0122669    .1519074
     h_female |  -.0167926   .0143498    -1.17   0.242    -.0449177    .0113324
   h_edu_high |   .0984094   .0512158     1.92   0.055    -.0019718    .1987906
 h_edu_medium |   .0539457    .036625     1.47   0.141     -.017838    .1257293
    h_retired |  -.0337515   .0390706    -0.86   0.388    -.1103285    .0428255
    h_student |  -.0182633   .0424692    -0.43   0.667    -.1015014    .0649749
 h_unemployed |   .0306591   .0304147     1.01   0.313    -.0289525    .0902708
     fall2009 |   .1428201   .0490135     2.91   0.004     .0467554    .2388848
   spring2010 |   .2272601   .0363323     6.26   0.000     .1560502      .29847
     fall2010 |   .2076606   .0490078     4.24   0.000     .1116071     .303714
   spring2011 |   .3403735   .0465997     7.30   0.000     .2490398    .4317072
           EU |  -.1576765   .1356021    -1.16   0.245    -.4234517    .1080986
         ExYu |   .3988741   .1780145     2.24   0.025     .0499721    .7477761
 high_lev_dev |   .3646598   .1384615     2.63   0.008     .0932803    .6360393
        _cons |   .3816653   .1808085     2.11   0.035     .0272872    .7360435
------------------------------------------------------------------------------

. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      37908
Model VCE    : Robust

Expression   : Pr(CSagree), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 8.q22f_1 ECSagree
2.q1_01 3.q1_01 4.q1_01 5.q1_01 6.q1_01 8.q1_01 h_aged2 h_aged3 h_female h_edu_high
h_edu_medium h_retired h_student h_unemployed fall2009 spring2010 fall2010 spring2011
EU ExYu high_lev_dev

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   .1880203   .0530767     3.54   0.000     .0839919    .2920487
             |
     q22f_1 |
          2  |  -.0335663   .0171483    -1.96   0.050    -.0671764    .0000437
          3  |  -.0940362   .0178741    -5.26   0.000    -.1290688   -.0590037
          4  |   -.117794   .0198351    -5.94   0.000    -.1566702   -.0789179
          5  |  -.1327767   .0171696    -7.73   0.000    -.1664286   -.0991248
          8  |  -.1582803   .0340909    -4.64   0.000    -.2250973   -.0914634
             |
    ECSagree |   .1671239   .0166765    10.02   0.000     .1344385    .1998093
             |
      q1_01 |
          2  |    -.02704   .0384268    -0.70   0.482    -.1023552    .0482751
          3  |  -.1537363   .0353078    -4.35   0.000    -.2229384   -.0845342
          4  |  -.3391219   .0335044   -10.12   0.000    -.4047893   -.2734545
          5  |  -.4250364   .0343505   -12.37   0.000    -.4923621   -.3577108
          6  |  -.5092652   .0345461   -14.74   0.000    -.5769744   -.4415561
          8  |  -.3539073   .0491965    -7.19   0.000    -.4503307   -.2574838
             |
     h_aged2 |  -.0066943    .007735    -0.87   0.387    -.0218546     .008466
     h_aged3 |   .0271887   .0119353     2.28   0.023      .003796    .0505814
    h_female |   -.005562   .0047853    -1.16   0.245    -.0149411     .003817
  h_edu_high |   .0325949   .0168623     1.93   0.053    -.0004545    .0656443
h_edu_medium |   .0178677   .0120661     1.48   0.139    -.0057814    .0415168
   h_retired |  -.0111791   .0129702    -0.86   0.389    -.0366003    .0142421
   h_student |  -.0060491   .0140389    -0.43   0.667    -.0335648    .0214666
h_unemployed |   .0101548   .0100883     1.01   0.314    -.0096179    .0299275
    fall2009 |   .0473045    .015944     2.97   0.003     .0160548    .0785542
  spring2010 |   .0752725   .0122538     6.14   0.000     .0512556    .0992894
    fall2010 |   .0687808   .0165578     4.15   0.000     .0363281    .1012335
  spring2011 |   .1127376   .0149607     7.54   0.000     .0834151    .1420601
```

```
          EU |  -.0522252    .044507    -1.17   0.241    -.1394573    .0350068
        ExYu |    .132114   .0598506     2.21   0.027     .0148089    .2494191
high_lev_dev |   .1207816   .0450929     2.68   0.007     .0324012    .2091621
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

```
probit CSagree i.CBA i.q22f_1 i.CBA#i.q22f_1 ECSagree i.q1_01 i.CBA#i.q1_01 h_aged2
h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed fall2009
spring2010 fall2010 spring2011  EU ExYu high_lev_dev[pweight = weight], vce(cluster
h_region) nolog
```

```
Probit regression                                 Number of obs   =      37908
                                                  Wald chi2(39)   =    2714.68
                                                  Prob > chi2     =     0.0000
Log pseudolikelihood = -21358.765                 Pseudo R2       =     0.1468

                              (Std. Err. adjusted for 71 clusters in h_region)
------------------------------------------------------------------------------
             |               Robust
     CSagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.1549252   .2605337    -0.59   0.552    -.6655619    .3557115
             |
      q22f_1 |
          2  |  -.1374525    .061652    -2.23   0.026    -.2582881   -.0166168
          3  |  -.3186284     .06298    -5.06   0.000    -.4420669     -.19519
          4  |  -.3735852   .0675092    -5.53   0.000    -.5059008   -.2412696
          5  |  -.4413636   .0571686    -7.72   0.000     -.553412   -.3293153
          8  |  -.4556819   .1077213    -4.23   0.000    -.6668117   -.2445521
             |
  CBA#q22f_1 |
        1 2  |   .2029156   .1272064     1.60   0.111    -.0464044    .4522355
        1 3  |   .2218257   .1102544     2.01   0.044      .005731    .4379204
        1 4  |   .1286026   .1449893     0.89   0.375    -.1555712    .4127765
        1 5  |   .2237129   .1190084     1.88   0.060    -.0095394    .4569652
        1 8  |  -.1634062    .262235    -0.62   0.533    -.6773774    .3505649
             |
    ECSagree |    .513579   .0532661     9.64   0.000     .4091794    .6179787
             |
       q1_01 |
          2  |  -.1492664   .1712584    -0.87   0.383    -.4849266    .1863939
          3  |  -.5564697   .1521496    -3.66   0.000    -.8546775   -.2582619
          4  |   -1.10353   .1318477    -8.37   0.000    -1.361947   -.8451131
          5  |  -1.428688   .1428719   -10.00   0.000    -1.708712   -1.148665
          6  |  -1.712855   .1475594   -11.61   0.000    -2.002066   -1.423644
          8  |  -1.205771   .1892481    -6.37   0.000     -1.57669   -.8348511
             |
   CBA#q1_01 |
        1 2  |   .1859653   .3563092     0.52   0.602     -.512388    .8843185
        1 3  |   .1130733   .2884476     0.39   0.695    -.4522737    .6784203
        1 4  |   .2827245   .3043371     0.93   0.353    -.3137652    .8792142
        1 5  |   .6238711   .2615752     2.39   0.017     .1111931    1.136549
        1 6  |   .7519809    .237862     3.16   0.002       .28578    1.218182
        1 8  |   .5162529   .3153241     1.64   0.102    -.1017709    1.134277
             |
     h_aged2 |  -.0201449   .0219208    -0.92   0.358    -.0631088    .0228191
     h_aged3 |   .0613338   .0354655     1.73   0.084    -.0081774     .130845
    h_female |  -.0193449   .0172073    -1.12   0.261    -.0530705    .0143807
  h_edu_high |   .0679674   .0534274     1.27   0.203    -.0367483    .1726832
h_edu_medium |   .0254547   .0387928     0.66   0.512    -.0505779    .1014872
   h_retired |  -.0450521   .0401864    -1.12   0.262     -.123816    .0337117
   h_student |  -.0182735   .0455422    -0.40   0.688    -.1075347    .0709877
h_unemployed |   .0302375   .0323635     0.93   0.350    -.0331939    .0936688
    fall2009 |    .137505   .0482026     2.85   0.004     .0430297    .2319804
  spring2010 |   .2270351   .0387037     5.87   0.000     .1511772    .3028931
    fall2010 |   .2107766   .0499434     4.22   0.000     .1128892    .3086639
  spring2011 |   .3500843   .0495201     7.07   0.000     .2530267     .447142
          EU |  -.1336745   .1435834    -0.93   0.352    -.4150928    .1477438
        ExYu |   .3947326   .1843535     2.14   0.032     .0334065    .7560588
high_lev_dev |   .3597711   .1347524     2.67   0.008     .0956612     .623881
       _cons |   .4486314   .2018609     2.22   0.026     .0529914    .8442714
------------------------------------------------------------------------------
```

```
. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      37908
Model VCE    : Robust

Expression   : Pr(CSagree), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 8.q22f_1 ECSagree
2.q1_01 3.q1_01 4.q1_01 5.q1_01 6.q1_01 8.q1_01 h_aged2 h_aged3 h_female h_edu_high
h_edu_medium h_retired h_student h_unemployed fall2009 spring2010 fall2010 spring2011
EU ExYu high_lev_dev

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   .1953283    .051058     3.83   0.000     .0952564    .2954002
             |
      q22f_1 |
          2  |  -.0326332    .018596    -1.75   0.079    -.0690806    .0038142
          3  |  -.0927603   .0180108    -5.15   0.000    -.1280607   -.0574598
          4  |  -.1180528   .0205547    -5.74   0.000    -.1583394   -.0777663
          5  |  -.1331311   .0171971    -7.74   0.000    -.1668368   -.0994253
          8  |  -.1661108   .0319272    -5.20   0.000    -.2286869   -.1035347
             |
    ECSagree |   .1689539   .0174431     9.69   0.000      .134766    .2031417
             |
       q1_01 |
          2  |  -.0294531   .0390562    -0.75   0.451    -.1060019    .0470956
          3  |   -.160738   .0364952    -4.40   0.000    -.2322673   -.0892088
          4  |  -.3470822   .0344382   -10.08   0.000    -.4145798   -.2795847
          5  |  -.4377729   .0352028   -12.44   0.000    -.5067692   -.3687766
          6  |  -.5209674   .0348249   -14.96   0.000    -.5892229   -.4527119
          8  |  -.3668721   .0525172    -6.99   0.000    -.4698038   -.2639404
             |
     h_aged2 |  -.0066271   .0071826    -0.92   0.356    -.0207047    .0074505
     h_aged3 |   .0201772   .0117753     1.71   0.087    -.0029019    .0432563
    h_female |   -.006364   .0056794    -1.12   0.262    -.0174955    .0047675
  h_edu_high |   .0223595   .0175323     1.28   0.202    -.0120031    .0567221
h_edu_medium |   .0083739   .0127515     0.66   0.511    -.0166186    .0333664
   h_retired |   -.014821   .0132583    -1.12   0.264    -.0408067    .0111648
   h_student |  -.0060115   .0149593    -0.40   0.688    -.0353312    .0233082
h_unemployed |   .0099473   .0106527     0.93   0.350    -.0109315    .0308262
    fall2009 |   .0452355   .0156087     2.90   0.004      .014643    .0758279
  spring2010 |   .0746885   .0130016     5.74   0.000      .049206    .1001711
    fall2010 |   .0693399   .0168021     4.13   0.000     .0364084    .1022713
  spring2011 |   .1151684   .0158278     7.28   0.000     .0841464    .1461905
          EU |  -.0439754   .0469464    -0.94   0.349    -.1359885    .0480378
        ExYu |   .1298565   .0614687     2.11   0.035     .0093801     .250333
high_lev_dev |   .1183551   .0434919     2.72   0.007     .0331127    .2035976
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

## Appendix 4.13: Single equation (probit) - future local currency stability

*Economic stability expectations categorical (q1_02), trust in government categorical (q22f_1) and interaction term between CBA and trust in government (q22f_1) and CBA and economic situation (q1_01)

```
.
. corr ExpCSagree CBA ExpECSagree q1_02 q22f_1 h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_u
> nemployed
(obs=37908)

             | ExpCSa~e      CBA ExpECS~e    q1_02   q22f_1  h_aged2  h_aged3 h_female h_edu_~h h_edu_~m h_reti~d
-------------+---------------------------------------------------------------------------------------------------
  ExpCSagree |   1.0000
         CBA |   0.0460   1.0000
 ExpECSagree |   0.2038   0.0136   1.0000
       q1_02 |  -0.3737   0.0814  -0.1576   1.0000
      q22f_1 |  -0.1943   0.0054  -0.0874   0.2924   1.0000
     h_aged2 |  -0.0147  -0.0208   0.0047   0.0117   0.0040   1.0000
     h_aged3 |  -0.0046   0.0210  -0.0116   0.0395   0.0019  -0.4995   1.0000
    h_female |   0.0083   0.0062   0.0069   0.0001  -0.0053  -0.0011  -0.0129   1.0000
  h_edu_high |   0.0146  -0.0174   0.0249  -0.0576  -0.0453   0.0152  -0.0731   0.0293   1.0000
h_edu_medium |  -0.0031   0.0250  -0.0292   0.0128   0.0188   0.0546  -0.1319  -0.0750  -0.6629   1.0000
   h_retired |  -0.0003   0.0108  -0.0097   0.0413   0.0100  -0.3023   0.6739  -0.0020  -0.0845  -0.1000   1.0000
   h_student |   0.0170   0.0152   0.0083  -0.0308  -0.0002  -0.1994  -0.1494   0.0209  -0.0754   0.1150  -0.1156
h_unemployed |  -0.0025   0.0468   0.0113   0.0382   0.0419   0.0343  -0.1012   0.1713  -0.1042  -0.0506  -0.2224

             | h_stud~t h_unem~d
-------------+------------------
   h_student |   1.0000
h_unemployed |  -0.1177   1.0000
```

```
probit ExpCSagree i.CBA i.q22f_1 i.CBA#i.q22f_1 ExpECSagree i.q1_02 i.CBA#i.q1_02
h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed
fall2009 spring2010 fall2010 spring2011 EU ExYu high_lev_dev, vce(cluster country)
nologProbitProbit
```

```
-
Probit regression                                 Number of obs   =      37908
                                                  Wald chi2(8)    =          .
                                                  Prob > chi2     =          .
Log pseudolikelihood = -21226.321                 Pseudo R2       =     0.1807

                               (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
  ExpCSagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.2366268   .3044133    -0.78   0.437    -.8332659    .3600124
             |
      q22f_1 |
          2  |  -.0305206   .0745925    -0.41   0.682    -.1767191     .115678
          3  |  -.1987121   .1138256    -1.75   0.081    -.4218061    .0243818
          4  |  -.3176501   .1194098    -2.66   0.008     -.551689   -.0836112
          5  |   -.395215   .0890106    -4.44   0.000    -.5696727   -.2207573
          8  |  -.4463742    .107868    -4.14   0.000    -.6577916   -.2349567
             |
  CBA#q22f_1 |
        1 2  |   .2362305   .0780302     3.03   0.002     .0832942    .3891668
        1 3  |   .3451125    .115289     2.99   0.003     .1191502    .5710748
        1 4  |   .3283812   .1352417     2.43   0.015     .0633123      .59345
        1 5  |    .481902   .0996024     4.84   0.000     .2866849    .6771192
        1 8  |   .3464832   .2102737     1.65   0.099    -.0656457    .7586121
             |
 ExpECSagree |   .4396729   .0683144     6.44   0.000     .3057791    .5735667
             |
       q1_02 |
          2  |  -.1608243   .0897909    -1.79   0.073    -.3368113    .0151626
          3  |  -.5567041   .0782642    -7.11   0.000    -.7100991   -.4033091
          4  |  -1.244896   .0805082   -15.46   0.000    -1.402689   -1.087103
          5  |  -1.638434   .1059702   -15.46   0.000    -1.846131   -1.430736
          6  |   -1.80307    .107701   -16.74   0.000     -2.01416    -1.59198
          8  |  -1.017605   .0644771   -15.78   0.000    -1.143978   -.8912322
             |
   CBA#q1_02 |
        1 2  |  -.1533817    .216452    -0.71   0.479    -.5776199    .2708565
        1 3  |  -.0061587   .2292878    -0.03   0.979    -.4555545    .4432372
        1 4  |   .3348362   .2667161     1.26   0.209    -.1879177    .8575901
        1 5  |   .4097571   .2949326     1.39   0.165    -.1683002    .9878144
        1 6  |   .4577628   .2564725     1.78   0.074    -.0449142    .9604397
        1 8  |  -.2468552   .2028864    -1.22   0.224    -.6445053     .150795
             |
     h_aged2 |  -.0079499   .0260377    -0.31   0.760    -.0589829    .0430831
     h_aged3 |  -.0036669   .0194248    -0.19   0.850    -.0417388     .034405
    h_female |   .0017819   .0158513     0.11   0.910     -.029286    .0328498
  h_edu_high |  -.0073131   .0319088    -0.23   0.819    -.0698532    .0552271
h_edu_medium |  -.0072793   .0377394    -0.19   0.847    -.0812471    .0666885
   h_retired |   .0496214   .0569159     0.87   0.383    -.0619317    .1611745
   h_student |   .0089133   .0437834     0.20   0.839    -.0769005    .0947271
h_unemployed |     .03455   .0439801     0.79   0.432    -.0516494    .1207495
    fall2009 |  -.0077957   .0552199    -0.14   0.888    -.1160248    .1004333
  spring2010 |   .0997511   .0529074     1.89   0.059    -.0039456    .2034478
    fall2010 |   .1069347   .0725687     1.47   0.141    -.0352974    .2491668
  spring2011 |   .2147687   .0558507     3.85   0.000     .1053033    .3242341
          EU |   .0556914   .1456292     0.38   0.702    -.2297366    .3411194
        ExYu |   .3824419   .2171548     1.76   0.078    -.0431738    .8080575
high_lev_dev |   .2330759   .1896901     1.23   0.219    -.1387099    .6048617
       _cons |   .3611998   .0838536     4.31   0.000     .1968498    .5255499
------------------------------------------------------------------------------
```

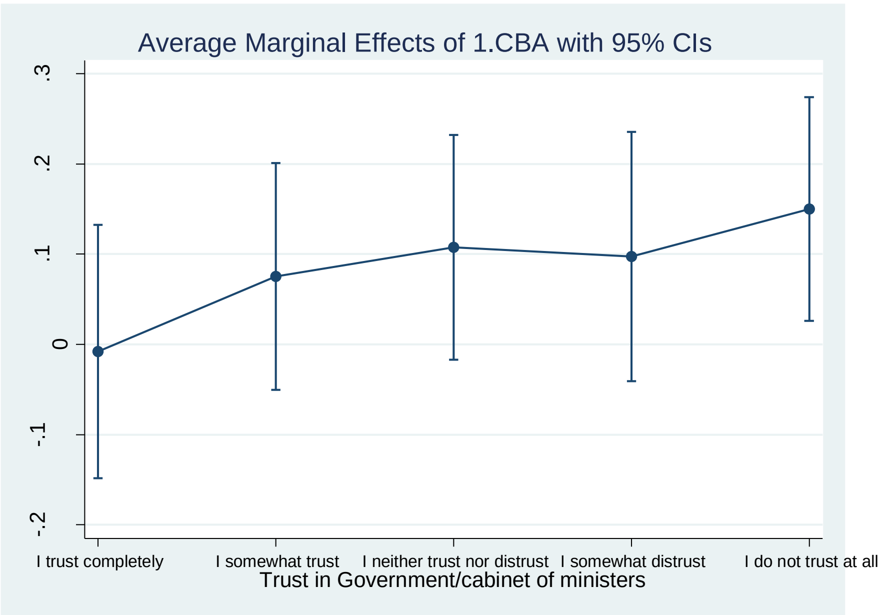
```
. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      37908
Model VCE    : Robust

Expression   : Pr(ExpCSagree), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 8.q22f_1 ExpECSagree
2.q1_02 3.q1_02 4.q1_02 5.q1_02 6.q1_02 8.q1_02 h_aged2 h_aged3 h_female h_edu_high
h_edu_medium h_retired h_student h_unemployed fall2009 spring2010 fall2010 spring2011
EU ExYu high_lev_dev

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   .1003119   .0625964     1.60   0.109    -.0223748    .2229986
             |
      q22f_1 |
          2  |   .0068671   .0192658     0.36   0.722    -.0308932    .0446274
          3  |  -.0406614   .0293479    -1.39   0.166    -.0981822    .0168594
          4  |  -.0803873    .030875    -2.60   0.009    -.1409011   -.0198735
          5  |  -.0941053   .0230894    -4.08   0.000    -.1393597   -.0488508
          8  |  -.1197765   .0288079    -4.16   0.000     -.176239   -.0633141
             |
 ExpECSagree |   .1395431   .0208498     6.69   0.000     .0986783    .1804079
             |
       q1_02 |
          2  |  -.0573904   .0238251    -2.41   0.016    -.1040868    -.010694
          3  |  -.1839387   .0222556    -8.26   0.000    -.2275589   -.1403186
          4  |  -.4151442    .023187   -17.90   0.000    -.4605899   -.3696984
          5  |  -.5389022   .0268568   -20.07   0.000    -.5915406   -.4862639
          6  |  -.5816545   .0248258   -23.43   0.000    -.6303122   -.5329968
          8  |   -.376293   .0232065   -16.21   0.000     -.421777    -.330809
             |
     h_aged2 |  -.0025231   .0082419    -0.31   0.760     -.018677    .0136308
     h_aged3 |  -.0011638   .0061476    -0.19   0.850    -.0132129    .0108853
    h_female |   .0005655   .0050235     0.11   0.910    -.0092804    .0104115
  h_edu_high |   -.002321   .0101233    -0.23   0.819    -.0221624    .0175204
h_edu_medium |  -.0023103   .0119805    -0.19   0.847    -.0257917    .0211711
   h_retired |   .0157488   .0179961     0.88   0.382    -.0195229    .0510205
   h_student |   .0028289   .0139274     0.20   0.839    -.0244683    .0301261
h_unemployed |   .0109655   .0139933     0.78   0.433     -.016461    .0383919
    fall2009 |  -.0024742   .0175343    -0.14   0.888    -.0368408    .0318923
  spring2010 |   .0316589   .0171417     1.85   0.065    -.0019381     .065256
    fall2010 |   .0339389   .0233416     1.45   0.146    -.0118098    .0796876
  spring2011 |   .0681632   .0175235     3.89   0.000     .0338177    .1025087
          EU |   .0176753   .0465324     0.38   0.704    -.0735266    .1088772
        ExYu |   .1213792   .0709263     1.71   0.087    -.0176337    .2603921
high_lev_dev |   .0739735   .0592281     1.25   0.212    -.0421114    .1900584
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

```
probit ExpCSagree i.CBA i.q22f_1 i.CBA#i.q22f_1 ExpECSagree i.q1_02 i.CBA#i.q1_02
h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed
fall2009 spring2010 fall2010 spring2011 EU ExYu high_lev_dev [pweight = weight],
vce(cluster country) nolog
```

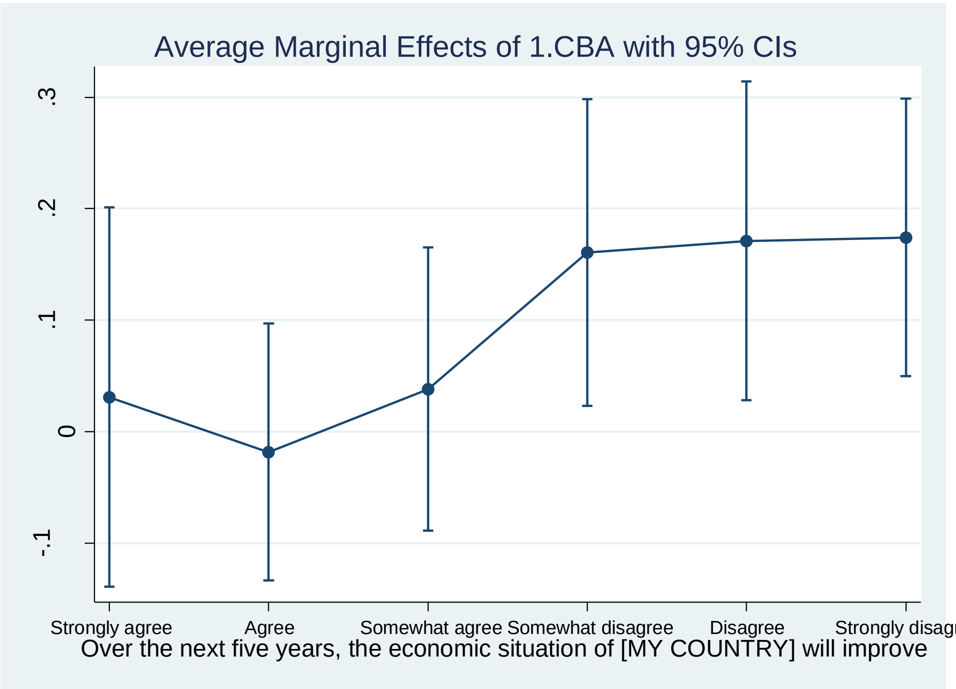
```
Probit regression                                 Number of obs   =      37908
                                                  Wald chi2(8)    =          .
                                                  Prob > chi2     =          .
Log pseudolikelihood = -20552.351                 Pseudo R2       =     0.1839

                               (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
  ExpCSagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.2381533    .290547    -0.82   0.412     -.807615    .3313083
             |
      q22f_1 |
          2  |  -.0021443    .078799    -0.03   0.978    -.1565875    .1522989
          3  |   -.180016   .1140191    -1.58   0.114    -.4034894    .0434573
          4  |  -.3000034   .1164626    -2.58   0.010     -.528266   -.0717408
          5  |   -.384338   .0914512    -4.20   0.000    -.5635791   -.2050969
          8  |  -.4431451   .1274328    -3.48   0.001    -.6929089   -.1933814
             |
  CBA#q22f_1 |
```

```
         1 2  |   .2339072   .0893321     2.62   0.009     .0588195     .408995
         1 3  |   .3428627   .1145299     2.99   0.003     .1183882    .5673372
         1 4  |   .3303813   .1400976     2.36   0.018      .055795    .6049676
         1 5  |     .49133   .1088759     4.51   0.000     .2779372    .7047228
         1 8  |   .4007943    .183006     2.19   0.029     .0421091    .7594795
              |
 ExpECSagree |   .4374702   .0701576     6.24   0.000     .2999638    .5749766
              |
       q1_02 |
           2  |  -.1309803   .1044096    -1.25   0.210    -.3356194    .0736588
           3  |   -.541197   .0967744    -5.59   0.000    -.7308712   -.3515227
           4  |  -1.252976   .0870832   -14.39   0.000    -1.423656   -1.082296
           5  |  -1.635839   .1138972   -14.36   0.000    -1.859073   -1.412604
           6  |  -1.817354   .1078161   -16.86   0.000     -2.02867   -1.606038
           8  |  -1.022292   .0705305   -14.49   0.000    -1.160529   -.8840544
              |
   CBA#q1_02 |
         1 2  |   -.167864   .2145963    -0.78   0.434     -.588465    .2527371
         1 3  |  -.0038901   .2275809    -0.02   0.986    -.4499405    .4421603
         1 4  |   .3312025   .2752497     1.20   0.229    -.2082771     .870682
         1 5  |   .4250911   .2924379     1.45   0.146    -.1480766    .9982589
         1 6  |   .4865043   .2509753     1.94   0.053    -.0053983    .9784068
         1 8  |  -.2168943   .1860019    -1.17   0.244    -.5814513    .1476626
              |
     h_aged2 |  -.0022786   .0266289    -0.09   0.932    -.0544702     .049913
     h_aged3 |  -.0051081   .0293229    -0.17   0.862    -.0625798    .0523637
    h_female |  -.0022386    .015195    -0.15   0.883    -.0320203     .027543
  h_edu_high |  -.0146153    .040329    -0.36   0.717    -.0936587     .064428
h_edu_medium |  -.0097686   .0357828    -0.27   0.785    -.0799016    .0603645
   h_retired |    .036308   .0618087     0.59   0.557    -.0848347    .1574508
   h_student |   .0036077   .0493667     0.07   0.942    -.0931491    .1003646
h_unemployed |   .0265681   .0493515     0.54   0.590    -.0701591    .1232954
    fall2009 |   .0064044   .0563212     0.11   0.909    -.1039831    .1167919
  spring2010 |   .1044287   .0548312     1.90   0.057    -.0030384    .2118959
    fall2010 |   .1025754   .0708433     1.45   0.148    -.0362749    .2414258
  spring2011 |   .2086741   .0569676     3.66   0.000     .0970196    .3203287
          EU |   .0689041   .1417098     0.49   0.627    -.2088421    .3466503
        ExYu |   .3890971   .2160925     1.80   0.072    -.0344364    .8126306
high_lev_dev |   .2305548   .1884984     1.22   0.221    -.1388954    .6000049
       _cons |   .3324575   .0950921     3.50   0.000     .1460805    .5188346
------------------------------------------------------------------------------

. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      37908
Model VCE    : Robust

Expression   : Pr(ExpCSagree), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 8.q22f_1 ExpECSagree
2.q1_02 3.q1_02 4.q1_02 5.q1_02 6.q1_02 8.q1_02 h_aged2 h_aged3 h_female h_edu_high
h_edu_medium h_retired h_student h_unemployed fall2009 spring2010 fall2010 spring2011
EU ExYu high_lev_dev

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   .1034698   .0622514     1.66   0.096    -.0185408    .2254803
             |
      q22f_1 |
          2  |   .0163353   .0202227     0.81   0.419    -.0233005    .0559712
          3  |  -.0340562    .029048    -1.17   0.241    -.0909891    .0228768
          4  |  -.0736387   .0301182    -2.44   0.014    -.1326692   -.0146081
          5  |  -.0886325   .0235208    -3.77   0.000    -.1347325   -.0425325
          8  |  -.1134889   .0322981    -3.51   0.000     -.176792   -.0501859
             |
 ExpECSagree |   .1380132   .0213058     6.48   0.000     .0962547    .1797718
             |
       q1_02 |
          2  |  -.0495517   .0263566    -1.88   0.060    -.1012097    .0021062
          3  |  -.1793215   .0261106    -6.87   0.000    -.2304974   -.1281455
          4  |  -.4190894   .0248368   -16.87   0.000    -.4677687     -.37041
          5  |  -.5369101    .028421   -18.89   0.000    -.5926142   -.4812061
          6  |  -.5827921   .0252288   -23.10   0.000    -.6322396   -.5333445
          8  |  -.3774567    .022864   -16.51   0.000    -.4222693   -.3326442
             |
     h_aged2 |  -.0007189   .0083929    -0.09   0.932    -.0171686    .0157309
```

```
     h_aged3 |  -.0016115   .0092219    -0.17   0.861    -.0196862    .0164632
    h_female |  -.0007062   .0047993    -0.15   0.883    -.0101126    .0087001
  h_edu_high |  -.0046109   .0126982    -0.36   0.717    -.0294988    .0202771
h_edu_medium |  -.0030818   .0112737    -0.27   0.785    -.0251779    .0190144
   h_retired |   .0114545   .0194231     0.59   0.555     -.026614     .049523
   h_student |   .0011382   .0155875     0.07   0.942    -.0294129    .0316892
h_unemployed |   .0083817   .0155922     0.54   0.591    -.0221784    .0389418
    fall2009 |   .0020205   .0177644     0.11   0.909     -.032797     .036838
  spring2010 |   .0329452   .0176551     1.87   0.062    -.0016582    .0675487
    fall2010 |   .0323605    .022656     1.43   0.153    -.0120444    .0767655
  spring2011 |   .0658326   .0176832     3.72   0.000     .0311741    .1004911
          EU |   .0217379   .0451221     0.48   0.630    -.0666997    .1101755
        ExYu |   .1227525   .0703494     1.74   0.081    -.0151298    .2606347
high_lev_dev |   .0727355   .0584998     1.24   0.214     -.041922     .187393
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.


. margins, dydx(CBA) at(q22f_1=(1(1)5)) vsquish

Average marginal effects                          Number of obs   =      37908
Model VCE    : Robust

Expression   : Pr(ExpCSagree), predict()
dy/dx w.r.t. : 1.CBA
1._at        : q22f_1          =           1
2._at        : q22f_1          =           2
3._at        : q22f_1          =           3
4._at        : q22f_1          =           4
5._at        : q22f_1          =           5

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |   -.007977   .0715497    -0.11   0.911    -.1482118    .1322578
          2  |   .0753105   .0642181     1.17   0.241    -.0505546    .2011756
          3  |   .1074275   .0635761     1.69   0.091    -.0171793    .2320343
          4  |   .0974073   .0705012     1.38   0.167    -.0407725     .235587
          5  |   .1502652   .0632234     2.38   0.017     .0263495    .2741808
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.

. marginsplot

  Variables that uniquely identify margins: q22f_1
```



```
. margins, dydx(CBA) at(q1_02=(1(1)6)) vsquish

Average marginal effects                          Number of obs   =      37908
Model VCE     : Robust

Expression    : Pr(ExpCSagree), predict()
dy/dx w.r.t. : 1.CBA
1._at         : q1_02           =           1
2._at         : q1_02           =           2
3._at         : q1_02           =           3
4._at         : q1_02           =           4
5._at         : q1_02           =           5
6._at         : q1_02           =           6

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |   .0308726   .0868377     0.36   0.722    -.1393261    .2010714
          2  |  -.0183821    .058773    -0.31   0.754     -.133575    .0968108
          3  |   .0380499   .0648771     0.59   0.558    -.0891068    .1652066
          4  |   .1606014   .0701449     2.29   0.022       .02312    .2980828
          5  |   .1710975   .0729771     2.34   0.019      .028065    .3141301
          6  |   .1742777   .0635129     2.74   0.006     .0497947    .2987607
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.

. marginsplot

  Variables that uniquely identify margins: q1_02
```



```
. **MARGINS for subsamples

. margins if CBA==0, at(CBA=(0 1))

Predictive margins                                Number of obs   =      30237
Model VCE    : Robust

Expression   : Pr(ExpCSagree), predict()

1._at        : CBA             =           0

2._at        : CBA             =           1

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         _at |
          1  |   .4140094   .0296863    13.95   0.000     .3558255    .4721934
          2  |   .5148438   .0482343    10.67   0.000     .4203064    .6093812
------------------------------------------------------------------------------

. margins if CBA==1, at(CBA=(0 1))

Predictive margins                                Number of obs   =       7671
Model VCE    : Robust

Expression   : Pr(ExpCSagree), predict()

1._at        : CBA             =           0

2._at        : CBA             =           1

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         _at |
          1  |   .3613566   .0555141     6.51   0.000      .252551    .4701621
          2  |    .475035   .0160035    29.68   0.000     .4436687    .5064012
------------------------------------------------------------------------------

. margins, over(CBA) at(CBA=(0 1)) contrast (atcontrast(r._at) wald) vsquish

Contrasts of predictive margins
Model VCE    : Robust

Expression   : Pr(ExpCSagree), predict()
over         : CBA
1._at        : 0.CBA
                   CBA             =           0
               1.CBA
                   CBA             =           0
2._at        : 0.CBA
                   CBA             =           1
               1.CBA
                   CBA             =           1

------------------------------------------------
             |         df        chi2     P>chi2
-------------+----------------------------------
     _at@CBA |
 (2 vs 1) 0  |          1        2.52     0.1121
 (2 vs 1) 1  |          1        3.89     0.0486
      Joint  |          2       44.52     0.0000
------------------------------------------------

--------------------------------------------------------------
             |            Delta-method
             |   Contrast   Std. Err.     [95% Conf. Interval]
-------------+------------------------------------------------
     _at@CBA |
 (2 vs 1) 0  |   .1008343   .0634622     -.0235492    .2252179
 (2 vs 1) 1  |   .1136784   .0576445      .0006973    .2266595
--------------------------------------------------------------

.
```

```
. *with region

unweighted

. probit ExpCSagree i.CBA i.q22f_1 i.CBA#i.q22f_1 ExpECSagree i.q1_02
i.CBA#i.q1_02 h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student
h_unemployed fall2009 spring2010 fall2010 spring2011 EU ExYu high_lev_dev,
vce(cluster h_region) nolog

Probit regression                                 Number of obs   =      37908
                                                  Wald chi2(39)   =    4998.26
                                                  Prob > chi2     =     0.0000
Log pseudolikelihood = -21226.321                 Pseudo R2       =     0.1807

                              (Std. Err. adjusted for 71 clusters in h_region)
------------------------------------------------------------------------------
             |               Robust
  ExpCSagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.2366268   .1695984    -1.40   0.163    -.5690335      .09578
             |
      q22f_1 |
          2  |  -.0305206   .0629652    -0.48   0.628    -.1539301     .092889
          3  |  -.1987121   .0766401    -2.59   0.010     -.348924   -.0485003
          4  |  -.3176501   .0757332    -4.19   0.000    -.4660845   -.1692158
          5  |   -.395215    .065187    -6.06   0.000    -.5229791   -.2674509
          8  |  -.4463742   .1092546    -4.09   0.000    -.6605093    -.232239
             |
  CBA#q22f_1 |
        1 2  |   .2362305   .0994841     2.37   0.018     .0412453    .4312156
        1 3  |   .3451125   .1079166     3.20   0.001     .1335999    .5566251
        1 4  |   .3283812   .1222415     2.69   0.007     .0887923      .56797
        1 5  |    .481902   .0909811     5.30   0.000     .3035823    .6602218
        1 8  |   .3464832   .2400624     1.44   0.149    -.1240305    .8169969
             |
 ExpECSagree |   .4396729   .0426955    10.30   0.000     .3559912    .5233546
             |
       q1_02 |
          2  |  -.1608243   .0821148    -1.96   0.050    -.3217664    .0001177
          3  |  -.5567041   .0775561    -7.18   0.000    -.7087113   -.4046968
          4  |  -1.244896   .0702232   -17.73   0.000    -1.382531   -1.107261
          5  |  -1.638434   .0735987   -22.26   0.000    -1.782684   -1.494183
          6  |   -1.80307   .0785744   -22.95   0.000    -1.957073   -1.649067
          8  |  -1.017605   .1067407    -9.53   0.000    -1.226813   -.8083971
             |
   CBA#q1_02 |
        1 2  |  -.1533817   .1515397    -1.01   0.311     -.450394    .1436306
        1 3  |  -.0061587   .1674999    -0.04   0.971    -.3344525    .3221352
        1 4  |   .3348362   .1637368     2.04   0.041      .013918    .6557545
        1 5  |   .4097571   .1784451     2.30   0.022      .060011    .7595031
        1 6  |   .4577628   .2049004     2.23   0.025     .0561653    .8593602
        1 8  |  -.2468552   .2289189    -1.08   0.281    -.6955279    .2018176
             |
     h_aged2 |  -.0079499   .0193027    -0.41   0.680    -.0457825    .0298826
     h_aged3 |  -.0036669   .0314273    -0.12   0.907    -.0652632    .0579294
    h_female |   .0017819   .0163386     0.11   0.913    -.0302411    .0338049
  h_edu_high |  -.0073131   .0416882    -0.18   0.861    -.0890203    .0743942
h_edu_medium |  -.0072793   .0341589    -0.21   0.831    -.0742296     .059671
   h_retired |   .0496214   .0356401     1.39   0.164    -.0202319    .1194747
   h_student |   .0089133   .0373912     0.24   0.812    -.0643721    .0821988
h_unemployed |     .03455   .0276123     1.25   0.211    -.0195691    .0886691
    fall2009 |  -.0077957   .0406385    -0.19   0.848    -.0874458    .0718543
  spring2010 |   .0997511   .0362736     2.75   0.006     .0286562     .170846
    fall2010 |   .1069347   .0461895     2.32   0.021     .0164049    .1974645
  spring2011 |   .2147687   .0416644     5.15   0.000      .133108    .2964294
          EU |   .0556914   .1003873     0.55   0.579     -.141064    .2524468
        ExYu |   .3824419   .1294329     2.95   0.003      .128758    .6361257
high_lev_dev |   .2330759   .0959466     2.43   0.015      .045024    .4211278
       _cons |   .3611998   .1107422     3.26   0.001     .1441491    .5782506
------------------------------------------------------------------------------
```

```
. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      37908
Model VCE    : Robust

Expression   : Pr(ExpCSagree), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 8.q22f_1 ExpECSagree
2.q1_02 3.q1_02 4.q1_02 5.q1_02 6.q1_02 8.q1_02 h_aged2 h_aged3 h_female h_edu_high
h_edu_medium h_retired h_student h_unemployed fall2009 spring2010 fall2010 spring2011
EU ExYu high_lev_dev

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   .1003119   .0372015     2.70   0.007     .0273984    .1732254
             |
      q22f_1 |
          2  |   .0068671   .0172224     0.40   0.690    -.0268883    .0406224
          3  |  -.0406614   .0204307    -1.99   0.047    -.0807049   -.0006179
          4  |  -.0803873   .0207107    -3.88   0.000    -.1209795    -.039795
          5  |  -.0941053   .0173054    -5.44   0.000    -.1280232   -.0601873
          8  |  -.1197765   .0305899    -3.92   0.000    -.1797316   -.0598215
             |
 ExpECSagree |   .1395431   .0127497    10.94   0.000     .1145542     .164532
             |
       q1_02 |
          2  |  -.0573904   .0206463    -2.78   0.005    -.0978565   -.0169244
          3  |  -.1839387   .0205399    -8.96   0.000    -.2241962   -.1436812
          4  |  -.4151442   .0181236   -22.91   0.000    -.4506657   -.3796226
          5  |  -.5389022   .0186721   -28.86   0.000    -.5754989   -.5023056
          6  |  -.5816545   .0200242   -29.05   0.000    -.6209013   -.5424077
          8  |   -.376293    .031909   -11.79   0.000    -.4388336   -.3137524
             |
     h_aged2 |  -.0025231   .0061125    -0.41   0.680    -.0145034    .0094571
     h_aged3 |  -.0011638   .0099724    -0.12   0.907    -.0207093    .0183817
    h_female |   .0005655   .0051838     0.11   0.913    -.0095945    .0107256
  h_edu_high |   -.002321    .013232    -0.18   0.861    -.0282552    .0236132
h_edu_medium |  -.0023103    .010844    -0.21   0.831    -.0235642    .0189436
   h_retired |   .0157488   .0113166     1.39   0.164    -.0064313    .0379289
   h_student |   .0028289   .0118802     0.24   0.812    -.0204558    .0261136
h_unemployed |   .0109655   .0087969     1.25   0.213    -.0062761     .028207
    fall2009 |  -.0024742   .0129026    -0.19   0.848    -.0277628    .0228144
  spring2010 |   .0316589   .0116629     2.71   0.007     .0088001    .0545178
    fall2010 |   .0339389   .0147883     2.29   0.022     .0049543    .0629234
  spring2011 |   .0681632   .0130583     5.22   0.000     .0425694     .093757
          EU |   .0176753   .0319214     0.55   0.580    -.0448895    .0802401
        ExYu |   .1213792   .0417214     2.91   0.004     .0396068    .2031516
high_lev_dev |   .0739735    .029895     2.47   0.013     .0153804    .1325666
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

weighted

```
. probit ExpCSagree i.CBA i.q22f_1 i.CBA#i.q22f_1 ExpECSagree i.q1_02
i.CBA#i.q1_02 h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student
h_unemployed fall2009 spring2010 fall2010 spring2011 EU ExYu high_lev_dev [pweight =
weight], vce(cluster h_region) nolog

Probit regression                                 Number of obs   =      37908
                                                  Wald chi2(39)   =    4202.21
                                                  Prob > chi2     =     0.0000
Log pseudolikelihood = -20552.351                 Pseudo R2       =     0.1839

                              (Std. Err. adjusted for 71 clusters in h_region)
------------------------------------------------------------------------------
             |               Robust
  ExpCSagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.2381533   .1702246    -1.40   0.162    -.5717875    .0954808
             |
      q22f_1 |
          2  |  -.0021443   .0657167    -0.03   0.974    -.1309467     .126658
          3  |   -.180016   .0759428    -2.37   0.018    -.3288612   -.0311709
          4  |  -.3000034   .0772922    -3.88   0.000    -.4514933   -.1485135
          5  |   -.384338   .0662745    -5.80   0.000    -.5142337   -.2544423
```

```
              8  |  -.4431451   .1098704    -4.03   0.000    -.6584872    -.227803
                 |
       CBA#q22f_1 |
             1 2  |   .2339072   .1019783     2.29   0.022     .0340334     .433781
             1 3  |   .3428627   .1100155     3.12   0.002     .1272363    .5584891
             1 4  |   .3303813   .1223211     2.70   0.007     .0906363    .5701263
             1 5  |     .49133       .095     5.17   0.000     .3051335    .6775265
             1 8  |   .4007943   .2524599     1.59   0.112     -.094018    .8956065
                  |
      ExpECSagree |   .4374702   .0437251    10.01   0.000     .3517705    .5231698
                  |
            q1_02 |
               2  |  -.1309803   .0867097    -1.51   0.131    -.3009281    .0389675
               3  |   -.541197   .0867825    -6.24   0.000    -.7112875   -.3711065
               4  |  -1.252976   .0766824   -16.34   0.000    -1.403271   -1.102681
               5  |  -1.635839   .0785499   -20.83   0.000    -1.789794   -1.481884
               6  |  -1.817354    .083834   -21.68   0.000    -1.981666   -1.653043
               8  |  -1.022292   .1109186    -9.22   0.000    -1.239688   -.8048953
                  |
        CBA#q1_02 |
             1 2  |   -.167864   .1568031    -1.07   0.284    -.4751923    .1394644
             1 3  |  -.0038901   .1714296    -0.02   0.982    -.3398859    .3321057
             1 4  |   .3312025   .1669143     1.98   0.047     .0040564    .6583485
             1 5  |   .4250911    .180224     2.36   0.018     .0718586    .7783236
             1 6  |   .4865043   .2050463     2.37   0.018      .084621    .8883876
             1 8  |  -.2168943   .2292365    -0.95   0.344    -.6661896    .2324009
                  |
         h_aged2 |  -.0022786   .0205353    -0.11   0.912    -.0425271    .0379699
         h_aged3 |  -.0051081   .0345425    -0.15   0.882    -.0728102     .062594
        h_female |  -.0022386   .0161725    -0.14   0.890    -.0339362    .0294589
      h_edu_high |  -.0146153   .0439624    -0.33   0.740      -.10078    .0715493
    h_edu_medium |  -.0097686   .0352257    -0.28   0.782    -.0788098    .0592726
       h_retired |    .036308   .0382213     0.95   0.342    -.0386044    .1112205
       h_student |   .0036077    .040332     0.09   0.929    -.0754415    .0826569
    h_unemployed |   .0265681   .0312752     0.85   0.396    -.0347302    .0878665
        fall2009 |   .0064044   .0432545     0.15   0.882     -.078373    .0911817
      spring2010 |   .1044287   .0413854     2.52   0.012     .0233148    .1855427
        fall2010 |   .1025754   .0463618     2.21   0.027      .011708    .1934429
      spring2011 |   .2086741   .0420011     4.97   0.000     .1263535    .2909947
              EU |   .0689041   .1072027     0.64   0.520    -.1412094    .2790176
            ExYu |   .3890971   .1354449     2.87   0.004       .12363    .6545642
    high_lev_dev |   .2305548   .0976429     2.36   0.018     .0391782    .4219314
           _cons |   .3324575   .1135079     2.93   0.003     .1099861     .554929
------------------------------------------------------------------------------

. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      37908
Model VCE    : Robust

Expression   : Pr(ExpCSagree), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 8.q22f_1 ExpECSagree
2.q1_02 3.q1_02 4.q1_02 5.q1_02 6.q1_02 8.q1_02 h_aged2 h_aged3 h_female h_edu_high
h_edu_medium h_retired h_student h_unemployed fall2009 spring2010 fall2010 spring2011
EU ExYu high_lev_dev

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   .1034698   .0368078     2.81   0.005     .0313278    .1756117
             |
      q22f_1 |
          2  |   .0163353   .0177509     0.92   0.357    -.0184559    .0511265
          3  |  -.0340562   .0201194    -1.69   0.091    -.0734895    .0053771
          4  |  -.0736387    .020846    -3.53   0.000    -.1144961   -.0327813
          5  |  -.0886325   .0174045    -5.09   0.000    -.1227447   -.0545203
          8  |  -.1134889   .0309733    -3.66   0.000    -.1741955   -.0527824
             |
 ExpECSagree |   .1380132   .0130379    10.59   0.000     .1124594     .163567
             |
       q1_02 |
          2  |  -.0495517   .0216532    -2.29   0.022    -.0919913   -.0071122
          3  |  -.1793215   .0226405    -7.92   0.000     -.223696    -.134947
          4  |  -.4190894   .0194302   -21.57   0.000    -.4571719   -.3810069
          5  |  -.5369101   .0197639   -27.17   0.000    -.5756466   -.4981736
          6  |  -.5827921   .0211835   -27.51   0.000     -.624311   -.5412731
```

```
             8  |  -.3774567   .0324406   -11.64   0.000    -.4410392   -.3138743
                |
        h_aged2 |  -.0007189   .0064736    -0.11   0.912    -.0134069    .0119692
        h_aged3 |  -.0016115   .0108922    -0.15   0.882    -.0229599    .0197369
       h_female |  -.0007062   .0051025    -0.14   0.890     -.010707    .0092945
     h_edu_high |  -.0046109    .013866    -0.33   0.739    -.0317877     .022566
   h_edu_medium |  -.0030818   .0111139    -0.28   0.782    -.0248646     .018701
      h_retired |   .0114545   .0120497     0.95   0.342    -.0121625    .0350715
      h_student |   .0011382   .0127285     0.09   0.929    -.0238092    .0260855
   h_unemployed |   .0083817   .0098903     0.85   0.397    -.0110028    .0277663
       fall2009 |   .0020205   .0136441     0.15   0.882    -.0247216    .0287625
     spring2010 |   .0329452   .0132057     2.49   0.013     .0070624     .058828
       fall2010 |   .0323605   .0147752     2.19   0.029     .0034016    .0613195
     spring2011 |   .0658326   .0131012     5.02   0.000     .0401547    .0915105
             EU |   .0217379   .0338832     0.64   0.521     -.044672    .0881477
           ExYu |   .1227525   .0433741     2.83   0.005     .0377407    .2077642
   high_lev_dev |   .0727355    .030255     2.40   0.016     .0134367    .1320343
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

**Appendix 4.14 Multinomial probit and probit without the interaction terms –** cheking for the potential bias caused by exclusion of do not know answers

**Perceptions about the local currency stability**

```
tab q1_03, missing

   Currently, the |
[LOCAL CURRENCY] |
 is a very stable |
  and trustworthy |
         currency |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree |      1,912        3.95        3.95
            Agree |      5,657       11.70       15.65
   Somewhat agree |     11,420       23.62       39.27
Somewhat disagree |     10,178       21.05       60.31
         Disagree |      9,288       19.21       79.52
Strongly disagree |      7,625       15.77       95.29
      Do not know |      2,064        4.27       99.56
        No answer |        214        0.44      100.00
------------------+-----------------------------------
            Total |     48,358      100.00
```

**Multinomial (do not know answers separate category) interaction terms excluded**

```
drop if q1_03==9
(214 observations deleted)

. *for multinomial (confidence model)
. generate MCSagree=0

. replace MCSagree=1 if  q1_03==4 |  q1_03==5 |  q1_03==6
(27091 real changes made)

. replace MCSagree=2 if  q1_03==8
(2064 real changes made)

. replace MCSagree=3 if  q1_03==1 |  q1_03==2 |  q1_03==3
(18989 real changes made)

. drop if MCSagree==0
(0 observations deleted)
```

```
. mprobit MCSagree i.CBA ECSagree i.q1_01 i.q22f_1 h_aged2 h_aged3 h_female
h_edu_high h_edu_medium h_retired h_student h_unemployed fall2009 spring2010
fall2010 spring2011 EU ExYu high_lev_dev [pweight = weight], vce(cluster
country) nolog

Multinomial probit regression                     Number of obs   =      48144
                                                  Wald chi2(7)    =          .
Log pseudolikelihood = -33153.173                 Prob > chi2     =          .

                               (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
    MCSagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1            |  (base outcome)
-------------+----------------------------------------------------------------
2            |
       1.CBA |   .3760398   .2360912     1.59   0.111    -.0866905      .83877
    ECSagree |  -.3504207   .1023947    -3.42   0.001    -.5511106   -.1497307
             |
       q1_01 |
          2  |  -.2636971   .2905198    -0.91   0.364    -.8331055    .3057113
          3  |  -.5576373    .255282    -2.18   0.029    -1.057981   -.0572938
          4  |  -.9035081   .2114029    -4.27   0.000     -1.31785    -.489166
          5  |  -.9446327   .2625437    -3.60   0.000    -1.459209   -.4300565
          6  |  -.9431694     .29107    -3.24   0.001    -1.513656   -.3726827
          8  |   1.923892   .3300224     5.83   0.000      1.27706    2.570724
             |
      q22f_1 |
          2  |  -.0932139    .095282    -0.98   0.328    -.2799632    .0935355
          3  |  -.1575646   .1351884    -1.17   0.244     -.422529    .1073998
          4  |  -.2325708   .1475324    -1.58   0.115    -.5217289    .0565874
          5  |  -.1495566    .107692    -1.39   0.165    -.3606289    .0615158
          8  |   .3359921   .1919906     1.75   0.080    -.0403026    .7122868
             |
     h_aged2 |  -.1372325   .0403625    -3.40   0.001    -.2163416   -.0581234
     h_aged3 |   .0631199   .0701151     0.90   0.368    -.0743032     .200543
    h_female |   .3060515    .043368     7.06   0.000     .2210517    .3910513
  h_edu_high |  -.4153595   .1063344    -3.91   0.000     -.623771   -.2069479
h_edu_medium |  -.2564101   .0803522    -3.19   0.001    -.4138975   -.0989226
   h_retired |   .1803111   .0886814     2.03   0.042     .0064988    .3541234
   h_student |   .2429176   .0875691     2.77   0.006     .0712852    .4145499
h_unemployed |   .1946533   .0630342     3.09   0.002     .0711085     .318198
    fall2009 |   .1602667   .1407067     1.14   0.255    -.1155133    .4360467
  spring2010 |   .0247698   .1009226     0.25   0.806    -.1730347    .2225744
    fall2010 |  -.0839084   .1122323    -0.75   0.455    -.3038797    .1360629
  spring2011 |   .2192004   .1215738     1.80   0.071    -.0190799    .4574806
          EU |   .3492434   .2102349     1.66   0.097    -.0628094    .7612962
        ExYu |   .4032179   .2671993     1.51   0.131     -.120483    .9269189
high_lev_dev |    .189112   .3067545     0.62   0.538    -.4121158    .7903398
       _cons |   -1.37005   .2582275    -5.31   0.000    -1.876167   -.8639333
-------------+----------------------------------------------------------------
3            |
       1.CBA |   .8489957   .3879892     2.19   0.029     .0885509     1.60944
    ECSagree |   .6422572   .1304109     4.92   0.000     .3866565    .8978579
             |
       q1_01 |
          2  |  -.0421901   .2259941    -0.19   0.852    -.4851303    .4007501
          3  |  -.6813418   .2403964    -2.83   0.005     -1.15251   -.2101734
          4  |  -1.389241   .2204123    -6.30   0.000    -1.821242   -.9572412
          5  |   -1.76987   .2541545    -6.96   0.000    -2.268003   -1.271736
          6  |  -2.081984   .2817064    -7.39   0.000    -2.634118   -1.529849
          8  |  -1.249986   .2558614    -4.89   0.000    -1.751465   -.7485072
             |
      q22f_1 |
          2  |   -.117519   .0705222    -1.67   0.096      -.25574    .0207021
          3  |  -.3650052   .0848565    -4.30   0.000     -.531321   -.1986895
          4  |  -.4892931   .1135357    -4.31   0.000     -.711819   -.2667672
          5  |  -.5538782   .1055826    -5.25   0.000    -.7608164   -.3469401
          8  |  -.5360612   .1467139    -3.65   0.000    -.8236151   -.2485074
             |
     h_aged2 |  -.0191889   .0269611    -0.71   0.477    -.0720316    .0336539
     h_aged3 |   .1119623   .0553222     2.02   0.043     .0035328    .2203919
    h_female |   -.018998   .0285723    -0.66   0.506    -.0749986    .0370026
  h_edu_high |   .0741897   .0614436     1.21   0.227    -.0462375    .1946168
h_edu_medium |   .0416033   .0746694     0.56   0.577    -.1047459    .1879526
```

```
   h_retired |  -.0402746   .0835518    -0.48   0.630    -.2040331    .1234839
   h_student |  -.0463293   .0793222    -0.58   0.559    -.2017979    .1091393
h_unemployed |   .0500297   .0653188     0.77   0.444    -.0779928    .1780522
    fall2009 |   .2061683   .0830758     2.48   0.013     .0433427     .368994
  spring2010 |   .3185293   .0586557     5.43   0.000     .2035662    .4334924
    fall2010 |   .2953145   .0960237     3.08   0.002     .1071115    .4835174
  spring2011 |    .507835   .0863572     5.88   0.000     .3385779     .677092
          EU |  -.1844637   .2811784    -0.66   0.512    -.7355633    .3666359
        ExYu |    .481735   .4448845     1.08   0.279    -.3902225    1.353692
high_lev_dev |   .4780588   .3872457     1.23   0.217    -.2809288    1.237046
       _cons |   .4532183   .3179032     1.43   0.154    -.1698606    1.076297
------------------------------------------------------------------------------
```

**Probit perception model (without do not know answers and interaction terms)**

```
. drop if q1_03==8
(2064 observations deleted)

. generate CSagree=0

. replace CSagree=3 if  q1_03==1 |  q1_03==2 |  q1_03==3
(18989 real changes made)

. probit CSagree i.CBA ECSagree i.q1_01 i.q22f_1 h_aged2 h_aged3 h_female
h_edu_high h_edu_medium h_retired h_student h_unemployed fall2009 spring2010
fall2010 spring2011 EU ExYu high_lev_dev [pweight = weight], vce(cluster
country) nolog

Probit regression                                 Number of obs   =      46080
                                                  Wald chi2(8)    =          .
                                                  Prob > chi2     =          .
Log pseudolikelihood = -26281.813                 Pseudo R2       =     0.1369

                               (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
     CSagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   .6138864   .2808503     2.19   0.029       .06343    1.164343
    ECSagree |   .4713505   .0921917     5.11   0.000     .2906581    .6520429
             |
       q1_01 |
          2  |   -.028648   .1660612    -0.17   0.863    -.3541219    .2968259
          3  |  -.4841942   .1750563    -2.77   0.006    -.8272983   -.1410901
          4  |  -.9896226   .1604126    -6.17   0.000    -1.304026   -.6752196
          5  |  -1.262955    .185507    -6.81   0.000    -1.626542   -.8993676
          6  |  -1.489812   .2061389    -7.23   0.000    -1.893837   -1.085787
          8  |  -1.042207   .1960878    -5.32   0.000    -1.426532   -.6578819
             |
      q22f_1 |
          2  |  -.0871213   .0493766    -1.76   0.078    -.1838977     .009655
          3  |  -.2667345   .0603506    -4.42   0.000    -.3850195   -.1484495
          4  |  -.3546859    .080949    -4.38   0.000    -.5133431   -.1960287
          5  |   -.400238   .0755494    -5.30   0.000    -.5483121    -.252164
          8  |  -.4207426   .1070656    -3.93   0.000    -.6305873    -.210898
             |
     h_aged2 |  -.0138848   .0193538    -0.72   0.473    -.0518177     .024048
     h_aged3 |    .080325   .0391933     2.05   0.040     .0035077    .1571424
    h_female |  -.0173968   .0204182    -0.85   0.394    -.0574158    .0226222
  h_edu_high |    .062402    .043124     1.45   0.148    -.0221195    .1469234
h_edu_medium |   .0330758   .0527102     0.63   0.530    -.0702342    .1363858
   h_retired |  -.0345318   .0581034    -0.59   0.552    -.1484123    .0793488
   h_student |  -.0307499   .0576937    -0.53   0.594    -.1438275    .0823276
h_unemployed |   .0385517   .0459462     0.84   0.401    -.0515012    .1286046
    fall2009 |   .1418092   .0601372     2.36   0.018     .0239424    .2596759
  spring2010 |   .2242776   .0435319     5.15   0.000     .1389567    .3095985
    fall2010 |   .2065909   .0695322     2.97   0.003     .0703102    .3428715
  spring2011 |   .3586436   .0629706     5.70   0.000     .2352234    .4820638
          EU |  -.1399055   .2036176    -0.69   0.492    -.5389886    .2591776
        ExYu |   .3484265   .3186748     1.09   0.274    -.2761646    .9730177
high_lev_dev |   .3572186   .2771033     1.29   0.197    -.1858938    .9003311
       _cons |   .3134725   .2298011     1.36   0.173    -.1369294    .7638744
------------------------------------------------------------------------------
```

**Expectations about the local currency stability**

```
. tab q1_04, missing

    Over the next |
  five years, the |
 [LOCAL CURRENCY] |
     will be very |
stable and trustw |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree |      1,442        3.00        3.00
            Agree |      4,928       10.24       13.23
   Somewhat agree |     11,381       23.64       36.87
Somewhat disagree |     10,084       20.95       57.82
         Disagree |      8,534       17.73       75.55
Strongly disagree |      5,690       11.82       87.37
      Do not know |      5,748       11.94       99.31
        No answer |        334        0.69      100.00
------------------+-----------------------------------
            Total |     48,141      100.00


. drop if q1_04==9
(334 observations deleted)


. *for multinomial (credibility model)
. generate MExpCSagree=0

. replace MExpCSagree=1 if  q1_04==4 |  q1_04==5 |  q1_04==6
(24308 real changes made)

. replace MExpCSagree=2 if  q1_04==8
(5748 real changes made)

. replace MExpCSagree=3 if  q1_04==1 |  q1_04==2 |  q1_04==3
(17751 real changes made)

. drop if MExpCSagree==0
(0 observations deleted)

. mprobit MExpCSagree i.CBA ExpECSagree i.q1_02 i.q22f_1 h_aged2 h_aged3
h_female h_edu_high h_edu_medium h_retired h_student h_unemployed fall2009
spring2010 fall2010 spring2011 EU ExYu high_lev_dev [pweight = weight],
vce(cluster country) nolog

Multinomial probit regression                     Number of obs   =      47807
                                                  Wald chi2(7)    =          .
Log pseudolikelihood = -36607.799                 Prob > chi2     =          .

                              (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
 MExpCSagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1            |  (base outcome)
-------------+----------------------------------------------------------------
2            |
       1.CBA |  -.0052224   .2148525    -0.02   0.981    -.4263256    .4158809
 ExpECSagree |  -.4285711   .0648493    -6.61   0.000    -.5556735   -.3014688
             |
       q1_02 |
          2  |  -.2627637   .1534866    -1.71   0.087     -.563592    .0380646
          3  |  -.5433784   .1225524    -4.43   0.000    -.7835767   -.3031801
          4  |  -1.064886   .1254577    -8.49   0.000    -1.310778   -.8189932
          5  |  -1.267374   .1100265   -11.52   0.000    -1.483022   -1.051726
          6  |  -1.152209   .0966405   -11.92   0.000    -1.341621   -.9627969
          8  |   1.211578   .1213358     9.99   0.000     .9737639    1.449391
             |
      q22f_1 |
          2  |   .1060693   .0478582     2.22   0.027      .012269    .1998697
          3  |   .0725006   .0813942     0.89   0.373    -.0870292    .2320303
```

```
           4  |  -.1150592   .1030316    -1.12   0.264    -.3169974     .086879
           5  |   .0337339   .0964765     0.35   0.727    -.1553566    .2228243
           8  |   .3459668   .1017557     3.40   0.001     .1465294    .5454042
              |
     h_aged2  |  -.0057914   .0402083    -0.14   0.885    -.0845982    .0730154
     h_aged3  |   .0563774   .0649638     0.87   0.385    -.0709493    .1837041
    h_female  |   .1639398   .0293729     5.58   0.000     .1063699    .2215097
  h_edu_high  |  -.2627025   .0571105    -4.60   0.000    -.3746371   -.1507679
h_edu_medium  |  -.1803886   .0384591    -4.69   0.000     -.255767   -.1050102
   h_retired  |   .1309812   .0438426     2.99   0.003     .0450512    .2169112
   h_student  |   .0341463   .0695727     0.49   0.624    -.1022137    .1705062
h_unemployed  |   .0613264   .0421494     1.45   0.146    -.0212848    .1439376
    fall2009  |   .1896633   .1548715     1.22   0.221    -.1138793    .4932059
  spring2010  |   .0242929   .1128408     0.22   0.830     -.196871    .2454569
    fall2010  |   .0369263   .0968114     0.38   0.703    -.1528206    .2266732
  spring2011  |   .2059762   .1003485     2.05   0.040     .0092967    .4026557
          EU  |   .7274676   .1285716     5.66   0.000      .475472    .9794633
        ExYu  |    .735323    .185362     3.97   0.000     .3720202    1.098626
high_lev_dev  |   .0024854   .1792808     0.01   0.989    -.3488985    .3538693
       _cons  |  -1.037816   .0979305   -10.60   0.000    -1.229756   -.8458754
-------------+----------------------------------------------------------------
3             |
       1.CBA  |   .4570424   .2725769     1.68   0.094    -.0771985    .9912833
 ExpECSagree  |   .5143176   .0916729     5.61   0.000      .334642    .6939932
              |
       q1_02  |
           2  |  -.1665413   .1401734    -1.19   0.235    -.4412761    .1081935
           3  |  -.6696554   .1606027    -4.17   0.000    -.9844309     -.35488
           4  |  -1.607211   .1741672    -9.23   0.000    -1.948573    -1.26585
           5  |  -2.078096   .1854394   -11.21   0.000    -2.441551   -1.714642
           6  |  -2.262039   .2039382   -11.09   0.000    -2.661751   -1.862327
           8  |   -1.22926   .1139746   -10.79   0.000    -1.452646   -1.005874
              |
      q22f_1  |
           2  |   .0845199   .0992432     0.85   0.394    -.1099933    .2790331
           3  |  -.1306297   .1371759    -0.95   0.341    -.3994896    .1382302
           4  |  -.2971909   .1450846    -2.05   0.041    -.5815515   -.0128302
           5  |  -.3590185   .1383488    -2.60   0.009    -.6301771   -.0878599
           8  |  -.4154835   .1444797    -2.88   0.004    -.6986586   -.1323084
              |
     h_aged2  |   .0010994   .0347911     0.03   0.975      -.06709    .0692887
     h_aged3  |    .009863    .037982     0.26   0.795    -.0645804    .0843065
    h_female  |   .0161293   .0148561     1.09   0.278    -.0129881    .0452466
  h_edu_high  |  -.0459619   .0490322    -0.94   0.349    -.1420633    .0501395
h_edu_medium  |  -.0264729   .0504101    -0.53   0.599    -.1252748     .072329
   h_retired  |   .0801085   .0750955     1.07   0.286    -.0670759    .2272929
   h_student  |  -.0063043   .0610991    -0.10   0.918    -.1260564    .1134478
h_unemployed  |    .047572   .0631124     0.75   0.451     -.076126      .17127
    fall2009  |   .0417807   .0735136     0.57   0.570    -.1023034    .1858648
  spring2010  |   .1465877   .0724243     2.02   0.043     .0046387    .2885367
    fall2010  |    .135524   .0968875     1.40   0.162     -.054372    .3254199
  spring2011  |   .2976175   .0824651     3.61   0.000     .1359889    .4592462
          EU  |   .0342117   .1984303     0.17   0.863    -.3547046    .4231279
        ExYu  |   .4448743   .3027429     1.47   0.142    -.1484908    1.038239
high_lev_dev  |   .3003473   .2612352     1.15   0.250    -.2116644     .812359
       _cons  |   .3690078   .1946954     1.90   0.058    -.0125881    .7506038
------------------------------------------------------------------------------
```

Probit expectations model (do not know answers excluded) no interaction terms

```
. drop if q1_04==8
(5748 observations deleted)


. generate ExpCSagree=0

. replace ExpCSagree=1 if  q1_04==1 |  q1_04==2 |  q1_04==3
(17751 real changes made)
```

```
. probit ExpCSagree i.CBA ExpECSagree i.q1_02 i.q22f_1 h_aged2 h_aged3
h_female h_edu_high h_edu_medium h_retired h_student h_unemployed fall2009
spring2010 fall2010 spring2011 EU ExYu high_lev_dev [pweight = weight],
vce(cluster country) nolog

Probit regression                                 Number of obs   =      42059
                                                  Wald chi2(8)    =          .
                                                  Prob > chi2     =          .
Log pseudolikelihood = -22942.825                 Pseudo R2       =     0.1787

                              (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
  ExpCSagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   .3412595    .202221     1.69   0.091    -.0550865    .7376054
 ExpECSagree |   .3893223   .0665493     5.85   0.000      .258888    .5197565
             |
       q1_02 |
          2  |  -.1259544   .1036882    -1.21   0.224    -.3291795    .0772706
          3  |  -.4955133   .1163707    -4.26   0.000    -.7235958   -.2674309
          4  |  -1.175078   .1256145    -9.35   0.000    -1.421278   -.9288783
          5  |  -1.518573   .1330145   -11.42   0.000    -1.779277   -1.257869
          6  |  -1.661275   .1446747   -11.48   0.000    -1.944832   -1.377718
          8  |  -.9689635   .0832532   -11.64   0.000    -1.132137   -.8057901
             |
      q22f_1 |
          2  |   .0626781   .0712713     0.88   0.379    -.0770111    .2023673
          3  |  -.0958331   .0992278    -0.97   0.334     -.290316    .0986499
          4  |  -.2191019   .1066619    -2.05   0.040    -.4281553   -.0100485
          5  |  -.2638808   .1021601    -2.58   0.010    -.4641109   -.0636507
          8  |  -.3257583    .116177    -2.80   0.005    -.5534609   -.0980556
             |
     h_aged2 |   .0061431   .0251216     0.24   0.807    -.0430943    .0553806
     h_aged3 |   .0107959   .0282661     0.38   0.703    -.0446047    .0661966
    h_female |   .0053788   .0116282     0.46   0.644     -.017412    .0281697
  h_edu_high |  -.0230082   .0376529    -0.61   0.541    -.0968065    .0507901
h_edu_medium |   -.014242   .0370434    -0.38   0.701    -.0868457    .0583618
   h_retired |   .0495839    .053733     0.92   0.356    -.0557309    .1548987
   h_student |    .002895   .0449705     0.06   0.949    -.0852456    .0910357
h_unemployed |    .031102   .0459838     0.68   0.499    -.0590247    .1212287
    fall2009 |   .0178102   .0575226     0.31   0.757     -.094932    .1305524
  spring2010 |   .0997597    .055283     1.80   0.071    -.0085929    .2081123
    fall2010 |   .0904027   .0704389     1.28   0.199     -.047655    .2284605
  spring2011 |   .2079658   .0612697     3.39   0.001     .0878795    .3280521
          EU |   .0190861   .1471743     0.13   0.897    -.2693703    .3075424
        ExYu |   .3316304   .2232556     1.49   0.137    -.1059425    .7692033
high_lev_dev |    .222418   .1915517     1.16   0.246    -.1530164    .5978524
       _cons |   .2648924    .141994     1.87   0.062    -.0134108    .5431956
------------------------------------------------------------------------------
```

## Appendices Chapter 5

### Appendix 5.1: Correlation matrix between explanatory variables

```
. correlate cba gdpg l1msg fb open tot ebrdi l1ccbi defactofix vat eu
(obs=155)

             |      cba     gdpg    l1msg       fb     open      tot    ebrdi   l1ccbi defact~x    vat    eu
-------------+----------------------------------------------------------------------------------------------------
         cba |   1.0000
        gdpg |   0.1451   1.0000
       l1msg |   0.0160   0.1802   1.0000
          fb |   0.4730   0.5050   0.1282   1.0000
        open |   0.2494   0.1306  -0.1989   0.2023   1.0000
         tot |   0.4521   0.0387   0.0519   0.2405   0.2443   1.0000
       ebrdi |   0.0125  -0.0712  -0.5061  -0.1767   0.4658   0.2678   1.0000
      l1ccbi |   0.3640  -0.0400  -0.3634   0.1022   0.3188   0.1289   0.3727   1.0000
  defactofix |   0.5670  -0.0147   0.0587   0.3503   0.2363   0.3974  -0.0552   0.2447   1.0000
         vat |   0.0750   0.0317   0.0163   0.1546  -0.0790  -0.0021  -0.1550   0.0228   0.0347   1.0000
        eu |    0.0545  -0.0257  -0.2207  -0.0077   0.3646   0.2056   0.5699   0.3233   0.0495  -0.0743   1
```

### Appendix 5.2: Estimation of inflation regression by OLS

```
. xi: regress lninf cba gdpg l1msg fb open tot ebrdi l1ccbi defactofix vat eu i.time
i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
note: _Itime_1999 omitted because of collinearity
note: _Itime_2009 omitted because of collinearity

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F( 20,   134) =    5.00
       Model |  78.5777266    20  3.92888633           Prob > F      =  0.0000
    Residual |  105.337836   134  .786103254           R-squared     =  0.4272
-------------+------------------------------           Adj R-squared =  0.3418
       Total |  183.915563   154   1.1942569           Root MSE      =  .88662

------------------------------------------------------------------------------
       lninf |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cba |  -.6308146   .2571821    -2.45   0.015    -1.139476   -.1221532
        gdpg |  -.0621849   .0271283    -2.29   0.023    -.1158399   -.0085298
       l1msg |   .0237804   .0050624     4.70   0.000     .0137678     .033793
          fb |    .076469   .0362129     2.11   0.037     .0048461    .1480918
        open |   .0043217   .0028773     1.50   0.135    -.0013692    .0100125
         tot |   .0078802   .0088849     0.89   0.377    -.0096927     .025453
       ebrdi |   .1734574   .2608658     0.66   0.507    -.3424897    .6894045
      l1ccbi |  -1.578377   .6110523    -2.58   0.011    -2.786932   -.3698222
  defactofix |   .0840839   .1969969     0.43   0.670    -.3055416    .4737094
         vat |   .9993783   .6663563     1.50   0.136    -.3185583    2.317315
          eu |   .0106969   .2309324     0.05   0.963    -.4460471    .4674409
 _Itime_1999 |  (omitted)
 _Itime_2000 |   .7701197   .5065317     1.52   0.131    -.2317117    1.771951
 _Itime_2001 |   .4267333   .4970574     0.86   0.392    -.5563596    1.409826
 _Itime_2002 |  -.3849064   .4968536    -0.77   0.440    -1.367596    .5977835
 _Itime_2003 |  -.2420223   .5103924    -0.47   0.636     -1.25149     .767445
 _Itime_2004 |   .3851175   .5211349     0.74   0.461    -.6455965    1.415832
 _Itime_2005 |    .064517   .5065685     0.13   0.899    -.9373872    1.066421
 _Itime_2006 |   .2955697    .520528     0.57   0.571    -.7339441    1.325083
 _Itime_2007 |   .3762072   .5204501     0.72   0.471    -.6531523    1.405567
 _Itime_2008 |   .8754101   .4785967     1.83   0.070    -.0711708    1.821991
 _Itime_2009 |  (omitted)
       _cons |   .6716565   1.125689     0.60   0.552     -1.55476    2.898073
------------------------------------------------------------------------------
```

***Test for joint significance of time dummies**

```
.  test    _Itime_1999  _Itime_2000  _Itime_2001  _Itime_2002  _Itime_2003  _Itime_2004
_Itime_2005 _Itime_2006 _Itime_2007 _Itime_2008 _Itime
> _2009

 ( 1)  o._Itime_1999 = 0
 ( 2)  _Itime_2000 = 0
 ( 3)  _Itime_2001 = 0
 ( 4)  _Itime_2002 = 0
 ( 5)  _Itime_2003 = 0
 ( 6)  _Itime_2004 = 0
 ( 7)  _Itime_2005 = 0
 ( 8)  _Itime_2006 = 0
```

```
 ( 9)  _Itime_2007 = 0
 (10)  _Itime_2008 = 0
 (11)  o._Itime_2009 = 0
       Constraint 1 dropped
       Constraint 11 dropped

       F(  9,   134) =    3.04
            Prob > F =    0.0025

. estat imtest

Cameron & Trivedi's decomposition of IM-test

---------------------------------------------------
              Source |       chi2     df      p
---------------------+-----------------------------
  Heteroskedasticity |     155.00    154    0.4622
            Skewness |      16.94     20    0.6570
            Kurtosis |       1.89      1    0.1696
---------------------+-----------------------------
               Total |     173.82    175    0.5109
---------------------------------------------------

. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of lninf

         chi2(1)      =     4.78
         Prob > chi2  =   0.0288

. estat ovtest

Ramsey RESET test using powers of the fitted values of lninf
       Ho:  model has no omitted variables
                 F(3, 131) =      2.19
                  Prob > F =      0.0926
```

**Appendix 5.3: Estimation of inflation regression by FE and RE model + Hausman test**

```
. xi: xtreg lninf cba gdpg l1msg fb open tot ebrdi l1ccbi defactofix vat eu i.time,
fe
i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
note: cba omitted because of collinearity
note: _Itime_1999 omitted because of collinearity
note: _Itime_2002 omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =       155
Group variable: ctyno                           Number of groups   =        17

R-sq:  within  = 0.3489                         Obs per group: min =         7
       between = 0.2582                                        avg =       9.1
       overall = 0.2870                                        max =        10

                                                F(19,119)          =      3.36
corr(u_i, Xb)  = -0.2561                        Prob > F           =    0.0000

------------------------------------------------------------------------------
       lninf |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cba |  (omitted)
        gdpg |  -.0546837   .0271802    -2.01   0.046    -.1085032   -.0008642
       l1msg |   .0124851   .0050748     2.46   0.015     .0024364    .0225337
          fb |    .035328   .0410985     0.86   0.392    -.0460511    .1167072
        open |   .0067485   .0087291     0.77   0.441     -.010536    .0240331
         tot |   .0233886   .0157799     1.48   0.141    -.0078571    .0546344
       ebrdi |  -.7084684   .6253588    -1.13   0.260    -1.946741    .5298046
      l1ccbi |  -1.329348    .664849    -2.00   0.048    -2.645815   -.0128804
  defactofix |   .0467399   .3033178     0.15   0.878    -.5538597    .6473394
         vat |   .8948198   .6044297     1.48   0.141    -.3020114    2.091651
          eu |  -.2835026   .2478527    -1.14   0.255    -.7742756    .2072704
 _Itime_1999 |  (omitted)
```

```
 _Itime_2000 |    .827447   .2975542     2.78   0.006       .23826    1.416634
 _Itime_2001 |   .7263703   .2706621     2.68   0.008     .1904323    1.262308
 _Itime_2002 |  (omitted)
 _Itime_2003 |  -.0168307   .2833613    -0.06   0.953    -.5779143    .5442529
 _Itime_2004 |   .7549974   .3206077     2.35   0.020      .120162    1.389833
 _Itime_2005 |   .6172059   .3259445     1.89   0.061    -.0281967    1.262608
 _Itime_2006 |   .8646385    .342647     2.52   0.013     .1861632    1.543114
 _Itime_2007 |   .9742344   .3715395     2.62   0.010     .2385491     1.70992
 _Itime_2008 |   1.497097   .3806897     3.93   0.000     .7432935    2.250901
 _Itime_2009 |   .2962255   .5236054     0.57   0.573    -.7405655    1.333016
       _cons |   1.229915   2.867919     0.43   0.669     -4.44885    6.908681
-------------+----------------------------------------------------------------
     sigma_u |  .68312727
     sigma_e |  .75493878
         rho |  .45018805   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(16, 119) =     4.11             Prob > F = 0.0000

. estimates store fe

. xi: xtreg lninf cba gdpg l1msg fb open tot ebrdi l1ccbi defactofix vat eu i.time,
re
i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
note: _Itime_1999 omitted because of collinearity
note: _Itime_2009 omitted because of collinearity

Random-effects GLS regression                   Number of obs      =       155
Group variable: ctyno                           Number of groups   =        17

R-sq:  within  = 0.3310                         Obs per group: min =         7
       between = 0.5579                                        avg =       9.1
       overall = 0.4204                                        max =        10

Random effects u_i ~ Gaussian                   Wald chi2(20)      =     84.43
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cba |  -.6471789   .3061231    -2.11   0.035    -1.247169   -.0471888
        gdpg |  -.0600399   .0263035    -2.28   0.022    -.1115938   -.0084861
       l1msg |   .0186279   .0049564     3.76   0.000     .0089135    .0283422
          fb |   .0612712   .0370175     1.66   0.098    -.0112817    .1338241
        open |   .0045083   .0036017     1.25   0.211    -.0025509    .0115674
         tot |   .0135639   .0100987     1.34   0.179    -.0062293    .0333571
       ebrdi |   .0018316   .2900018     0.01   0.995    -.5665615    .5702246
      l1ccbi |  -1.550297   .6113205    -2.54   0.011    -2.748464   -.3521311
  defactofix |   .0791879   .2217125     0.36   0.721    -.3553605    .5137363
         vat |   .9094053   .6203551     1.47   0.143    -.3064684    2.125279
          eu |  -.0749511   .2267764    -0.33   0.741    -.5194246    .3695224
 _Itime_1999 |  (omitted)
 _Itime_2000 |   .7672598    .480852     1.60   0.111    -.1751929    1.709712
 _Itime_2001 |   .5200251   .4718278     1.10   0.270    -.4047404    1.444791
 _Itime_2002 |  -.2676336   .4701534    -0.57   0.569    -1.189117    .6538501
 _Itime_2003 |  -.2042607   .4820654    -0.42   0.672    -1.149092    .7405702
 _Itime_2004 |   .4663733   .4899871     0.95   0.341    -.4939838     1.42673
 _Itime_2005 |   .2132034   .4741583     0.45   0.653    -.7161298    1.142537
 _Itime_2006 |   .4551041   .4862486     0.94   0.349    -.4979257    1.408134
 _Itime_2007 |   .5368049   .4872725     1.10   0.271    -.4182317    1.491841
 _Itime_2008 |   1.035671    .443925     2.33   0.020     .1655944    1.905748
 _Itime_2009 |  (omitted)
       _cons |   .6088284    1.26771     0.48   0.631    -1.875837    3.093494
-------------+----------------------------------------------------------------
     sigma_u |  .26079691
     sigma_e |  .75493878
         rho |  .10661539   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. estimates store re

. hausman fe re

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |       fe           re         Difference          S.E.
-------------+----------------------------------------------------------------
        gdpg |   -.0546837    -.0600399        .0053562        .0068477
```

```
       l1msg |    .0124851     .0186279       -.0061428        .0010899
          fb |     .035328     .0612712       -.0259432        .0178548
        open |    .0067485     .0045083        .0022403        .0079515
         tot |    .0233886     .0135639        .0098247        .0121252
       ebrdi |   -.7084684     .0018316       -.7102999        .5540511
      l1ccbi |   -1.329348    -1.550297        .2209495        .2613645
  defactofix |    .0467399     .0791879       -.0324481         .206991
         vat |    .8948198     .9094053       -.0145855               .
          eu |   -.2835026    -.0749511       -.2085515        .1000172
 _Itime_2000 |     .827447     .7672598        .0601872               .
 _Itime_2001 |    .7263703     .5200251        .2063452               .
 _Itime_2003 |   -.0168307    -.2042607          .18743               .
 _Itime_2004 |    .7549974     .4663733        .2886241               .
 _Itime_2005 |    .6172059     .2132034        .4040025               .
 _Itime_2006 |    .8646385     .4551041        .4095344               .
 _Itime_2007 |    .9742344     .5368049        .4374295               .
 _Itime_2008 |    1.497097     1.035671        .4614259               .
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                 chi2(18) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =   -20.38    chi2<0 ==> model fitted on these
                                        data fails to meet the asymptotic
                                        assumptions of the Hausman test;
                                        see suest for a generalized test
```

**Appendix 5.4: Inflation model - Between and within variance for all variables**

```
. xtsum lninf cba gdpg l1msg fb open tot ebrdi l1ccbi defactofix vat eu

Variable         |      Mean   Std. Dev.       Min        Max |    Observations
-----------------+--------------------------------------------+----------------
lninf    overall |   1.78142   1.140335   -2.99537    5.68249 |     N =     291
         between |             .7921285   .6006939   3.406685 |     n =      25
         within  |             .8346604  -1.814644   4.208096 | T-bar =   11.64
                 |                                            |
cba      overall |  .1546392   .3621832          0          1 |     N =     291
         between |             .3741657          0          1 |     n =      25
         within  |                    0   .1546392   .1546392 | T-bar =   11.64
                 |                                            |
gdpg     overall |  5.149239   5.437408   -18.0147       34.5 |     N =     291
         between |             2.779035   2.799421    15.9049 |     n =      25
         within  |             4.772553    -17.613   23.74434 | T-bar =   11.64
                 |                                            |
l1msg    overall |  28.37699    29.4667   -14.1329    276.004 |     N =     266
         between |             17.78962   8.150274   89.80534 |     n =      25
         within  |             23.54474  -35.08755   214.5757 | T-bar =   10.64
                 |                                            |
fb       overall | -2.347059   3.903684      -13.1       25.5 |     N =     289
         between |             2.590408  -6.516667       3.84 |     n =      25
         within  |             2.973249  -11.35539   19.31294 | T-bar =   11.56
                 |                                            |
open     overall |  103.0023   31.49195    45.1349    203.203 |     N =     289
         between |             28.61242   57.85231   157.6787 |     n =      25
         within  |             14.02616   55.97229   185.8942 | T-bar =   11.56
                 |                                            |
tot      overall |   106.485   20.79161    73.5077    238.183 |     N =     242
         between |             14.45807   91.55393   145.8427 |     n =      25
         within  |             15.13587   53.74685   198.8254 | T-bar =    9.68
                 |                                            |
ebrdi    overall |  3.107154   .5478565        1.4          4 |     N =     289
         between |             .5205618   1.833333      3.925 |     n =      25
         within  |             .1938693   2.207154   3.807154 | T-bar =   11.56
                 |                                            |
l1ccbi   overall |  .7750055   .1651642        .34       .979 |     N =     177
         between |              .112309   .5425202       .979 |     n =      17
         within  |             .1228211    .425051   1.064324 | T-bar = 10.4118
                 |                                            |
defact~x overall |  .2886598     .45392          0          1 |     N =     291
         between |              .398462          0          1 |     n =      25
         within  |             .2376522  -.5446735   1.205326 | T-bar =   11.64
```

```
             |                                                 |
vat      overall |  .0171821   .1301735          0          1 |     N =     291
         between |             .0361258          0         .1 |     n =      25
         within  |             .1253834  -.0828179   .9338488 | T-bar =   11.64
             |                                                 |
eu       overall |  .1821306    .386617          0          1 |     N =     291
         between |             .2344437          0   .5454545 |     n =      25
         within  |             .3104754   -.363324   .9321306 | T-bar =   11.64
```

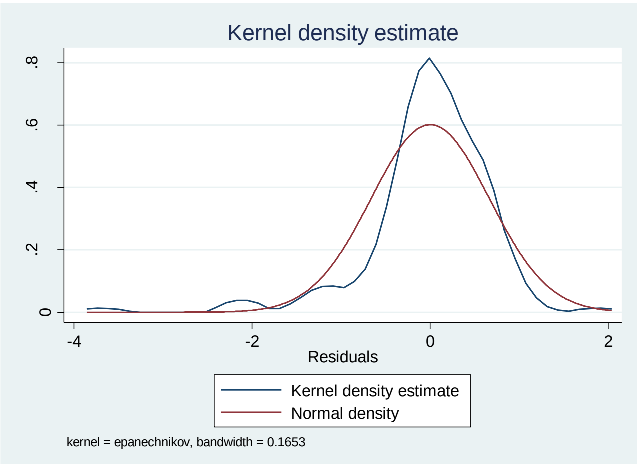
## Appendix 5.5: Inflation model - FEVD (with 4 CBA countries)

## Appendix 5.5a Inflation performance - Stage-by-stage estimation

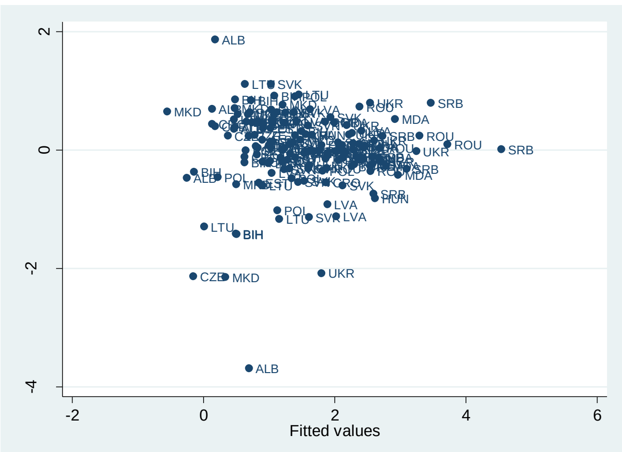
```
. *Stage 1 (panel robust SE)
. xi: xtreg lninf cba gdpg l1msg fb open tot ebrdi l1ccbi defactofix vat eu i.time ,
fe robust i.time
_Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
note: cba omitted because of collinearity
note: _Itime_1999 omitted because of collinearity
note: _Itime_2002 omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =       155
Group variable: ctyno                           Number of groups   =        17

R-sq:  within  = 0.3489                         Obs per group: min =         7
       between = 0.2582                                        avg =       9.1
       overall = 0.2870                                        max =        10

                                                F(16,16)           =         .
corr(u_i, Xb)  = -0.2561                        Prob > F           =         .

                                 (Std. Err. adjusted for 17 clusters in ctyno)
------------------------------------------------------------------------------
             |               Robust
       lninf |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cba |  (omitted)
        gdpg |  -.0546837   .0196203    -2.79   0.013     -.096277   -.0130905
       l1msg |   .0124851   .0052811     2.36   0.031     .0012897    .0236805
          fb |    .035328   .0371683     0.95   0.356    -.0434652    .1141213
        open |   .0067485   .0080507     0.84   0.414    -.0103183    .0238153
         tot |   .0233886    .013262     1.76   0.097    -.0047256    .0515028
       ebrdi |  -.7084684   .8168121    -0.87   0.399    -2.440033    1.023096
      l1ccbi |  -1.329348   .5704019    -2.33   0.033    -2.538546   -.1201497
  defactofix |   .0467399   .5175766     0.09   0.929    -1.050473    1.143953
         vat |   .8948198   .1930988     4.63   0.000     .4854686    1.304171
          eu |  -.2835026    .245017    -1.16   0.264    -.8029153    .2359102
 _Itime_1999 |  (omitted)
 _Itime_2000 |    .827447   .5764563     1.44   0.170    -.3945857     2.04948
 _Itime_2001 |   .7263703   .3033033     2.39   0.029      .083396    1.369345
 _Itime_2002 |  (omitted)
 _Itime_2003 |  -.0168307   .3726068    -0.05   0.965    -.8067219    .7730605
 _Itime_2004 |   .7549974   .2426289     3.11   0.007     .2406472    1.269348
 _Itime_2005 |   .6172059   .3413577     1.81   0.089    -.1064402    1.340852
 _Itime_2006 |   .8646385    .280688     3.08   0.007     .2696065     1.45967
 _Itime_2007 |   .9742344   .2977478     3.27   0.005     .3430371    1.605432
 _Itime_2008 |   1.497097   .3528985     4.24   0.001     .7489858    2.245209
 _Itime_2009 |   .2962255   .4149905     0.71   0.486    -.5835152    1.175966
       _cons |   1.229915   3.620088     0.34   0.738    -6.444328    8.904159
-------------+----------------------------------------------------------------
     sigma_u |  .68312727
     sigma_e |  .75493878
         rho |  .45018805   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. *Save fixed effect (unit effects) from stage 1
. predict fixeff, u
(136 missing values generated)

. *Stage 2 (regression of the FE vector on the time-invariant and slowly changing
explantory variables - by OLS)
. reg fixeff cba ebrdi l1ccbi

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F(  3,   151) =   24.54
       Model |  22.2052649     3  7.40175495           Prob > F      =  0.0000
    Residual |  45.5462998   151  .301631125           R-squared     =  0.3277
-------------+------------------------------           Adj R-squared =  0.3144
       Total |  67.7515647   154  .439945225           Root MSE      =  .54921

------------------------------------------------------------------------------
      fixeff |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cba |  -.6141823   .1144441    -5.37   0.000    -.8403007   -.3880638
       ebrdi |   .5598661   .1025604     5.46   0.000     .3572274    .7625048
      l1ccbi |  -.6626595   .3234178    -2.05   0.042    -1.301668   -.0236509
       _cons |   -1.20862   .3358441    -3.60   0.000    -1.872181   -.5450599
------------------------------------------------------------------------------

. * Save the residuals from stage 2
. predict resfevd, residuals
(136 missing values generated)

. *Stage 3 (estimation of pooled OLS by including all explanatory time-variant, time-
invariant variables and unexplained part of the FE vector - error term from the stage
2)

. regress lninf cba gdpg l1msg fb open tot ebrdi l1ccbi defactofix vat eu  resfevd
i.time

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F( 21,   133) =   10.84
       Model |  116.093589    21  5.52826613           Prob > F      =  0.0000
    Residual |   67.821974   133  .509939654           R-squared     =  0.6312
-------------+------------------------------           Adj R-squared =  0.5730
       Total |  183.915563   154   1.1942569           Root MSE      =   .7141

------------------------------------------------------------------------------
       lninf |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cba |  -.6141823   .2071473    -2.96   0.004    -1.023912   -.2044528
        gdpg |  -.0546837    .021867    -2.50   0.014    -.0979359   -.0114316
       l1msg |   .0124851   .0042847     2.91   0.004      .00401    .0209601
          fb |    .035328   .0295582     1.20   0.234    -.0231369     .093793
        open |   .0067485   .0023346     2.89   0.004     .0021307    .0113664
         tot |   .0233886   .0073809     3.17   0.002     .0087894    .0379878
       ebrdi |  -.1486023   .2134339    -0.70   0.487    -.5707663    .2735617
      l1ccbi |  -1.992007   .4945076    -4.03   0.000    -2.970124    -1.01389
  defactofix |   .0467399   .1587239     0.29   0.769    -.2672099    .3606896
         vat |   .8948198   .5368316     1.67   0.098    -.1670124    1.956652
          eu |  -.2835026   .1891326    -1.50   0.136    -.6575995    .0905943
     resfevd |          1   .1165875     8.58   0.000     .7693945    1.230606
             |
        time |
       2001  |  -.1010767    .255624    -0.40   0.693     -.606691    .4045376
       2002  |   -.827447    .264803    -3.12   0.002    -1.351217    -.303677
       2003  |  -.8442777   .2637907    -3.20   0.002    -1.366046   -.3225099
       2004  |  -.0724496   .2845577    -0.25   0.799    -.6352937    .4903944
       2005  |  -.2102411   .2930076    -0.72   0.474    -.7897988    .3693166
       2006  |   .0371915   .2950501     0.13   0.900    -.5464062    .6207891
       2007  |   .1467874   .3035534     0.48   0.629    -.4536296    .7472043
       2008  |   .6696502   .3071827     2.18   0.031     .0620547    1.277246
       2009  |  -.5312215   .4089178    -1.30   0.196    -1.340045    .2776019
             |
       _cons |   .8487422   .8537954     0.99   0.322     -.840032    2.537516
------------------------------------------------------------------------------
```

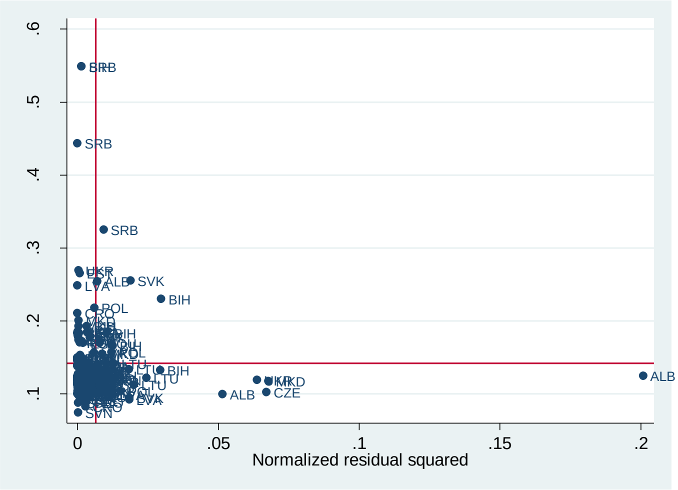
```
. *Diagnostic tests after 3rd stage*
. estat imtest

Cameron & Trivedi's decomposition of IM-test

---------------------------------------------------
              Source |       chi2     df      p
---------------------+-----------------------------
  Heteroskedasticity |     155.00    154    0.4622
            Skewness |      21.95     21    0.4022
            Kurtosis |       1.74      1    0.1868
---------------------+-----------------------------
               Total |     178.70    176    0.4292
---------------------------------------------------

. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of lninf

         chi2(1)      =    32.67
         Prob > chi2  =   0.0000

. estat ovtest

Ramsey RESET test using powers of the fitted values of lninf
       Ho:  model has no omitted variables
                 F(3, 130) =      0.62
                  Prob > F =      0.6061

Predict resid, residuals

Kdensity resid, normal
```




```
. rvfplot, mlabel(cntry)
```



```
. lvr2plot, mlabel(cntry)
```




```
. hilo resi ctyno time
10 lowest and highest observations on resi

  +--------------------------+
  |      resi   ctyno   time |
  |--------------------------|
  | -3.690872       1   2000 |
  | -2.144845      16   2005 |
  | -2.134328       8   2003 |
  | -2.079443      25   2002 |
  | -1.421205       5   2002 |
  |--------------------------|
  | -1.412706       5   2004 |
  | -1.289507      15   2002 |
  | -1.166808      15   2000 |
  | -1.130314      22   2009 |
  |  -1.11768      14   2001 |
  +--------------------------+

  +-------------------------+
  |     resi   ctyno   time |
  |-------------------------|
  | .7954019      21   2000 |
  | .7956773      25   2000 |
  | .8416286       5   2000 |
  | .8534227       5   2005 |
  | .9085998      18   2000 |
  |-------------------------|
  | .9203253       5   2008 |
  | .9382645      15   2008 |
  | 1.113313      15   2007 |
  |  1.11936      22   2003 |
  | 1.870186       1   2002 |
  +-------------------------+

. predict levi, leverage
(136 missing values generated)

. hilo levi cntry time, show(5)high
5 highest observations on levi

  +-------------------------+
  |     levi   cntry   time |
  |-------------------------|
  |  .268995     UKR   2009 |
  | .3250492     SRB   2000 |
  | .4431643     SRB   2001 |
  | .5485758     BIH   2006 |
  | .5485758     SRB   2005 |
  +-------------------------+
```

**Appendix 5.5b: inflation performance – 'xtfevd' (only CBA included)**

```
. xtfevd lninf cba gdpg l1msg fb open tot ebrdi vat eu  _itimeb2001 _itimeb2002
_itimeb2003 _itimeb2004 _itimeb2005 _itimeb2006 _itimeb2007 _itimeb2008 _itimeb2009,
invariant(cba ebrdi)

panel fixed effects regression with vector decomposition

degrees of freedom fevd    =       194          number of obs       =       237
mean squared error         = .4203354           F( 20, 194)         = 4.910439
root mean squared error    = .6483328           Prob > F            = 4.76e-09
Residual Sum of Squares    = 99.61948           R-squared           = .6374333
Total Sum of Squares       = 274.7618           adj. R-squared      = .5589395
Estimation Sum of Squares  = 175.1423

------------------------------------------------------------------------------
             |                fevd
       lninf |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        gdpg |  -.0186843   .0187171    -1.00   0.319    -.0555995    .0182308
       l1msg |   .0078899   .0033026     2.39   0.018     .0013762    .0144035
          fb |  -.0089355   .0251457    -0.36   0.723    -.0585295    .0406585
        open |   .0122116   .0054566     2.24   0.026     .0014497    .0229736
         tot |   .0044066   .0050605     0.87   0.385     -.005574    .0143873
         vat |   .9350791   .5049941     1.85   0.066    -.0609043    1.931063
          eu |  -.1626722   .2653044    -0.61   0.540    -.6859234    .3605791
 _itimeb2001 |  -.0754908   .2225219    -0.34   0.735    -.5143636     .363382
 _itimeb2002 |   -.651487   .2187473    -2.98   0.003    -1.082915   -.2200589
 _itimeb2003 |  -.7015375   .2223031    -3.16   0.002    -1.139979   -.2630963
 _itimeb2004 |  -.2855623   .2371017    -1.20   0.230    -.7531903    .1820656
 _itimeb2005 |  -.4099703   .2448656    -1.67   0.096    -.8929108    .0729703
 _itimeb2006 |  -.2606088    .246929    -1.06   0.293    -.7476188    .2264013
 _itimeb2007 |  -.1253398   .2581695    -0.49   0.628    -.6345192    .3838396
 _itimeb2008 |   .3327671   .2679142     1.24   0.216    -.1956313    .8611655
 _itimeb2009 |  -.6760545   .3296745    -2.05   0.042    -1.326261   -.0258481
         cba |  -.7038182   .3345448    -2.10   0.037     -1.36363   -.0440062
       ebrdi |  -.6298597   .2894539    -2.18   0.031     -1.20074   -.0589791
         eta |          1          .        .       .            .           .
       _cons |   2.193502   1.104957     1.99   0.049     .0142299    4.372773
------------------------------------------------------------------------------
```

**Appendix 5.5c Inflation performance - Xtfevd (CBA and defactofix included)**

```
. xtfevd lninf cba gdpg l1msg fb open tot ebrdi defactofix vat eu  _itimeb2001
_itimeb2002 _itimeb2003 _itimeb2004 _itimeb2005 _itimeb2006 _itimeb2007 _itimeb2008
_itimeb2009, invariant(cba ebrdi)

panel fixed effects regression with vector decomposition

degrees of freedom fevd    =       193          number of obs       =       237
mean squared error         = .4194591           F( 21, 193)         = 4.670842
root mean squared error    = .6476567           Prob > F            = 8.65e-09
Residual Sum of Squares    = 99.41182           R-squared           = .6381891
Total Sum of Squares       = 274.7618           adj. R-squared      = .5575784
Estimation Sum of Squares  =   175.35

------------------------------------------------------------------------------
             |                fevd
       lninf |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        gdpg |  -.0189399   .0187468    -1.01   0.314    -.0559149    .0180351
       l1msg |   .0075539   .0032817     2.30   0.022     .0010813    .0140265
          fb |  -.0090471   .0249388    -0.36   0.717    -.0582348    .0401406
        open |   .0122489    .005459     2.24   0.026     .0014819    .0230158
         tot |   .0042656   .0050699     0.84   0.401    -.0057339    .0142651
  defactofix |  -.1559313   .2408224    -0.65   0.518     -.630913    .3190503
         vat |   .9328164   .5018904     1.86   0.065    -.0570779    1.922711
          eu |  -.1662221   .2650648    -0.63   0.531    -.6890178    .3565736
 _itimeb2001 |  -.0640545   .2224051    -0.29   0.774    -.5027111     .374602
 _itimeb2002 |  -.6555547   .2197275    -2.98   0.003     -1.08893   -.2221792
 _itimeb2003 |  -.7005997   .2227122    -3.15   0.002    -1.139862   -.2613374
 _itimeb2004 |  -.2840184   .2376834    -1.19   0.234    -.7528089     .184772
 _itimeb2005 |  -.3992297   .2440055    -1.64   0.103    -.8804894    .0820301
 _itimeb2006 |  -.2485361   .2459721    -1.01   0.314    -.7336747    .2366025
 _itimeb2007 |  -.1111487   .2562446    -0.43   0.665    -.6165481    .3942506
```

```
 _itimeb2008 |   .3494022    .266294     1.31   0.191    -.1758179    .8746223
 _itimeb2009 |  -.6554932   .3300719    -1.99   0.048    -1.306505   -.0044819
         cba |  -.6012392   .3501566    -1.72   0.088    -1.291864    .0893857
       ebrdi |  -.6621008   .2853098    -2.32   0.021    -1.224826   -.0993752
         eta |          1          .        .       .            .           .
       _cons |   2.342948   1.100545     2.13   0.035      .172308    4.513588
------------------------------------------------------------------------------
```

**Appendix 5.5d: Inflation performance - Xtfevd (CBA, defactofix and CCBI included)**

```
. xtfevd lninf cba gdpg l1msg fb open tot ebrdi defactofix l1ccbi vat eu _itimeb2001
_itimeb2002 _itimeb2003 _itimeb2004 _itimeb2005 _itimeb2006 _itimeb2007 _itimeb2008
_itimeb2009, invariant(cba ebrdi l1ccbi)

panel fixed effects regression with vector decomposition

degrees of freedom fevd    =       118          number of obs       =       155
mean squared error         = .4375611           F( 22, 118)         = 3.194856
root mean squared error    =  .661484           Prob > F            = .0000445
Residual Sum of Squares    = 67.82197           R-squared           = .6312331
Total Sum of Squares       = 183.9156           adj. R-squared      = .5187279
Estimation Sum of Squares  = 116.0936

------------------------------------------------------------------------------
             |              fevd
       lninf |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        gdpg |  -.0546837   .0402868    -1.36   0.177    -.1344626    .0250951
       l1msg |   .0124851   .0062977     1.98   0.050     .0000139    .0249562
          fb |    .035328   .0641731     0.55   0.583    -.0917522    .1624083
        open |   .0067485   .0092904     0.73   0.469     -.011649    .0251461
         tot |   .0233886   .0241193     0.97   0.334    -.0243742    .0711514
  defactofix |   .0467399    .339528     0.14   0.891    -.6256179    .7190976
         vat |   .8948198   .7115343     1.26   0.211    -.5142117    2.303851
          eu |  -.2835026   .2735224    -1.04   0.302    -.8251514    .2581462
 _itimeb2001 |  -.1010767   .2943891    -0.34   0.732    -.6840473    .4818939
 _itimeb2002 |   -.827447    .320393    -2.58   0.011    -1.461912   -.1929816
 _itimeb2003 |  -.8442777   .3226181    -2.62   0.010    -1.483149   -.2054061
 _itimeb2004 |  -.0724496   .3710893    -0.20   0.846    -.8073076    .6624083
 _itimeb2005 |  -.2102411    .392175    -0.54   0.593    -.9868544    .5663722
 _itimeb2006 |   .0371915   .3896512     0.10   0.924     -.734424     .808807
 _itimeb2007 |   .1467874   .4352834     0.34   0.737    -.7151922    1.008767
 _itimeb2008 |   .6696502   .4129752     1.62   0.108    -.1481531    1.487454
 _itimeb2009 |  -.5312215   .5314657    -1.00   0.320    -1.583668    .5212253
         cba |  -.6141823   .5673333    -1.08   0.281    -1.737657    .5092921
       ebrdi |  -.1486023   .5152978    -0.29   0.774    -1.169032    .8718276
      l1ccbi |  -1.992007   .8656309    -2.30   0.023    -3.706192   -.2778224
         eta |          1          .        .       .            .           .
       _cons |   .8487422   2.421635     0.35   0.727    -3.946754    5.644239
------------------------------------------------------------------------------
```

**Appendix 5.5e test for serial correlation**

```
xtserial lninf cba gdpg l1msg fb open tot ebrdi defactofix l1ccbi vat eu
_itimeb2001 _itimeb2002 _itimeb2003 _itimeb2004 _itimeb2005 _itimeb2006
_itimeb2007 _itimeb2008 _itimeb2009

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      16) =     11.376
           Prob > F =      0.0039

.
```

**Appendix 5.6: Inflation model - System GMM (4 CBA countries) MSG and CCBI treated as endogenous**

**Appendix 5.6a: One-step robust System GMM with one lag of dependent variable and minimum number of instruments (only with CBA)**

```
. xi: xtabond2 lninf L.lninf cba gdpg msg fb open tot ebrdi vat eu i.time,
gmm(L.lninf, laglimits(1 1)) gmm( msg, laglimits (2 2)) iv(cba gdpg fb open tot ebrdi
vat eu i.time)  robust
i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring space over speed. To switch, type or click on mata: mata set matafavor
speed, perm.
_Itime_1999 dropped due to collinearity
_Itime_2009 dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       229
Time variable : time                            Number of groups   =        25
Number of instruments = 56                      Obs per group: min =         7
Wald chi2(19) =   2361.63                                      avg =      9.16
Prob > chi2   =     0.000                                      max =        10
------------------------------------------------------------------------------
             |               Robust
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
         L1. |   .4639305   .0527785     8.79   0.000     .3604865    .5673746
             |
         cba |  -.3061125   .1713281    -1.79   0.074    -.6419095    .0296844
        gdpg |  -.0064315   .0084673    -0.76   0.448    -.0230271    .0101642
         msg |   .0088429   .0040539     2.18   0.029     .0008974    .0167885
          fb |   .0025863   .0167791     0.15   0.878    -.0303001    .0354727
        open |   .0034007   .0014445     2.35   0.019     .0005696    .0062319
         tot |   .0037916   .0018184     2.09   0.037     .0002277    .0073555
       ebrdi |  -.2232649   .1572676    -1.42   0.156    -.5315037    .0849739
         vat |   .6211287   .0989985     6.27   0.000     .4270953    .8151621
          eu |   .1692215   .1754875     0.96   0.335    -.1747277    .5131707
 _Itime_2000 |   .5309532   .2761268     1.92   0.054    -.0102453    1.072152
 _Itime_2001 |   .5661692   .2160038     2.62   0.009     .1428094    .9895289
 _Itime_2002 |   .0170196    .280702     0.06   0.952    -.5331462    .5671853
 _Itime_2003 |   .1426942   .2994785     0.48   0.634    -.4442729    .7296614
 _Itime_2004 |   .5305055   .2307795     2.30   0.022     .0781861    .9828249
 _Itime_2005 |   .1986226   .2774023     0.72   0.474    -.3450759    .7423211
 _Itime_2006 |   .3889961   .2341876     1.66   0.097    -.0700032    .8479955
 _Itime_2007 |   .4316993   .2407429     1.79   0.073    -.0401481    .9035468
 _Itime_2008 |   1.013989   .1920099     5.28   0.000     .6376569    1.390322
       _cons |   .2571777   .6634739     0.39   0.698    -1.043207    1.557563
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(cba gdpg fb open tot ebrdi vat eu _Itime_1999 _Itime_2000 _Itime_2001
    _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006 _Itime_2007
    _Itime_2008 _Itime_2009)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L.L.lninf
    L2.msg
Instruments for levels equation
  Standard
    _cons
    cba gdpg fb open tot ebrdi vat eu _Itime_1999 _Itime_2000 _Itime_2001
    _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006 _Itime_2007
    _Itime_2008 _Itime_2009
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    D.L.lninf
    DL.msg
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -3.11  Pr > z =  0.002
Arellano-Bond test for AR(2) in first differences: z =  -0.92  Pr > z =  0.356
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(36)   =  70.68  Prob > chi2 =  0.000
```

```
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(36)   =   8.13  Prob > chi2 =  1.000
  (Robust, but can be weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(16)   =   6.51  Prob > chi2 =  0.982
    Difference (null H = exogenous): chi2(20)   =   1.62  Prob > chi2 =  1.000
  gmm(L.lninf, lag(1 1))
    Hansen test excluding group:     chi2(17)   =   7.99  Prob > chi2 =  0.967
    Difference (null H = exogenous): chi2(19)   =   0.14  Prob > chi2 =  1.000
  gmm(msg, lag(2 2))
    Hansen test excluding group:     chi2(17)   =   4.82  Prob > chi2 =  0.998
    Difference (null H = exogenous): chi2(19)   =   3.31  Prob > chi2 =  1.000
  iv(cba gdpg fb open tot ebrdi vat eu _Itime_1999 _Itime_2000 _Itime_2001
_Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
>  _Itime_2007 _Itime_2008 _Itime_2009)
    Hansen test excluding group:     chi2(18)   =   6.53  Prob > chi2 =  0.994
    Difference (null H = exogenous): chi2(18)   =   1.60  Prob > chi2 =  1.000
```

**Appendix 5.6b: One-step robust System GMM with one lag of dependent variable and minimum number of instruments (with CBA and defactofix)**

```
. xi: xtabond2 lninf L.lninf cba gdpg msg fb open tot ebrdi defactofix vat eu i.time,
gmm(L.lninf, laglimits(1 1)) gmm( msg , laglimits (2 2)) iv(cba gdpg fb defactofix
open tot ebrdi  vat eu i.time)  robust

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring space over speed. To switch, type or click on mata: mata set matafavor
speed, perm.
_Itime_1999 dropped due to collinearity
_Itime_2009 dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       229
Time variable : time                            Number of groups   =        25
Number of instruments = 57                      Obs per group: min =         7
Wald chi2(20) =   3983.41                                      avg =      9.16
Prob > chi2   =     0.000                                      max =        10
------------------------------------------------------------------------------
             |               Robust
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
         L1. |   .4657802   .0517046     9.01   0.000     .3644411    .5671194
             |
         cba |  -.3028429   .1634869    -1.85   0.064    -.6232713    .0175855
        gdpg |  -.0063912   .0082364    -0.78   0.438    -.0225344    .0097519
         msg |   .0083968    .003905     2.15   0.032     .0007431    .0160504
          fb |   .0043333   .0174643     0.25   0.804    -.0298962    .0385628
        open |   .0034576   .0014343     2.41   0.016     .0006464    .0062688
         tot |   .0038242   .0018474     2.07   0.038     .0002033    .0074451
       ebrdi |  -.2400691   .1600861    -1.50   0.134    -.5538321    .0736938
  defactofix |  -.0138704   .0821436    -0.17   0.866     -.174869    .1471282
         vat |   .6189535   .0978384     6.33   0.000     .4271937    .8107133
          eu |   .1852163   .1779883     1.04   0.298    -.1636343    .5340669
 _Itime_2000 |   .5390328   .2676489     2.01   0.044     .0144506    1.063615
 _Itime_2001 |   .5701964   .2067132     2.76   0.006      .165046    .9753469
 _Itime_2002 |   .0155312   .2709071     0.06   0.954     -.515437    .5464994
 _Itime_2003 |   .1451683   .2937011     0.49   0.621    -.4304752    .7208119
 _Itime_2004 |   .5292617    .228246     2.32   0.020     .0819079    .9766156
 _Itime_2005 |   .1959581   .2706275     0.72   0.469    -.3344621    .7263782
 _Itime_2006 |   .3883307   .2326415     1.67   0.095    -.0676382    .8442997
 _Itime_2007 |   .4292987   .2383272     1.80   0.072    -.0378142    .8964115
 _Itime_2008 |   1.005695   .1929883     5.21   0.000     .6274447    1.383945
       _cons |   .3131708   .6786487     0.46   0.644    -1.016956    1.643298
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(cba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999 _Itime_2000
```

```
    _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
    _Itime_2007 _Itime_2008 _Itime_2009)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L.L.lninf
    L2.msg
Instruments for levels equation
  Standard
    _cons
    cba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999 _Itime_2000
    _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
    _Itime_2007 _Itime_2008 _Itime_2009
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    D.L.lninf
    DL.msg
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -3.10  Pr > z =  0.002
Arellano-Bond test for AR(2) in first differences: z =  -0.93  Pr > z =  0.355
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(36)   =  71.95  Prob > chi2 =  0.000
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(36)   =   7.28  Prob > chi2 =  1.000
  (Robust, but can be weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(16)   =   4.97  Prob > chi2 =  0.996
    Difference (null H = exogenous): chi2(20)   =   2.31  Prob > chi2 =  1.000
  gmm(L.lninf, lag(1 1))
    Hansen test excluding group:     chi2(17)   =   9.65  Prob > chi2 =  0.918
    Difference (null H = exogenous): chi2(19)   =  -2.37  Prob > chi2 =  1.000
  gmm(msg, lag(2 2))
    Hansen test excluding group:     chi2(17)   =   2.99  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(19)   =   4.29  Prob > chi2 =  1.000
  iv(cba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999 _Itime_2000 _Itime_2001
_Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005
> _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009)
    Hansen test excluding group:     chi2(17)   =   5.75  Prob > chi2 =  0.995
    Difference (null H = exogenous): chi2(19)   =   1.53  Prob > chi2 =  1.000
```

### Appendix 5.6c: One-step robust System GMM with one lag of dependent variable and minimum number of instruments (with CBA, defactofix and CCBI)

```
. xi: xtabond2 lninf L.lninf cba gdpg msg fb open tot ebrdi ccbi defactofix vat eu
i.time, gmm(L.lninf, laglimits(1 1)) gmm( msg ccbi, laglimits (2 2)) iv(cba gdpg fb
defactofix open tot ebrdi  vat eu i.time)  robust

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring space over speed. To switch, type or click on mata: mata set matafavor
speed, perm.
_Itime_1999 dropped due to collinearity
_Itime_2009 dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       153
Time variable : time                            Number of groups   =        17
Number of instruments = 74                      Obs per group: min =         7
Wald chi2(21) =  61247.98                                      avg =      9.00
Prob > chi2   =     0.000                                      max =        10
------------------------------------------------------------------------------
             |               Robust
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
         L1. |   .4133376   .0923474     4.48   0.000       .23234    .5943352
             |
         cba |  -.2735989   .1209112    -2.26   0.024    -.5105806   -.0366172
        gdpg |  -.0127862   .0227034    -0.56   0.573    -.0572839    .0317116
         msg |   .0227702   .0075813     3.00   0.003     .0079112    .0376293
```

```
          fb |    .003244   .0385821     0.08   0.933    -.0723755    .0788636
        open |   .0039723   .0022929     1.73   0.083    -.0005217    .0084664
         tot |   .0037358   .0057687     0.65   0.517    -.0075705    .0150422
       ebrdi |   .2923156   .2116847     1.38   0.167    -.1225788      .70721
        ccbi |  -.9374185   .6811244    -1.38   0.169    -2.272398    .3975608
  defactofix |   .1261089   .1015027     1.24   0.214    -.0728328    .3250506
         vat |   .5340823   .1606154     3.33   0.001      .219282    .8488826
          eu |  -.0650747   .1790189    -0.36   0.716    -.4159453     .285796
 _Itime_2000 |  -.0106298    .305064    -0.03   0.972    -.6085443    .5872847
 _Itime_2001 |  -.0515282   .3080127    -0.17   0.867     -.655222    .5521657
 _Itime_2002 |  -.4385532   .3836107    -1.14   0.253    -1.190416      .31331
 _Itime_2003 |  -.4083327   .3386198    -1.21   0.228    -1.072015    .2553499
 _Itime_2004 |   .2190135   .2733053     0.80   0.423     -.316655     .754682
 _Itime_2005 |  -.1600374   .3527307    -0.45   0.650    -.8513768     .531302
 _Itime_2006 |   .0598999   .2451646     0.24   0.807     -.420614    .5404137
 _Itime_2007 |   .0013767   .2781369     0.00   0.996    -.5437617     .546515
 _Itime_2008 |   .8208721   .2662447     3.08   0.002      .299042    1.342702
       _cons |  -.5378359    1.09392    -0.49   0.623     -2.68188    1.606208
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(cba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999 _Itime_2000
    _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
    _Itime_2007 _Itime_2008 _Itime_2009)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L.L.lninf
    L2.(msg ccbi)
Instruments for levels equation
  Standard
    _cons
    cba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999 _Itime_2000
    _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
    _Itime_2007 _Itime_2008 _Itime_2009
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    D.L.lninf
    DL.(msg ccbi)
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -3.01  Pr > z =  0.003
Arellano-Bond test for AR(2) in first differences: z =  -0.85  Pr > z =  0.397
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(52)   =  65.79  Prob > chi2 =  0.095
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(52)   =   0.00  Prob > chi2 =  1.000
  (Robust, but can be weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(24)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(28)   =   0.00  Prob > chi2 =  1.000
  gmm(L.lninf, lag(1 1))
    Hansen test excluding group:     chi2(33)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(19)   =   0.00  Prob > chi2 =  1.000
  gmm(msg ccbi, lag(2 2))
    Hansen test excluding group:     chi2(16)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(36)   =   0.00  Prob > chi2 =  1.000
  iv(cba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999 _Itime_2000 _Itime_2001
_Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005
> _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009)
    Hansen test excluding group:     chi2(34)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(18)   =   0.00  Prob > chi2 =  1.000
```

**Appendix 5.6d: *Checking whether the coefficient on lagged dependent variable from dynamic estimator is between coefficient on lagged dependent variable from OLS and FE - conduct OLS and FE with lagged dependent variable**

```
. xi: regress lninf L.lninf cba gdpg l1msg fb open tot ebrdi l1ccbi defactofix vat eu
i.time
i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
note: _Itime_1999 omitted because of collinearity
note: _Itime_2009 omitted because of collinearity

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F( 21,   133) =    9.21
       Model |  108.981934    21  5.18961591           Prob > F      =  0.0000
    Residual |  74.9336284   133   .56341074           R-squared     =  0.5926
```

```
-------------+------------------------------           Adj R-squared =  0.5282
       Total |  183.915563   154   1.1942569           Root MSE      =  .75061

------------------------------------------------------------------------------
       lninf |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
         L1. |   .5027727   .0684412     7.35   0.000     .3673987    .6381467
             |
         cba |  -.2480504   .2238754    -1.11   0.270    -.6908674    .1947666
        gdpg |  -.0201014   .0236702    -0.85   0.397    -.0669202    .0267174
       l1msg |   .0102729   .0046636     2.20   0.029     .0010485    .0194973
          fb |   .0334065   .0312129     1.07   0.286    -.0283313    .0951444
        open |   .0021594   .0024536     0.88   0.380    -.0026937    .0070126
         tot |   .0052803   .0075302     0.70   0.484    -.0096142    .0201748
       ebrdi |   .0880168   .2211522     0.40   0.691    -.3494137    .5254474
      l1ccbi |  -.9934621   .5234022    -1.90   0.060    -2.028731    .0418071
  defactofix |   .0515366   .1668343     0.31   0.758    -.2784551    .3815284
         vat |   .6760186   .5658448     1.19   0.234    -.4432005    1.795238
          eu |  -.0033297   .1955142    -0.02   0.986    -.3900493    .3833898
 _Itime_1999 |          0  (omitted)
 _Itime_2000 |   .7113972   .4288988     1.66   0.100    -.1369479    1.559742
 _Itime_2001 |   .5007893   .4209242     1.19   0.236    -.3317824    1.333361
 _Itime_2002 |  -.3212202   .4207203    -0.76   0.447    -1.153389    .5109483
 _Itime_2003 |  -.0419886   .4329499    -0.10   0.923    -.8983467    .8143695
 _Itime_2004 |   .7417133   .4438497     1.67   0.097    -.1362042    1.619631
 _Itime_2005 |     .29701   .4300217     0.69   0.491    -.5535562    1.147576
 _Itime_2006 |   .5269775   .4417979     1.19   0.235    -.3468817    1.400837
 _Itime_2007 |   .5092991   .4409798     1.15   0.250    -.3629419     1.38154
 _Itime_2008 |   1.006556   .4055679     2.48   0.014     .2043581    1.808753
 _Itime_2009 |          0  (omitted)
       _cons |   .0179345   .9571418     0.02   0.985    -1.875255    1.911124
------------------------------------------------------------------------------

. xi: xtreg lninf L.lninf cba gdpg l1msg fb open tot ebrdi l1ccbi defactofix vat eu
i.time , fe

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
note: cba omitted because of collinearity
note: _Itime_1999 omitted because of collinearity
note: _Itime_2002 omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =       155
Group variable: ctyno                           Number of groups   =        17

R-sq:  within  = 0.3946                         Obs per group: min =         7
       between = 0.5269                                        avg =       9.1
       overall = 0.4437                                        max =        10

                                                F(20,118)          =      3.84
corr(u_i, Xb)  = -0.1413                        Prob > F           =    0.0000

------------------------------------------------------------------------------
       lninf |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
         L1. |   .2603267    .087271     2.98   0.003     .0875063     .433147
             |
         cba |          0  (omitted)
        gdpg |  -.0375621   .0269393    -1.39   0.166    -.0909093    .0157851
       l1msg |   .0093101   .0050283     1.85   0.067    -.0006472    .0192675
          fb |    .026081   .0399195     0.65   0.515    -.0529705    .1051326
        open |   .0081376   .0084659     0.96   0.338    -.0086272    .0249025
         tot |   .0222952   .0152853     1.46   0.147    -.0079739    .0525643
       ebrdi |  -.6281403   .6061836    -1.04   0.302    -1.828549    .5722682
      l1ccbi |  -1.033191   .6514367    -1.59   0.115    -2.323213    .2568307
  defactofix |   .0132103   .2939419     0.04   0.964    -.5688747    .5952954
         vat |   .8146669   .5859342     1.39   0.167    -.3456424    1.974976
          eu |  -.2388922   .2404811    -0.99   0.323    -.7151102    .2373258
 _Itime_1999 |          0  (omitted)
 _Itime_2000 |   .8557655    .288302     2.97   0.004     .2848491    1.426682
 _Itime_2001 |   .7475509      .2622     2.85   0.005     .2283235    1.266778
 _Itime_2002 |          0  (omitted)
 _Itime_2003 |   .1023264   .2772937     0.37   0.713    -.4467907    .6514435
 _Itime_2004 |   .9153939   .3150921     2.91   0.004     .2914258    1.539362
 _Itime_2005 |   .6636595   .3160221     2.10   0.038     .0378497    1.289469
 _Itime_2006 |   .8879307   .3319044     2.68   0.009     .2306695    1.545192
```

```
 _Itime_2007 |   .9335144   .3600503     2.59   0.011     .2205167    1.646512
 _Itime_2008 |   1.457121   .3688959     3.95   0.000     .7266061    2.187635
 _Itime_2009 |   .2796861   .5070794     0.55   0.582    -.7244692    1.283841
       _cons |   .2254762   2.797574     0.08   0.936    -5.314483    5.765435
-------------+----------------------------------------------------------------
     sigma_u |   .5244859
     sigma_e |  .73106778
         rho |  .33980232   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(16, 118) =     1.47             Prob > F = 0.1230

.
```

**Appendix 5.6e Dynamic estimation (one-step system GMM) of inflation performance model with 'pca' option used for lowering the number of instruments**

```
. *One-step robust System GMM with one lag of dependent variable and minimum number
of instruments(with 4 CBA countries)*

. xi: xtabond2 lninf L.lninf cba gdpg msg fb open tot ebrdi vat eu i.time,
gmm(L.lninf, laglimits(1 1)) gmm( msg, laglimits (2 2)) iv(cba gdpg fb open tot ebrdi
vat eu i.time)  robust pca i.time

_Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring speed over space. To switch, type or click on mata: mata set matafavor
space, perm.
_Itime_1999 dropped due to collinearity
_Itime_2009 dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan/Hansen statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       229
Time variable : time                            Number of groups   =        25
Number of instruments = 36                      Obs per group: min =        38
Wald chi2(19) =   7649.17                                      avg =      9.16
Prob > chi2   =     0.000                                      max =        38
------------------------------------------------------------------------------
             |               Robust
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
         L1. |   .5528311   .1880125     2.94   0.003     .1843334    .9213287
             |
         cba |  -.2639115   .1803957    -1.46   0.143    -.6174806    .0896577
        gdpg |  -.0040119   .0081185    -0.49   0.621    -.0199238    .0119001
         msg |   .0051613   .0027437     1.88   0.060    -.0002163     .010539
          fb |   .0055143   .0168516     0.33   0.743    -.0275142    .0385429
        open |   .0034467   .0018715     1.84   0.066    -.0002214    .0071148
         tot |   .0034411   .0019785     1.74   0.082    -.0004366    .0073188
       ebrdi |  -.2174344   .2194684    -0.99   0.322    -.6475846    .2127158
         vat |    .547241   .1640865     3.34   0.001     .2256373    .8688447
          eu |   .1280062   .2086674     0.61   0.540    -.2809745    .5369868
 _Itime_2000 |   .6459994   .2991861     2.16   0.031     .0596054    1.232393
 _Itime_2001 |   .6586403   .2290491     2.88   0.004     .2097124    1.107568
 _Itime_2002 |   .0747318   .2897098     0.26   0.796    -.4930889    .6425525
 _Itime_2003 |   .2522143   .4030073     0.63   0.531    -.5376654    1.042094
 _Itime_2004 |   .6876901   .2903451     2.37   0.018     .1186242    1.256756
 _Itime_2005 |   .3309456   .3165856     1.05   0.296    -.2895508     .951442
 _Itime_2006 |   .5466059   .3456027     1.58   0.114     -.130763    1.223975
 _Itime_2007 |   .5801986   .3017254     1.92   0.054    -.0111722    1.171569
 _Itime_2008 |   1.079503   .2483932     4.35   0.000     .5926613    1.566345
       _cons |   .0976708    .960068     0.10   0.919    -1.784028     1.97937
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(cba gdpg fb open tot ebrdi vat eu _Itime_1999 _Itime_2000 _Itime_2001
    _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006 _Itime_2007
    _Itime_2008 _Itime_2009)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L2.msg
    L.L.lninf
```

```
Instruments for levels equation
  Standard
    cba gdpg fb open tot ebrdi vat eu _Itime_1999 _Itime_2000 _Itime_2001
    _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006 _Itime_2007
    _Itime_2008 _Itime_2009
    _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    DL.msg
    D.L.lninf
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.64  Pr > z =  0.008
Arellano-Bond test for AR(2) in first differences: z =  -0.87  Pr > z =  0.383
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(16)   =  30.21  Prob > chi2 =  0.017
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(16)   =   8.58  Prob > chi2 =  0.930
  (Robust, but weakened by many instruments.)
------------------------------------------------------------------------------
Extracted 18 principal components from GMM-style instruments
  Portion of variance explained by the components =  0.730
  Kaiser-Meyer-Olkin measure of sampling adequacy =  0.511


. xi: xtabond2 lninf L.lninf cba gdpg msg fb open tot ebrdi defactofix vat eu i.time,
gmm(L.lninf, laglimits(1 1)) gmm( msg , laglimits (2 2)) iv(cba gdpg fb defactofix
open tot ebrdi  vat eu i.time)  robust pca

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring speed over space. To switch, type or click on mata: mata set matafavor
space, perm.
_Itime_1999 dropped due to collinearity
_Itime_2009 dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan/Hansen statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       229
Time variable : time                            Number of groups   =        25
Number of instruments = 37                      Obs per group: min =        38
Wald chi2(20) =  11395.86                                      avg =      9.16
Prob > chi2   =     0.000                                      max =        38
------------------------------------------------------------------------------
             |               Robust
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
         L1. |   .5552031   .1910238     2.91   0.004     .1808033     .929603
             |
         cba |  -.2601173   .1683082    -1.55   0.122    -.5899953    .0697607
        gdpg |  -.0038691   .0079841    -0.48   0.628    -.0195177    .0117795
         msg |   .0049178   .0026706     1.84   0.066    -.0003166    .0101522
          fb |   .0061045   .0172188     0.35   0.723    -.0276437    .0398527
        open |   .0034663   .0019353     1.79   0.073    -.0003269    .0072595
         tot |   .0034546   .0020038     1.72   0.085    -.0004728    .0073819
       ebrdi |  -.2242757   .2268157    -0.99   0.323    -.6688262    .2202749
  defactofix |  -.0072699    .074992    -0.10   0.923    -.1542515    .1397118
         vat |   .5436374   .1668105     3.26   0.001     .2166949    .8705799
          eu |   .1335212   .2103006     0.63   0.525    -.2786604    .5457027
 _Itime_2000 |   .6498121   .3017706     2.15   0.031     .0583525    1.241272
 _Itime_2001 |   .6608526   .2246567     2.94   0.003     .2205337    1.101172
 _Itime_2002 |   .0739156   .2835974     0.26   0.794    -.4819251    .6297562
 _Itime_2003 |   .2538546   .4075004     0.62   0.533    -.5448315    1.052541
 _Itime_2004 |   .6889335   .2995531     2.30   0.021     .1018202    1.276047
 _Itime_2005 |   .3313031   .3175638     1.04   0.297    -.2911106    .9537168
 _Itime_2006 |   .5481626   .3555869     1.54   0.123    -.1487751      1.2451
 _Itime_2007 |   .5808801   .3072423     1.89   0.059    -.0213036    1.183064
 _Itime_2008 |   1.076146   .2553947     4.21   0.000     .5755818    1.576711
       _cons |    .118123   .9911652     0.12   0.905    -1.824525    2.060771
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(cba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999 _Itime_2000
    _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
    _Itime_2007 _Itime_2008 _Itime_2009)
```

```
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L2.msg
    L.L.lninf
Instruments for levels equation
  Standard
    cba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999 _Itime_2000
    _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
    _Itime_2007 _Itime_2008 _Itime_2009
    _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    DL.msg
    D.L.lninf
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.59  Pr > z =  0.010
Arellano-Bond test for AR(2) in first differences: z =  -0.87  Pr > z =  0.383
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(16)   =  30.25  Prob > chi2 =  0.017
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(16)   =  10.16  Prob > chi2 =  0.858
  (Robust, but weakened by many instruments.)
------------------------------------------------------------------------------
Extracted 18 principal components from GMM-style instruments
  Portion of variance explained by the components =  0.730
  Kaiser-Meyer-Olkin measure of sampling adequacy =  0.511


. xi: xtabond2 lninf L.lninf cba gdpg msg fb open tot ebrdi ccbi defactofix vat eu
i.time, gmm(L.lninf, laglimits(1 1)) gmm( msg ccbi , laglimits (2 2)) iv(cba gdpg fb
defactofix open tot ebrdi vat eu i.time)  robust pca

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring speed over space. To switch, type or click on mata: mata set matafavor
space, perm.
_Itime_1999 dropped due to collinearity
_Itime_2004 dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan/Hansen statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       153
Time variable : time                            Number of groups   =        17
Number of instruments = 40                      Obs per group: min =        55
Wald chi2(21) =  67321.49                                      avg =      9.00
Prob > chi2   =     0.000                                      max =        55
------------------------------------------------------------------------------
             |               Robust
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
         L1. |   .4976537    .151398     3.29   0.001      .200919    .7943884
             |
         cba |  -.2260211    .211121    -1.07   0.284    -.6398107    .1877684
        gdpg |   -.007009   .0196149    -0.36   0.721    -.0454535    .0314355
         msg |   .0169707   .0073696     2.30   0.021     .0025266    .0314148
          fb |   .0129984   .0415417     0.31   0.754    -.0684218    .0944185
        open |   .0034144   .0020827     1.64   0.101    -.0006675    .0074964
         tot |   .0044132   .0054012     0.82   0.414    -.0061729    .0149993
       ebrdi |   .2220976   .2124077     1.05   0.296    -.1942138    .6384089
        ccbi |  -1.054577   1.087319    -0.97   0.332    -3.185682    1.076528
  defactofix |   .0815699   .1065735     0.77   0.444    -.1273104    .2904502
         vat |   .4849265   .1051745     4.61   0.000     .2787884    .6910647
          eu |  -.0418527   .2105153    -0.20   0.842    -.4544552    .3707498
 _Itime_2000 |  -.2151111   .2667061    -0.81   0.420    -.7378455    .3076233
 _Itime_2001 |  -.2573768   .2123408    -1.21   0.225    -.6735571    .1588035
 _Itime_2002 |  -.7358616   .2918759    -2.52   0.012    -1.307928   -.1637954
 _Itime_2003 |  -.6809864   .2942832    -2.31   0.021    -1.257771   -.1042019
 _Itime_2005 |  -.3917967   .2678245    -1.46   0.143    -.9167232    .1331297
 _Itime_2006 |  -.1662154   .1840303    -0.90   0.366    -.5269081    .1944773
 _Itime_2007 |  -.2429351   .1504028    -1.62   0.106    -.5377192     .051849
 _Itime_2008 |   .5302382   .2404021     2.21   0.027     .0590586    1.001418
 _Itime_2009 |   -.336566   .2936314    -1.15   0.252    -.9120729    .2389409
       _cons |   .0199831   1.482004     0.01   0.989    -2.884692    2.924658
------------------------------------------------------------------------------
Instruments for first differences equation
```

```
  Standard
    D.(cba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999 _Itime_2000
     _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
     _Itime_2007 _Itime_2008 _Itime_2009)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L2.(msg ccbi)
    L.L.lninf
Instruments for levels equation
  Standard
    cba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999 _Itime_2000
     _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
     _Itime_2007 _Itime_2008 _Itime_2009
     _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    DL.(msg ccbi)
    D.L.lninf
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.86  Pr > z =  0.004
Arellano-Bond test for AR(2) in first differences: z =  -0.85  Pr > z =  0.397
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(18)   =  20.40  Prob > chi2 =  0.311
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(18)   =   0.00  Prob > chi2 =  1.000
  (Robust, but weakened by many instruments.)
------------------------------------------------------------------------------
Extracted 21 principal components from GMM-style instruments
  Portion of variance explained by the components =  0.736
  Kaiser-Meyer-Olkin measure of sampling adequacy =  0.671
```

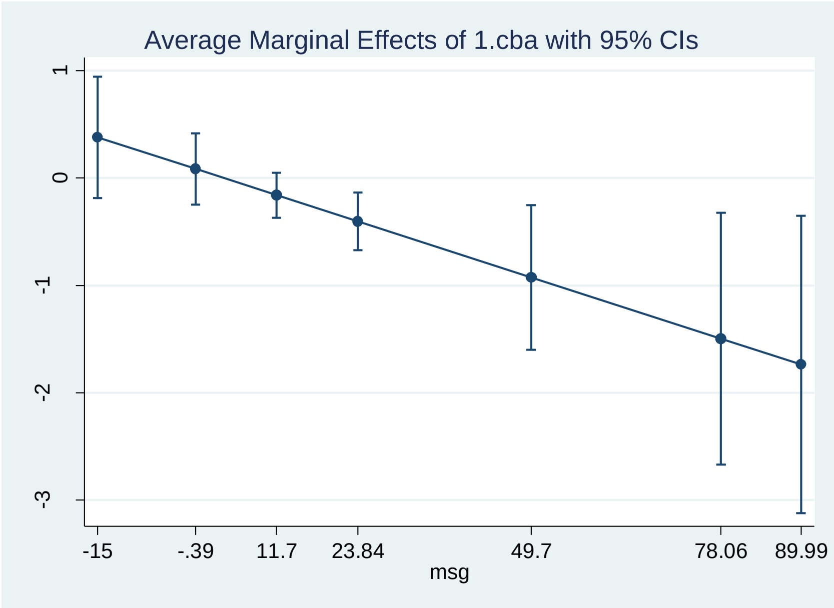
**Appendix 5.6f Estiomation of the preferred model (where defactoFIX and CCBI are included) with interaction between CBA and MSG**

```
. xtabond2 lninf L.lninf i.cba gdpg c.msg i.cba#c.msg fb open tot ebrdi ccbi
defactofix vat eu i.time, gmm(L.lninf, laglimits(1 1)) gmm( msg ccbi cbamsg,
laglimits (2 2)) iv(cba
> gdpg fb defactofix open tot ebrdi  vat eu i.time)  robust
Favoring space over speed. To switch, type or click on mata: mata set matafavor
speed, perm.
0b.cba dropped due to collinearity
0b.cba#co.msg dropped due to collinearity
1998b.time dropped due to collinearity
1999.time dropped due to collinearity
2004.time dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan/Hansen statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       153
Time variable : time                            Number of groups   =        17
Number of instruments = 93                      Obs per group: min =         7
Wald chi2(22) =  18334.71                                      avg =      9.00
Prob > chi2   =     0.000                                      max =        10
------------------------------------------------------------------------------
             |               Robust
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
         L1. |    .415943   .0936605     4.44   0.000     .2323718    .5995143
             |
       1.cba |   .0767912   .1667385     0.46   0.645    -.2500103    .4035927
        gdpg |  -.0131177   .0218015    -0.60   0.547     -.055848    .0296125
         msg |   .0214536   .0066099     3.25   0.001     .0084984    .0344088
             |
   cba#c.msg |
          1  |  -.0201526   .0092075    -2.19   0.029    -.0381988   -.0021063
             |
          fb |   .0166235   .0384847     0.43   0.666    -.0588051     .092052
        open |    .003348   .0022216     1.51   0.132    -.0010062    .0077022
         tot |   .0035896   .0053045     0.68   0.499     -.006807    .0139861
       ebrdi |   .2187959   .1943406     1.13   0.260    -.1621046    .5996964
        ccbi |  -.4271802   .5049099    -0.85   0.398    -1.416785    .5624249
  defactofix |   .0885962   .0937916     0.94   0.345     -.095232    .2724243
```

```
         vat |   .5429553   .1411478     3.85   0.000     .2663106       .8196
          eu |  -.0062168   .1917987    -0.03   0.974    -.3821353    .3697017
             |
        time |
       2000  |  -.1240813   .3100992    -0.40   0.689    -.7318645    .4837019
       2001  |  -.1107358   .1894373    -0.58   0.559    -.4820262    .2605545
       2002  |  -.6718101   .2848722    -2.36   0.018    -1.230149   -.1134708
       2003  |  -.6484138   .2933601    -2.21   0.027    -1.223389   -.0734386
       2005  |  -.3882323   .2445444    -1.59   0.112    -.8675305    .0910659
       2006  |  -.1729429   .2137196    -0.81   0.418    -.5918257    .2459398
       2007  |  -.2333855   .1420068    -1.64   0.100    -.5117138    .0449428
       2008  |   .4779356   .2262106     2.11   0.035     .0345708    .9213003
       2009  |  -.2806911   .2896737    -0.97   0.333    -.8484411    .2870588
             |
       _cons |  -.3337998   1.058864    -0.32   0.753    -2.409135    1.741535
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(cba gdpg fb defactofix open tot ebrdi vat eu 1998b.time 1999.time
    2000.time 2001.time 2002.time 2003.time 2004.time 2005.time 2006.time
    2007.time 2008.time 2009.time)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L2.(msg ccbi cbamsg)
    L.L.lninf
Instruments for levels equation
  Standard
    cba gdpg fb defactofix open tot ebrdi vat eu 1998b.time 1999.time
    2000.time 2001.time 2002.time 2003.time 2004.time 2005.time 2006.time
    2007.time 2008.time 2009.time
    _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    DL.(msg ccbi cbamsg)
    D.L.lninf
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.93  Pr > z =  0.003
Arellano-Bond test for AR(2) in first differences: z =  -0.69  Pr > z =  0.492
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(70)   =  76.00  Prob > chi2 =  0.292
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(70)   =   0.00  Prob > chi2 =  1.000
  (Robust, but weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(32)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(38)   =  -0.00  Prob > chi2 =  1.000
  gmm(L.lninf, lag(1 1))
    Hansen test excluding group:     chi2(52)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(18)   =   0.00  Prob > chi2 =  1.000
  gmm(msg ccbi cbamsg, lag(2 2))
    Hansen test excluding group:     chi2(14)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(56)   =   0.00  Prob > chi2 =  1.000
  iv(cba gdpg fb defactofix open tot ebrdi vat eu 1998b.time 1999.time 2000.time
2001.time 2002.time 2003.time 2004.time 2005.time 2006.time 2007.time 2008.time
2009.time)
    Hansen test excluding group:     chi2(52)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(18)   =   0.00  Prob > chi2 =  1.000
. margins, dydx(_all) force
Warning: cannot perform check for estimable functions.
(note: continuous option implied because a factor with only one level was specified
in the dydx() option)
(note: default prediction is a function of possibly stochastic quantities other than
e(b))

Average marginal effects                          Number of obs   =        153
Model VCE    : Robust

Expression   : Fitted Values, predict()
dy/dx w.r.t. : L.lninf 1.cba gdpg msg fb open tot ebrdi ccbi defactofix vat eu
2000.time 2001.time 2002.time 2003.time 2005.time 2006.time 2007.time 2008.time
2009.time

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
```

```
         L1. |    .415943   .0936605     4.44   0.000     .2323718    .5995143
             |
       1.cba |    -.35234   .1239431    -2.84   0.004     -.595264    -.109416
        gdpg |  -.0131177   .0218015    -0.60   0.547     -.055848    .0296125
         msg |   .0168435   .0054402     3.10   0.002     .0061809    .0275061
          fb |   .0166235   .0384847     0.43   0.666    -.0588051     .092052
        open |    .003348   .0022216     1.51   0.132    -.0010062    .0077022
         tot |   .0035896   .0053045     0.68   0.499     -.006807    .0139861
       ebrdi |   .2187959   .1943406     1.13   0.260    -.1621046    .5996964
        ccbi |  -.4271802   .5049099    -0.85   0.398    -1.416785    .5624249
  defactofix |   .0885962   .0937916     0.94   0.345     -.095232    .2724243
         vat |   .5429553   .1411478     3.85   0.000     .2663106       .8196
          eu |  -.0062168   .1917987    -0.03   0.974    -.3821353    .3697017
             |
        time |
       2000  |  -.1240813   .3100992    -0.40   0.689    -.7318645    .4837019
       2001  |  -.1107358   .1894373    -0.58   0.559    -.4820262    .2605545
       2002  |  -.6718101   .2848722    -2.36   0.018    -1.230149   -.1134708
       2003  |  -.6484138   .2933601    -2.21   0.027    -1.223389   -.0734386
       2005  |  -.3882323   .2445444    -1.59   0.112    -.8675305    .0910659
       2006  |  -.1729429   .2137196    -0.81   0.418    -.5918257    .2459398
       2007  |  -.2333855   .1420068    -1.64   0.100    -.5117138    .0449428
       2008  |   .4779356   .2262106     2.11   0.035     .0345708    .9213003
       2009  |  -.2806911   .2896737    -0.97   0.333    -.8484411    .2870588
------------------------------------------------------------------------------

.

. margins, dydx(cba) at(msg=(-15 -0.39 11.7 23.84 49.7 78.06 89.99)) force
Warning: cannot perform check for estimable functions.
(note: continuous option implied because a factor with only one level was specified
in the dydx() option)
(note: default prediction is a function of possibly stochastic quantities other than
e(b))

Average marginal effects                          Number of obs   =        153
Model VCE    : Robust

Expression   : Fitted Values, predict()
dy/dx w.r.t. : 1.cba

1._at        : msg             =         -15
2._at        : msg             =        -.39
3._at        : msg             =        11.7
4._at        : msg             =       23.84
5._at        : msg             =        49.7
6._at        : msg             =       78.06
7._at        : msg             =       89.99
------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.cba        |
         _at |
          1  |   .3790795    .287608     1.32   0.187    -.1846218    .9427808
          2  |   .0846507    .169548     0.50   0.618    -.2476573    .4169586
          3  |  -.1589937   .1070062    -1.49   0.137    -.3687221    .0507347
          4  |  -.4036457   .1379132    -2.93   0.003    -.6739506   -.1333409
          5  |  -.9247908   .3441708    -2.69   0.007    -1.599353   -.2502284
          6  |  -1.496317   .5982139    -2.50   0.012    -2.668795   -.3238393
          7  |  -1.736737   .7066246    -2.46   0.014    -3.121696   -.3517783
------------------------------------------------------------------------------
```

```
. marginsplot

  Variables that uniquely identify margins: msg
```




**Appendix 5.7: Inflation model - Calculation of the long-run coefficient on CBA**

```
. nlcom _b[cba]/(1-_b[l.lninf])

       _nl_1:  _b[cba]/(1-_b[l.lninf])

------------------------------------------------------------------------------
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _nl_1 |  -.4663652   .2230883    -2.09   0.037    -.9036101   -.0291202
------------------------------------------------------------------------------
```

**Appendix 5.8: Inflation model - FEVD (strong and weak CBA)**

**Appendix 5.8a Strong and weak CBA - Stage-by-stage estimation**

```
. *Stage 1 (panel robust SE)
. xi: xtreg lninf strongcba weakcba gdpg l1msg fb open tot ebrdi l1ccbi defactofix
vat eu i.time , fe robust
i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
note: strongcba omitted because of collinearity
note: weakcba omitted because of collinearity
note: _Itime_1999 omitted because of collinearity
note: _Itime_2002 omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =       155
Group variable: ctyno                           Number of groups   =        17

R-sq:  within  = 0.3489                         Obs per group: min =         7
       between = 0.2582                                        avg =       9.1
       overall = 0.2870                                        max =        10

                                                F(16,16)           =         .
corr(u_i, Xb)  = -0.2561                        Prob > F           =         .

                                 (Std. Err. adjusted for 17 clusters in ctyno)
------------------------------------------------------------------------------
             |               Robust
       lninf |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   strongcba |  (omitted)
```

```
    weakcba |  (omitted)
       gdpg |  -.0546837   .0196203    -2.79   0.013     -.096277   -.0130905
      l1msg |   .0124851   .0052811     2.36   0.031     .0012897    .0236805
         fb |    .035328   .0371683     0.95   0.356    -.0434652    .1141213
       open |   .0067485   .0080507     0.84   0.414    -.0103183    .0238153
        tot |   .0233886    .013262     1.76   0.097    -.0047256    .0515028
      ebrdi |  -.7084684   .8168121    -0.87   0.399    -2.440033    1.023096
     l1ccbi |  -1.329348   .5704019    -2.33   0.033    -2.538546   -.1201497
 defactofix |   .0467399   .5175766     0.09   0.929    -1.050473    1.143953
        vat |   .8948198   .1930988     4.63   0.000     .4854686    1.304171
         eu |  -.2835026    .245017    -1.16   0.264    -.8029153    .2359102
_Itime_1999 |  (omitted)
_Itime_2000 |    .827447   .5764563     1.44   0.170    -.3945857     2.04948
_Itime_2001 |   .7263703   .3033033     2.39   0.029      .083396    1.369345
_Itime_2002 |  (omitted)
_Itime_2003 |  -.0168307   .3726068    -0.05   0.965    -.8067219    .7730605
_Itime_2004 |   .7549974   .2426289     3.11   0.007     .2406472    1.269348
_Itime_2005 |   .6172059   .3413577     1.81   0.089    -.1064402    1.340852
_Itime_2006 |   .8646385    .280688     3.08   0.007     .2696065     1.45967
_Itime_2007 |   .9742344   .2977478     3.27   0.005     .3430371    1.605432
_Itime_2008 |   1.497097   .3528985     4.24   0.001     .7489858    2.245209
_Itime_2009 |   .2962255   .4149905     0.71   0.486    -.5835152    1.175966
      _cons |   1.229915   3.620088     0.34   0.738    -6.444328    8.904159
------------+----------------------------------------------------------------
    sigma_u |  .68312727
    sigma_e |  .75493878
        rho |  .45018805   (fraction of variance due to u_i)
-----------------------------------------------------------------------------

. *Save fixed effect (unit effects) from stage 1
. predict fixedef, u
(136 missing values generated)

. *Stage 2 (regression of the FE vector on the time-invariant and slowly changing
explantory variables - by OLS)
. reg fixedef strongcba weakcba ebrdi l1ccbi

     Source |       SS       df       MS              Number of obs =     155
------------+------------------------------           F(  4,   150) =   28.17
      Model |  29.0629202     4  7.26573004           Prob > F      =  0.0000
   Residual |  38.6886445   150  .257924297           R-squared     =  0.4290
------------+------------------------------           Adj R-squared =  0.4137
      Total |  67.7515647   154  .439945225           Root MSE      =  .50786

-----------------------------------------------------------------------------
    fixedef |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
------------+----------------------------------------------------------------
  strongcba |   -1.08795   .1401487    -7.76   0.000    -1.364871   -.8110297
    weakcba |   -.180387   .1351932    -1.33   0.184     -.447516     .086742
      ebrdi |   .4587825   .0968441     4.74   0.000     .2674278    .6501372
     l1ccbi |  -.4150091   .3029014    -1.37   0.173    -1.013514    .1834953
      _cons |  -1.058327    .311925    -3.39   0.001    -1.674661   -.4419925
-----------------------------------------------------------------------------

. * Save the residuals from stage 2
. predict rsifevd, residuals
(136 missing values generated)

. *Stage 3 (estimation of pooled OLS by including all explanatory time-variant, time-
invariant variables and unexplained part of the FE vector - error term from the stage
2)

. regress lninf strongcba weakcba gdpg l1msg fb open tot ebrdi l1ccbi defactofix vat
eu rsifevd i.time

     Source |       SS       df       MS              Number of obs =     155
------------+------------------------------           F( 22,   132) =   10.27
      Model |  116.093589    22   5.2769813           Prob > F      =  0.0000
   Residual |  67.8219739   132  .513802833           R-squared     =  0.6312
------------+------------------------------           Adj R-squared =  0.5698
      Total |  183.915563   154   1.1942569           Root MSE      =   .7168

-----------------------------------------------------------------------------
      lninf |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
------------+----------------------------------------------------------------
  strongcba |   -1.08795   .3106867    -3.50   0.001    -1.702519   -.4733812
    weakcba |   -.180387   .2283862    -0.79   0.431    -.6321574    .2713834
```

```
        gdpg |  -.0546837   .0220891    -2.48   0.015    -.0983782   -.0109893
       l1msg |   .0124851   .0043159     2.89   0.004     .0039478    .0210223
          fb |    .035328   .0299553     1.18   0.240    -.0239266    .0945826
        open |   .0067485   .0024272     2.78   0.006     .0019472    .0115498
         tot |   .0233886   .0088334     2.65   0.009     .0059153    .0408619
       ebrdi |  -.2496858   .2367197    -1.05   0.293    -.7179408    .2185692
      l1ccbi |  -1.744357   .5120116    -3.41   0.001    -2.757167   -.7315473
  defactofix |   .0467399   .1594452     0.29   0.770    -.2686585    .3621383
         vat |   .8948198   .5433936     1.65   0.102    -.1800664    1.969706
          eu |  -.2835026   .1899735    -1.49   0.138     -.659289    .0922838
     rsifevd |          1   .1241242     8.06   0.000       .75447     1.24553
             |
        time |
       2001  |  -.1010767   .2565943    -0.39   0.694    -.6086456    .4064923
       2002  |   -.827447   .2658057    -3.11   0.002    -1.353237   -.3016571
       2003  |  -.8442777   .2647934    -3.19   0.002    -1.368065   -.3204902
       2004  |  -.0724496   .2860272    -0.25   0.800    -.6382396    .4933404
       2005  |  -.2102411   .2943228    -0.71   0.476    -.7924407    .3719584
       2006  |   .0371915   .2966494     0.13   0.900    -.5496104    .6239934
       2007  |   .1467874   .3053766     0.48   0.632    -.4572777    .7508525
       2008  |   .6696502   .3084295     2.17   0.032     .0595463    1.279754
       2009  |  -.5312215    .410756    -1.29   0.198    -1.343738    .2812945
             |
       _cons |   .9990358   .9215329     1.08   0.280    -.8238473    2.821919
------------------------------------------------------------------------------

. *Diagnostic tests after 3rd stage*
. estat imtest

Cameron & Trivedi's decomposition of IM-test

---------------------------------------------------
              Source |       chi2     df      p
---------------------+-----------------------------
  Heteroskedasticity |     155.00    154    0.4622
            Skewness |      23.79     22    0.3585
            Kurtosis |       1.74      1    0.1868
---------------------+-----------------------------
               Total |     180.53    177    0.4122
---------------------------------------------------

. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of lninf

         chi2(1)      =    32.67
         Prob > chi2  =   0.0000

. estat ovtest

Ramsey RESET test using powers of the fitted values of lninf
       Ho:  model has no omitted variables
                 F(3, 129) =      0.62
                  Prob > F =      0.6008
```

**Appendix 5.8b: Strong and weak CBA – 'xtfevd' (only strongcb and weakcba included)**

```
. xtfevd lninf strongcba weakcba gdpg l1msg fb open tot ebrdi vat eu  _itimeb2001
_itimeb2002 _itimeb2003 _itimeb2004 _itimeb2005 _itimeb2006 _itimeb2007 _itimeb2008
_itimeb2009, invariant(strongcba weakcba ebrdi)

panel fixed effects regression with vector decomposition

degrees of freedom fevd    =      193          number of obs       =      237
mean squared error         = .4176935          F( 21, 193)         = 5.007147
root mean squared error    = .6462921          Prob > F            = 1.46e-09
Residual Sum of Squares    = 98.99337          R-squared           = .6397121
Total Sum of Squares       = 274.7618          adj. R-squared      = .5594406
Estimation Sum of Squares  = 175.7684

------------------------------------------------------------------------------
             |               fevd
```

| lninf | Coef. | Std. Err. | t | P>\|t\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| gdpg | -.0207467 | .0185194 | -1.12 | 0.264 | -.0572731 | .0157797 |
| l1msg | .0095006 | .0033904 | 2.80 | 0.006 | .0028135 | .0161876 |
| fb | -.0095807 | .0244901 | -0.39 | 0.696 | -.0578833 | .0387219 |
| open | .0126077 | .0053225 | 2.37 | 0.019 | .00211 | .0231054 |
| tot | .0045037 | .0049164 | 0.92 | 0.361 | -.0051931 | .0142005 |
| vat | .9537611 | .5000911 | 1.91 | 0.058 | -.0325844 | 1.940107 |
| eu | -.1618953 | .2591259 | -0.62 | 0.533 | -.6729777 | .349187 |
| _itimeb2001 | -.0554761 | .2208511 | -0.25 | 0.802 | -.4910677 | .3801155 |
| _itimeb2002 | -.6552779 | .2177573 | -3.01 | 0.003 | -1.084767 | -.2257884 |
| _itimeb2003 | -.6880249 | .2209066 | -3.11 | 0.002 | -1.123726 | -.2523238 |
| _itimeb2004 | -.2728506 | .2349661 | -1.16 | 0.247 | -.7362816 | .1905804 |
| _itimeb2005 | -.4082294 | .2428364 | -1.68 | 0.094 | -.8871834 | .0707245 |
| _itimeb2006 | -.2616122 | .2447868 | -1.07 | 0.287 | -.744413 | .2211886 |
| _itimeb2007 | -.1347947 | .2563835 | -0.53 | 0.600 | -.640468 | .3708786 |
| _itimeb2008 | .3123235 | .2657191 | 1.18 | 0.241 | -.2117628 | .8364097 |
| _itimeb2009 | -.681964 | .3264695 | -2.09 | 0.038 | -1.32587 | -.0380579 |
| strongcba | -1.123176 | .4110094 | -2.73 | 0.007 | -1.933823 | -.3125292 |
| weakcba | -.3289956 | .4066039 | -0.81 | 0.419 | -1.130953 | .4729622 |
| ebrdi | -.6337204 | .2840473 | -2.23 | 0.027 | -1.193956 | -.073485 |
| eta | 1 | . | . | . | . | . |
| _cons | 2.121916 | 1.070609 | 1.98 | 0.049 | .0103208 | 4.233512 |

## Appendix 5.8c: Strong and weak CBA – 'xtfevd' (strongCBA, weakCBA and defactofix included)

```
. xtfevd lninf strongcba weakcba gdpg l1msg fb open tot ebrdi defactofix vat eu
itimeb2001 _itimeb2002 _itimeb2003 _itimeb2004 _itimeb2005 _itimeb2006 _itimeb2007
_itimeb2008 _itimeb2009, invariant(strongcba weakcba ebrdi)

panel fixed effects regression with vector decomposition

degrees of freedom fevd    =      192         number of obs       =      237
mean squared error         = .4161365         F( 22, 192)         =  4.83689
root mean squared error    = .6450864         Prob > F            = 1.90e-09
Residual Sum of Squares    = 98.62434         R-squared           = .6410551
Total Sum of Squares       = 274.7618         adj. R-squared      = .5587969
Estimation Sum of Squares  = 176.1375
```

| lninf | Coef. | fevd Std. Err. | t | P>\|t\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| gdpg | -.0213817 | .0185746 | -1.15 | 0.251 | -.0580181 | .0152548 |
| l1msg | .0092708 | .0033454 | 2.77 | 0.006 | .0026723 | .0158693 |
| fb | -.0098222 | .0243086 | -0.40 | 0.687 | -.0577684 | .0381239 |
| open | .0127136 | .0053448 | 2.38 | 0.018 | .0021715 | .0232557 |
| tot | .0043262 | .0049485 | 0.87 | 0.383 | -.0054341 | .0140865 |
| defactofix | -.2112894 | .2420742 | -0.87 | 0.384 | -.6887558 | .2661769 |
| vat | .95331 | .4980363 | 1.91 | 0.057 | -.0290152 | 1.935635 |
| eu | -.1665969 | .2599386 | -0.64 | 0.522 | -.6792989 | .3461052 |
| _itimeb2001 | -.0371784 | .2209248 | -0.17 | 0.867 | -.4729297 | .3985729 |
| _itimeb2002 | -.6613203 | .2188709 | -3.02 | 0.003 | -1.09302 | -.2296202 |
| _itimeb2003 | -.6848629 | .2215356 | -3.09 | 0.002 | -1.121819 | -.2479069 |
| _itimeb2004 | -.2689794 | .2360137 | -1.14 | 0.256 | -.7344919 | .1965331 |
| _itimeb2005 | -.3934321 | .2422239 | -1.62 | 0.106 | -.8711937 | .0843296 |
| _itimeb2006 | -.245394 | .243941 | -1.01 | 0.316 | -.7265424 | .2357544 |
| _itimeb2007 | -.1168889 | .2545226 | -0.46 | 0.647 | -.6189084 | .3851307 |
| _itimeb2008 | .332003 | .2641302 | 1.26 | 0.210 | -.1889664 | .8529724 |
| _itimeb2009 | -.6549303 | .3273902 | -2.00 | 0.047 | -1.300674 | -.0091871 |
| strongcba | -.9550537 | .4584606 | -2.08 | 0.039 | -1.85932 | -.0507877 |
| weakcba | -.2331633 | .3901961 | -0.60 | 0.551 | -1.002785 | .5364581 |
| ebrdi | -.666561 | .2795846 | -2.38 | 0.018 | -1.218013 | -.1151094 |
| eta | 1 | . | . | . | . | . |
| _cons | 2.278551 | 1.064645 | 2.14 | 0.034 | .1786493 | 4.378453 |

**Appendix 5.8d: Strong and weak CBA - Xtfevd (strongcba, weakcba, defactofix and CCBI included)**

```
. xtfevd lninf strongcba weakcba gdpg l1msg fb open tot ebrdi defactofix l1ccbi vat eu _itimeb2001 _itimeb2002 _itimeb2003 _itimeb2004 _itimeb2005 _itimeb2006 _itimeb2007 _itimeb2008 _itimeb2009, invariant(strongcba weakcba ebrdi l1ccbi)

panel fixed effects regression with vector decomposition

degrees of freedom fevd    =       117          number of obs       =      155
mean squared error         = .4375611          F( 23, 117)         = 3.187405
root mean squared error    =  .661484          Prob > F            = .0000359
Residual Sum of Squares    = 67.82197          R-squared           = .6312331
Total Sum of Squares       = 183.9156          adj. R-squared      = .5146145
Estimation Sum of Squares  = 116.0936

------------------------------------------------------------------------------
             |              fevd
       lninf |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        gdpg |  -.0546837   .0398703    -1.37   0.173    -.1336447    .0242773
       l1msg |   .0124851   .0061298     2.04   0.044     .0003452    .0246249
          fb |    .035328   .0623575     0.57   0.572    -.0881676    .1588237
        open |   .0067485   .0088012     0.77   0.445    -.0106817    .0241788
         tot |   .0233886   .0227529     1.03   0.306    -.0216723    .0684495
  defactofix |   .0467399   .3239702     0.14   0.886    -.5948661    .6883458
         vat |   .8948198   .6930653     1.29   0.199    -.4777597    2.267399
          eu |  -.2835026   .2645627    -1.07   0.286    -.8074553    .2404501
 _itimeb2001 |  -.1010767   .2915248    -0.35   0.729    -.6784263    .4762729
 _itimeb2002 |   -.827447   .3158774    -2.62   0.010    -1.453026   -.2018683
 _itimeb2003 |  -.8442777   .3179071    -2.66   0.009    -1.473876   -.2146793
 _itimeb2004 |  -.0724496   .3628616    -0.20   0.842     -.791078    .6461787
 _itimeb2005 |  -.2102411   .3822739    -0.55   0.583    -.9673146    .5468324
 _itimeb2006 |   .0371915   .3805621     0.10   0.922    -.7164919    .7908748
 _itimeb2007 |   .1467874   .4247336     0.35   0.730    -.6943754    .9879501
 _itimeb2008 |   .6696502    .402042     1.67   0.098    -.1265729    1.465873
 _itimeb2009 |  -.5312215   .5236243    -1.01   0.312    -1.568232     .505789
   strongcba |   -1.08795   .8019846    -1.36   0.178    -2.676239    .5003383
     weakcba |   -.180387   .4686723    -0.38   0.701    -1.108568     .747794
       ebrdi |  -.2496858   .5158172    -0.48   0.629    -1.271235    .7718631
      l1ccbi |  -1.744357   .8660747    -2.01   0.046    -3.459572   -.0291414
         eta |          1          .        .       .            .           .
       _cons |   .9990358   2.235198     0.45   0.656    -3.427657    5.425729
------------------------------------------------------------------------------
```

## Appendix 5.9. Inflation model - Strong and weak CBA - System GMM

### Appendix 5.9a: Strong and weak CBA - One-step robust System GMM with one lag of dependent variable and minimum number of instruments (with strong and weak CBA only)

```
. xi: xtabond2 lninf L.lninf strongcba weakcba gdpg msg fb open tot ebrdi vat eu i.time, gmm(L.lninf, laglimits(1 1)) gmm( msg , laglimits (2 2)) iv(strongcba weakcba gdpg fb open tot ebrdi vat eu i.time)  robust

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring space over speed. To switch, type or click on mata: mata set matafavor speed, perm.
_Itime_1999 dropped due to collinearity
_Itime_2009 dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       229
Time variable : time                            Number of groups   =        25
Number of instruments = 57                      Obs per group: min =         7
```

```
Wald chi2(20) =   1586.46                                       avg =      9.16
Prob > chi2   =     0.000                                       max =        10
------------------------------------------------------------------------------
             |               Robust
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
         L1. |   .4641078   .0526576     8.81   0.000     .3609008    .5673148
             |
   strongcba |  -.5363993   .1737119    -3.09   0.002    -.8768684   -.1959302
     weakcba |  -.1737023   .1743658    -1.00   0.319    -.5154529    .1680484
        gdpg |  -.0076536    .008517    -0.90   0.369    -.0243467    .0090395
         msg |   .0081731   .0039815     2.05   0.040     .0003695    .0159768
          fb |    .000564   .0168245     0.03   0.973    -.0324115    .0335395
        open |   .0040079   .0015229     2.63   0.008      .001023    .0069928
         tot |   .0047989   .0019469     2.46   0.014      .000983    .0086148
       ebrdi |  -.2683651   .1417887    -1.89   0.058    -.5462659    .0095357
         vat |   .6754365   .0831459     8.12   0.000     .5124735    .8383995
          eu |   .1704956    .178119     0.96   0.338    -.1786112    .5196023
 _Itime_2000 |   .5760229   .2816288     2.05   0.041     .0240406    1.128005
 _Itime_2001 |   .6189559   .2122865     2.92   0.004      .202882     1.03503
 _Itime_2002 |   .0577665   .2785236     0.21   0.836    -.4881297    .6036626
 _Itime_2003 |   .1889474   .2980574     0.63   0.526    -.3952343    .7731292
 _Itime_2004 |   .5784878   .2282359     2.53   0.011     .1311537    1.025822
 _Itime_2005 |   .2452591   .2854024     0.86   0.390    -.3141193    .8046374
 _Itime_2006 |   .4343248   .2367211     1.83   0.067    -.0296401    .8982897
 _Itime_2007 |    .477025   .2367251     2.02   0.044     .0130522    .9409977
 _Itime_2008 |   1.036203   .1987245     5.21   0.000     .6467103    1.425696
       _cons |   .2161296   .6591434     0.33   0.743    -1.075768    1.508027
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(strongcba weakcba gdpg fb open tot ebrdi vat eu _Itime_1999 _Itime_2000
    _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
    _Itime_2007 _Itime_2008 _Itime_2009)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L.L.lninf
    L2.msg
Instruments for levels equation
  Standard
    _cons
    strongcba weakcba gdpg fb open tot ebrdi vat eu _Itime_1999 _Itime_2000
    _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
    _Itime_2007 _Itime_2008 _Itime_2009
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    D.L.lninf
    DL.msg
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -3.12  Pr > z =  0.002
Arellano-Bond test for AR(2) in first differences: z =  -0.89  Pr > z =  0.372
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(36)   =  70.05  Prob > chi2 =  0.001
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(36)   =   8.55  Prob > chi2 =  1.000
  (Robust, but can be weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(16)   =   3.52  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(20)   =   5.03  Prob > chi2 =  1.000
  gmm(L.lninf, lag(1 1))
    Hansen test excluding group:     chi2(17)   =   8.11  Prob > chi2 =  0.964
    Difference (null H = exogenous): chi2(19)   =   0.44  Prob > chi2 =  1.000
  gmm(msg, lag(2 2))
    Hansen test excluding group:     chi2(17)   =   3.80  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(19)   =   4.75  Prob > chi2 =  1.000
  iv(strongcba weakcba gdpg fb open tot ebrdi vat eu _Itime_1999 _Itime_2000
_Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_20
> 05 _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009)
    Hansen test excluding group:     chi2(17)   =   4.38  Prob > chi2 =  0.999
    Difference (null H = exogenous): chi2(19)   =   4.17  Prob > chi2 =  1.000
```

**Appendix 5.9b: Strong and weak CBA - One-step robust System GMM with one lag of dependent variable and minimum number of instruments (with strong and weak CBA and defactofix)**

```
. xi: xtabond2 lninf L.lninf strongcba weakcba gdpg msg fb open tot ebrdi defactofix
vat eu i.time, gmm(L.lninf, laglimits(1 1)) gmm(msg , laglimits (2 2)) iv(strongcba
weakcb gdpg fb defactofix open tot ebrdi  vat eu i.time)  robust

i.time           _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring space over speed. To switch, type or click on mata: mata set matafavor
speed, perm.
_Itime_1999 dropped due to collinearity
_Itime_2009 dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       229
Time variable : time                            Number of groups   =        25
Number of instruments = 58                      Obs per group: min =         7
Wald chi2(21) =   2392.62                                      avg =      9.16
Prob > chi2   =     0.000                                      max =        10
------------------------------------------------------------------------------
             |               Robust
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
         L1. |   .4687924   .0514528     9.11   0.000     .3679468    .5696381
             |
   strongcba |  -.5480212   .1774193    -3.09   0.002    -.8957565   -.2002858
     weakcba |  -.1867495   .1635761    -1.14   0.254    -.5073527    .1338537
        gdpg |  -.0078169   .0083088    -0.94   0.347    -.0241018    .0084679
         msg |   .0076595   .0037731     2.03   0.042     .0002644    .0150546
          fb |   .0027238   .0177167     0.15   0.878    -.0320003    .0374478
        open |    .003975   .0014852     2.68   0.007     .0010641    .0068859
         tot |   .0047488   .0019532     2.43   0.015     .0009206    .0085769
       ebrdi |  -.2805028   .1425631    -1.97   0.049    -.5599213   -.0010843
  defactofix |   .0109525   .0811646     0.13   0.893    -.1481272    .1700323
         vat |   .6631541   .0833685     7.95   0.000     .4997549    .8265533
          eu |   .1883841   .1807319     1.04   0.297    -.1658438    .5426121
 _Itime_2000 |   .5938111   .2749572     2.16   0.031      .054905    1.132717
 _Itime_2001 |   .6311181   .2043528     3.09   0.002      .230594    1.031642
 _Itime_2002 |   .0646181   .2706158     0.24   0.811    -.4657791    .5950153
 _Itime_2003 |   .2007303   .2946386     0.68   0.496    -.3767507    .7782113
 _Itime_2004 |   .5868322   .2302435     2.55   0.011     .1355632    1.038101
 _Itime_2005 |   .2507414   .2821554     0.89   0.374    -.3022729    .8037557
 _Itime_2006 |     .44309   .2401043     1.85   0.065    -.0275057    .9136858
 _Itime_2007 |   .4828501   .2381383     2.03   0.043     .0161077    .9495926
 _Itime_2008 |   1.033911   .2030037     5.09   0.000     .6360312    1.431791
       _cons |   .2608055   .6775174     0.38   0.700    -1.067104    1.588715
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(strongcba weakcba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999
    _Itime_2000 _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005
    _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L.L.lninf
    L2.msg
Instruments for levels equation
  Standard
    _cons
    strongcba weakcba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999
    _Itime_2000 _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005
    _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    D.L.lninf
    DL.msg
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -3.10  Pr > z =  0.002
Arellano-Bond test for AR(2) in first differences: z =  -0.89  Pr > z =  0.373
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(36)   =  72.24  Prob > chi2 =  0.000
```

```
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(36)   =   2.74  Prob > chi2 =  1.000
  (Robust, but can be weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(16)   =   4.60  Prob > chi2 =  0.997
    Difference (null H = exogenous): chi2(20)   =  -1.86  Prob > chi2 =  1.000
  gmm(L.lninf, lag(1 1))
    Hansen test excluding group:     chi2(17)   =   5.74  Prob > chi2 =  0.995
    Difference (null H = exogenous): chi2(19)   =  -3.00  Prob > chi2 =  1.000
  gmm(msg, lag(2 2))
    Hansen test excluding group:     chi2(17)   =   1.50  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(19)   =   1.24  Prob > chi2 =  1.000
  iv(strongcba weakcba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999
_Itime_2000 _Itime_2001 _Itime_2002 _Itime_2003 _Itime_200
> 4 _Itime_2005 _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009)
    Hansen test excluding group:     chi2(16)   =   3.61  Prob > chi2 =  0.999
    Difference (null H = exogenous): chi2(20)   =  -0.87  Prob > chi2 =  1.000
```

**Appendix 5.9c: Strong and weak CBA - One-step robust System GMM with one lag of dependent variable and minimum number of instruments (with strong and weak CBA, defactofix and CCBI)**

```
 . xi: xtabond2 lninf L.lninf strongcba weakcba gdpg msg fb open tot ebrdi ccbi
defactofix vat eu i.time, gmm(L.lninf, laglimits(1 1)) gmm( msg ccbi , laglimits (2
2)) iv(strongcba weakcba gdpg fb defactofix open tot ebrdi  vat eu i.time)  robust

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring space over speed. To switch, type or click on mata: mata set matafavor
speed, perm.
_Itime_1999 dropped due to collinearity
_Itime_2009 dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       153
Time variable : time                            Number of groups   =        17
Number of instruments = 75                      Obs per group: min =         7
Wald chi2(22) =   7503.61                                      avg =      9.00
Prob > chi2   =     0.000                                      max =        10
------------------------------------------------------------------------------
             |               Robust
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
         L1. |   .4130802   .0904698     4.57   0.000     .2357627    .5903977
             |
   strongcba |  -.5970075   .2130635    -2.80   0.005    -1.014604   -.1794107
     weakcba |  -.1466866   .1520962    -0.96   0.335    -.4447898    .1514165
        gdpg |  -.0119486   .0222416    -0.54   0.591    -.0555413    .0316442
         msg |   .0200228   .0071955     2.78   0.005     .0059199    .0341256
          fb |   .0051923   .0374304     0.14   0.890    -.0681698    .0785545
        open |   .0048776   .0025334     1.93   0.054    -.0000878     .009843
         tot |   .0100397   .0055771     1.80   0.072    -.0008912    .0209707
       ebrdi |   .1238593   .2101311     0.59   0.556      -.28799    .5357086
        ccbi |  -.8486154   .7000709    -1.21   0.225    -2.220729    .5234985
  defactofix |   .1232278     .09563     1.29   0.198    -.0642036    .3106591
         vat |   .5752745   .1617938     3.56   0.000     .2581644    .8923846
          eu |  -.0575058   .1734746    -0.33   0.740    -.3975097    .2824982
 _Itime_2000 |   .0594779    .312698     0.19   0.849    -.5533989    .6723546
 _Itime_2001 |   .0176935   .2768351     0.06   0.949    -.5248933    .5602803
 _Itime_2002 |  -.4107094   .3641861    -1.13   0.259    -1.124501    .3030822
 _Itime_2003 |  -.3787647    .338734    -1.12   0.263    -1.042671    .2851418
 _Itime_2004 |   .2520283   .2680688     0.94   0.347     -.273377    .7774336
 _Itime_2005 |  -.1120071   .3529503    -0.32   0.751     -.803777    .5797628
 _Itime_2006 |   .1047999   .2409124     0.44   0.664    -.3673796    .5769795
 _Itime_2007 |   .0432424     .26864     0.16   0.872    -.4832823    .5697671
 _Itime_2008 |   .8475828   .2560735     3.31   0.001      .345688    1.349478
       _cons |  -.7529306   1.176178    -0.64   0.522    -3.058196    1.552335
```

```
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(strongcba weakcba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999
    _Itime_2000 _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005
    _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L.L.lninf
    L2.(msg ccbi)
Instruments for levels equation
  Standard
    _cons
    strongcba weakcba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999
    _Itime_2000 _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005
    _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    D.L.lninf
    DL.(msg ccbi)
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -3.00  Pr > z =  0.003
Arellano-Bond test for AR(2) in first differences: z =  -0.81  Pr > z =  0.419
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(52)   =  67.95  Prob > chi2 =  0.068
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(52)   =   0.00  Prob > chi2 =  1.000
  (Robust, but can be weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(24)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(28)   =  -0.00  Prob > chi2 =  1.000
  gmm(L.lninf, lag(1 1))
    Hansen test excluding group:     chi2(33)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(19)   =  -0.00  Prob > chi2 =  1.000
  gmm(msg ccbi, lag(2 2))
    Hansen test excluding group:     chi2(16)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(36)   =   0.00  Prob > chi2 =  1.000
  iv(strongcba weakcba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999
_Itime_2000 _Itime_2001 _Itime_2002 _Itime_2003 _Itime_200
> 4 _Itime_2005 _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009)
    Hansen test excluding group:     chi2(33)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(19)   =   0.00  Prob > chi2 =  1.000

. *One-step robust System GMM with one lag of dependent variable and minimum number
of instruments(with strong and weak CBA)*

. xi: xtabond2 lninf L.lninf strongcba weakcba gdpg msg fb open tot ebrdi vat eu
i.time, gmm(L.lninf, laglimits(1 1)) gmm( msg , laglimits (2 2)) iv(strongcba weakcba
gdpg fb open tot ebrdi vat eu i.time)  robust pca

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring speed over space. To switch, type or click on mata: mata set matafavor
space, perm.
_Itime_1999 dropped due to collinearity
_Itime_2009 dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan/Hansen statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       229
Time variable : time                            Number of groups   =        25
Number of instruments = 37                      Obs per group: min =        38
Wald chi2(20) =   1855.38                                      avg =      9.16
Prob > chi2   =     0.000                                      max =        38
------------------------------------------------------------------------------
             |               Robust
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
         L1. |    .531867   .1764894     3.01   0.003     .1859541    .8777799
             |
   strongcba |  -.5013883     .228282    -2.20   0.028    -.9488128   -.0539638
     weakcba |  -.1088541     .145897    -0.75   0.456    -.3948069    .1770988
        gdpg |  -.0054466    .0081847    -0.67   0.506    -.0214883    .0105952
```

```
         msg |   .0043889   .0024194     1.81   0.070     -.000353    .0091308
          fb |   .0037293   .0167635     0.22   0.824    -.0291266    .0365852
        open |   .0041696   .0020314     2.05   0.040     .0001881    .0081511
         tot |   .0047209   .0022473     2.10   0.036     .0003163    .0091254
       ebrdi |   -.287985   .2084227    -1.38   0.167    -.6964859    .1205159
         vat |   .6203563   .1498961     4.14   0.000     .3265653    .9141473
          eu |   .1380587    .207803     0.66   0.506    -.2692278    .5453451
 _Itime_2000 |   .6923616   .3017542     2.29   0.022     .1009341    1.283789
 _Itime_2001 |   .7094562   .2237341     3.17   0.002     .2709453    1.147967
 _Itime_2002 |   .1143852   .2887069     0.40   0.692    -.4514698    .6802403
 _Itime_2003 |   .2838587   .3862335     0.73   0.462     -.473145    1.040862
 _Itime_2004 |   .7146461   .2792115     2.56   0.010     .1674018    1.261891
 _Itime_2005 |   .3636931   .3132674     1.16   0.246    -.2502998    .9776859
 _Itime_2006 |    .575762   .3303548     1.74   0.081    -.0717215    1.223246
 _Itime_2007 |    .613314   .2905819     2.11   0.035     .0437841    1.182844
 _Itime_2008 |   1.090378   .2457953     4.44   0.000     .6086284    1.572128
       _cons |    .143454   .9108596     0.16   0.875    -1.641798    1.928706
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(strongcba weakcba gdpg fb open tot ebrdi vat eu _Itime_1999 _Itime_2000
     _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
     _Itime_2007 _Itime_2008 _Itime_2009)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L2.msg
    L.L.lninf
Instruments for levels equation
  Standard
    strongcba weakcba gdpg fb open tot ebrdi vat eu _Itime_1999 _Itime_2000
     _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
     _Itime_2007 _Itime_2008 _Itime_2009
     _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    DL.msg
    D.L.lninf
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.73  Pr > z =  0.006
Arellano-Bond test for AR(2) in first differences: z =  -0.85  Pr > z =  0.397
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(16)   =  29.81  Prob > chi2 =  0.019
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(16)   =   8.45  Prob > chi2 =  0.934
  (Robust, but weakened by many instruments.)
------------------------------------------------------------------------------
Extracted 18 principal components from GMM-style instruments
  Portion of variance explained by the components =  0.730
  Kaiser-Meyer-Olkin measure of sampling adequacy =  0.511


. xi: xtabond2 lninf L.lninf strongcba weakcba gdpg msg fb open tot ebrdi defactofix
vat eu i.time, gmm(L.lninf, laglimits(1 1)) gmm(msg , laglimits (2 2)) iv(strongcba
weakcb gdpg fb defactofix open tot ebrdi  vat eu i.time)  robust pca

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring speed over space. To switch, type or click on mata: mata set matafavor
space, perm.
_Itime_1999 dropped due to collinearity
_Itime_2009 dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan/Hansen statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       229
Time variable : time                            Number of groups   =        25
Number of instruments = 38                      Obs per group: min =        38
Wald chi2(21) =   3303.74                                      avg =      9.16
Prob > chi2   =     0.000                                      max =        38
------------------------------------------------------------------------------
             |               Robust
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
         L1. |   .5396373   .1813941     2.97   0.003     .1841115    .8951632
             |
```

```
   strongcba |  -.5058679   .2191464    -2.31   0.021     -.935387   -.0763488
     weakcba |  -.1143877   .1349443    -0.85   0.397    -.3788736    .1500983
        gdpg |  -.0053782   .0080822    -0.67   0.506    -.0212191    .0104627
         msg |   .0040766   .0023523     1.73   0.083    -.0005338    .0086871
          fb |   .0041547   .0172298     0.24   0.809    -.0296152    .0379245
        open |   .0041027   .0020833     1.97   0.049     .0000194     .008186
         tot |    .004699   .0022594     2.08   0.038     .0002706    .0091274
       ebrdi |  -.2885296   .2159798    -1.34   0.182    -.7118421     .134783
  defactofix |   .0134594   .0763594     0.18   0.860    -.1362021     .163121
         vat |   .6120243   .1550179     3.95   0.000     .3081949    .9158538
          eu |   .1424486   .2101996     0.68   0.498     -.269535    .5544322
 _Itime_2000 |   .7056588   .3067214     2.30   0.021     .1044959    1.306822
 _Itime_2001 |   .7198596   .2210865     3.26   0.001      .286538    1.153181
 _Itime_2002 |   .1221537   .2834026     0.43   0.666    -.4333052    .6776125
 _Itime_2003 |   .2969753   .3942519     0.75   0.451    -.4757442    1.069695
 _Itime_2004 |   .7295099   .2930843     2.49   0.013     .1550752    1.303945
 _Itime_2005 |   .3749628   .3174762     1.18   0.238    -.2472791    .9972046
 _Itime_2006 |   .5896336   .3456613     1.71   0.088    -.0878501    1.267117
 _Itime_2007 |    .625147   .3004856     2.08   0.037     .0362061    1.214088
 _Itime_2008 |   1.094846    .255861     4.28   0.000     .5933674    1.596324
       _cons |   .1347081   .9466574     0.14   0.887    -1.720706    1.990123
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(strongcba weakcba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999
    _Itime_2000 _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005
    _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L2.msg
    L.L.lninf
Instruments for levels equation
  Standard
    strongcba weakcba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999
    _Itime_2000 _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005
    _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009
    _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    DL.msg
    D.L.lninf
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.68  Pr > z =  0.007
Arellano-Bond test for AR(2) in first differences: z =  -0.84  Pr > z =  0.402
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(16)   =  29.79  Prob > chi2 =  0.019
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(16)   =   6.31  Prob > chi2 =  0.984
  (Robust, but weakened by many instruments.)
------------------------------------------------------------------------------
Extracted 18 principal components from GMM-style instruments
  Portion of variance explained by the components =  0.730
  Kaiser-Meyer-Olkin measure of sampling adequacy =  0.511


. xi: xtabond2 lninf L.lninf strongcba weakcba gdpg msg fb open tot ebrdi ccbi
defactofix vat eu i.time, gmm(L.lninf, laglimits(1 1)) gmm( msg ccbi , laglimits (2
2)) iv(strongcba weakcba gdpg fb defactofix open tot ebrdi  vat eu i.time)  robust
pca

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring speed over space. To switch, type or click on mata: mata set matafavor
space, perm.
_Itime_1999 dropped due to collinearity
_Itime_2004 dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan/Hansen statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       153
Time variable : time                            Number of groups   =        17
Number of instruments = 41                      Obs per group: min =        55
Wald chi2(22) =   5431.04                                      avg =      9.00
Prob > chi2   =     0.000                                      max =        55
------------------------------------------------------------------------------
             |               Robust
```

```
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
         L1. |   .5031731   .1487152     3.38   0.001     .2116966    .7946495
             |
   strongcba |  -.5449068    .356888    -1.53   0.127    -1.244394    .1545808
     weakcba |  -.1167281   .1748934    -0.67   0.505     -.459513    .2260567
        gdpg |  -.0052871   .0180724    -0.29   0.770    -.0407084    .0301343
         msg |   .0132457   .0069024     1.92   0.055    -.0002829    .0267742
          fb |   .0158289   .0415519     0.38   0.703    -.0656114    .0972692
        open |   .0042664   .0022793     1.87   0.061    -.0002009    .0087336
         tot |   .0110288    .006496     1.70   0.090    -.0017031    .0237607
       ebrdi |   .0240833   .2239707     0.11   0.914    -.4148912    .4630579
        ccbi |  -.9151494    1.07644    -0.85   0.395    -3.024934    1.194635
  defactofix |   .0721218   .1014604     0.71   0.477    -.1267369    .2709805
         vat |   .5178367   .1157166     4.48   0.000     .2910363    .7446371
          eu |  -.0207531   .2047163    -0.10   0.919    -.4219897    .3804834
 _Itime_2000 |  -.1579008   .2750145    -0.57   0.566    -.6969192    .3811177
 _Itime_2001 |  -.2026059   .2122965    -0.95   0.340    -.6186994    .2134876
 _Itime_2002 |  -.7410209   .2719629    -2.72   0.006    -1.274058   -.2079834
 _Itime_2003 |  -.6838276   .2966671    -2.31   0.021    -1.265285   -.1023707
 _Itime_2005 |  -.3724798    .264211    -1.41   0.159    -.8903239    .1453643
 _Itime_2006 |  -.1507162   .1780847    -0.85   0.397    -.4997557    .1983234
 _Itime_2007 |  -.2317311   .1369876    -1.69   0.091    -.5002218    .0367596
 _Itime_2008 |   .5141997   .2412265     2.13   0.033     .0414046    .9869949
 _Itime_2009 |  -.3689911   .2968278    -1.24   0.214     -.950763    .2127808
       _cons |  -.1249458   1.503263    -0.08   0.934    -3.071288    2.821396
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(strongcba weakcba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999
    _Itime_2000 _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005
    _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L2.(msg ccbi)
    L.L.lninf
Instruments for levels equation
  Standard
    strongcba weakcba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999
    _Itime_2000 _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005
    _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009
    _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    DL.(msg ccbi)
    D.L.lninf
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.86  Pr > z =  0.004
Arellano-Bond test for AR(2) in first differences: z =  -0.80  Pr > z =  0.423
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(18)   =  20.81  Prob > chi2 =  0.289
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(18)   =   0.00  Prob > chi2 =  1.000
  (Robust, but weakened by many instruments.)
------------------------------------------------------------------------------
Extracted 21 principal components from GMM-style instruments
  Portion of variance explained by the components =  0.736
  Kaiser-Meyer-Olkin measure of sampling adequacy =  0.671
```

### Appedix 5.9d Dynamic estimation (one-step system GMM) of inflation performance model with 'pca' option used for lowering the number of instruments (strong and weak CBA)

```
. *One-step robust System GMM with one lag of dependent variable and minimum
number of instruments(with strong and weak CBA)*

. xi: xtabond2 lninf L.lninf strongcba weakcba gdpg msg fb open tot ebrdi
vat eu i.time, gmm(L.lninf, laglimits(1 1)) gmm( msg , laglimits (2 2))
iv(strongcba weakcba gdpg fb open tot ebrdi vat  eu i.time)  robust pca

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring speed over space. To switch, type or click on mata: mata set matafavor
space, perm.
_Itime_1999 dropped due to collinearity
_Itime_2009 dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
```

```
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan/Hansen statistics may be negative.


Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       229
Time variable : time                            Number of groups   =        25
Number of instruments = 37                      Obs per group: min =        38
Wald chi2(20) =   1855.38                                      avg =      9.16
Prob > chi2   =     0.000                                      max =        38
------------------------------------------------------------------------------
             |               Robust
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
         L1. |    .531867   .1764894     3.01   0.003     .1859541    .8777799
             |
   strongcba |  -.5013883    .228282    -2.20   0.028    -.9488128   -.0539638
     weakcba |  -.1088541    .145897    -0.75   0.456    -.3948069    .1770988
        gdpg |  -.0054466   .0081847    -0.67   0.506    -.0214883    .0105952
         msg |   .0043889   .0024194     1.81   0.070     -.000353    .0091308
          fb |   .0037293   .0167635     0.22   0.824    -.0291266    .0365852
        open |   .0041696   .0020314     2.05   0.040     .0001881    .0081511
         tot |   .0047209   .0022473     2.10   0.036     .0003163    .0091254
       ebrdi |   -.287985   .2084227    -1.38   0.167    -.6964859    .1205159
         vat |   .6203563   .1498961     4.14   0.000     .3265653    .9141473
          eu |   .1380587    .207803     0.66   0.506    -.2692278    .5453451
 _Itime_2000 |   .6923616   .3017542     2.29   0.022     .1009341    1.283789
 _Itime_2001 |   .7094562   .2237341     3.17   0.002     .2709453    1.147967
 _Itime_2002 |   .1143852   .2887069     0.40   0.692    -.4514698    .6802403
 _Itime_2003 |   .2838587   .3862335     0.73   0.462     -.473145    1.040862
 _Itime_2004 |   .7146461   .2792115     2.56   0.010     .1674018    1.261891
 _Itime_2005 |   .3636931   .3132674     1.16   0.246    -.2502998    .9776859
 _Itime_2006 |    .575762   .3303548     1.74   0.081    -.0717215    1.223246
 _Itime_2007 |    .613314   .2905819     2.11   0.035     .0437841    1.182844
 _Itime_2008 |   1.090378   .2457953     4.44   0.000     .6086284    1.572128
       _cons |    .143454   .9108596     0.16   0.875    -1.641798    1.928706
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(strongcba weakcba gdpg fb open tot ebrdi vat eu _Itime_1999 _Itime_2000
    _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
    _Itime_2007 _Itime_2008 _Itime_2009)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L2.msg
    L.L.lninf
Instruments for levels equation
  Standard
    strongcba weakcba gdpg fb open tot ebrdi vat eu _Itime_1999 _Itime_2000
    _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
    _Itime_2007 _Itime_2008 _Itime_2009
    _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    DL.msg
    D.L.lninf
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.73  Pr > z =  0.006
Arellano-Bond test for AR(2) in first differences: z =  -0.85  Pr > z =  0.397
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(16)   =  29.81  Prob > chi2 =  0.019
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(16)   =   8.45  Prob > chi2 =  0.934
  (Robust, but weakened by many instruments.)
------------------------------------------------------------------------------
Extracted 18 principal components from GMM-style instruments
  Portion of variance explained by the components =  0.730
  Kaiser-Meyer-Olkin measure of sampling adequacy =  0.511
```

```
. xi: xtabond2 lninf L.lninf strongcba weakcba gdpg msg fb open tot ebrdi
defactofix vat eu i.time, gmm(L.lninf, laglimits(1 1)) gmm(msg , laglimits
(2 2)) iv(strongcba weakcb gdpg fb defactofix open tot ebrdi  vat eu i.time)
robust pca

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring speed over space. To switch, type or click on mata: mata set
matafavor space, perm.
_Itime_1999 dropped due to collinearity
_Itime_2009 dropped due to collinearity
Warning: Number of instruments may be large relative to number of
observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for
Hansen test.
  Difference-in-Sargan/Hansen statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       229
Time variable : time                            Number of groups   =        25
Number of instruments = 38                      Obs per group: min =        38
Wald chi2(21) =   3303.74                                      avg =      9.16
Prob > chi2   =     0.000                                      max =        38
------------------------------------------------------------------------------
             |               Robust
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
         L1. |   .5396373   .1813941     2.97   0.003     .1841115    .8951632
             |
   strongcba |  -.5058679   .2191464    -2.31   0.021     -.935387   -.0763488
     weakcba |  -.1143877   .1349443    -0.85   0.397    -.3788736    .1500983
        gdpg |  -.0053782   .0080822    -0.67   0.506    -.0212191    .0104627
         msg |   .0040766   .0023523     1.73   0.083    -.0005338    .0086871
          fb |   .0041547   .0172298     0.24   0.809    -.0296152    .0379245
        open |   .0041027   .0020833     1.97   0.049     .0000194     .008186
         tot |    .004699   .0022594     2.08   0.038     .0002706    .0091274
       ebrdi |  -.2885296   .2159798    -1.34   0.182    -.7118421     .134783
  defactofix |   .0134594   .0763594     0.18   0.860    -.1362021     .163121
         vat |   .6120243   .1550179     3.95   0.000     .3081949    .9158538
          eu |   .1424486   .2101996     0.68   0.498     -.269535    .5544322
 _Itime_2000 |   .7056588   .3067214     2.30   0.021     .1044959    1.306822
 _Itime_2001 |   .7198596   .2210865     3.26   0.001      .286538    1.153181
 _Itime_2002 |   .1221537   .2834026     0.43   0.666    -.4333052    .6776125
 _Itime_2003 |   .2969753   .3942519     0.75   0.451    -.4757442    1.069695
 _Itime_2004 |   .7295099   .2930843     2.49   0.013     .1550752    1.303945
 _Itime_2005 |   .3749628   .3174762     1.18   0.238    -.2472791    .9972046
 _Itime_2006 |   .5896336   .3456613     1.71   0.088    -.0878501    1.267117
 _Itime_2007 |    .625147   .3004856     2.08   0.037     .0362061    1.214088
 _Itime_2008 |   1.094846    .255861     4.28   0.000     .5933674    1.596324
       _cons |   .1347081   .9466574     0.14   0.887    -1.720706    1.990123
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(strongcba weakcba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999
    _Itime_2000 _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005
    _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L2.msg
    L.L.lninf
Instruments for levels equation
  Standard
    strongcba weakcba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999
    _Itime_2000 _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005
    _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009
    _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    DL.msg
    D.L.lninf
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.68  Pr > z =  0.007
Arellano-Bond test for AR(2) in first differences: z =  -0.84  Pr > z =  0.402
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(16)   =  29.79  Prob > chi2 =  0.019
```

```
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(16)   =   6.31  Prob > chi2 =  0.984
  (Robust, but weakened by many instruments.)
------------------------------------------------------------------------------
Extracted 18 principal components from GMM-style instruments
  Portion of variance explained by the components =  0.730
  Kaiser-Meyer-Olkin measure of sampling adequacy =  0.511
```

```
. xi: xtabond2 lninf L.lninf strongcba weakcba gdpg msg fb open tot ebrdi
ccbi defactofix vat eu i.time, gmm(L.lninf, laglimits(1 1)) gmm( msg ccbi ,
laglimits (2 2)) iv(strongcba weakcba gdpg fb defactofix open tot ebrdi  vat
eu i.time)  robust pca

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring speed over space. To switch, type or click on mata: mata set
matafavor space, perm.
_Itime_1999 dropped due to collinearity
_Itime_2004 dropped due to collinearity
Warning: Number of instruments may be large relative to number of
observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for
Hansen test.
  Difference-in-Sargan/Hansen statistics may be negative.
```

```
Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       153
Time variable : time                            Number of groups   =        17
Number of instruments = 41                      Obs per group: min =        55
Wald chi2(22) =   5431.04                                      avg =      9.00
Prob > chi2   =     0.000                                      max =        55
------------------------------------------------------------------------------
             |               Robust
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
         L1. |   .5031731   .1487152     3.38   0.001     .2116966    .7946495
             |
   strongcba |  -.5449068    .356888    -1.53   0.127    -1.244394    .1545808
     weakcba |  -.1167281   .1748934    -0.67   0.505     -.459513    .2260567
        gdpg |  -.0052871   .0180724    -0.29   0.770    -.0407084    .0301343
         msg |   .0132457   .0069024     1.92   0.055    -.0002829    .0267742
          fb |   .0158289   .0415519     0.38   0.703    -.0656114    .0972692
        open |   .0042664   .0022793     1.87   0.061    -.0002009    .0087336
         tot |   .0110288    .006496     1.70   0.090    -.0017031    .0237607
       ebrdi |   .0240833   .2239707     0.11   0.914    -.4148912    .4630579
        ccbi |  -.9151494    1.07644    -0.85   0.395    -3.024934    1.194635
  defactofix |   .0721218   .1014604     0.71   0.477    -.1267369    .2709805
         vat |   .5178367   .1157166     4.48   0.000     .2910363    .7446371
          eu |  -.0207531   .2047163    -0.10   0.919    -.4219897    .3804834
 _Itime_2000 |  -.1579008   .2750145    -0.57   0.566    -.6969192    .3811177
 _Itime_2001 |  -.2026059   .2122965    -0.95   0.340    -.6186994    .2134876
 _Itime_2002 |  -.7410209   .2719629    -2.72   0.006    -1.274058   -.2079834
 _Itime_2003 |  -.6838276   .2966671    -2.31   0.021    -1.265285   -.1023707
 _Itime_2005 |  -.3724798    .264211    -1.41   0.159    -.8903239    .1453643
 _Itime_2006 |  -.1507162   .1780847    -0.85   0.397    -.4997557    .1983234
 _Itime_2007 |  -.2317311   .1369876    -1.69   0.091    -.5002218    .0367596
 _Itime_2008 |   .5141997   .2412265     2.13   0.033     .0414046    .9869949
 _Itime_2009 |  -.3689911   .2968278    -1.24   0.214     -.950763    .2127808
       _cons |  -.1249458   1.503263    -0.08   0.934    -3.071288    2.821396
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(strongcba weakcba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999
    _Itime_2000 _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005
    _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L2.(msg ccbi)
    L.L.lninf
Instruments for levels equation
  Standard
    strongcba weakcba gdpg fb defactofix open tot ebrdi vat eu _Itime_1999
    _Itime_2000 _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005
```

```
    _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009
    _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    DL.(msg ccbi)
    D.L.lninf
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.86  Pr > z =  0.004
Arellano-Bond test for AR(2) in first differences: z =  -0.80  Pr > z =  0.423
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(18)   =  20.81  Prob > chi2 =  0.289
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(18)   =   0.00  Prob > chi2 =  1.000
  (Robust, but weakened by many instruments.)
------------------------------------------------------------------------------
Extracted 21 principal components from GMM-style instruments
  Portion of variance explained by the components =  0.736
  Kaiser-Meyer-Olkin measure of sampling adequacy =  0.671
```

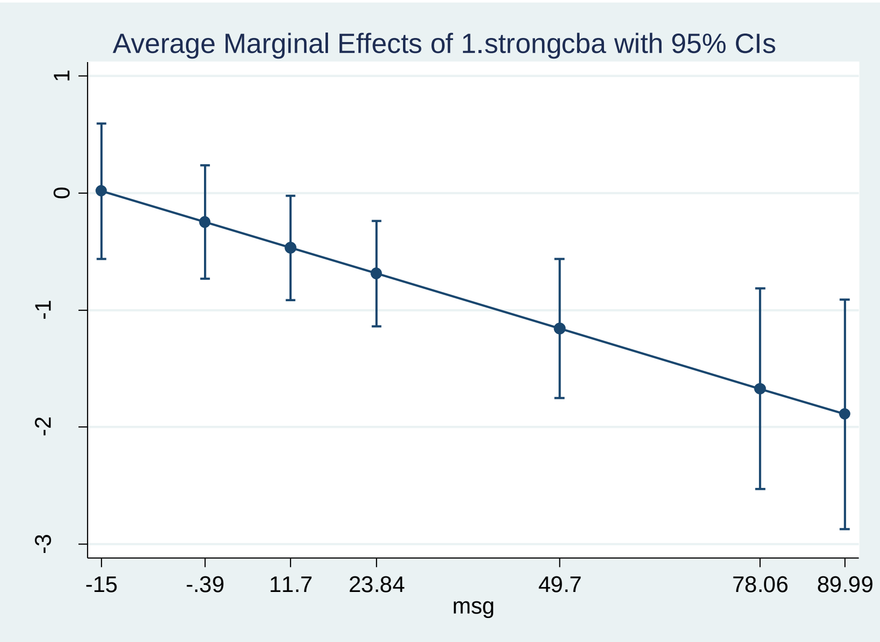
**Appendix 5.9e Estimation of the preferred 'strongCBA' and 'weakCBA' model (defactoFIX and CCBI included) with interactions between strong and weak CBA and MSG**

```
. xtabond2 lninf L.lninf i.strongcba i.weakcba  gdpg c.msg i.strongcba#c.msg
i.weakcba#c.msg fb open tot ebrdi ccbi defactofix vat eu i.time, gmm(L.lninf,
laglimits(1 1)) gmm(msg
>  ccbi strongcbamsg weakcbamsg, laglimits (2 2)) iv(strongcba weakcba gdpg fb
defactofix open tot ebrdi  vat eu i.time)  robust
Favoring speed over space. To switch, type or click on mata: mata set matafavor
space, perm.
0b.strongcba dropped due to collinearity
0b.weakcba dropped due to collinearity
0b.strongcba#co.msg dropped due to collinearity
0b.weakcba#co.msg dropped due to collinearity
1998b.time dropped due to collinearity
1999.time dropped due to collinearity
2004.time dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan/Hansen statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       153
Time variable : time                            Number of groups   =        17
Number of instruments = 108                     Obs per group: min =         7
Wald chi2(24) =   2580.56                                      avg =      9.00
Prob > chi2   =     0.000                                      max =        10
------------------------------------------------------------------------------
                |              Robust
          lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
----------------+----------------------------------------------------------------
          lninf |
            L1. |   .4512445   .0883423     5.11   0.000     .2780968    .6243923
                |
    1.strongcba |  -.2555598   .2465148    -1.04   0.300    -.7387199    .2276003
      1.weakcba |   -.439393   .1252994    -3.51   0.000    -.6849754   -.1938107
           gdpg |  -.0074923   .0213009    -0.35   0.725    -.0492413    .0342566
            msg |   .0158064   .0052688     3.00   0.003     .0054796    .0261331
                |
strongcba#c.msg |
             1  |  -.0181627   .0060566    -3.00   0.003    -.0300335   -.0062919
                |
  weakcba#c.msg |
             1  |   .0126184   .0079425     1.59   0.112    -.0029485    .0281853
                |
             fb |   .0137444   .0363032     0.38   0.705    -.0574087    .0848974
           open |   .0041846   .0024095     1.74   0.082     -.000538    .0089072
            tot |   .0093109   .0059136     1.57   0.115    -.0022796    .0209013
          ebrdi |  -.0043847   .1678415    -0.03   0.979     -.333348    .3245786
           ccbi |  -.4953554   .4888827    -1.01   0.311    -1.453548     .462837
     defactofix |   .1275156   .0841562     1.52   0.130    -.0374275    .2924587
            vat |   .7611455   .1846367     4.12   0.000     .3992641    1.123027
```

```
          eu |   .0380904   .1733737     0.22   0.826    -.3017158    .3778967
             |
        time |
        2000  |  -.1086016   .3014018    -0.36   0.719    -.6993383    .4821351
        2001  |  -.0981274   .1897969    -0.52   0.605    -.4701224    .2738676
        2002  |  -.6895505   .2808223    -2.46   0.014    -1.239952   -.1391488
        2003  |  -.6538419   .3018307    -2.17   0.030    -1.245419   -.0622646
        2005  |  -.4074378   .2494761    -1.63   0.102    -.8964019    .0815263
        2006  |  -.1847647   .2151966    -0.86   0.391    -.6065424    .2370129
        2007  |  -.2426678   .1536809    -1.58   0.114    -.5438767    .0585412
        2008  |   .5160649   .2319276     2.23   0.026     .0614953    .9706346
        2009  |  -.2813677   .2737482    -1.03   0.304    -.8179044    .2551689
             |
       _cons |  -.1916945   1.021083    -0.19   0.851     -2.19298    1.809591
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(strongcba weakcba gdpg fb defactofix open tot ebrdi vat eu 1998b.time
    1999.time 2000.time 2001.time 2002.time 2003.time 2004.time 2005.time
    2006.time 2007.time 2008.time 2009.time)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L2.(msg ccbi strongcbamsg weakcbamsg)
    L.L.lninf
Instruments for levels equation
  Standard
    strongcba weakcba gdpg fb defactofix open tot ebrdi vat eu 1998b.time
    1999.time 2000.time 2001.time 2002.time 2003.time 2004.time 2005.time
    2006.time 2007.time 2008.time 2009.time
    _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    DL.(msg ccbi strongcbamsg weakcbamsg)
    D.L.lninf
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -3.05  Pr > z =  0.002
Arellano-Bond test for AR(2) in first differences: z =  -0.55  Pr > z =  0.579
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(83)   =  91.42  Prob > chi2 =  0.247
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(83)   =   0.00  Prob > chi2 =  1.000
  (Robust, but weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(39)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(44)   =  -0.00  Prob > chi2 =  1.000
  gmm(L.lninf, lag(1 1))
    Hansen test excluding group:     chi2(66)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(17)   =   0.00  Prob > chi2 =  1.000
  gmm(msg ccbi strongcbamsg weakcbamsg, lag(2 2))
    Hansen test excluding group:     chi2(12)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(71)   =   0.00  Prob > chi2 =  1.000
  iv(strongcba weakcba gdpg fb defactofix open tot ebrdi vat eu 1998b.time 1999.time
2000.time 2001.time 2002.time 2003.time 2004.time 2005.time 2006.time 2007.time
2008.time 200
> 9.time)
    Hansen test excluding group:     chi2(63)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(20)   =   0.00  Prob > chi2 =  1.000
```

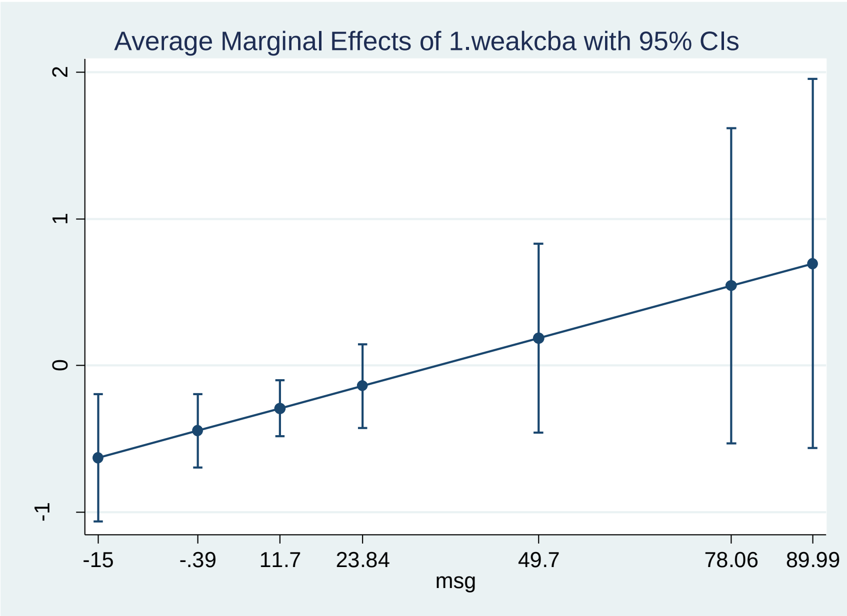
```
. margins, dydx(_all) force
Warning: cannot perform check for estimable functions.
(note: continuous option implied because a factor with only one level was specified
in the dydx() option)
(note: default prediction is a function of possibly stochastic quantities other than
e(b))

Average marginal effects                          Number of obs   =        153
Model VCE    : Robust

Expression   : Fitted Values, predict()
dy/dx w.r.t. : L.lninf 1.strongcba 1.weakcba gdpg msg fb open tot ebrdi ccbi
defactofix vat eu 2000.time 2001.time 2002.time 2003.time 2005.time 2006.time
2007.time 2008.time
               2009.time

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
         L1. |   .4512445   .0883423     5.11   0.000     .2780968    .6243923
             |
 1.strongcba |   -.642318   .2280948    -2.82   0.005    -1.089376   -.1952604
   1.weakcba |  -.1706952   .1311069    -1.30   0.193    -.4276601    .0862697
        gdpg |  -.0074923   .0213009    -0.35   0.725    -.0492413    .0342566
         msg |   .0150716   .0045569     3.31   0.001     .0061403     .024003
          fb |   .0137444   .0363032     0.38   0.705    -.0574087    .0848974
        open |   .0041846   .0024095     1.74   0.082     -.000538    .0089072
         tot |   .0093109   .0059136     1.57   0.115    -.0022796    .0209013
       ebrdi |  -.0043847   .1678415    -0.03   0.979     -.333348    .3245786
        ccbi |  -.4953554   .4888827    -1.01   0.311    -1.453548     .462837
  defactofix |   .1275156   .0841562     1.52   0.130    -.0374275    .2924587
         vat |   .7611455   .1846367     4.12   0.000     .3992641    1.123027
          eu |   .0380904   .1733737     0.22   0.826    -.3017158    .3778967
             |
        time |
       2000  |  -.1086016   .3014018    -0.36   0.719    -.6993383    .4821351
       2001  |  -.0981274   .1897969    -0.52   0.605    -.4701224    .2738676
       2002  |  -.6895505   .2808223    -2.46   0.014    -1.239952   -.1391488
       2003  |  -.6538419   .3018307    -2.17   0.030    -1.245419   -.0622646
       2005  |  -.4074378   .2494761    -1.63   0.102    -.8964019    .0815263
       2006  |  -.1847647   .2151966    -0.86   0.391    -.6065424    .2370129
       2007  |  -.2426678   .1536809    -1.58   0.114    -.5438767    .0585412
       2008  |   .5160649   .2319276     2.23   0.026     .0614953    .9706346
       2009  |  -.2813677   .2737482    -1.03   0.304    -.8179044    .2551689
------------------------------------------------------------------------------

.
```

```
. margins, dydx(strongcba) at(msg=(-15 -0.39 11.7 23.84 49.7 78.06 89.99)) force
Warning: cannot perform check for estimable functions.
(note: continuous option implied because a factor with only one level was specified
in the dydx() option)
(note: default prediction is a function of possibly stochastic quantities other than
e(b))

Average marginal effects                          Number of obs    =        153
Model VCE    : Robust

Expression   : Fitted Values, predict()
dy/dx w.r.t. : 1.strongcba

1._at        : msg             =         -15
2._at        : msg             =        -.39
3._at        : msg             =        11.7
4._at        : msg             =       23.84
5._at        : msg             =        49.7
6._at        : msg             =       78.06
7._at        : msg             =       89.99

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.strongcba  |
         _at |
          1  |   .0168801   .2947853     0.06   0.954    -.5608885    .5946487
          2  |  -.2484764   .2474669    -1.00   0.315    -.7335026    .2365499
          3  |   -.468063   .2277024    -2.06   0.040    -.9143516   -.0217744
          4  |  -.6885577   .2306695    -2.99   0.003    -1.140662   -.2364537
          5  |  -1.158244   .3035672    -3.82   0.000    -1.753225   -.5632635
          6  |  -1.673337   .4373431    -3.83   0.000    -2.530514   -.8161604
          7  |  -1.890018   .5005951    -3.78   0.000    -2.871166   -.9088695
------------------------------------------------------------------------------

. marginsplot
  Variables that uniquely identify margins: msg
```




```
. margins, dydx(weakcba) at(msg=(-15 -0.39 11.7 23.84 49.7 78.06 89.99)) force
Warning: cannot perform check for estimable functions.
(note: continuous option implied because a factor with only one level was specified
in the dydx() option)
(note: default prediction is a function of possibly stochastic quantities other than
e(b))

Average marginal effects                          Number of obs    =        153
Model VCE    : Robust
```

```
Expression    : Fitted Values, predict()
dy/dx w.r.t. : 1.weakcba

1._at         : msg               =          -15
2._at         : msg               =          -.39
3._at         : msg               =          11.7
4._at         : msg               =         23.84
5._at         : msg               =          49.7
6._at         : msg               =         78.06
7._at         : msg               =         89.99

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.weakcba    |
         _at |
          1  |   -.628669   .2213456    -2.84   0.005    -1.062498   -.1948395
          2  |  -.4443142   .1273034    -3.49   0.000    -.6938242   -.1948042
          3  |  -.2917578   .0971443    -3.00   0.003    -.4821571   -.1013584
          4  |  -.1385704   .1455876    -0.95   0.341    -.4239169    .1467761
          5  |   .1877413   .3289887     0.57   0.568    -.4570647    .8325473
          6  |    .545599   .5483488     0.99   0.320    -.5291448    1.620343
          7  |   .6961365   .6418453     1.08   0.278    -.5618572     1.95413
------------------------------------------------------------------------------

. marginsplot
  Variables that uniquely identify margins: msg
```




**Appendix 5.10: Inflation model - Calculation of the long-run coefficients on strongCBA and weakCBA**

```
. nlcom _b[strongcba]/(1-_b[l.lninf])

       _nl_1:  _b[strongcba]/(1-_b[l.lninf])

------------------------------------------------------------------------------
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _nl_1 |  -1.017188   .3722709    -2.73   0.006    -1.746825   -.2875501
------------------------------------------------------------------------------

. nlcom _b[weakcba]/(1-_b[l.lninf])

       _nl_1:  _b[weakcba]/(1-_b[l.lninf])
```

```
------------------------------------------------------------------------------
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _nl_1 |  -.2499262    .271412    -0.92   0.357     -.781884    .2820315
------------------------------------------------------------------------------
```

## Appendix 5.11: Inflation model - Preferred dynamic model with 'defactofix' variable treated as endogenous

**Appendix 5.11a CBA**

```
. xi: xtabond2 lninf L.lninf cba gdpg msg fb open tot ebrdi ccbi defactofix vat eu
i.time, gmm(L.lninf, laglimits(1 1)) gmm( msg ccbi defactofix, laglimits (2 2))
iv(cba gdpg fb  open tot ebrdi  vat eu i.time)  robust

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring space over speed. To switch, type or click on mata: mata set matafavor
speed, perm.
_Itime_1999 dropped due to collinearity
_Itime_2009 dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       153
Time variable : time                            Number of groups   =        17
Number of instruments = 87                      Obs per group: min =         7
Wald chi2(21) =  14429.42                                      avg =      9.00
Prob > chi2   =     0.000                                      max =        10
------------------------------------------------------------------------------
             |               Robust
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
         L1. |   .4392953   .0898076     4.89   0.000     .2632756     .615315
             |
         cba |  -.2044083   .1588469    -1.29   0.198    -.5157424    .1069259
        gdpg |  -.0127972   .0229637    -0.56   0.577    -.0578052    .0322107
         msg |   .0215845   .0080562     2.68   0.007     .0057946    .0373744
          fb |  -.0007123   .0354056    -0.02   0.984    -.0701059    .0686813
        open |   .0039272    .002135     1.84   0.066    -.0002573    .0081118
         tot |   .0050696   .0057321     0.88   0.376    -.0061651    .0163044
       ebrdi |   .2465187   .2370199     1.04   0.298    -.2180318    .7110691
        ccbi |  -.8513596    .560217    -1.52   0.129    -1.949365    .2466455
  defactofix |   .0241084   .1598802     0.15   0.880    -.2892511    .3374678
         vat |   .5556165   .1374824     4.04   0.000      .286156     .825077
          eu |   -.051247   .1871418    -0.27   0.784    -.4180381    .3155441
 _Itime_2000 |   .0521562    .322855     0.16   0.872     -.580628    .6849404
 _Itime_2001 |   .0086322   .3090609     0.03   0.978    -.5971161    .6143805
 _Itime_2002 |  -.4152494   .3677885    -1.13   0.259    -1.136102    .3056028
 _Itime_2003 |  -.3537186   .3174832    -1.11   0.265    -.9759742    .2685371
 _Itime_2004 |   .2851059   .2639978     1.08   0.280    -.2323204    .8025321
 _Itime_2005 |   -.102917    .328698    -0.31   0.754    -.7471533    .5413192
 _Itime_2006 |   .1176817   .2116082     0.56   0.578    -.2970628    .5324262
 _Itime_2007 |   .0533394   .2473593     0.22   0.829    -.4314759    .5381548
 _Itime_2008 |   .8508683   .2394767     3.55   0.000     .3815026    1.320234
       _cons |  -.6449889   .9789124    -0.66   0.510    -2.563622    1.273644
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(cba gdpg fb open tot ebrdi vat eu _Itime_1999 _Itime_2000 _Itime_2001
    _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006 _Itime_2007
    _Itime_2008 _Itime_2009)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L.L.lninf
    L2.(msg ccbi defactofix)
Instruments for levels equation
  Standard
    _cons
    cba gdpg fb open tot ebrdi vat eu _Itime_1999 _Itime_2000 _Itime_2001
    _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006 _Itime_2007
    _Itime_2008 _Itime_2009
```

```
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    D.L.lninf
    DL.(msg ccbi defactofix)
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.96  Pr > z =  0.003
Arellano-Bond test for AR(2) in first differences: z =  -0.83  Pr > z =  0.409
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(65)   =  83.36  Prob > chi2 =  0.062
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(65)   =   0.00  Prob > chi2 =  1.000
  (Robust, but can be weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(32)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(33)   =  -0.00  Prob > chi2 =  1.000
  gmm(L.lninf, lag(1 1))
    Hansen test excluding group:     chi2(47)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(18)   =   0.00  Prob > chi2 =  1.000
  gmm(msg ccbi defactofix, lag(2 2))
    Hansen test excluding group:     chi2(14)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(51)   =   0.00  Prob > chi2 =  1.000
  iv(cba gdpg fb open tot ebrdi vat eu _Itime_1999 _Itime_2000 _Itime_2001
_Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
>  _Itime_2007 _Itime_2008 _Itime_2009)
    Hansen test excluding group:     chi2(48)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(17)   =   0.00  Prob > chi2 =  1.000
```

**Appendix 5.11b STRONG AND WEAK CBA**

```
. xi: xtabond2 lninf L.lninf strongcba weakcba gdpg msg fb open tot ebrdi ccbi
defactofix vat eu i.time, gmm(L.lninf, laglimits(1 1)) gmm( msg ccbi defactofix,
laglimits (2 2)) iv(strongcba weakcba gdpg fb  open tot ebrdi  vat eu i.time) robust

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring space over speed. To switch, type or click on mata: mata set matafavor
speed, perm.
_Itime_1999 dropped due to collinearity
_Itime_2009 dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       153
Time variable : time                            Number of groups   =        17
Number of instruments = 88                      Obs per group: min =         7
Wald chi2(22) =   6272.07                                      avg =      9.00
Prob > chi2   =     0.000                                      max =        10
------------------------------------------------------------------------------
             |               Robust
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lninf |
         L1. |   .4407372    .086425     5.10   0.000     .2713472    .6101272
             |
   strongcba |  -.4847145   .2495969    -1.94   0.052    -.9739154    .0044865
     weakcba |   -.057327   .1892578    -0.30   0.762    -.4282655    .3136115
        gdpg |  -.0121406   .0230984    -0.53   0.599    -.0574127    .0331314
         msg |   .0189493   .0078209     2.42   0.015     .0036206    .0342779
          fb |   .0018322   .0353625     0.05   0.959     -.067477    .0711414
        open |   .0048184   .0022824     2.11   0.035      .000345    .0092917
         tot |   .0109916   .0050438     2.18   0.029      .001106    .0208772
       ebrdi |   .0878779   .2344187     0.37   0.708    -.3715742      .54733
        ccbi |  -.7999091   .5798765    -1.38   0.168    -1.936446     .336628
  defactofix |  -.0139783   .1497631    -0.09   0.926    -.3075087     .279552
         vat |   .5902754   .1423941     4.15   0.000     .3111881    .8693627
          eu |  -.0443724   .1811441    -0.24   0.806    -.3994083    .3106635
 _Itime_2000 |   .1072465   .3344192     0.32   0.748    -.5482031    .7626961
 _Itime_2001 |   .0654581   .2798495     0.23   0.815    -.4830368    .6139531
 _Itime_2002 |  -.4007956   .3520024    -1.14   0.255    -1.090708    .2891165
 _Itime_2003 |  -.3342281   .3160889    -1.06   0.290    -.9537509    .2852947
 _Itime_2004 |   .3088003   .2584708     1.19   0.232    -.1977931    .8153937
 _Itime_2005 |   -.065391   .3286733    -0.20   0.842    -.7095788    .5787968
```

```
 _Itime_2006 |   .1522146   .2057552     0.74   0.459    -.2510582    .5554874
 _Itime_2007 |   .0851243   .2350442     0.36   0.717    -.3755538    .5458024
 _Itime_2008 |   .8646356   .2291321     3.77   0.000     .4155448    1.313726
       _cons |  -.8084344     1.0473    -0.77   0.440    -2.861104    1.244236
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(strongcba weakcba gdpg fb open tot ebrdi vat eu _Itime_1999 _Itime_2000
    _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
    _Itime_2007 _Itime_2008 _Itime_2009)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L.L.lninf
    L2.(msg ccbi defactofix)
Instruments for levels equation
  Standard
    _cons
    strongcba weakcba gdpg fb open tot ebrdi vat eu _Itime_1999 _Itime_2000
    _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
    _Itime_2007 _Itime_2008 _Itime_2009
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    D.L.lninf
    DL.(msg ccbi defactofix)
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.95  Pr > z =  0.003
Arellano-Bond test for AR(2) in first differences: z =  -0.79  Pr > z =  0.430
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(65)   =  86.06  Prob > chi2 =  0.041
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(65)   =   0.00  Prob > chi2 =  1.000
  (Robust, but can be weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(32)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(33)   =  -0.00  Prob > chi2 =  1.000
  gmm(L.lninf, lag(1 1))
    Hansen test excluding group:     chi2(47)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(18)   =  -0.00  Prob > chi2 =  1.000
  gmm(msg ccbi defactofix, lag(2 2))
    Hansen test excluding group:     chi2(14)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(51)   =  -0.00  Prob > chi2 =  1.000
  iv(strongcba weakcba gdpg fb open tot ebrdi vat eu _Itime_1999 _Itime_2000
_Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_20
> 05 _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009)
    Hansen test excluding group:     chi2(47)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(18)   =   0.00  Prob > chi2 =  1.000


. nlcom _b[ccbi]/(1-_b[l.lninf])

       _nl_1:  _b[ccbi]/(1-_b[l.lninf])

------------------------------------------------------------------------------
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _nl_1 |  -1.597884   1.087846    -1.47   0.142    -3.730022    .5342542
------------------------------------------------------------------------------


nlcom _b[ccbi]/(1-_b[l.lninf])

       _nl_1:  _b[ccbi]/(1-_b[l.lninf])

------------------------------------------------------------------------------
       lninf |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _nl_1 |   -1.44588   1.144994    -1.26   0.207    -3.690027    .7982679
------------------------------------------------------------------------------
```

## Appendices Chapter 6

### Appendix 6.1: Growth model - Correlation matrix

```
cor cba defactofix l1lninf l1fb yit popg educ l1inv l1ebrdi open tot gov eu aze2006
aze2007 lva2009 arm2009 cbal1lninf cbal1fb
```

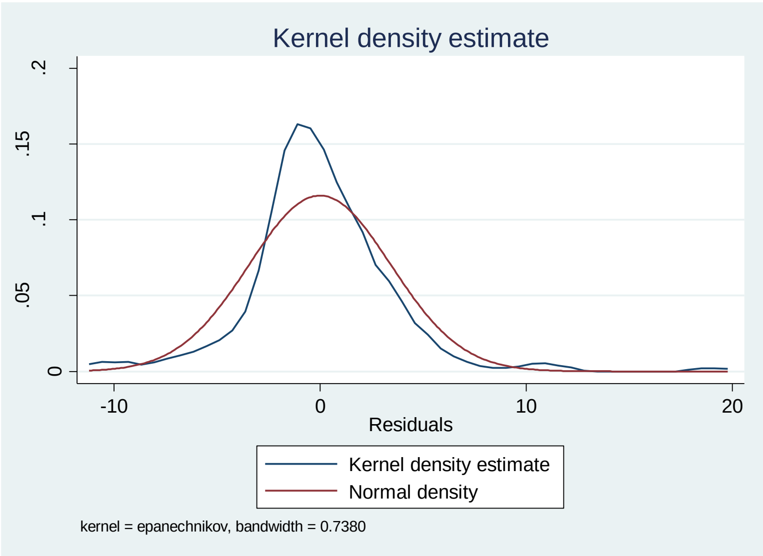
```
             |      cba defact~x  l1lninf     l1fb      yit     popg     educ    l1inv  l1ebrdi     open      tot      gov       eu
-------------+---------------------------------------------------------------------------------------------------------------------
         cba |   1.0000
  defactofix |   0.3985   1.0000
     l1lninf |  -0.1897  -0.0950   1.0000
        l1fb |   0.2684   0.2953   0.0933   1.0000
         yit |  -0.0648   0.0381  -0.1567   0.2241   1.0000
        popg |  -0.2071  -0.0630  -0.0790  -0.0222   0.2182   1.0000
        educ |   0.1917   0.2475  -0.0316   0.2766   0.3737  -0.2397   1.0000
       l1inv |   0.0441   0.2810  -0.1472   0.2451   0.3986  -0.0414   0.1563   1.0000
     l1ebrdi |   0.2765  -0.0606  -0.4882  -0.1471   0.3515  -0.1084   0.3580   0.2021   1.0000
        open |   0.2618   0.2661   0.0428   0.0085   0.0749   0.0122   0.1157   0.1439   0.2092   1.0000
         tot |   0.1022   0.0569   0.0035   0.5187   0.1857   0.1351   0.1236   0.2388   0.0556  -0.1362   1.0000
         gov |   0.0412   0.2407   0.0618  -0.1837   0.2390  -0.2594   0.4964   0.1403   0.3113   0.3482  -0.1821   1.0000
          eu |   0.1880   0.1048  -0.2410   0.0029   0.5060   0.0390   0.4936   0.2175   0.5888   0.3622  -0.0609   0.3033   1.0000
     aze2006 |  -0.0281   0.1023   0.0139   0.0962   0.0274   0.1162  -0.1249   0.1609  -0.0613  -0.0032   0.1383  -0.0599  -0.0385
     aze2007 |  -0.0281   0.1023   0.0044   0.0392   0.0509   0.1196  -0.1248   0.0410  -0.0613  -0.0217   0.1474  -0.0600  -0.0385
     lva2009 |  -0.0281   0.1023   0.0493  -0.0411   0.0979  -0.0315   0.0710   0.0545   0.0716  -0.0461  -0.0097   0.0631   0.1238
     arm2009 |  -0.0281  -0.0466   0.0087   0.0076   0.0979   0.0312   0.0076   0.1844   0.0105  -0.1253   0.0213  -0.0495  -0.0385

             |  aze2006  aze2007  lva2009  arm2009 --
-------------+------------------------------------
     aze2006 |   1.0000
     aze2007 |  -0.0048   1.0000
     lva2009 |  -0.0048  -0.0048   1.0000
     arm2009 |  -0.0048  -0.0048  -0.0048   1.0000
```

### Appendix 6.2: Growth model – OLS estimation and diagnostic tests

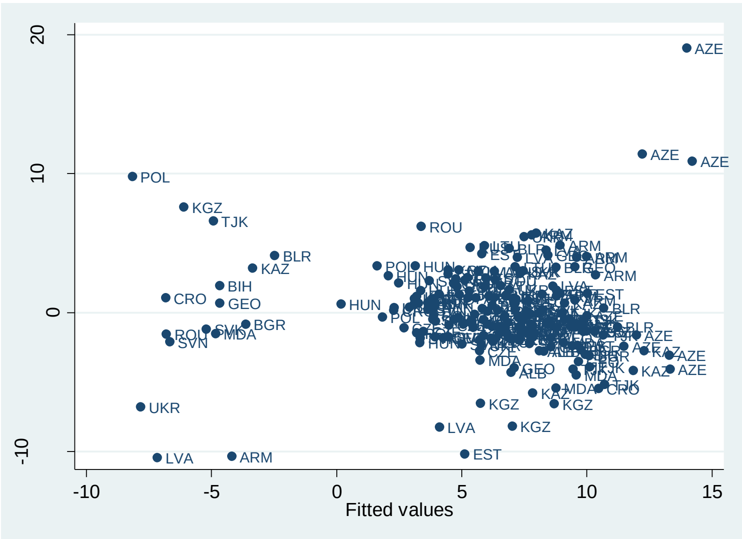
```
. *OLS*
. xi: regress gdppcg cba defactofix l1lninf l1fb yit popg educ l1inv l1ebrdi open tot
gov eu i.time
i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
note: _Itime_1999 omitted because of collinearity
note: _Itime_2000 omitted because of collinearity

      Source |       SS       df       MS              Number of obs =     211
-------------+------------------------------           F( 22,   188) =   12.45
       Model |  3617.45006    22  164.429548           Prob > F      =  0.0000
    Residual |  2483.58611   188  13.2105644           R-squared     =  0.5929
-------------+------------------------------           Adj R-squared =  0.5453
       Total |  6101.03617   210  29.0525532           Root MSE      =  3.6346

------------------------------------------------------------------------------
      gdppcg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cba |   .0136442   .9782945     0.01   0.989    -1.916201    1.943489
  defactofix |   .6822965   .7344438     0.93   0.354    -.7665135    2.131106
     l1lninf |  -1.267199   .6786705    -1.87   0.063    -2.605987     .071589
        l1fb |   .2040996   .1155468     1.77   0.079    -.0238353    .4320345
         yit |   .0165124   .2777045     0.06   0.953     -.531305    .5643298
        popg |  -22.35853   41.03362    -0.54   0.586     -103.304    58.58695
        educ |   -.030927   .0206452    -1.50   0.136    -.0716529     .009799
       l1inv |    .067696   .0461214     1.47   0.144    -.0232859    .1586779
     l1ebrdi |  -2.755845   .8875001    -3.11   0.002    -4.506583   -1.005106
        open |   .0094838   .0100338     0.95   0.346    -.0103095     .029277
         tot |   .0125687   .0156314     0.80   0.422    -.0182666    .0434041
         gov |  -.1032536   .0410912    -2.51   0.013    -.1843128   -.0221945
          eu |   1.034472   .9812314     1.05   0.293    -.9011662    2.970111
 _Itime_1999 |  (omitted)
 _Itime_2000 |  (omitted)
 _Itime_2001 |   .2732949   1.137281     0.24   0.810    -1.970178    2.516767
 _Itime_2002 |   -.323897    1.24255    -0.26   0.795     -2.77503    2.127236
 _Itime_2003 |   .9404849    1.38599     0.68   0.498    -1.793607    3.674576
 _Itime_2004 |    .552599    1.57438     0.35   0.726    -2.553122     3.65832
 _Itime_2005 |   .5752839   1.763548     0.33   0.745    -2.903602    4.054169
 _Itime_2006 |   1.862646   1.981391     0.94   0.348     -2.04597    5.771263
 _Itime_2007 |   1.406016   2.050591     0.69   0.494    -2.639107     5.45114
 _Itime_2008 |  -2.495724   2.437021    -1.02   0.307    -7.303144    2.311696
 _Itime_2009 |  -11.46674   2.589524    -4.43   0.000      -16.575    -6.35848
       _cons |   42.09454    41.3255     1.02   0.310    -39.42674    123.6158
------------------------------------------------------------------------------
```

```
. *Diagnostic tests after OLS*
. test _Itime_1999 _Itime_2000 _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004
_Itime_2005 _Itime_2006 _Itime_2007 _Itime_2008 _Itime_
> 2009

 ( 1)  o._Itime_1999 = 0
 ( 2)  o._Itime_2000 = 0
 ( 3)  _Itime_2001 = 0
 ( 4)  _Itime_2002 = 0
 ( 5)  _Itime_2003 = 0
 ( 6)  _Itime_2004 = 0
 ( 7)  _Itime_2005 = 0
 ( 8)  _Itime_2006 = 0
 ( 9)  _Itime_2007 = 0
 (10)  _Itime_2008 = 0
 (11)  _Itime_2009 = 0
       Constraint 1 dropped
       Constraint 2 dropped

       F(  9,   188) =   13.11
            Prob > F =    0.0000

. estat imtest

Cameron & Trivedi's decomposition of IM-test

---------------------------------------------------
              Source |       chi2     df      p
---------------------+-----------------------------
  Heteroskedasticity |     211.00    210    0.4676
            Skewness |      39.96     22    0.0109
            Kurtosis |       2.12      1    0.1455
---------------------+-----------------------------
               Total |     253.08    233    0.1748
---------------------------------------------------

. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of gdppcg

         chi2(1)      =     0.01
         Prob > chi2  =   0.9265

. estat ovtest

Ramsey RESET test using powers of the fitted values of gdppcg
       Ho:  model has no omitted variables
                 F(3, 185) =     12.66
                  Prob > F =      0.0000

. predict resid, residuals
(89 missing values generated)
```

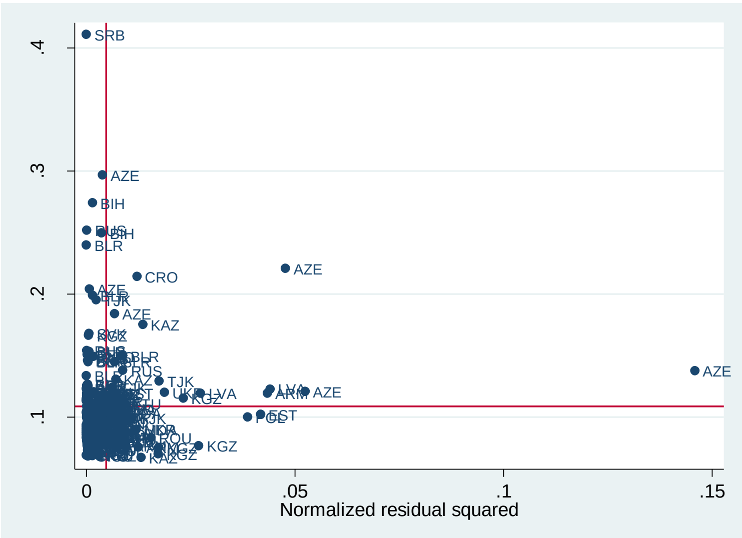
```
. kdensity resid, normal
```




```
rvfplot, mlabel(cntry)
```




```
lvrplot, mlabel(cntry)
```

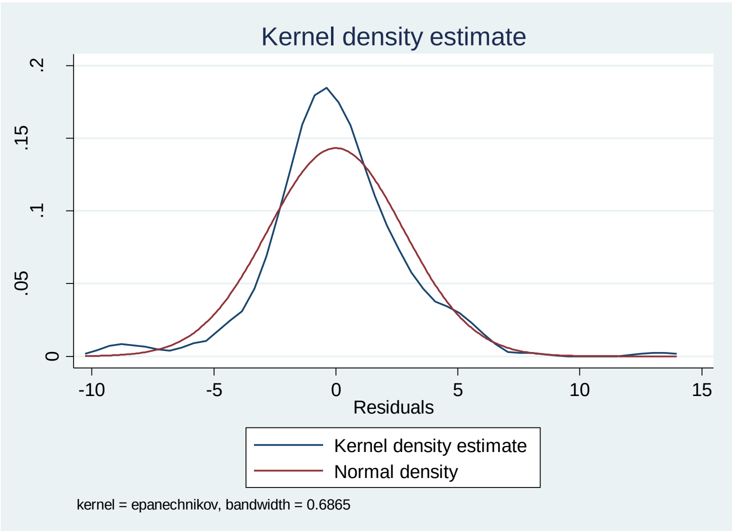


```
. hilo resid cntry time
10 lowest and highest observations on resid

  +--------------------------+
  |     resid   cntry   time |
  |--------------------------|
  | -10.46123     LVA   2009 |
  | -10.37951     ARM   2009 |
  | -10.18907     EST   2008 |
  | -8.248364     LVA   2008 |
  | -8.186865     KGZ   2005 |
  |--------------------------|
  |  -6.81614     UKR   2009 |
  | -6.568299     KGZ   2006 |
  | -6.549735     KGZ   2002 |
  |  -5.79646     KAZ   2008 |
  | -5.491123     CRO   2006 |
  +--------------------------+

  +-------------------------+
  |    resid   cntry   time |
  |-------------------------|
  | 5.456204     UKR   2004 |
  | 5.570442     ARM   2002 |
  | 5.706831     KAZ   2001 |
  | 6.205907     ROU   2008 |
  | 6.593705     TJK   2009 |
  |-------------------------|
  | 7.602277     KGZ   2009 |
  | 9.797885     POL   2009 |
  | 10.89322     AZE   2005 |
  | 11.41376     AZE   2007 |
  | 19.03766     AZE   2006 |
  +-------------------------+

. predict levg, leverage
(89 missing values generated)

. hilo levg cntry time, show(5)high
5 highest observations on levg

  +-------------------------+
  |     levg   cntry   time |
  |-------------------------|
  | .2498109     BIH   2007 |
  | .2521123     RUS   2008 |
  | .2743592     BIH   2009 |
  | .2966747     AZE   2000 |
  | .4109208     SRB   2007 |
  +-------------------------+


. test  aze2006 aze2007 lva2009 arm2009

 ( 1)  aze2006 = 0
 ( 2)  aze2007 = 0
 ( 3)  lva2009 = 0
 ( 4)  arm2009 = 0

       F(  4,   182) =   28.53
            Prob > F =    0.0000
```

## Appendix 6.3: Growth model - OLS with country-time dummies for outliers – estimation and diagnostic tests

```
. xi: regress gdppcg cba defactofix l1lninf l1fb yit popg educ l1inv l1ebrdi open tot
gov eu aze2006 aze2007 lva2009 arm2009 i.time
i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
note: _Itime_1999 omitted because of collinearity
note: _Itime_2000 omitted because of collinearity

      Source |       SS       df       MS              Number of obs =     211
-------------+------------------------------           F( 26,   184) =   19.43
       Model |  4472.24461    26  172.009408           Prob > F      =  0.0000
    Residual |  1628.79156   184  8.85212807           R-squared     =  0.7330
-------------+------------------------------           Adj R-squared =  0.6953
       Total |  6101.03617   210  29.0525532           Root MSE      =  2.9753

------------------------------------------------------------------------------
      gdppcg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cba |   .0028747   .8068582     0.00   0.997    -1.589009    1.594758
  defactofix |   .0689172      .6232     0.11   0.912    -1.160619    1.298454
     l1lninf |  -1.323807   .5606108    -2.36   0.019    -2.429859   -.2177549
        l1fb |   .1822829   .0949466     1.92   0.056    -.0050412    .3696069
         yit |  -.1153624    .228573    -0.50   0.614    -.5663234    .3355986
        popg |  -46.29363   33.81417    -1.37   0.173     -113.007    20.41972
        educ |   .0019909   .0173852     0.11   0.909    -.0323092     .036291
       l1inv |   .0601007   .0389306     1.54   0.124     -.016707    .1369085
     l1ebrdi |   -2.38907   .7304977    -3.27   0.001    -3.830298   -.9478411
        open |   .0095985   .0083027     1.16   0.249    -.0067823    .0259793
         tot |  -.0051524   .0130132    -0.40   0.693    -.0308267    .0205219
         gov |  -.1294429   .0337847    -3.83   0.000    -.1960981   -.0627877
          eu |   .8145401   .8115415     1.00   0.317     -.786583    2.415663
     aze2006 |   22.82109   3.213293     7.10   0.000     16.48146    29.16073
     aze2007 |   14.58037   3.182797     4.58   0.000     8.300901    20.85984
     lva2009 |   -12.2097   3.182448    -3.84   0.000    -18.48848    -5.93092
     arm2009 |  -12.15751   3.176461    -3.83   0.000    -18.42448    -5.89054
 _Itime_1999 |  (omitted)
 _Itime_2000 |  (omitted)
 _Itime_2001 |   .3311203   .9312389     0.36   0.723    -1.506159    2.168399
 _Itime_2002 |  -.2226854   1.019052    -0.22   0.827    -2.233215    1.787844
 _Itime_2003 |   1.148187   1.138096     1.01   0.314     -1.09721    3.393584
 _Itime_2004 |   .9624805   1.291356     0.75   0.457    -1.585288    3.510249
 _Itime_2005 |   1.124899    1.44725     0.78   0.438     -1.73044    3.980238
 _Itime_2006 |   1.443823   1.632137     0.88   0.378    -1.776287    4.663932
 _Itime_2007 |   1.640097   1.686212     0.97   0.332    -1.686699    4.966894
 _Itime_2008 |   -1.38609   2.003118    -0.69   0.490    -5.338122    2.565942
 _Itime_2009 |   -8.81296   2.154567    -4.09   0.000    -13.06379   -4.562128
       _cons |    67.9565   34.07475     1.99   0.048     .7290552    135.1839
------------------------------------------------------------------------------

. *Diagnostic tests after OLS*
. test _Itime_1999 _Itime_2000 _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004
_Itime_2005 _Itime_2006 _Itime_2007 _Itime_2008 _Itime_
> 2009

 ( 1)  o._Itime_1999 = 0
 ( 2)  o._Itime_2000 = 0
 ( 3)  _Itime_2001 = 0
 ( 4)  _Itime_2002 = 0
 ( 5)  _Itime_2003 = 0
 ( 6)  _Itime_2004 = 0
 ( 7)  _Itime_2005 = 0
 ( 8)  _Itime_2006 = 0
 ( 9)  _Itime_2007 = 0
 (10)  _Itime_2008 = 0
 (11)  _Itime_2009 = 0
       Constraint 1 dropped
       Constraint 2 dropped

       F(  9,   184) =   11.88
            Prob > F =    0.0000
```

```
. estat imtest

Cameron & Trivedi's decomposition of IM-test

---------------------------------------------------
              Source |       chi2     df      p
---------------------+-----------------------------
  Heteroskedasticity |     211.00    210    0.4676
            Skewness |      40.99     26    0.0311
            Kurtosis |       2.72      1    0.0992
---------------------+-----------------------------
               Total |     254.70    237    0.2049
---------------------------------------------------

. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of gdppcg

         chi2(1)      =     1.37
         Prob > chi2  =   0.2417

. estat ovtest

Ramsey RESET test using powers of the fitted values of gdppcg
       Ho:  model has no omitted variables
                 F(3, 181) =      0.69
                  Prob > F =      0.5588


. predict resi, residuals
(89 missing values generated)

. kdensity resi, normal
```



## Appendix 6.4: Growth model – Fixed and random effects estimations

***FE model***

```
. xi: xtreg gdppcg cba defactofix l1lninf l1fb yit popg educ l1inv l1ebrdi open tot
gov eu aze2006 aze2007 lva2009 arm2009 i.time, fe
i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
note: cba omitted because of collinearity
note: _Itime_1999 omitted because of collinearity
note: _Itime_2000 omitted because of collinearity
note: _Itime_2009 omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =       211
Group variable: ctyno                           Number of groups   =        24

R-sq:  within  = 0.7269                         Obs per group: min =         1
       between = 0.3238                                        avg =       8.8
       overall = 0.6267                                        max =        10

                                                F(24,163)          =     18.08
corr(u_i, Xb)  = -0.3049                        Prob > F           =    0.0000

------------------------------------------------------------------------------
      gdppcg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cba |  (omitted)
  defactofix | -.8146296   .9873261    -0.83   0.411    -2.764228    1.134969
     l1lninf |  -1.04398   .6607603    -1.58   0.116    -2.348734    .2607736
        l1fb |  .1017036   .1177439     0.86   0.389    -.1307964    .3342036
         yit | -.6888733   .2183326    -3.16   0.002    -1.119998   -.2577483
        popg | -153.7705   73.09014    -2.10   0.037    -298.0961   -9.444889
        educ | -.0445416   .0486068    -0.92   0.361    -.1405217    .0514385
       l1inv |  .0314903   .0513857     0.61   0.541    -.0699771    .1329578
     l1ebrdi | -2.894078   3.712939    -0.78   0.437    -10.22574    4.437584
        open |  .0434588   .0162058     2.68   0.008     .0114585    .0754591
         tot | -.0161965   .0145608    -1.11   0.268    -.0449487    .0125558
         gov | -.1108882   .0558521    -1.99   0.049    -.2211752   -.0006012
          eu | -.5039566   .9202699    -0.55   0.585    -2.321144    1.313231
     aze2006 |  20.53851    3.13901     6.54   0.000     14.34015    26.73688
     aze2007 |  11.72412   3.165784     3.70   0.000     5.472882    17.97535
     lva2009 | -13.98651   3.177718    -4.40   0.000    -20.26131   -7.711709
     arm2009 | -14.31888   3.230568    -4.43   0.000    -20.69804    -7.93972
 _Itime_1999 |  (omitted)
 _Itime_2000 |  (omitted)
 _Itime_2001 |  1.459042   .8228779     1.77   0.078    -.1658328    3.083917
 _Itime_2002 |  1.766063   .8187571     2.16   0.032      .149325    3.382801
 _Itime_2003 |  3.987397   .8343029     4.78   0.000     2.339962    5.634832
 _Itime_2004 |  5.043893   .8523823     5.92   0.000     3.360758    6.727028
 _Itime_2005 |  6.199033   .8524543     7.27   0.000     4.515756     7.88231
 _Itime_2006 |  7.286308   .9297091     7.84   0.000     5.450482    9.122135
 _Itime_2007 |  8.452767   .9383083     9.01   0.000      6.59996    10.30557
 _Itime_2008 |   6.05729   .9739753     6.22   0.000     4.134055    7.980526
 _Itime_2009 |  (omitted)
       _cons |  180.0914   73.53415     2.45   0.015     34.88907    325.2938
-------------+----------------------------------------------------------------
     sigma_u |  2.8140341
     sigma_e |  2.7968994
         rho |  .50305378   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(23, 163) =     1.97             Prob > F = 0.0082
```

***RE model***

```
. xi: xtreg gdppcg cba defactofix l1lninf l1fb yit popg educ l1inv l1ebrdi open tot
gov eu aze2006 aze2007 lva2009 arm2009 i.time, re
i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
note: _Itime_1999 omitted because of collinearity
note: _Itime_2009 omitted because of collinearity

Random-effects GLS regression                   Number of obs      =       211
Group variable: ctyno                           Number of groups   =        24

R-sq:  within  = 0.7058                         Obs per group: min =         1
       between = 0.8417                                        avg =       8.8
       overall = 0.7326                                        max =        10

Random effects u_i ~ Gaussian                   Wald chi2(26)      =    493.68
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      gdppcg |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cba |  -.0312795   .8759536    -0.04   0.972    -1.748117    1.685558
  defactofix |   .0653488   .6530205     0.10   0.920    -1.214548    1.345245
     l1lninf |  -1.276424   .5629833    -2.27   0.023    -2.379851   -.1729966
        l1fb |   .1830978   .0971337     1.89   0.059    -.0072807    .3734763
         yit |   -.095953   .2366472    -0.41   0.685     -.559773    .3678671
        popg |  -52.13858   36.15419    -1.44   0.149    -122.9995    18.72233
        educ |     .00106   .0184137     0.06   0.954    -.0350301    .0371501
       l1inv |   .0553196   .0398415     1.39   0.165    -.0227683    .1334076
     l1ebrdi |  -2.323929   .7724565    -3.01   0.003    -3.837916    -.809942
        open |    .011942   .0087843     1.36   0.174    -.0052748    .0291589
         tot |  -.0058388   .0130806    -0.45   0.655    -.0314763    .0197986
         gov |  -.1314148   .0349782    -3.76   0.000    -.1999709   -.0628587
          eu |    .635639   .8186637     0.78   0.437    -.9689124     2.24019
     aze2006 |    22.5706   3.178035     7.10   0.000     16.34176    28.79943
     aze2007 |   14.25788   3.152831     4.52   0.000      8.07845    20.43732
     lva2009 |  -12.41058   3.158823    -3.93   0.000    -18.60176   -6.219404
     arm2009 |  -12.69124   3.155165    -4.02   0.000    -18.87525   -6.507225
 _Itime_1999 |  (omitted)
 _Itime_2000 |   8.734762   2.208778     3.95   0.000     4.405637    13.06389
 _Itime_2001 |   9.059416   2.012051     4.50   0.000      5.11587    13.00296
 _Itime_2002 |   8.500647   1.823363     4.66   0.000     4.926922    12.07437
 _Itime_2003 |   9.863448   1.656723     5.95   0.000     6.616331    13.11057
 _Itime_2004 |   9.724918   1.498803     6.49   0.000     6.787318    12.66252
 _Itime_2005 |   9.876668    1.33888     7.38   0.000     7.252512    12.50082
 _Itime_2006 |   10.17915   1.240468     8.21   0.000     7.747879    12.61042
 _Itime_2007 |   10.40197   1.172677     8.87   0.000     8.103567    12.70038
 _Itime_2008 |   7.347916    1.06209     6.92   0.000     5.266257    9.429575
 _Itime_2009 |  (omitted)
       _cons |    64.5521   36.60287     1.76   0.078    -7.188213    136.2924
-------------+----------------------------------------------------------------
     sigma_u |  .48064621
     sigma_e |  2.7968994
         rho |  .02868517   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. estimates store random

. hausman fixed random

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |     fixed        random       Difference          S.E.
-------------+----------------------------------------------------------------
         cba |    .0028747    -.0312795        .0341542               .
  defactofix |    .0689172     .0653488        .0035684               .
     l1lninf |   -1.323807    -1.276424       -.0473831               .
        l1fb |    .1822829     .1830978       -.0008149               .
         yit |   -.1153624     -.095953       -.0194094               .
        popg |   -46.29363    -52.13858        5.844949               .
        educ |    .0019909       .00106        .0009309               .
       l1inv |    .0601007     .0553196        .0047811               .
     l1ebrdi |    -2.38907    -2.323929       -.0651406               .
        open |    .0095985      .011942       -.0023435               .
         tot |   -.0051524    -.0058388        .0006864               .
         gov |   -.1294429    -.1314148        .0019719               .
          eu |    .8145401      .635639        .1789011               .
```

```
     aze2006 |    22.82109      22.5706        .2504958        .4747032
     aze2007 |    14.58037     14.25788        .3224866        .4357275
     lva2009 |    -12.2097    -12.41058        .2008825        .3870562
     arm2009 |   -12.15751    -12.69124        .5337279        .3671968
 _Itime_2001 |    .3311203     9.059416       -8.728296               .
 _Itime_2002 |   -.2226854     8.500647       -8.723332               .
 _Itime_2003 |    1.148187     9.863448       -8.715261               .
 _Itime_2004 |    .9624805     9.724918       -8.762437               .
 _Itime_2005 |    1.124899     9.876668       -8.751769        .5494861
 _Itime_2006 |    1.443823     10.17915       -8.735329        1.060712
 _Itime_2007 |    1.640097     10.40197       -8.761876        1.211668
 _Itime_2008 |    -1.38609     7.347916       -8.734006        1.698365
------------------------------------------------------------------------------
                             b = consistent under Ho and Ha; obtained from fit
              B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                 chi2(25) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =    -0.20    chi2<0 ==> model fitted on these
                                        data fails to meet the asymptotic
                                        assumptions of the Hausman test;
                                        see suest for a generalized test

. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

        gdppcg[ctyno,t] = Xb + u[ctyno] + e[ctyno,t]

        Estimated results:
                         |       Var     sd = sqrt(Var)
                ---------+-----------------------------
                  gdppcg |   29.05255       5.390042
                       e |   7.822646       2.796899
                       u |   .2310208       .4806462

        Test:   Var(u) = 0
                             chi2(1) =     2.01
                         Prob > chi2 =     0.0784
```

**Appendix 6.5: Growth model - FEVD**

**Appendix 6.5a: Growth model - Between and within effects**

```
. xtsum cba defactofix l1lninf l1fb yit popg educ l1inv l1ebrdi open tot gov eu
cbal1lninf cbal1fb

Variable         |      Mean   Std. Dev.       Min        Max |    Observations
-----------------+--------------------------------------------+----------------
cba      overall |       .16    .3672186          0          1 |     N =     300
         between |              .3741657          0          1 |     n =      25
         within  |                     0        .16        .16 |     T =      12
                 |                                            |
defact~x overall |  .3033333    .4604661          0          1 |     N =     300
         between |              .3937298          0          1 |     n =      25
         within  |              .2504177       -.53       1.22 |     T =      12
                 |                                            |
l1lninf  overall |   2.89359    .5115875   .3885427   5.715971 |     N =     275
         between |              .3570453   2.520275   3.863841 |     n =      25
         within  |              .3726835   .7374492    4.74572 |     T =      11
                 |                                            |
l1fb     overall | -2.135042    3.750397  -13.13681   25.46177 |     N =     273
         between |              2.492413  -6.438151   2.912338 |     n =      25
         within  |               2.83499  -11.38511   21.48492 | T-bar =   10.92
                 |                                            |
yit      overall |  12.54333    4.109064          0         20 |     N =     300
         between |              2.269606   4.583333       14.5 |     n =      25
         within  |              3.452941   7.043333   18.04333 |     T =      12
                 |                                            |
popg     overall |  .9991076    .0075943   .9718928   1.034805 |     N =     275
         between |              .0065562   .9858042   1.013155 |     n =      25
         within  |              .0040322   .9723614   1.026627 |     T =      11
                 |                                            |
educ     overall |  45.50164     18.4419    13.3479    87.6183 |     N =     267
         between |              16.11634   15.24345   70.41013 |     n =      25
```

```
         within |             9.377196   18.87013   71.67195 | T-bar =   10.68
                |                                            |
l1inv    overall |  25.47524   6.766868      4.386     57.991 |     N =     264
         between |             4.403091   13.90618   32.81645 |     n =      24
         within  |              5.20965   12.07824   50.64979 |     T =      11
                 |                                            |
l1ebrdi  overall |  3.089649   .5522207    1.41625          4 |     N =     274
         between |             .5298104   1.799318   3.915227 |     n =      25
         within  |             .1872695   2.267376   3.768626 |     T =   10.96
                 |                                            |
open     overall |  102.8195   31.22955    45.1349    203.203 |     N =     298
         between |             28.39026   57.85231   157.0112 |     n =      25
         within  |             14.09477   55.78941   185.7113 |     T =   11.92
                 |                                            |
tot      overall |  106.5036   20.74314    73.5077    238.183 |     N =     248
         between |             14.57014   91.55393   145.8427 |     n =      25
         within  |             14.97536   53.76543   198.8439 |     T =    9.92
                 |                                            |
gov      overall |  36.38287   9.321389    3.09956    62.8461 |     N =     297
         between |             8.346872   21.66292   49.46571 |     n =      25
         within  |             4.452042  -.7212324   53.27864 | T-bar =   11.88
                 |                                            |
eu       overall |       .18   .3848294          0          1 |     N =     300
         between |             .2340762          0         .5 |     n =      25
         within  |             .3087357       -.32        .93 |     T =      12
                 |                                            |
cbal1l~f overall |  .4276988    .986831          0    3.35593 |     N =     275
         between |             1.001378          0   2.853096 |     n =      25
         within  |             .0876046   .0725165    .974297 |     T =      11
                 |                                            |
cbal1fb  overall | -.0345027   .9541556   -4.68313   3.374847 |     N =     273
         between |             .5472353  -2.052314   1.580108 |     n =      25
         within  |             .7872503   -4.05974   2.971546 | T-bar =   10.92
```

## Appnedix 6.5b: Growth model - FEVD estimated by using a 3-stages procedure

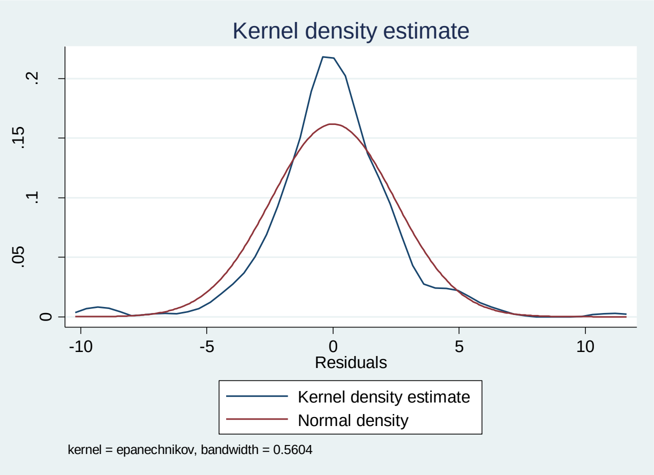
```
3 stages

. **CBA (4 countries)**
. *Stage 1 (panel robust SE)
. xi: xtreg gdppcg cba defactofix l1lninf l1fb yit popg educ l1inv l1ebrdi open tot
gov eu aze2006 aze2007 lva2009 arm2009 i.time , fe robust

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
note: cba omitted because of collinearity
note: _Itime_1999 omitted because of collinearity
note: _Itime_2000 omitted because of collinearity
note: _Itime_2009 omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =       211
Group variable: ctyno                           Number of groups   =        24

R-sq:  within  = 0.7269                         Obs per group: min =         1
       between = 0.3238                                        avg =       8.8
       overall = 0.6267                                        max =        10

                                                F(20,23)           =         .
corr(u_i, Xb)  = -0.3049                        Prob > F           =         .

                                 (Std. Err. adjusted for 24 clusters in ctyno)
------------------------------------------------------------------------------
             |               Robust
      gdppcg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cba |  (omitted)
  defactofix | -.8146296   .7942158    -1.03   0.316     -2.45759     .828331
     l1lninf |  -1.04398   .8754877    -1.19   0.245    -2.855064    .7671043
        l1fb |  .1017036   .1138939     0.89   0.381    -.1339039    .3373111
         yit | -.6888733   .2535229    -2.72   0.012    -1.213325   -.1644213
        popg | -153.7705   40.24269    -3.82   0.001    -237.0188   -70.52213
        educ | -.0445416   .0638235    -0.70   0.492    -.1765706    .0874873
       l1inv |  .0314903   .0724473     0.43   0.668    -.1183783     .181359
     l1ebrdi | -2.894078   3.879948    -0.75   0.463    -10.92036    5.132207
        open |  .0434588   .0151035     2.88   0.009     .0122149    .0747027
         tot | -.0161965   .0180372    -0.90   0.379    -.0535092    .0211163
```

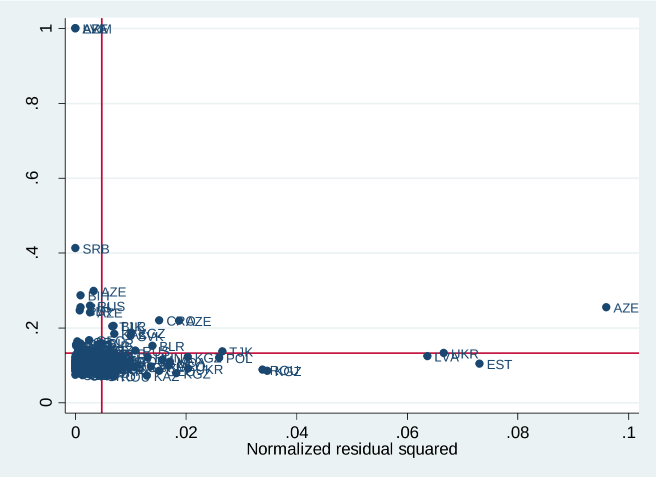
```
         gov |  -.1108882   .0882642    -1.26   0.222    -.2934765    .0717001
          eu |  -.5039566   .9971896    -0.51   0.618      -2.5668    1.558887
     aze2006 |   20.53851   1.177344    17.44   0.000     18.10299    22.97403
     aze2007 |   11.72412   1.035585    11.32   0.000     9.581845    13.86639
     lva2009 |  -13.98651    1.71791    -8.14   0.000    -17.54028   -10.43274
     arm2009 |  -14.31888   1.975586    -7.25   0.000    -18.40569   -10.23207
 _Itime_1999 |  (omitted)
 _Itime_2000 |  (omitted)
 _Itime_2001 |   1.459042   .6273596     2.33   0.029     .1612499    2.756834
 _Itime_2002 |   1.766063   .7205152     2.45   0.022     .2755636    3.256562
 _Itime_2003 |   3.987397   .7525256     5.30   0.000     2.430679    5.544114
 _Itime_2004 |   5.043893   .6539156     7.71   0.000     3.691165     6.39662
 _Itime_2005 |   6.199033   1.116281     5.55   0.000      3.88983    8.508236
 _Itime_2006 |   7.286308   .9692477     7.52   0.000     5.281267     9.29135
 _Itime_2007 |   8.452767   1.052611     8.03   0.000     6.275274    10.63026
 _Itime_2008 |    6.05729   1.394932     4.34   0.000     3.171653    8.942928
 _Itime_2009 |  (omitted)
       _cons |   180.0914   41.04663     4.39   0.000     95.17999    265.0028
-------------+----------------------------------------------------------------
     sigma_u |  2.8140341
     sigma_e |  2.7968994
         rho |  .50305378   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. *Save fixed effect (unit effects) from stage 1
. predict fixedeff, u
(89 missing values generated)

. *Stage 2 (regression of the FE vector on the time-invariant and slowly changing
explantory variables - by OLS)
. reg fixedeff cba l1ebrdi popg open gov educ

      Source |       SS       df       MS              Number of obs =     211
-------------+------------------------------           F(  6,   204) =   22.07
       Model |  435.191935     6  72.5319892           Prob > F      =  0.0000
    Residual |  670.329791   204  3.28593035           R-squared     =  0.3937
-------------+------------------------------           Adj R-squared =  0.3758
       Total |  1105.52173   210  5.26438917           Root MSE      =  1.8127

------------------------------------------------------------------------------
    fixedeff |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cba |   .2141747   .3998075     0.54   0.593    -.5741101     1.00246
     l1ebrdi |   1.211426   .2702099     4.48   0.000      .678664    1.744189
        popg |   95.08174   18.13671     5.24   0.000     59.32229    130.8412
        open |  -.0283921   .0044044    -6.45   0.000     -.037076   -.0197082
         gov |  -.0171296   .0173659    -0.99   0.325    -.0513693      .01711
        educ |   .0479532    .008142     5.89   0.000        .0319    .0640064
       _cons |  -97.48203   18.20847    -5.35   0.000     -133.383    -61.5811
------------------------------------------------------------------------------

. * Save the residuals from stage 2
. predict resdfevd, residuals
(89 missing values generated)

. *Stage 3 (estimation of pooled OLS by including all explanatory time-variant, time-
invariant variables and unexplained part of the FE vector - error term from the stage
2)
. regress gdppcg cba defactofix l1lninf l1fb yit popg educ l1inv l1ebrdi open tot gov
eu resdfevd aze2006 aze2007 lva2009 arm2009 i.time

      Source |       SS       df       MS              Number of obs =     211
-------------+------------------------------           F( 27,   183) =   25.65
       Model |  4825.94487    27  178.738699           Prob > F      =  0.0000
    Residual |   1275.0913   183  6.96771202           R-squared     =  0.7910
-------------+------------------------------           Adj R-squared =  0.7602
       Total |  6101.03617   210  29.0525532           Root MSE      =  2.6396

------------------------------------------------------------------------------
      gdppcg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cba |   .2141747   .7164582     0.30   0.765    -1.199406    1.627755
  defactofix |  -.8146296   .5666391    -1.44   0.152    -1.932615    .3033561
     l1lninf |   -1.04398   .4989219    -2.09   0.038    -2.028359   -.0596012
        l1fb |   .1017036   .0849924     1.20   0.233    -.0659875    .2693947
         yit |  -.6888733   .2181815    -3.16   0.002    -1.119348   -.2583985
        popg |  -58.68874   30.05032    -1.95   0.052    -117.9784    .6008878
```

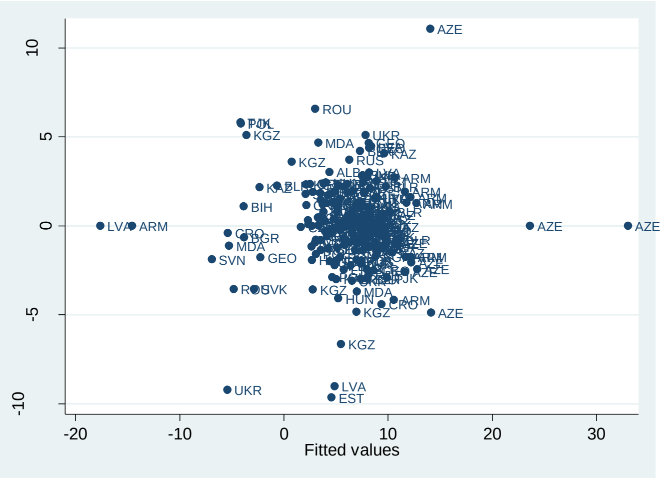
```
        educ |   .0034116   .0154255     0.22   0.825    -.0270231    .0338462
       l1inv |   .0314903   .0347718     0.91   0.366    -.0371149    .1000956
     l1ebrdi |  -1.682652   .6556374    -2.57   0.011    -2.976232   -.3890714
        open |   .0150667    .007406     2.03   0.043     .0004545    .0296789
         tot |  -.0161965   .0116489    -1.39   0.166    -.0391799     .006787
         gov |  -.1280178   .0299744    -4.27   0.000    -.1871577   -.0688779
          eu |  -.5039566   .7434009    -0.68   0.499    -1.970695    .9627823
    resdfevd |          1   .1403548     7.12   0.000     .7230782    1.276922
     aze2006 |   20.53851   2.868777     7.16   0.000     14.87838    26.19864
     aze2007 |   11.72412   2.852091     4.11   0.000     6.096907    17.35133
     lva2009 |  -13.98651   2.834458    -4.93   0.000    -19.57893   -8.394089
     arm2009 |  -14.31888   2.834435    -5.05   0.000    -19.91125   -8.726506
             |
        time |
       2001  |   1.459042    .841225     1.73   0.085    -.2007047    3.118789
       2002  |   1.766063   .9462111     1.87   0.064    -.1008229    3.632949
       2003  |   3.987397    1.08551     3.67   0.000     1.845673     6.12912
       2004  |   5.043893   1.280921     3.94   0.000      2.51662    7.571165
       2005  |   6.199033   1.468283     4.22   0.000     3.302093    9.095973
       2006  |   7.286308     1.6641     4.38   0.000      4.00302     10.5696
       2007  |   8.452767   1.775482     4.76   0.000     4.949719    11.95581
       2008  |    6.05729    2.06149     2.94   0.004     1.989945    10.12464
       2009  |  -1.44e-07   2.276834    -0.00   1.000    -4.492221     4.49222
             |
       _cons |   82.60938   30.30097     2.73   0.007     22.82521    142.3936
------------------------------------------------------------------------------
```

**. *Diagnostic tests after 3rd stage***

```
. estat imtest

Cameron & Trivedi's decomposition of IM-test

---------------------------------------------------
              Source |       chi2     df      p
---------------------+-----------------------------
  Heteroskedasticity |     211.00    210    0.4676
            Skewness |      34.57     27    0.1502
            Kurtosis |       4.79      1    0.0287
---------------------+-----------------------------
               Total |     250.35    238    0.2786
---------------------------------------------------

. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of gdppcg

         chi2(1)      =     2.35
         Prob > chi2  =   0.1252

. estat ovtest

Ramsey RESET test using powers of the fitted values of gdppcg
       Ho:  model has no omitted variables
                 F(3, 180) =      2.36
                  Prob > F =      0.0733

. predict resd, residuals
(89 missing values generated)
```




```
. xtserial gdppcg cba defactofix l1lninf l1fb yit popg educ l1inv l1ebrdi open tot
gov eu res
> dfevd aze2006 aze2007 lva2009 arm2009

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      21) =      12.400
           Prob > F =      0.0020
```

**Appendix 6.5c: Growth model - FEVD estimated by using 'xtfevd' command**

```
. xtfevd gdppcg cba defactofix l1lninf l1fb yit popg educ l1inv l1ebrdi open tot gov
eu aze2006 aze2007 lva2009 arm2009  _Itime_2001 _ Itime_2002 _Itime_2003 _Itime_2004
_Itime_2005 _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009, invariant(cba l1ebrdi
popg open gov educ)

panel fixed effects regression with vector decomposition

degrees of freedom fevd    =      161          number of obs       =       211
mean squared error         = 6.043087          F( 28, 161)         = 14.48251
root mean squared error    = 2.458269          Prob > F            = 4.11e-30
Residual Sum of Squares    = 1275.091          R-squared           = .7910041
Total Sum of Squares       = 6101.036          adj. R-squared      = .7273967
Estimation Sum of Squares  = 4825.945

------------------------------------------------------------------------------
             |                fevd
      gdppcg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  defactofix |  -.8146296   1.136658    -0.72   0.475     -3.05931    1.430051
     l1lninf |   -1.04398   .7766185    -1.34   0.181    -2.577653    .4896925
        l1fb |   .1017036   .1419908     0.72   0.475     -.178701    .3821082
         yit |  -.6888733   .4264105    -1.62   0.108    -1.530952    .1532057
       l1inv |   .0314903   .0545337     0.58   0.564    -.0762032    .1391839
         tot |  -.0161965   .0185765    -0.87   0.385    -.0528816    .0204887
          eu |  -.5039566   1.189929    -0.42   0.672    -2.853838    1.845925
     aze2006 |   20.53851   3.237682     6.34   0.000     14.14471    26.93231
     aze2007 |   11.72412   3.301798     3.55   0.001     5.203699    18.24453
     lva2009 |  -13.98651   3.312015    -4.22   0.000     -20.5271   -7.445915
     arm2009 |  -14.31888   3.363808    -4.26   0.000    -20.96176   -7.676003
 _Itime_2001 |   1.459042   .9589177     1.52   0.130    -.4346363    3.352721
 _Itime_2002 |   1.766063   1.166511     1.51   0.132    -.5375729    4.069699
 _Itime_2003 |   3.987397   1.456347     2.74   0.007     1.111391    6.863402
 _Itime_2004 |   5.043893   1.717731     2.94   0.004     1.651703    8.436083
 _Itime_2005 |   6.199033   2.046121     3.03   0.003     2.158337    10.23973
 _Itime_2006 |   7.286308   2.417103     3.01   0.003     2.512993    12.05962
 _Itime_2007 |   8.452767   2.540041     3.33   0.001     3.436673    13.46886
 _Itime_2008 |    6.05729   3.107008     1.95   0.053    -.0784541    12.19303
 _Itime_2009 |  -1.44e-07   3.355038    -0.00   1.000    -6.625557    6.625556
         cba |   .2141747   1.364171     0.16   0.875    -2.479802    2.908151
     l1ebrdi |  -1.682652   1.131441    -1.49   0.139    -3.917031    .5517274
        popg |  -58.68874   49.91269    -1.18   0.241    -157.2567    39.87924
        open |   .0150667   .0140415     1.07   0.285    -.0126626     .042796
         gov |  -.1280178   .0523622    -2.44   0.016    -.2314231   -.0246126
        educ |   .0034116   .0280833     0.12   0.903    -.0520475    .0588706
         eta |          1          .        .       .            .           .
       _cons |   82.60938    50.3086     1.64   0.103    -16.74044    181.9592
------------------------------------------------------------------------------
```

**Appendix 6.5d: Growth model - FEVD estimated by using 'xtfevd' command, when some or all of these variables (defactofix, inflation and fiscal balance) are excluded**

```
. xtfevd gdppcg cba yit popg educ l1inv l1ebrdi open tot gov eu  aze2006 aze2007
lva2009 arm2009  _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005
_Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009, invariant(cba l1ebrdi popg open gov
educ)

panel fixed effects regression with vector decomposition

degrees of freedom fevd    =      164          number of obs       =       211
mean squared error         = 6.171605          F( 25, 164)         =  15.6739
root mean squared error    = 2.484272          Prob > F            = 1.74e-30
Residual Sum of Squares    = 1302.209          R-squared           = .7865594
Total Sum of Squares       = 6101.036          adj. R-squared      =  .726692
Estimation Sum of Squares  = 4798.827

------------------------------------------------------------------------------
             |                fevd
      gdppcg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         yit |  -.6621969    .426989    -1.55   0.123    -1.505302    .1809077
       l1inv |   .0256383   .0550035     0.47   0.642    -.0829679    .1342445
```

```
         tot |  -.0153826   .0185079    -0.83   0.407    -.0519271    .0211618
          eu |  -.8509592   1.168169    -0.73   0.467     -3.15755    1.455631
     aze2006 |   20.06522   3.244804     6.18   0.000     13.65824     26.4722
     aze2007 |   10.85893   3.296061     3.29   0.001     4.350739    17.36711
     lva2009 |  -14.80286   3.404457    -4.35   0.000    -21.52508   -8.080643
     arm2009 |  -14.74286   3.368894    -4.38   0.000    -21.39486   -8.090863
 _Itime_2001 |   1.413153   .9591884     1.47   0.143    -.4807977    3.307103
 _Itime_2002 |   1.982669   1.182499     1.68   0.096    -.3522165    4.317554
 _Itime_2003 |   4.320024   1.488128     2.90   0.004     1.381664    7.258385
 _Itime_2004 |   5.530041   1.769071     3.13   0.002     2.036949    9.023133
 _Itime_2005 |   6.579685   2.100037     3.13   0.002      2.43309    10.72628
 _Itime_2006 |   7.735206   2.487712     3.11   0.002     2.823133    12.64728
 _Itime_2007 |   8.961264   2.615821     3.43   0.001     3.796236    14.12629
 _Itime_2008 |   6.367587   3.194333     1.99   0.048     .0602672    12.67491
 _Itime_2009 |  -1.47e-07   3.415133    -0.00   1.000    -6.743299    6.743298
         cba |     .20636   1.199804     0.17   0.864    -2.162695    2.575415
     l1ebrdi |  -1.010972   1.021709    -0.99   0.324    -3.028371    1.006428
        popg |  -57.22434   50.70812    -1.13   0.261    -157.3493     42.9006
        open |   .0123902   .0133155     0.93   0.353    -.0139017     .038682
         gov |  -.1537282   .0487131    -3.16   0.002    -.2499138   -.0575425
        educ |   .0047975   .0260385     0.18   0.854    -.0466164    .0562113
         eta |          1          .        .       .            .           .
       _cons |    76.1918   50.70366     1.50   0.135    -23.92433    176.3079
------------------------------------------------------------------------------


. xtfevd gdppcg cba defactofix yit popg educ l1inv l1ebrdi open tot gov eu  aze2006
aze2007 lva2009 arm2009  _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005
_Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009, invariant(cba l1ebrdi popg open gov
educ)

panel fixed effects regression with vector decomposition

degrees of freedom fevd    =      163          number of obs       =      211
mean squared error         = 6.164829          F( 26, 163)         = 15.25497
root mean squared error    = 2.482907          Prob > F            = 2.23e-30
Residual Sum of Squares    = 1300.779          R-squared           = .7867938
Total Sum of Squares       = 6101.036          adj. R-squared      = .7253171
Estimation Sum of Squares  = 4800.257

------------------------------------------------------------------------------
             |                fevd
      gdppcg |      Coef.   Std. Err.       t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  defactofix |  -.4090803   1.177875    -0.35   0.729    -2.734942    1.916782
         yit |  -.6509779    .431911    -1.51   0.134     -1.50384    .2018841
       l1inv |   .0270581   .0569311     0.48   0.635    -.0853594    .1394756
         tot |  -.0158791   .0187309    -0.85   0.398    -.0528655    .0211073
          eu |  -.8687623   1.186844    -0.73   0.465    -3.212333    1.474809
     aze2006 |   20.04557   3.287659     6.10   0.000     13.55368    26.53747
     aze2007 |   10.85279   3.378237     3.21   0.002     4.182043    17.52354
     lva2009 |  -14.63276    3.35555    -4.36   0.000    -21.25871   -8.006808
     arm2009 |  -14.79266   3.399144    -4.35   0.000    -21.50469   -8.080628
 _Itime_2001 |   1.424628   .9642297     1.48   0.141    -.4793634     3.32862
 _Itime_2002 |   1.951503   1.193966     1.63   0.104    -.4061324    4.309138
 _Itime_2003 |   4.301772   1.504134     2.86   0.005     1.331672    7.271871
 _Itime_2004 |   5.509954   1.783771     3.09   0.002     1.987676    9.032231
 _Itime_2005 |   6.575749    2.12134     3.10   0.002     2.386899     10.7646
 _Itime_2006 |   7.724299    2.51344     3.07   0.002     2.761198     12.6874
 _Itime_2007 |    8.94626   2.650793     3.37   0.001     3.711938    14.18058
 _Itime_2008 |   6.344626   3.229608     1.96   0.051    -.0326387    12.72189
 _Itime_2009 |  -2.26e-07     3.4485    -0.00   1.000    -6.809493    6.809493
         cba |    .457859   1.310891     0.35   0.727    -2.130659    3.046377
     l1ebrdi |  -1.144498   1.075802    -1.06   0.289    -3.268803    .9798078
        popg |  -55.81065   51.35885    -1.09   0.279    -157.2251     45.6038
        open |   .0131693   .0139922     0.94   0.348    -.0144601    .0407987
         gov |  -.1501541   .0496804    -3.02   0.003    -.2482542    -.052054
        educ |   .0063786   .0266491     0.24   0.811    -.0462433    .0590005
         eta |          1          .        .       .            .           .
       _cons |   74.88616   51.38472     1.46   0.147    -26.57938    176.3517
------------------------------------------------------------------------------
```

```
. xtfevd gdppcg cba defactofix l1lninf  yit popg educ l1inv l1ebrdi open tot gov eu
aze2006 aze2007 lva2009 arm2009  _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004
_Itime_2005 _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009, invariant(cba l1ebrdi
popg open gov educ)

panel fixed effects regression with vector decomposition

degrees of freedom fevd    =      162          number of obs       =      211
mean squared error         = 6.070748          F( 27, 162)         = 14.88962
root mean squared error    = 2.463889          Prob > F            = 2.67e-30
Residual Sum of Squares    = 1280.928          R-squared           = .7900475
Total Sum of Squares       = 6101.036          adj. R-squared      = .7278394
Estimation Sum of Squares  = 4820.108

------------------------------------------------------------------------------
             |                fevd
      gdppcg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  defactofix |  -.7951543   1.161249    -0.68   0.494     -3.08829    1.497982
     l1lninf |  -1.052473   .7678049    -1.37   0.172     -2.56867    .4637232
         yit |   -.642272    .428293    -1.50   0.136    -1.488029     .203485
       l1inv |   .0356407   .0553157     0.64   0.520     -.073592    .1448735
         tot |  -.0136897   .0185666    -0.74   0.462    -.0503534     .022974
          eu |  -.6410211    1.16992    -0.55   0.585     -2.95128    1.669237
     aze2006 |   20.61677   3.234293     6.37   0.000     14.22996    27.00358
     aze2007 |   11.50133   3.299686     3.49   0.001     4.985392    18.01728
     lva2009 |  -14.14655     3.3162    -4.27   0.000    -20.69511   -7.598001
     arm2009 |  -14.17851   3.376633    -4.20   0.000     -20.8464   -7.510621
 _Itime_2001 |    1.52678   .9645778     1.58   0.115    -.3779871    3.431547
 _Itime_2002 |   1.911259    1.18051     1.62   0.107    -.4199132    4.242431
 _Itime_2003 |   4.068836   1.480585     2.75   0.007     1.145101    6.992571
 _Itime_2004 |   5.169594   1.746933     2.96   0.004     1.719899    8.619289
 _Itime_2005 |   6.361126   2.085952     3.05   0.003     2.241964    10.48029
 _Itime_2006 |   7.417547   2.469866     3.00   0.003     2.540264    12.29483
 _Itime_2007 |   8.622172   2.597899     3.32   0.001      3.49206    13.75228
 _Itime_2008 |   6.156137    3.17948     1.94   0.055    -.1224332    12.43471
 _Itime_2009 |   7.69e-08   3.423001     0.00   1.000    -6.759455    6.759455
         cba |   .4920759    1.29389     0.38   0.704    -2.062989     3.04714
     l1ebrdi |  -1.926557   1.122932    -1.72   0.088    -4.144029    .2909141
        popg |  -64.13291    50.9057    -1.26   0.210    -164.6572    36.39138
        open |   .0163219   .0140627     1.16   0.247     -.011448    .0440919
         gov |  -.1411927   .0491324    -2.87   0.005    -.2382152   -.0441702
        educ |    .010072   .0265439     0.38   0.705    -.0423447    .0624887
         eta |          1          .        .       .            .           .
       _cons |   87.50513   51.37562     1.70   0.090    -13.94711    188.9574
------------------------------------------------------------------------------
```

**Appendix 6.6: Growth model – separating a CBA to strong and weak – FEVD**

**Appendix 6.6a: Estimating growth model (with strong and weak CBA) with 3-stage FEVD procedure**

```
. *Stage 1 (panel robust SE)
. xi: xtreg gdppcg strongcba weakcba defactofix l1lninf l1fb yit popg educ l1inv
l1ebrdi open tot gov eu  aze2006 aze2007 lva2009 arm2009 i.time , fe robust

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
note: strongcba omitted because of collinearity
note: weakcba omitted because of collinearity
note: _Itime_1999 omitted because of collinearity
note: _Itime_2000 omitted because of collinearity
note: _Itime_2009 omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =       211
Group variable: ctyno                           Number of groups   =        24

R-sq:  within  = 0.7269                         Obs per group: min =         1
       between = 0.3238                                        avg =       8.8
       overall = 0.6267                                        max =        10

                                                F(20,23)           =         .
corr(u_i, Xb)  = -0.3049                        Prob > F           =         .

                                (Std. Err. adjusted for 24 clusters in ctyno)
------------------------------------------------------------------------------
```

```
             |               Robust
      gdppcg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   strongcba |  (omitted)
     weakcba |  (omitted)
  defactofix |  -.8146296   .7942158    -1.03   0.316     -2.45759     .828331
     l1lninf |   -1.04398   .8754877    -1.19   0.245    -2.855064    .7671043
        l1fb |   .1017036   .1138939     0.89   0.381    -.1339039    .3373111
         yit |  -.6888733   .2535229    -2.72   0.012    -1.213325   -.1644213
        popg |  -153.7705   40.24269    -3.82   0.001    -237.0188   -70.52213
        educ |  -.0445416   .0638235    -0.70   0.492    -.1765706    .0874873
       l1inv |   .0314903   .0724473     0.43   0.668    -.1183783     .181359
     l1ebrdi |  -2.894078   3.879948    -0.75   0.463    -10.92036    5.132207
        open |   .0434588   .0151035     2.88   0.009     .0122149    .0747027
         tot |  -.0161965   .0180372    -0.90   0.379    -.0535092    .0211163
         gov |  -.1108882   .0882642    -1.26   0.222    -.2934765    .0717001
          eu |  -.5039566   .9971896    -0.51   0.618      -2.5668    1.558887
     aze2006 |   20.53851   1.177344    17.44   0.000     18.10299    22.97403
     aze2007 |   11.72412   1.035585    11.32   0.000     9.581845    13.86639
     lva2009 |  -13.98651    1.71791    -8.14   0.000    -17.54028   -10.43274
     arm2009 |  -14.31888   1.975586    -7.25   0.000    -18.40569   -10.23207
 _Itime_1999 |  (omitted)
 _Itime_2000 |  (omitted)
 _Itime_2001 |   1.459042   .6273596     2.33   0.029     .1612499    2.756834
 _Itime_2002 |   1.766063   .7205152     2.45   0.022     .2755636    3.256562
 _Itime_2003 |   3.987397   .7525256     5.30   0.000     2.430679    5.544114
 _Itime_2004 |   5.043893   .6539156     7.71   0.000     3.691165     6.39662
 _Itime_2005 |   6.199033   1.116281     5.55   0.000      3.88983    8.508236
 _Itime_2006 |   7.286308   .9692477     7.52   0.000     5.281267     9.29135
 _Itime_2007 |   8.452767   1.052611     8.03   0.000     6.275274    10.63026
 _Itime_2008 |    6.05729   1.394932     4.34   0.000     3.171653    8.942928
 _Itime_2009 |  (omitted)
       _cons |   180.0914   41.04663     4.39   0.000     95.17999    265.0028
-------------+----------------------------------------------------------------
     sigma_u |  2.8140341
     sigma_e |  2.7968994
         rho |  .50305378   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. *Save fixed effect (unit effects) from stage 1
. predict fixedeff1, u
(89 missing values generated)

. *Stage 2 (regression of the FE vector on the time-invariant and slowly changing
explantory variables - by OLS)
. reg fixedeff1 strongcba weakcba l1ebrdi popg open gov educ

      Source |       SS       df       MS              Number of obs =     211
-------------+------------------------------           F(  7,   203) =   18.92
       Model |  436.554082     7  62.3648688           Prob > F      =  0.0000
    Residual |  668.967644   203  3.29540712           R-squared     =  0.3949
-------------+------------------------------           Adj R-squared =  0.3740
       Total |  1105.52173   210  5.26438917           Root MSE      =  1.8153

------------------------------------------------------------------------------
   fixedeff1 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   strongcba |  -.0872524   .6165374    -0.14   0.888    -1.302891    1.128386
     weakcba |   .3669469   .4655871     0.79   0.432    -.5510599    1.284954
     l1ebrdi |    1.21911    .270863     4.50   0.000     .6850438    1.753175
        popg |   96.00191   18.21915     5.27   0.000     60.07886    131.9249
        open |  -.0278373   .0044943    -6.19   0.000    -.0366988   -.0189757
         gov |  -.0178776   .0174298    -1.03   0.306    -.0522442     .016489
        educ |   .0481601     .00816     5.90   0.000     .0320708    .0642494
       _cons |  -98.46594   18.29882    -5.38   0.000    -134.5461   -62.38582
------------------------------------------------------------------------------

. * Save the residuals from stage 2
. predict resfevd1, residuals
(89 missing values generated)
```

```
. *Stage 3 (estimation of pooled OLS by including all explanatory time-variant, time-invariant variables and unexplained part of the FE vector - error term from the stage 2)

. regress gdppcg strongcba weakcba defactofix l1lninf l1fb yit popg educ l1inv
l1ebrdi open tot gov eu resfevd1 aze2006 aze2007 lva2009 arm2009 i.time

      Source |       SS       df       MS              Number of obs =     211
-------------+------------------------------           F( 28,   182) =   24.60
       Model |  4825.94487    28  172.355174           Prob > F      =  0.0000
    Residual |   1275.0913   182  7.00599617           R-squared     =  0.7910
-------------+------------------------------           Adj R-squared =  0.7589
       Total |  6101.03617   210  29.0525532           Root MSE      =  2.6469

------------------------------------------------------------------------------
      gdppcg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   strongcba |  -.0872525   1.163678    -0.07   0.940    -2.383287    2.208782
     weakcba |   .3669468   .7731113     0.47   0.636    -1.158467     1.89236
  defactofix |  -.8146296   .5772616    -1.41   0.160    -1.953615    .3243561
     l1lninf |   -1.04398   .5019711    -2.08   0.039    -2.034411   -.0535488
        l1fb |   .1017036   .0862037     1.18   0.240    -.0683835    .2717907
         yit |  -.6888733   .2320359    -2.97   0.003      -1.1467   -.231047
        popg |  -57.76857   30.31969    -1.91   0.058    -117.5919    2.054732
        educ |   .0036185    .015481     0.23   0.815    -.0269269    .0341639
       l1inv |   .0314903   .0351443     0.90   0.371    -.0378523     .100833
     l1ebrdi |  -1.674969   .6697857    -2.50   0.013    -2.996512   -.3534251
        open |   .0156215   .0075822     2.06   0.041     .0006612    .0305818
         tot |  -.0161965   .0120956    -1.34   0.182     -.040062    .0076691
         gov |  -.1287658    .030096    -4.28   0.000    -.1881477   -.0693839
          eu |  -.5039566   .7456561    -0.68   0.500    -1.975199    .9672855
    resfevd1 |          1    .140742     7.11   0.000     .7223042    1.277696
     aze2006 |   20.53851   2.886427     7.12   0.000     14.84335    26.23368
     aze2007 |   11.72412   2.867076     4.09   0.000     6.067135     17.3811
     lva2009 |  -13.98651   2.847274    -4.91   0.000    -19.60442   -8.368599
     arm2009 |  -14.31888   2.842655    -5.04   0.000    -19.92768   -8.710082
             |
        time |
       2001  |   1.459042   .8466058     1.72   0.087    -.2113822    3.129467
       2002  |   1.766063   .9628546     1.83   0.068    -.1337303    3.665856
       2003  |   3.987397   1.110318     3.59   0.000     1.796645    6.178148
       2004  |   5.043893   1.314028     3.84   0.000     2.451205     7.63658
       2005  |   6.199033   1.510823     4.10   0.000     3.218052    9.180014
       2006  |   7.286308   1.716786     4.24   0.000     3.898945    10.67367
       2007  |   8.452767   1.840555     4.59   0.000     4.821197    12.08434
       2008  |    6.05729   2.127148     2.85   0.005     1.860249    10.25433
       2009  |  -1.01e-07   2.367823    -0.00   1.000    -4.671915    4.671915
             |
       _cons |   81.62547   30.60988     2.67   0.008      21.2296    142.0213
------------------------------------------------------------------------------
```

**. *Diagnostic tests after 3rd stage***

```
. estat imtest

Cameron & Trivedi's decomposition of IM-test

---------------------------------------------------
              Source |       chi2     df      p
---------------------+-----------------------------
  Heteroskedasticity |     211.00    211    0.4871
            Skewness |      38.05     28    0.0974
            Kurtosis |       4.79      1    0.0287
---------------------+-----------------------------
               Total |     253.84    240    0.2578
---------------------------------------------------

. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of gdppcg

         chi2(1)      =     2.35
         Prob > chi2  =   0.1252
```

```
. estat ovtest

Ramsey RESET test using powers of the fitted values of gdppcg
       Ho:  model has no omitted variables
                 F(3, 179) =      2.37
                  Prob > F =      0.0722

.

. xtserial gdppcg strongcba weakcba defactofix l1lninf l1fb yit popg educ l1inv
l1ebrdi open
> tot gov eu aze2006 aze2007 lva2009 arm2009

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      21) =     12.400
           Prob > F =      0.0020
```

## Appendix 6.6b: FEVD - Estimating growth model (with strong and weak CBA) with 'xtfevd' command

```
. *Xtfevd command (treating cba, ebrdi and l1cbi as invariant, slowly moving
variables)


. xtfevd gdppcg strongcba weakcba defactofix l1lninf l1fb yit popg educ l1inv l1ebrdi
open tot gov eu aze2006 aze2007 lva2009 arm2009 _Itime_2001 _Itime_2002 _Itime_2003
_Itime_2004 _Itime_2005 _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009,
invariant(strongcba weakcba  l1ebrdi popg open gov educ)

panel fixed effects regression with vector decomposition

degrees of freedom fevd    =      160          number of obs       =      211
mean squared error         = 6.043087          F( 29, 160)         = 13.98637
root mean squared error    = 2.458269          Prob > F            = 9.84e-30
Residual Sum of Squares    = 1275.091          R-squared           = .7910041
Total Sum of Squares       = 6101.036          adj. R-squared      = .7256929
Estimation Sum of Squares  = 4825.945

------------------------------------------------------------------------------
             |                fevd
      gdppcg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  defactofix |  -.8146296   1.152951    -0.71   0.481    -3.091594    1.462335
     l1lninf |   -1.04398   .7794749    -1.34   0.182    -2.583366    .4954061
        l1fb |   .1017036    .141814     0.72   0.474     -.178365    .3817723
         yit |  -.6888733   .4304095    -1.60   0.111     -1.53889    .1611432
       l1inv |   .0314903   .0538978     0.58   0.560    -.0749524    .1379331
         tot |  -.0161965    .018468    -0.88   0.382     -.052669     .020276
          eu |  -.5039566   1.161178    -0.43   0.665    -2.797169    1.789256
     aze2006 |   20.53851   3.232696     6.35   0.000     14.15426    26.92277
     aze2007 |   11.72412   3.303871     3.55   0.001     5.199296    18.24894
     lva2009 |  -13.98651   3.309913    -4.23   0.000    -20.52326   -7.449756
     arm2009 |  -14.31888   3.362426    -4.26   0.000    -20.95934    -7.67842
 _Itime_2001 |   1.459042   .9596797     1.52   0.130    -.4362308    3.354315
 _Itime_2002 |   1.766063   1.175264     1.50   0.135    -.5549686    4.087094
 _Itime_2003 |   3.987397    1.46183     2.73   0.007     1.100426    6.874368
 _Itime_2004 |   5.043893    1.73743     2.90   0.004     1.612639    8.475147
 _Itime_2005 |   6.199033   2.071412     2.99   0.003     2.108198    10.28987
 _Itime_2006 |   7.286308    2.43642     2.99   0.003     2.474619      12.098
 _Itime_2007 |   8.452767   2.594503     3.26   0.001     3.328879    13.57665
 _Itime_2008 |    6.05729   3.143448     1.93   0.056    -.1507097    12.26529
 _Itime_2009 |  -1.01e-07   3.420591    -0.00   1.000     -6.75533     6.75533
   strongcba |  -.0872525   2.255228    -0.04   0.969    -4.541106    4.366601
     weakcba |   .3669468    1.44982     0.25   0.801    -2.496305    3.230199
     l1ebrdi |  -1.674969   1.159061    -1.45   0.150       -3.964    .6140633
        popg |  -57.76857    50.3144    -1.15   0.253    -157.1346    41.59742
        open |   .0156215   .0139033     1.12   0.263    -.0118361    .0430791
         gov |  -.1287658   .0516255    -2.49   0.014    -.2307211   -.0268105
        educ |   .0036185   .0277309     0.13   0.896    -.0511473    .0583843
         eta |          1          .        .       .            .           .
       _cons |   81.62547   50.76872     1.61   0.110    -18.63776    181.8887
------------------------------------------------------------------------------
```

**Appendix 6.6c: FEVD - Estimating growth model (with strong and weak CBA) with 'xtfevd' command (withough some of the variables)**

```
. xtfevd gdppcg strongcba weakcba yit popg educ l1inv l1ebrdi open tot gov eu
aze2006 aze2007 lva2009 arm2009  _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004
_Itime_2005 _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009, invariant(strongcba
weakcba l1ebrdi popg open gov educ)

panel fixed effects regression with vector decomposition

degrees of freedom fevd    =      163         number of obs       =      211
mean squared error         = 6.171605         F( 26, 163)         = 15.07293
root mean squared error    = 2.484272         Prob > F            = 4.21e-30
Residual Sum of Squares    = 1302.209         R-squared           = .7865594
Total Sum of Squares       = 6101.036         adj. R-squared      = .7250152
Estimation Sum of Squares  = 4798.828

------------------------------------------------------------------------------
             |                fevd
      gdppcg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         yit |  -.6621969   .4297683    -1.54   0.125    -1.510828    .1864341
       l1inv |   .0256383   .0541917     0.47   0.637      -.08137    .1326466
         tot |  -.0153826   .0183033    -0.84   0.402    -.0515248    .0207595
          eu |  -.8509593   1.141391    -0.75   0.457    -3.104779     1.40286
     aze2006 |   20.06522   3.240712     6.19   0.000     13.66603    26.46441
     aze2007 |   10.85893   3.293474     3.30   0.001      4.35555     17.3623
     lva2009 |  -14.80286   3.405169    -4.35   0.000    -21.52679    -8.07893
     arm2009 |  -14.74286   3.366974    -4.38   0.000    -21.39137   -8.094351
 _Itime_2001 |   1.413153   .9591526     1.47   0.143    -.4808134    3.307119
 _Itime_2002 |   1.982669   1.182246     1.68   0.095     -.351823    4.317161
 _Itime_2003 |   4.320025   1.482897     2.91   0.004      1.39186    7.248189
 _Itime_2004 |   5.530041   1.774832     3.12   0.002     2.025413    9.034668
 _Itime_2005 |   6.579685   2.108432     3.12   0.002     2.416323    10.74305
 _Itime_2006 |   7.735207   2.487977     3.11   0.002     2.822385    12.64803
 _Itime_2007 |   8.961264   2.645105     3.39   0.001     3.738174    14.18435
 _Itime_2008 |   6.367587   3.207992     1.98   0.049     .0330069    12.70217
 _Itime_2009 |  -3.56e-08   3.463386    -0.00   1.000    -6.838886    6.838886
   strongcba |  -.2838851   2.081555    -0.14   0.892    -4.394174    3.826404
     weakcba |   .4548307   1.337434     0.34   0.734      -2.1861    3.095761
     l1ebrdi |  -.9984754   1.034976    -0.96   0.336    -3.042164    1.045213
        popg |  -55.72777   51.03869    -1.09   0.277      -156.51    45.05449
        open |   .0132925   .0133547     1.00   0.321    -.0130781     .039663
         gov |  -.1549447    .047972    -3.23   0.001    -.2496714   -.0602179
        educ |    .005134    .025755     0.20   0.842    -.0457224    .0559904
         eta |          1          .        .       .            .           .
       _cons |   74.59155   51.04677     1.46   0.146    -26.20665    175.3898
------------------------------------------------------------------------------


. xtfevd gdppcg strongcba weakcba defactofix yit popg educ l1inv l1ebrdi open tot gov
eu  aze2006 aze2007 lva2009 arm2009  _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004
_Itime_2005 _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009, invariant(strongcba
weakcba  l1ebrdi popg open gov educ)

panel fixed effects regression with vector decomposition

degrees of freedom fevd    =      162         number of obs       =      211
mean squared error         = 6.164829         F( 27, 162)         =  14.6852
root mean squared error    = 2.482907         Prob > F            = 5.54e-30
Residual Sum of Squares    = 1300.779         R-squared           = .7867938
Total Sum of Squares       = 6101.036         adj. R-squared      = .7236216
Estimation Sum of Squares  = 4800.257

------------------------------------------------------------------------------
             |                fevd
      gdppcg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  defactofix |  -.4090803   1.190327    -0.34   0.732    -2.759637    1.941476
         yit |  -.6509779   .4362421    -1.49   0.138    -1.512432    .2104762
       l1inv |   .0270581   .0561859     0.48   0.631    -.0838932    .1380093
         tot |  -.0158791   .0185622    -0.86   0.394    -.0525342     .020776
          eu |  -.8687623   1.159381    -0.75   0.455    -3.158211    1.420686
     aze2006 |   20.04557   3.282955     6.11   0.000     13.56267    26.52848
     aze2007 |   10.85279   3.378278     3.21   0.002     4.181655    17.52393
     lva2009 |  -14.63276   3.354731    -4.36   0.000     -21.2574   -8.008121
```

```
     arm2009 |  -14.79266   3.397257    -4.35   0.000    -21.50128   -8.084045
  _Itime_2001 |   1.424628    .964105     1.48   0.141    -.4792052    3.328462
  _Itime_2002 |   1.951503    1.19672     1.63   0.105    -.4116783    4.314684
  _Itime_2003 |   4.301772   1.501952     2.86   0.005     1.335843      7.2677
  _Itime_2004 |   5.509954   1.793413     3.07   0.002     1.968472    9.051435
  _Itime_2005 |    6.57575   2.134664     3.08   0.002     2.360394     10.7911
  _Itime_2006 |   7.724299   2.519372     3.07   0.003     2.749254    12.69934
  _Itime_2007 |    8.94626   2.689412     3.33   0.001     3.635436    14.25708
  _Itime_2008 |   6.344626   3.252812     1.95   0.053    -.0787527      12.768
  _Itime_2009 |  -2.01e-07   3.507983    -0.00   1.000     -6.92727     6.92727
    strongcba |   .0762231    2.27959     0.03   0.973     -4.42532    4.577766
      weakcba |   .6512833    1.40209     0.46   0.643    -2.117445    3.420012
      l1ebrdi |   -1.13477   1.099125    -1.03   0.303     -3.30523     1.03569
         popg |  -54.64562   51.69602    -1.06   0.292    -156.7306    47.43932
         open |   .0138718   .0138706     1.00   0.319    -.0135187    .0412623
          gov |  -.1511011   .0489874    -3.08   0.002    -.2478372    -.054365
         educ |   .0066405    .026371     0.25   0.802    -.0454348    .0587159
          eta |          1          .        .       .            .           .
        _cons |   73.64043   51.73498     1.42   0.157    -28.52145    175.8023
------------------------------------------------------------------------------
```

```
. xtfevd gdppcg strongcba weakcba defactofix l1lninf  yit popg educ l1inv l1ebrdi
open tot gov eu  aze2006 aze2007 lva2009 arm2009  _I time_2001 _Itime_2002
_Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009,
invariant(strongcba weakcba  l1ebrdi popg open gov educ)

panel fixed effects regression with vector decomposition

degrees of freedom fevd    =       161          number of obs       =       211
mean squared error         = 6.070748           F( 28, 161)         = 14.36005
root mean squared error    = 2.463889           Prob > F            = 6.43e-30
Residual Sum of Squares    = 1280.928           R-squared           = .7900475
Total Sum of Squares       = 6101.036           adj. R-squared      = .7261489
Estimation Sum of Squares  = 4820.108

------------------------------------------------------------------------------
             |              fevd
      gdppcg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   defactofix |  -.7951543   1.177418    -0.68   0.500    -3.120328     1.53002
      l1lninf |  -1.052473   .7701544    -1.37   0.174     -2.57338    .4684339
          yit |   -.642272   .4325974    -1.48   0.140    -1.496569    .2120248
        l1inv |   .0356407   .0545686     0.65   0.515    -.0721219    .1434033
          tot |  -.0136897   .0183811    -0.74   0.457    -.0499888    .0226094
           eu |  -.6410211   1.143299    -0.56   0.576    -2.898817    1.616775
      aze2006 |   20.61677   3.230855     6.38   0.000     14.23645    26.99709
      aze2007 |   11.50133    3.30142     3.48   0.001     4.981663    18.02101
      lva2009 |  -14.14655   3.314625    -4.27   0.000     -20.6923   -7.600804
      arm2009 |  -14.17851   3.375087    -4.20   0.000    -20.84366   -7.513363
  _Itime_2001 |    1.52678   .9640719     1.58   0.115    -.3770771    3.430637
  _Itime_2002 |   1.911259   1.183992     1.61   0.108     -.426898    4.249416
  _Itime_2003 |   4.068836   1.480736     2.75   0.007     1.144665    6.993006
  _Itime_2004 |   5.169594    1.75974     2.94   0.004     1.694446    8.644742
  _Itime_2005 |   6.361126   2.101863     3.03   0.003     2.210351     10.5119
  _Itime_2006 |   7.417547   2.478877     2.99   0.003     2.522241    12.31285
  _Itime_2007 |   8.622172   2.640801     3.26   0.001     3.407096    13.83725
  _Itime_2008 |   6.156137   3.205412     1.92   0.057    -.1739363    12.48621
  _Itime_2009 |   1.48e-07   3.481967     0.00   1.000    -6.876217    6.876217
    strongcba |    .193222   2.250569     0.09   0.932    -4.251219    4.637663
      weakcba |   .6435438   1.383189     0.47   0.642    -2.087988    3.375076
      l1ebrdi |   -1.91894   1.154523    -1.66   0.098    -4.198902    .3610223
         popg |   -63.2206   51.30601    -1.23   0.220    -164.5401    38.09892
         open |    .016872    .013905     1.21   0.227    -.0105877    .0443316
          gov |  -.1419343   .0485038    -2.93   0.004    -.2377199   -.0461487
         educ |   .0102771   .0262755     0.39   0.696    -.0416119    .0621662
          eta |          1          .        .       .            .           .
        _cons |   86.52962   51.82314     1.67   0.097    -15.81114    188.8704
------------------------------------------------------------------------------
```

## Appendix 6.7: Dynamic estimation of growth model

### Appendix 6.7a: Dynamic estimation of growth model – Equation 6.5

. *One-step robust System GMM with one lag of dependent variable and minimum number of instruments (with 4 CBA countries)* with defactoorfix, lagged inflation and lagged fiscal balance

```
. xi: xtabond2 gdppcg L.gdppcg cba defactofix l1lninf l1fb yit popg educ l1inv
l1ebrdi open tot gov eu aze2006 aze2007 lva2009 arm2009 i.time, gmm(L.gdppc,
laglimits(1 1)) gmm(lninf fb inv ebrdi, laglimits (2 2)) iv(cba defactofix yit popg
educ open tot gov eu i.time)  robust

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring space over speed. To switch, type or click on mata: mata set matafavor
speed, perm.
_Itime_1999 dropped due to collinearity
_Itime_2009 dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       211
Time variable : time                            Number of groups   =        24
Number of instruments = 114                     Obs per group: min =         1
Wald chi2(27) = 348468.36                                      avg =      8.79
Prob > chi2   =     0.000                                      max =        10
------------------------------------------------------------------------------
             |               Robust
      gdppcg |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      gdppcg |
         L1. |    .224201   .0794835     2.82   0.005     .0684162    .3799859
             |
         cba |  -.0392862   .5404047    -0.07   0.942     -1.09846    1.019888
  defactofix |   .0380669   .5472831     0.07   0.945    -1.034588    1.110722
     l1lninf |  -1.103777   .6187332    -1.78   0.074    -2.316472    .1089176
        l1fb |   .1031044   .1294611     0.80   0.426    -.1506347    .3568435
         yit |  -.1256583    .125556    -1.00   0.317    -.3717436     .120427
        popg |  -48.10207   33.16512    -1.45   0.147    -113.1045    16.90037
        educ |   .0049183   .0215698     0.23   0.820    -.0373578    .0471945
       l1inv |   .0411641   .0760009     0.54   0.588     -.107795    .1901232
     l1ebrdi |  -1.729295     .96004    -1.80   0.072    -3.610938    .1523491
        open |   .0101361   .0074117     1.37   0.171    -.0043906    .0246627
         tot |  -.0108618   .0109205    -0.99   0.320    -.0322656     .010542
         gov |  -.1188664   .0439525    -2.70   0.007    -.2050118    -.032721
          eu |   .3503412   .7629867     0.46   0.646    -1.145085    1.845768
     aze2006 |   20.28882   2.713537     7.48   0.000     14.97039    25.60726
     aze2007 |   10.53514   2.966509     3.55   0.000     4.720893    16.34939
     lva2009 |  -12.05169    5.65327    -2.13   0.033    -23.13189   -.9714834
     arm2009 |  -14.19495   3.220656    -4.41   0.000    -20.50732   -7.882577
 _Itime_2000 |   8.749638   1.792351     4.88   0.000     5.236694    12.26258
 _Itime_2001 |   8.436127   1.950402     4.33   0.000     4.613408    12.25885
 _Itime_2002 |   7.881245   1.831438     4.30   0.000     4.291691     11.4708
 _Itime_2003 |   9.389126   1.680104     5.59   0.000     6.096182    12.68207
 _Itime_2004 |   9.171672   1.640492     5.59   0.000     5.956368    12.38698
 _Itime_2005 |   9.297892   1.839624     5.05   0.000     5.692294    12.90349
 _Itime_2006 |   9.817982   1.547482     6.34   0.000     6.784972    12.85099
 _Itime_2007 |   9.897621   1.326613     7.46   0.000     7.297508    12.49773
 _Itime_2008 |   6.714931   1.624215     4.13   0.000     3.531528    9.898333
       _cons |   57.91533   34.66826     1.67   0.095    -10.03322    125.8639
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(cba defactofix yit popg educ open tot gov eu _Itime_1999 _Itime_2000
    _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
    _Itime_2007 _Itime_2008 _Itime_2009)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L.L.gdppcg
    L2.(lninf fb inv ebrdi)
Instruments for levels equation
```

```
  Standard
    _cons
    cba defactofix yit popg educ open tot gov eu _Itime_1999 _Itime_2000
    _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
    _Itime_2007 _Itime_2008 _Itime_2009
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    D.L.gdppcg
    DL.(lninf fb inv ebrdi)
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -3.09  Pr > z =  0.002
Arellano-Bond test for AR(2) in first differences: z =  -0.14  Pr > z =  0.886
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(86)   = 150.65  Prob > chi2 =  0.000
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(86)   =   0.00  Prob > chi2 =  1.000
  (Robust, but can be weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(36)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(50)   =  -0.00  Prob > chi2 =  1.000
  gmm(L.gdppcg, lag(1 1))
    Hansen test excluding group:     chi2(69)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(17)   =  -0.00  Prob > chi2 =  1.000
  gmm(lninf fb inv ebrdi, lag(2 2))
    Hansen test excluding group:     chi2(8)    =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(78)   =   0.00  Prob > chi2 =  1.000
  iv(cba defactofix yit popg educ open tot gov eu _Itime_1999 _Itime_2000 _Itime_2001
_Itime_
> 2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006 _Itime_2007 _Itime_2008
_Itime_2009)
    Hansen test excluding group:     chi2(67)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(19)   =   0.00  Prob > chi2 =  1.000


. *Calculation of the long-run coefficient on CBA
. nlcom _b[cba]/(1-_b[l.gdppcg])

       _nl_1:  _b[cba]/(1-_b[l.gdppcg])

------------------------------------------------------------------------------
      gdppcg |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _nl_1 |  -.0506397   .6967095    -0.07   0.942    -1.416165    1.314886
------------------------------------------------------------------------------
```

**Appendix 6.7b: Growth model - Checking whether the coefficient on the lagged dependent variable from GMM is between the OLS and FE**

```
. xi: regress gdppcg L.gdppcg cba defactofix l1lninf l1fb yit popg educ l1inv l1ebrdi
open tot gov eu cbal1lninf cbal1fb i.time

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
note: _Itime_1999 omitted because of collinearity
note: _Itime_2000 omitted because of collinearity

      Source |       SS       df       MS              Number of obs =     211
-------------+------------------------------           F( 25,   185) =   17.25
       Model |  4269.67597    25  170.787039           Prob > F      =  0.0000
    Residual |   1831.3602   185  9.89924435           R-squared     =  0.6998
-------------+------------------------------           Adj R-squared =  0.6593
       Total |  6101.03617   210  29.0525532           Root MSE      =  3.1463

------------------------------------------------------------------------------
      gdppcg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      gdppcg |
         L1. |   .5145435   .0693186     7.42   0.000      .377787       .6513
             |
         cba |   2.887661   9.393183     0.31   0.759    -15.64387    21.41919
  defactofix |   .2604671   .6636977     0.39   0.695    -1.048922    1.569856
     l1lninf |  -.6655765   .6062577    -1.10   0.274    -1.861644    .5304911
        l1fb |   .1838756   .1033126     1.78   0.077    -.0199467    .3876979
         yit |    .132998   .2466302     0.54   0.590    -.3535713    .6195674
        popg |  -30.20599   35.63992    -0.85   0.398    -100.5189    40.10694
```

```
        educ |  -.0322826   .0194047    -1.66   0.098    -.0705655    .0060003
       l1inv |   .0201363   .0406596     0.50   0.621    -.0600798    .1003523
     l1ebrdi |  -1.687365   .7829621    -2.16   0.032    -3.232048   -.1426829
        open |   .0115875   .0088047     1.32   0.190     -.005783    .0289579
         tot |  -.0004069   .0137247    -0.03   0.976     -.027484    .0266702
         gov |  -.0531341   .0363216    -1.46   0.145    -.1247918    .0185236
          eu |   .8358156   .8733461     0.96   0.340    -.8871827    2.558814
  cbal1lninf |  -1.092708   3.552312    -0.31   0.759    -8.100957    5.915542
     cbal1fb |  -.6707896   .3459496    -1.94   0.054    -1.353303     .011724
 _Itime_1999 |          0  (omitted)
 _Itime_2000 |          0  (omitted)
 _Itime_2001 |   -1.32417   1.010917    -1.31   0.192    -3.318577    .6702372
 _Itime_2002 |  -2.134354   1.108198    -1.93   0.056    -4.320686    .0519769
 _Itime_2003 |  -.6082979   1.221335    -0.50   0.619    -3.017833    1.801237
 _Itime_2004 |  -1.629256   1.391467    -1.17   0.243    -4.374439    1.115927
 _Itime_2005 |  -1.731505   1.564004    -1.11   0.270    -4.817082    1.354073
 _Itime_2006 |  -.3370645   1.752933    -0.19   0.848    -3.795372    3.121243
 _Itime_2007 |  -1.415571   1.829221    -0.77   0.440    -5.024386    2.193243
 _Itime_2008 |  -5.389398   2.178681    -2.47   0.014    -9.687652   -1.091145
 _Itime_2009 |  -13.15362   2.320437    -5.67   0.000    -17.73154   -8.575701
       _cons |   42.52026   35.85063     1.19   0.237    -28.20838    113.2489
------------------------------------------------------------------------------


. xi: xtreg gdppcg L.gdppcg cba defactofix l1lninf l1fb yit popg educ l1inv l1ebrdi
open tot gov eu aze2006 aze2007 lva2009 arm2009 i.time, fe

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
note: cba omitted because of collinearity
note: _Itime_1999 omitted because of collinearity
note: _Itime_2000 omitted because of collinearity
note: _Itime_2009 omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =       211
Group variable: ctyno                           Number of groups   =        24

R-sq:  within  = 0.7332                         Obs per group: min =         1
       between = 0.3778                                        avg =       8.8
       overall = 0.6317                                        max =        10

                                                F(25,162)          =     17.80
corr(u_i, Xb)  = -0.4113                        Prob > F           =    0.0000

------------------------------------------------------------------------------
      gdppcg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      gdppcg |
         L1. |   .1699785   .0871162     1.95   0.053    -.0020513    .3420083
             |
         cba |          0  (omitted)
  defactofix |  -.7802154   .9790917    -0.80   0.427    -2.713643    1.153212
     l1lninf |  -1.023647   .6552261    -1.56   0.120    -2.317533    .2702379
        l1fb |   .0653824   .1182178     0.55   0.581    -.1680641    .2988289
         yit |  -.7226916   .2171693    -3.33   0.001    -1.151539   -.2938439
        popg |  -147.0211   72.55131    -2.03   0.044    -290.2893   -3.752838
        educ |  -.0450993   .0481944    -0.94   0.351    -.1402696    .0500709
       l1inv |   .0350048   .0509807     0.69   0.493    -.0656675    .1356772
     l1ebrdi |  -3.770869     3.7087    -1.02   0.311     -11.0945    3.552761
        open |   .0426758    .016073     2.66   0.009     .0109362    .0744154
         tot |  -.0154203   .0144425    -1.07   0.287    -.0439402    .0130997
         gov |  -.1042761   .0554809    -1.88   0.062    -.2138351    .0052829
          eu |  -.4898017   .9124755    -0.54   0.592    -2.291681    1.312078
     aze2006 |   18.21631   3.332124     5.47   0.000     11.63631    24.79631
     aze2007 |   8.171773   3.628662     2.25   0.026     1.006197    15.33735
     lva2009 |  -11.89894   3.327408    -3.58   0.000    -18.46962   -5.328253
     arm2009 |  -13.60155   3.224134    -4.22   0.000     -19.9683   -7.234798
 _Itime_1999 |          0  (omitted)
 _Itime_2000 |          0  (omitted)
 _Itime_2001 |   1.034626   .8443808     1.23   0.222     -.632786    2.702038
 _Itime_2002 |   1.379701   .8355981     1.65   0.101    -.2703676     3.02977
 _Itime_2003 |   3.766921   .8348925     4.51   0.000     2.118245    5.415596
 _Itime_2004 |   4.668681   .8667381     5.39   0.000      2.95712    6.380243
 _Itime_2005 |   5.835671   .8654806     6.74   0.000     4.126593    7.544749
 _Itime_2006 |   7.162562   .9239849     7.75   0.000     5.337955     8.98717
 _Itime_2007 |   8.176671   .9410315     8.69   0.000     6.318401    10.03494
 _Itime_2008 |   5.711128    .981857     5.82   0.000      3.77224    7.650017
```

```
 _Itime_2009 |          0  (omitted)
       _cons |   175.2928   72.95051     2.40   0.017     31.23626    319.3493
-------------+----------------------------------------------------------------
     sigma_u |   2.961208
     sigma_e |   2.773123
         rho |  .53276457   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(23, 162) =     1.33            Prob > F = 0.1563
```

**Appendix 6.7c: Growth model – some variables excluded**

```
. *One-step robust System GMM with one lag of dependent variable and minimum
number of instruments (with 4 CBA countries)* without defactoorfix and
inflation

. xi: xtabond2 gdppcg L.gdppcg cba yit popg educ inv ebrdi open tot gov eu aze2006
aze2007 lva2009 arm2009 i.time, gmm(L.gdppc, laglimits(1 1)) gmm(inv ebrdi, laglimits
(2 2)) iv(cba yit popg educ open tot gov eu i.time)  robust

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring space over speed. To switch, type or click on mata: mata set matafavor
speed, perm.
_Itime_1999 dropped due to collinearity
_Itime_2009 dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       210
Time variable : time                            Number of groups   =        24
Number of instruments = 75                      Obs per group: min =         1
Wald chi2(24) =  4.47e+08                                      avg =      8.75
Prob > chi2   =     0.000                                      max =        10
------------------------------------------------------------------------------
             |               Robust
      gdppcg |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      gdppcg |
         L1. |   .1557199   .0677275     2.30   0.021     .0229764    .2884634
             |
         cba |   .6313482   .6432404     0.98   0.326    -.6293798    1.892076
         yit |  -.0724769   .1764425    -0.41   0.681    -.4182978     .273344
        popg |  -53.34085   36.12291    -1.48   0.140    -124.1405    17.45876
        educ |    .008998   .0215688     0.42   0.677     -.033276     .051272
         inv |   .1034526   .0339553     3.05   0.002     .0369015    .1700037
       ebrdi |  -1.781249   1.008622    -1.77   0.077    -3.758113    .1956143
        open |   .0058138   .0070274     0.83   0.408    -.0079598    .0195873
         tot |  -.0084263   .0161636    -0.52   0.602    -.0401063    .0232538
         gov |  -.1350244   .0416304    -3.24   0.001    -.2166185   -.0534303
          eu |   .3805078   .9338237     0.41   0.684    -1.449753    2.210769
     aze2006 |   23.11203   3.069191     7.53   0.000     17.09652    29.12753
     aze2007 |    13.2607   3.135026     4.23   0.000     7.116167    19.40524
     lva2009 |  -13.17536   5.055244    -2.61   0.009    -23.08345   -3.267261
     arm2009 |  -13.98767   3.321402    -4.21   0.000     -20.4975   -7.477843
 _Itime_2000 |   8.644948   1.766119     4.89   0.000     5.183419    12.10648
 _Itime_2001 |   8.492865    1.89053     4.49   0.000     4.787493    12.19824
 _Itime_2002 |   8.154398   1.887345     4.32   0.000      4.45527    11.85353
 _Itime_2003 |   9.606871   1.617647     5.94   0.000      6.43634     12.7774
 _Itime_2004 |   9.509297   1.510221     6.30   0.000     6.549318    12.46928
 _Itime_2005 |   9.594517   1.778372     5.40   0.000     6.108973    13.08006
 _Itime_2006 |   9.815025   1.457604     6.73   0.000     6.958174    12.67188
 _Itime_2007 |   9.772542   1.266414     7.72   0.000     7.290417    12.25467
 _Itime_2008 |   7.011497   1.515008     4.63   0.000     4.042135    9.980859
       _cons |   58.39906   36.63256     1.59   0.111    -13.39944    130.1976
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(cba yit popg educ open tot gov eu _Itime_1999 _Itime_2000 _Itime_2001
    _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006 _Itime_2007
    _Itime_2008 _Itime_2009)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L.L.gdppcg
```

```
    L2.(inv ebrdi)
Instruments for levels equation
  Standard
    _cons
    cba yit popg educ open tot gov eu _Itime_1999 _Itime_2000 _Itime_2001
    _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006 _Itime_2007
    _Itime_2008 _Itime_2009
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    D.L.gdppcg
    DL.(inv ebrdi)
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.83  Pr > z =  0.005
Arellano-Bond test for AR(2) in first differences: z =  -0.58  Pr > z =  0.561
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(50)   = 109.72  Prob > chi2 =  0.000
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(50)   =   0.07  Prob > chi2 =  1.000
  (Robust, but can be weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(20)   =   0.70  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(30)   =  -0.63  Prob > chi2 =  1.000
  gmm(L.gdppcg, lag(1 1))
    Hansen test excluding group:     chi2(31)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(19)   =   0.07  Prob > chi2 =  1.000
  gmm(inv ebrdi, lag(2 2))
    Hansen test excluding group:     chi2(12)   =   0.01  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(38)   =   0.06  Prob > chi2 =  1.000
  iv(cba yit popg educ open tot gov eu _Itime_1999 _Itime_2000 _Itime_2001
_Itime_2002 _Itime_
> 2003 _Itime_2004 _Itime_2005 _Itime_2006 _Itime_2007 _Itime_2008 _Itime_2009)
    Hansen test excluding group:     chi2(33)   =   9.71  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(17)   =  -9.65  Prob > chi2 =  1.000
```

. *One-step robust System GMM with one lag of dependent variable and minimum number of instruments (with 4 CBA countries)* with defactoorfix and without inflation

```
. xi: xtabond2 gdppcg L.gdppcg cba defactofix yit popg educ inv ebrdi open tot gov eu
aze2006 aze2007 lva2009 arm2009 i.time, gmm(L.gdppc, laglimits(1 1)) gmm(inv ebrdi,
laglimits (2 2)) iv(cba defactofix yit popg educ open tot gov eu i.time)  robust

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring space over speed. To switch, type or click on mata: mata set matafavor
speed, perm.
_Itime_1999 dropped due to collinearity
_Itime_2009 dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       210
Time variable : time                            Number of groups   =        24
Number of instruments = 76                      Obs per group: min =         1
Wald chi2(25) = 609130.12                                      avg =      8.75
Prob > chi2   =     0.000                                      max =        10
------------------------------------------------------------------------------
             |               Robust
      gdppcg |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      gdppcg |
         L1. |   .1392481   .0733134     1.90   0.058    -.0044436    .2829398
             |
         cba |   .2120582   .8027844     0.26   0.792     -1.36137    1.785487
  defactofix |   .4159919   .7084561     0.59   0.557    -.9725565     1.80454
         yit |  -.1586578   .1640105    -0.97   0.333    -.4801125    .1627968
        popg |  -53.93048   35.02933    -1.54   0.124    -122.5867    14.72574
        educ |   .0071976   .0230141     0.31   0.754    -.0379092    .0523043
         inv |   .0928871   .0351097     2.65   0.008     .0240733    .1617008
       ebrdi |   -1.24364   .9632369    -1.29   0.197     -3.13155    .6442695
        open |   .0053417   .0067006     0.80   0.425    -.0077912    .0184745
         tot |  -.0092665   .0159463    -0.58   0.561    -.0405207    .0219877
```

```
         gov |  -.1420776   .0449795    -3.16   0.002    -.2302359   -.0539193
          eu |   .2302227   .8976968     0.26   0.798    -1.529231    1.989676
     aze2006 |   23.24468   3.106153     7.48   0.000     17.15673    29.33263
     aze2007 |   13.24331   3.109204     4.26   0.000     7.149387    19.33724
     lva2009 |  -14.38427   5.948364    -2.42   0.016    -26.04284   -2.725686
     arm2009 |  -14.05549   3.360964    -4.18   0.000    -20.64286   -7.468125
 _Itime_2000 |   7.835424   1.792918     4.37   0.000     4.321369    11.34948
 _Itime_2001 |   7.779612   1.932032     4.03   0.000     3.992898    11.56633
 _Itime_2002 |   7.558305   1.888872     4.00   0.000     3.856184    11.26043
 _Itime_2003 |   9.076448   1.679965     5.40   0.000     5.783777    12.36912
 _Itime_2004 |   9.136296   1.604562     5.69   0.000     5.991413    12.28118
 _Itime_2005 |   9.271744   1.721839     5.38   0.000     5.897002    12.64649
 _Itime_2006 |   9.572377   1.504041     6.36   0.000     6.624512    12.52024
 _Itime_2007 |   9.675217   1.303298     7.42   0.000       7.1208    12.22963
 _Itime_2008 |   7.002938   1.528852     4.58   0.000     4.006442    9.999433
       _cons |    59.6709   35.26989     1.69   0.091    -9.456804    128.7986
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(cba defactofix yit popg educ open tot gov eu _Itime_1999 _Itime_2000
    _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
    _Itime_2007 _Itime_2008 _Itime_2009)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L.L.gdppcg
    L2.(inv ebrdi)
Instruments for levels equation
  Standard
    _cons
    cba defactofix yit popg educ open tot gov eu _Itime_1999 _Itime_2000
    _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
    _Itime_2007 _Itime_2008 _Itime_2009
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    D.L.gdppcg
    DL.(inv ebrdi)
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.87  Pr > z =  0.004
Arellano-Bond test for AR(2) in first differences: z =  -0.59  Pr > z =  0.553
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(50)   = 109.15  Prob > chi2 =  0.000
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(50)   =   0.00  Prob > chi2 =  1.000
  (Robust, but can be weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(20)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(30)   =  -0.00  Prob > chi2 =  1.000
  gmm(L.gdppcg, lag(1 1))
    Hansen test excluding group:     chi2(31)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(19)   =   0.00  Prob > chi2 =  1.000
  gmm(inv ebrdi, lag(2 2))
    Hansen test excluding group:     chi2(12)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(38)   =   0.00  Prob > chi2 =  1.000
  iv(cba defactofix yit popg educ open tot gov eu _Itime_1999 _Itime_2000 _Itime_2001
 _Itime_2
> 002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006 _Itime_2007 _Itime_2008
_Itime_2009)
    Hansen test excluding group:     chi2(32)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(18)   =  -0.00  Prob > chi2 =  1.000
```

. *One-step robust System GMM with one lag of dependent variable and minimum number of instruments (with 4 CBA countries)* with defactoorfix and inflation

```
. xi: xtabond2 gdppcg L.gdppcg cba defactofix lninf  yit popg educ inv ebrdi open tot
gov eu aze2006 aze2007 lva2009 arm2009 i.time, gmm(L.gdppc, laglimits(1 1)) gmm(lninf
inv ebrdi, lag limits (2 2)) iv(cba defactofix yit popg educ open tot gov eu i.time)
robust

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring space over speed. To switch, type or click on mata: mata set matafavor
speed, perm.
_Itime_1999 dropped due to collinearity
_Itime_2009 dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
Warning: Two-step estimated covariance matrix of moments is singular.
```

```
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       210
Time variable : time                            Number of groups   =        24
Number of instruments = 95                      Obs per group: min =         1
Wald chi2(26) =  13839.65                                      avg =      8.75
Prob > chi2   =     0.000                                      max =        10
------------------------------------------------------------------------------
             |               Robust
      gdppcg |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      gdppcg |
         L1. |   .2030068   .0747743     2.71   0.007     .0564519    .3495617
             |
         cba |  -.1103925    .716017    -0.15   0.877    -1.51376    1.292975
  defactofix |   .4455914   .7173826     0.62   0.535   -.9604527    1.851635
       lninf |  -.6537562   .8438847    -0.77   0.439    -2.30774    1.000228
         yit |  -.1928442   .1746329    -1.10   0.269   -.5351184    .1494299
        popg |  -50.13675   31.31664    -1.60   0.109   -111.5162    11.24274
        educ |   .0065232   .0225599     0.29   0.772   -.0376934    .0507397
         inv |   .0800689   .0391936     2.04   0.041     .0032508     .156887
       ebrdi |  -1.084131   1.263958    -0.86   0.391   -3.561444    1.393181
        open |   .0090125   .0072453     1.24   0.214   -.0051879     .023213
         tot |  -.0077038   .0149768    -0.51   0.607   -.0370577    .0216501
         gov |  -.1348228     .04224    -3.19   0.001   -.2176117   -.0520339
          eu |   .0811958   .7854628     0.10   0.918   -1.458283    1.620675
     aze2006 |   21.42311   2.358287     9.08   0.000    16.80095    26.04527
     aze2007 |   11.47322   2.699182     4.25   0.000    6.182916    16.76352
     lva2009 |  -12.87344   6.138368    -2.10   0.036   -24.90442   -.8424619
     arm2009 |  -13.69858   3.220683    -4.25   0.000   -20.01101   -7.386162
 _Itime_2000 |   8.074314   2.265829     3.56   0.000    3.633371    12.51526
 _Itime_2001 |   7.781077   2.229305     3.49   0.000     3.41172    12.15043
 _Itime_2002 |   7.433851    2.01076     3.70   0.000    3.492833    11.37487
 _Itime_2003 |   9.002215   1.801829     5.00   0.000    5.470694    12.53374
 _Itime_2004 |   9.086501   1.790828     5.07   0.000    5.576543    12.59646
 _Itime_2005 |   9.216422   1.774548     5.19   0.000    5.738372    12.69447
 _Itime_2006 |   9.647289   1.583481     6.09   0.000    6.543724    12.75086
 _Itime_2007 |   9.792356   1.343252     7.29   0.000    7.159631    12.42508
 _Itime_2008 |    7.12201    1.64343     4.33   0.000    3.900947    10.34307
       _cons |   56.88492   31.41471     1.81   0.070   -4.686786    118.4566
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(cba defactofix yit popg educ open tot gov eu _Itime_1999 _Itime_2000
    _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
    _Itime_2007 _Itime_2008 _Itime_2009)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L.L.gdppcg
    L2.(lninf inv ebrdi)
Instruments for levels equation
  Standard
    _cons
    cba defactofix yit popg educ open tot gov eu _Itime_1999 _Itime_2000
    _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
    _Itime_2007 _Itime_2008 _Itime_2009
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    D.L.gdppcg
    DL.(lninf inv ebrdi)
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.90  Pr > z =  0.004
Arellano-Bond test for AR(2) in first differences: z =  -0.28  Pr > z =  0.783
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(68)   = 127.18  Prob > chi2 =  0.000
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(68)   =   0.00  Prob > chi2 =  1.000
  (Robust, but can be weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(28)   =   5.16  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(40)   =  -5.16  Prob > chi2 =  1.000
  gmm(L.gdppcg, lag(1 1))
    Hansen test excluding group:     chi2(50)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(18)   =   0.00  Prob > chi2 =  1.000
```

```
  gmm(lninf inv ebrdi, lag(2 2))
    Hansen test excluding group:     chi2(10)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(58)   =   0.00  Prob > chi2 =  1.000
  iv(cba defactofix yit popg educ open tot gov eu _Itime_1999 _Itime_2000 _Itime_2001
_Itime_2 002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006 _Itime_2007 _Itime_2008
_Itime_2009)
    Hansen test excluding group:     chi2(50)   =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(18)   =   0.00  Prob > chi2 =  1.000
```

## Appendix 6.7d: Dynamic estimation of growth model (CBA divided to strong and weak CBA)

```
. xi: xtabond2 gdppcg L.gdppcg strongcba weakcba defactofix lninf fb yit popg educ
inv ebrdi open tot gov eu aze2006 aze2007 lva2009 arm2009 i.time, gmm(L.gdppc,
laglimits(1 1)) gmm(lninf fb inv ebrdi, laglimits (2 2)) iv(cba defactofix yit popg
educ open tot gov eu i.time)  robust

i.time            _Itime_1998-2009    (naturally coded; _Itime_1998 omitted)
Favoring space over speed. To switch, type or click on mata: mata set matafavor
speed, perm.
_Itime_1999 dropped due to collinearity
_Itime_2009 dropped due to collinearity
Warning: Number of instruments may be large relative to number of observations.
Warning: Two-step estimated covariance matrix of moments is singular.
  Using a generalized inverse to calculate robust weighting matrix for Hansen test.
  Difference-in-Sargan statistics may be negative.

Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: ctyno                           Number of obs      =       210
Time variable : time                            Number of groups   =        24
Number of instruments = 114                     Obs per group: min =         1
Wald chi2(28) =  22897.53                                      avg =      8.75
Prob > chi2   =     0.000                                      max =        10
------------------------------------------------------------------------------
             |               Robust
      gdppcg |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      gdppcg |
         L1. |   .1280044   .0875631     1.46   0.144    -.0436161    .2996249
             |
   strongcba |   -1.62993   2.416363    -0.67   0.500    -6.365914    3.106053
     weakcba |   .3381877   .8294035     0.41   0.683    -1.287413    1.963789
  defactofix |  -.0614471   .7445943    -0.08   0.934    -1.520825    1.397931
       lninf |  -1.594183   .8937731    -1.78   0.074    -3.345946    .1575799
          fb |   .2218096    .098942     2.24   0.025     .0278868    .4157323
         yit |  -.2250792   .2055921    -1.09   0.274    -.6280323    .1778738
        popg |  -39.31064   36.45884    -1.08   0.281    -110.7687    32.14738
        educ |   .0073097   .0183107     0.40   0.690    -.0285787     .043198
         inv |   .0859166   .0392705     2.19   0.029     .0089479    .1628853
       ebrdi |  -1.574837   1.136526    -1.39   0.166    -3.802388    .6527135
        open |   .0131361   .0087004     1.51   0.131    -.0039164    .0301886
         tot |  -.0138158   .0172442    -0.80   0.423    -.0476138    .0199822
         gov |  -.1186955    .045215    -2.63   0.009    -.2073153   -.0300757
          eu |   .3595713   .6520291     0.55   0.581    -.9183823    1.637525
     aze2006 |   22.84915   2.160128    10.58   0.000     18.61538    27.08292
     aze2007 |   14.29831   2.858433     5.00   0.000     8.695886    19.90074
     lva2009 |  -11.26372   5.261366    -2.14   0.032    -21.57581    -.951633
     arm2009 |  -13.45295   2.662998    -5.05   0.000    -18.67233   -8.233573
 _Itime_2000 |   7.592943   2.335759     3.25   0.001      3.01494    12.17095
 _Itime_2001 |   7.284139   2.152325     3.38   0.001      3.06566    11.50262
 _Itime_2002 |   6.800666   1.975843     3.44   0.001     2.928086    10.67325
 _Itime_2003 |   8.211506   1.586329     5.18   0.000     5.102358    11.32065
 _Itime_2004 |   8.243767   1.705761     4.83   0.000     4.900537      11.587
 _Itime_2005 |   8.340013   1.662312     5.02   0.000      5.08194    11.59808
 _Itime_2006 |   8.698516   1.488385     5.84   0.000     5.781335     11.6157
 _Itime_2007 |   8.945411   1.165478     7.68   0.000     6.661117    11.22971
 _Itime_2008 |   6.649818   1.502282     4.43   0.000     3.705398    9.594237
       _cons |   51.92749   36.26256     1.43   0.152    -19.14582    123.0008
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(cba defactofix yit popg educ open tot gov eu _Itime_1999 _Itime_2000
    _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
    _Itime_2007 _Itime_2008 _Itime_2009)
```

```
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L.L.gdppcg
    L2.(lninf fb inv ebrdi)
Instruments for levels equation
  Standard
    _cons
    cba defactofix yit popg educ open tot gov eu _Itime_1999 _Itime_2000
    _Itime_2001 _Itime_2002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006
    _Itime_2007 _Itime_2008 _Itime_2009
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    D.L.gdppcg
    DL.(lninf fb inv ebrdi)
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.86  Pr > z =  0.004
Arellano-Bond test for AR(2) in first differences: z =  -0.40  Pr > z =  0.688
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(85)   = 151.91  Prob > chi2 =  0.000
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(85)   =   0.00  Prob > chi2 =  1.000
  (Robust, but can be weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(35)    =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(50)    =   0.00  Prob > chi2 =  1.000
  gmm(L.gdppcg, lag(1 1))
    Hansen test excluding group:     chi2(68)    =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(17)    =   0.00  Prob > chi2 =  1.000
  gmm(lninf fb inv ebrdi, lag(2 2))
    Hansen test excluding group:     chi2(7)     =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(78)    =   0.00  Prob > chi2 =  1.000
  iv(cba defactofix yit popg educ open tot gov eu _Itime_1999 _Itime_2000 _Itime_2001
_Itime_2
> 002 _Itime_2003 _Itime_2004 _Itime_2005 _Itime_2006 _Itime_2007 _Itime_2008
_Itime_2009)
    Hansen test excluding group:     chi2(67)    =   0.00  Prob > chi2 =  1.000
    Difference (null H = exogenous): chi2(18)    =   0.00  Prob > chi2 =  1.000


.
. *Calculation of the long-run coefficient
. nlcom _b[strongcba]/(1-_b[l.gdppcg])

       _nl_1:  _b[strongcba]/(1-_b[l.gdppcg])

------------------------------------------------------------------------------
      gdppcg |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _nl_1 |  -1.869196   2.738976    -0.68   0.495     -7.23749    3.499099
------------------------------------------------------------------------------

. nlcom _b[weakcba]/(1-_b[l.gdppcg])

       _nl_1:  _b[weakcba]/(1-_b[l.gdppcg])

------------------------------------------------------------------------------
      gdppcg |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _nl_1 |   .3878319   .9438577     0.41   0.681    -1.462095    2.237759
------------------------------------------------------------------------------
```

## Appendices for growth volatility model

### Appendix 6.8: Growth volatility model - Correlation matrix

```
. correlate cba mnlninf mnfb mncred mnmsg mnopen mninv mnebrdi mntot mngov sdinf sdfb sdcred sdmsg sdopen sdinv sdebrdi sdtot sdgov
(obs=68)

             |      cba  mnlninf     mnfb   mncred    mnmsg   mnopen    mninv  mnebrdi    mntot    mngov    sdinf     sdfb   sdcred
-------------+---------------------------------------------------------------------------------------------------------------------
         cba |   1.0000
     mnlninf |  -0.2771   1.0000
        mnfb |   0.2165   0.2251   1.0000
      mncred |   0.2114  -0.2208  -0.3163   1.0000
       mnmsg |  -0.1423   0.5934   0.4941  -0.5771   1.0000
      mnopen |   0.2910  -0.0855  -0.0574   0.3842  -0.1853   1.0000
       mninv |   0.0399  -0.2078   0.0854   0.2063  -0.1537   0.1814   1.0000
     mnebrdi |   0.1904  -0.5330  -0.3399   0.6053  -0.6945   0.2851   0.0919   1.0000
       mntot |   0.0874   0.1572   0.4959   0.0045   0.1726  -0.1683   0.0986   0.0391   1.0000
       mngov |   0.0955   0.0353  -0.3409   0.5195  -0.3113   0.3754  -0.0294   0.2227  -0.2145   1.0000
       sdinf |  -0.0789   0.6407  -0.0016  -0.1322   0.3777  -0.1031  -0.3618  -0.4037  -0.0025   0.1031   1.0000
        sdfb |   0.0077   0.1841   0.3001   0.1076   0.0357  -0.1272  -0.0910  -0.0220   0.4873  -0.0036   0.1815   1.0000
      sdcred |   0.0564  -0.0462  -0.0240   0.3400  -0.0999   0.1676   0.1022   0.1755  -0.0044   0.2330   0.0492   0.1138   1.0000
       sdmsg |  -0.0255   0.1542   0.1471  -0.2716   0.4302  -0.2370  -0.0714  -0.3542   0.1638  -0.1516   0.2478   0.4804  -0.0967
      sdopen |   0.2103  -0.1279   0.1019   0.0681   0.0106   0.3731   0.1393   0.0167  -0.0525  -0.0088  -0.1006   0.1755   0.0405
       sdinv |   0.1079  -0.0597  -0.0171   0.1387  -0.1506   0.0586   0.4862   0.0367   0.1922  -0.1231  -0.0461   0.2173   0.0424
     sdebrdi |   0.0764   0.2889   0.0709  -0.2429   0.3843  -0.1634  -0.2145  -0.3626  -0.1932   0.1151   0.5980  -0.1691   0.0429
       sdtot |  -0.1579   0.2273   0.6178  -0.2267   0.3450  -0.2797   0.0080  -0.1792   0.8339  -0.3478   0.0069   0.5307  -0.0519
       sdgov |  -0.0324  -0.0845  -0.1074   0.1756  -0.1323  -0.0581   0.1355   0.0517  -0.0116  -0.0850  -0.0478   0.0787   0.0601

             |    sdmsg   sdopen    sdinv  sdebrdi    sdtot    sdgov
-------------+------------------------------------------------------
       sdmsg |   1.0000
      sdopen |   0.2576   1.0000
       sdinv |   0.2278   0.2583   1.0000
     sdebrdi |   0.1221  -0.1900  -0.1995   1.0000
       sdtot |   0.2960  -0.0380   0.1393  -0.1789   1.0000
       sdgov |   0.0434  -0.0895   0.2311  -0.0538  -0.0396   1.0000
```

### Appendix 6.9: Growth volatility model - OLS and FE estimations and diagnostic tests

### Appendix 6.9a: Growth volatility model – estimated with OLS

```
. xi: regress lnsdgdpg cba mnlninf mnfb sdmsg mncred mnopen mninv mnebrdi sdtot mngov
i.time
i.time            _Itime_1-4          (naturally coded; _Itime_1 omitted)
note: _Itime_2 omitted because of collinearity

      Source |       SS       df       MS              Number of obs =      70
-------------+------------------------------           F( 12,    57) =    7.45
       Model |  53.4257957    12  4.45214964           Prob > F      =  0.0000
    Residual |  34.0832805    57   .59795229           R-squared     =  0.6105
-------------+------------------------------           Adj R-squared =  0.5285
       Total |  87.5090762    69  1.26824748           Root MSE      =  .77327

------------------------------------------------------------------------------
    lnsdgdpg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cba |  -.2909527   .3110434    -0.94   0.354    -.9138064    .3319009
     mnlninf |   .0873947   .4124313     0.21   0.833    -.7384848    .9132742
        mnfb |   -.003791   .0465732    -0.08   0.935    -.0970523    .0894702
       sdmsg |   .0021179   .0087002     0.24   0.809     -.015304    .0195398
      mncred |  -.0081426   .0076151    -1.07   0.289    -.0233916    .0071065
      mnopen |  -.0005552   .0037112    -0.15   0.882    -.0079868    .0068763
       mninv |   .0166146   .0185705     0.89   0.375    -.0205721    .0538013
     mnebrdi |  -.0389592   .2886037    -0.13   0.893     -.616878    .5389597
       sdtot |   -.009734   .0199648    -0.49   0.628    -.0497128    .0302448
       mngov |  -.0118984   .0139415    -0.85   0.397    -.0398157     .016019
    _Itime_2 |  (omitted)
    _Itime_3 |   .2349784   .2431929     0.97   0.338    -.2520071    .7219638
    _Itime_4 |   2.089941   .2988884     6.99   0.000     1.491427    2.688455
       _cons |   .2618367     1.8876     0.14   0.890    -3.518017     4.04169
------------------------------------------------------------------------------


. test  _Itime_2 _Itime_3 _Itime_4

 ( 1)  o._Itime_2 = 0
 ( 2)  _Itime_3 = 0
 ( 3)  _Itime_4 = 0
       Constraint 1 dropped

       F(  2,    57) =   29.46
            Prob > F =    0.0000
```

```
. estat imtest

Cameron & Trivedi's decomposition of IM-test

---------------------------------------------------
              Source |       chi2     df      p
---------------------+-----------------------------
  Heteroskedasticity |      70.00     69    0.4438
            Skewness |      21.31     12    0.0460
            Kurtosis |       0.00      1    0.9598
---------------------+-----------------------------
               Total |      91.31     82    0.2257
---------------------------------------------------

. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of lnsdgdpg

         chi2(1)      =     0.36
         Prob > chi2  =   0.5458

. estat ovtest

Ramsey RESET test using powers of the fitted values of lnsdgdpg
       Ho:  model has no omitted variables
                  F(3, 54) =      3.68
                  Prob > F =      0.0174
```

**Appendix 6.9b: Growth volatility model – estimated with FE**

```
. xi: xtreg lnsdgdpg cba mnlninf mnfb sdmsg mncred mnopen mninv mnebrdi sdtot mngov
i.time, fe
i.time            _Itime_1-4          (naturally coded; _Itime_1 omitted)
note: cba omitted because of collinearity
note: _Itime_2 omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =        70
Group variable: ctyno                           Number of groups   =        24

R-sq:  within  = 0.7198                         Obs per group: min =         2
       between = 0.1614                                        avg =       2.9
       overall = 0.1938                                        max =         3

                                                F(11,35)           =      8.17
corr(u_i, Xb)  = -0.6293                        Prob > F           =    0.0000

------------------------------------------------------------------------------
    lnsdgdpg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cba |  (omitted)
     mnlninf |  -.4922498   .6650691    -0.74   0.464    -1.842412    .8579123
        mnfb |  -.0218301   .0670222    -0.33   0.747    -.1578924    .1142321
       sdmsg |   .0102652   .0143599     0.71   0.479    -.0188869    .0394174
      mncred |   .0095414   .0156806     0.61   0.547    -.0222918    .0413747
      mnopen |   .0134795   .0128675     1.05   0.302    -.0126429    .0396019
       mninv |  -.0043306   .0325464    -0.13   0.895    -.0704034    .0617421
     mnebrdi |   .5279664   2.383398     0.22   0.826     -4.31059    5.366522
       sdtot |  -.0092178   .0287452    -0.32   0.750    -.0675737     .049138
       mngov |   .0073202   .0466596     0.16   0.876    -.0874037    .1020441
    _Itime_2 |  (omitted)
    _Itime_3 |   .0164111   .4518118     0.04   0.971    -.9008155    .9336378
    _Itime_4 |   1.531839   .6767495     2.26   0.030     .1579641    2.905713
       _cons |  -2.177287   7.877055    -0.28   0.784    -18.16856    13.81399
-------------+----------------------------------------------------------------
     sigma_u |   1.127091
     sigma_e |  .75832308
         rho |  .68838322   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(23, 35) =     1.06             Prob > F = 0.4337
```

```
. xttest3

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (24)  =    2898.20
Prob>chi2 =      0.0000


. xtserial lnsdgdpg cba mnlninf mnfb sdmsg mncred mnopen mninv mnebrdi sdtot
mngov time2 time3 time4

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      21) =      1.201
           Prob > F =      0.2855
```

**Appendix 6.10: Growth volatility model - Between and within effects**

```
. xtsum lnsdgdpg cba mnlninf mnfb sdmsg mncred mnopen mninv mnebrdi sdtot mngov
Variable         |      Mean   Std. Dev.       Min        Max |    Observations
-----------------+--------------------------------------------+----------------
lnsdgdpg overall |   .718022   1.080679  -2.512017   2.684023 |     N =     100
         between |             .4431941  -.3255604   1.575824 |     n =      25
         within  |             .9886345  -1.697646   2.553148 |     T =       4
                 |                                            |
cba      overall |       .16   .3684529          0          1 |     N =     100
         between |             .3741657          0          1 |     n =      25
         within  |                    0        .16        .16 |     T =       4
                 |                                            |
mnlninf  overall |   2.87096   .4471348   1.693078   5.106167 |     N =     100
         between |             .3432977   2.499878   3.802948 |     n =      25
         within  |              .292656   2.028603   4.174179 |     T =       4
                 |                                            |
mnfb     overall |  -2.37524   3.312008   -11.0075   12.42793 |     N =     100
         between |             2.451754  -6.519593   2.473491 |     n =      25
         within  |             2.267257  -8.171591   7.579199 |     T =       4
                 |                                            |
sdmsg    overall |  14.29999    15.4573   .8326664   79.37995 |     N =      99
         between |              9.48929    3.24449   38.64995 |     n =      25
         within  |             12.27698  -21.09449   63.84012 |     T =    3.96
                 |                                            |
mncred   overall |  36.62961   20.12363   7.424119    98.8027 |     N =     100
         between |             15.94451   10.68834    62.7205 |     n =      25
         within  |             12.58718    1.32907   74.17355 |     T =       4
                 |                                            |
mnopen   overall |  103.0911   30.29766    50.3587   182.0003 |     N =     100
         between |              28.5004   57.85231   157.0112 |     n =      25
         within  |             11.41443   69.12999   136.2494 |     T =       4
                 |                                            |
mninv    overall |  25.23141   5.866623   8.677333     43.125 |     N =      96
         between |             4.137591    14.2795   31.65808 |     n =      24
         within  |             4.223533     13.662   37.10258 |     T =       4
                 |                                            |
mnebrdi  overall |  3.110508   .5487099    1.41625          4 |     N =     100
         between |             .5243443   1.829896   3.922188 |     n =      25
         within  |             .1856802   2.228217     3.7153 |     T =       4
                 |                                            |
sdtot    overall |  4.359198   7.313583    .107677   32.04279 |     N =      74
         between |             6.141459    .994316   22.14266 |     n =      25
         within  |             4.047778  -11.35077   16.89533 |     T =    2.96
                 |                                            |
mngov    overall |  36.35975   8.961845    17.5763   58.13747 |     N =     100
         between |             8.308116   21.66292   49.46571 |     n =      25
         within  |             3.658079   24.52424   49.31682 |     T =       4
```

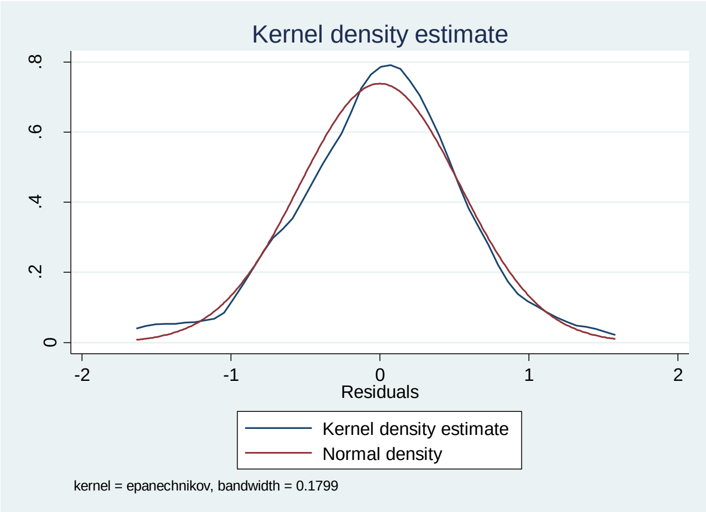
## Appendix 6.11: Growth volatility model - FEVD

### Appendix 6.11a: Growth volatility model - FEVD 3 stages

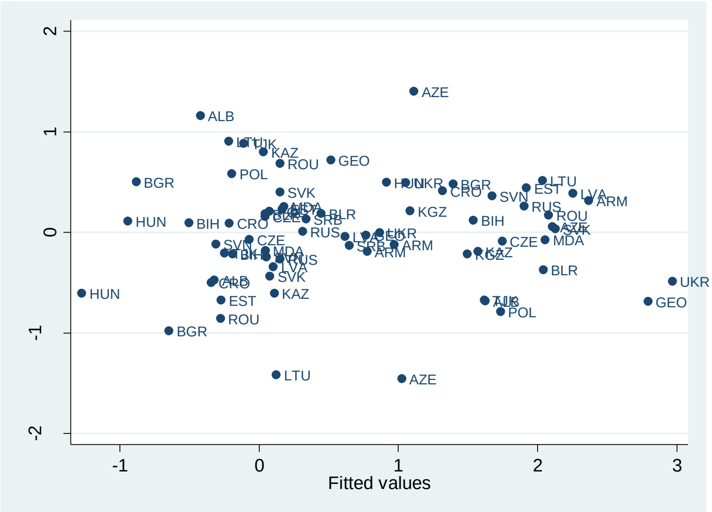
```
. *Stage 1 (panel robust SE)
. xi: xtreg lnsdgdpg cba mnlninf mnfb sdmsg mncred mnopen mninv mnebrdi sdtot mngov
i.time, fe robust
i.time            _Itime_1-4          (naturally coded; _Itime_1 omitted)
note: cba omitted because of collinearity
note: _Itime_2 omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =        70
Group variable: ctyno                           Number of groups   =        24

R-sq:  within  = 0.7198                         Obs per group: min =         2
       between = 0.1614                                        avg =       2.9
       overall = 0.1938                                        max =         3

                                                F(11,23)           =     23.96
corr(u_i, Xb)  = -0.6293                        Prob > F           =    0.0000

                                 (Std. Err. adjusted for 24 clusters in ctyno)
------------------------------------------------------------------------------
             |               Robust
    lnsdgdpg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cba |  (omitted)
     mnlninf |  -.4922498   .6211893    -0.79   0.436    -1.777278    .7927781
        mnfb |  -.0218301   .0400767    -0.54   0.591    -.1047351    .0610748
       sdmsg |   .0102652   .0080805     1.27   0.217    -.0064505     .026981
      mncred |   .0095414   .0135365     0.70   0.488    -.0184608    .0375437
      mnopen |   .0134795   .0111331     1.21   0.238    -.0095511    .0365102
       mninv |  -.0043306   .0318648    -0.14   0.893     -.070248    .0615867
     mnebrdi |   .5279664   1.156774     0.46   0.652    -1.865002    2.920935
       sdtot |  -.0092178   .0402346    -0.23   0.821    -.0924494    .0740137
       mngov |   .0073202   .0395686     0.18   0.855    -.0745337    .0891741
    _Itime_2 |  (omitted)
    _Itime_3 |   .0164111   .3032203     0.05   0.957    -.6108479    .6436702
    _Itime_4 |   1.531839   .4783389     3.20   0.004     .5423193    2.521358
       _cons |  -2.177287   4.202452    -0.52   0.609    -10.87072    6.516148
-------------+----------------------------------------------------------------
     sigma_u |   1.127091
     sigma_e |  .75832308
         rho |  .68838322   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. *Save fixed effect (unit effects) from stage 1
. predict fixedeff, u
(299 missing values generated)

. *Stage 2 (regression of the FE vector on the time-invariant and slowly changing
explantory variables - by OLS)
. reg fixedeff cba mnebrdi mngov

      Source |       SS       df       MS              Number of obs =      70
-------------+------------------------------           F(  3,    66) =   40.12
       Model |  53.9216069     3   17.973869           Prob > F      =  0.0000
    Residual |  29.5656409    66  .447964255           R-squared     =  0.6459
-------------+------------------------------           Adj R-squared =  0.6298
       Total |  83.4872478    69  1.20996011           Root MSE      =   .6693

------------------------------------------------------------------------------
    fixedeff |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cba |  -.6589329   .2162816    -3.05   0.003    -1.090753   -.2271128
     mnebrdi |  -1.127531   .1596616    -7.06   0.000    -1.446306   -.8087567
       mngov |  -.0470683   .0095318    -4.94   0.000    -.0660991   -.0280374
       _cons |   5.406343    .543863     9.94   0.000     4.320486    6.492201
------------------------------------------------------------------------------

. * Save the residuals from stage 2
. predict resfevd, residuals
(299 missing values generated)
```

```
. *Stage 3 (estimation of pooled OLS by including all explanatory time-variant, time-
invariant variables and unexplained part of the FE
> vector - error term from the stage 2)
. regress lnsdgdpg cba mnlninf mnfb sdmsg mncred mnopen mninv mnebrdi sdtot mngov
resfevd i.time

      Source |       SS       df       MS              Number of obs =      70
-------------+------------------------------           F( 13,    56) =   14.42
       Model |  67.3821901    13  5.18324539           Prob > F      =  0.0000
    Residual |  20.1268862    56  .359408682           R-squared     =  0.7700
-------------+------------------------------           Adj R-squared =  0.7166
       Total |  87.5090762    69  1.26824748           Root MSE      =  .59951

------------------------------------------------------------------------------
    lnsdgdpg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cba |  -.6589329    .248272    -2.65   0.010    -1.156282   -.1615842
     mnlninf |  -.4922498   .3330067    -1.48   0.145    -1.159343    .1748428
        mnfb |  -.0218301   .0362233    -0.60   0.549    -.0943942    .0507339
       sdmsg |   .0102652   .0068707     1.49   0.141    -.0034984    .0240289
      mncred |   .0095414   .0065505     1.46   0.151    -.0035808    .0226637
      mnopen |   .0134795   .0036539     3.69   0.001     .0061599    .0207992
       mninv |  -.0043307   .0147845    -0.29   0.771    -.0339476    .0252863
     mnebrdi |  -.5995651   .2411585    -2.49   0.016    -1.082664   -.1164666
       sdtot |  -.0092178   .0154786    -0.60   0.554    -.0402252    .0217896
       mngov |  -.0397481   .0116962    -3.40   0.001    -.0631783   -.0163179
     resfevd |          1   .1604751     6.23   0.000     .6785297     1.32147
             |
        time |
          3  |   .0164111   .1917784     0.09   0.932    -.3677671    .4005894
          4  |   1.531839   .2484292     6.17   0.000     1.034175    2.029502
             |
       _cons |   3.229056   1.538945     2.10   0.040     .1461798    6.311932
------------------------------------------------------------------------------

. *Diagnostic tests after 3rd stage*
. estat imtest

Cameron & Trivedi's decomposition of IM-test

---------------------------------------------------
              Source |       chi2     df      p
---------------------+-----------------------------
  Heteroskedasticity |      70.00     69    0.4438
            Skewness |      13.19     13    0.4330
            Kurtosis |       1.32      1    0.2499
---------------------+-----------------------------
               Total |      84.52     83    0.4330
---------------------------------------------------

. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of lnsdgdpg

         chi2(1)      =     0.97
         Prob > chi2  =   0.3245

. estat ovtest

Ramsey RESET test using powers of the fitted values of lnsdgdpg
       Ho:  model has no omitted variables
                  F(3, 53) =      0.77
                  Prob > F =      0.5151

predict res, residuals
```

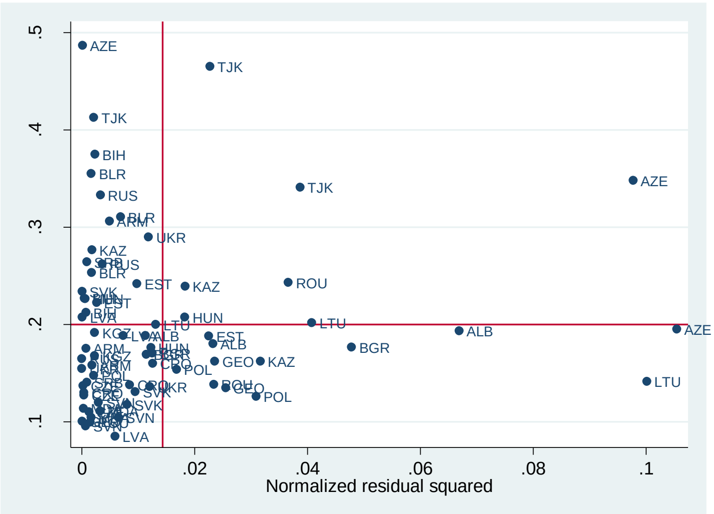
```
kdensity res, normal
```




```
rvfplot, mlabel(cntry)
```




```
lvr2plot, mlabel(cntry)
```



```
. hilo res cntry time
10 lowest and highest observations on res

  +--------------------------+
  |       res   cntry   time |
  |--------------------------|
  |  -1.45669     AZE      2 |
  | -1.419738     LTU      3 |
  | -.9811749     BGR      3 |
  | -.8582078     ROU      2 |
  | -.7885178     POL      4 |
  |--------------------------|
  | -.6887646     GEO      4 |
  | -.6836675     ALB      4 |
  | -.6758925     TJK      4 |
  | -.6729501     EST      2 |
  |  -.607364     KAZ      3 |
  +--------------------------+

  +-------------------------+
  |      res   cntry   time |
  |-------------------------|
  | .5018888     BGR      2 |
  | .5136604     LTU      4 |
  | .5813437     POL      2 |
  | .6857823     ROU      3 |
  | .7164961     GEO      2 |
  |-------------------------|
  | .7979323     KAZ      2 |
  | .8826559     TJK      3 |
  | .9060773     LTU      2 |
  |  1.16013     ALB      2 |
  | 1.402287     AZE      3 |
  +-------------------------+

. predict lev, leverage
(299 missing values generated)

. hilo lev cntry time, show(5)high
5 highest observations on lev

  +-------------------------+
  |      lev   cntry   time |
  |-------------------------|
  | .3549501     BLR      2 |
  | .3747917     BIH      2 |
  | .4127378     TJK      2 |
  | .4653097     TJK      4 |
  | .4868824     AZE      4 |
  +-------------------------+


.
F-TEST - JOINT TEST

       F( 13,    56) =   14.42
            Prob > F =    0.0000

. test cba mnlninf mnfb sdmsg mncred mnopen mninv mnebrdi sdtot mngov
resfevd8 time3 time4

 ( 1)  cba = 0
 ( 2)  mnlninf = 0
 ( 3)  mnfb = 0
 ( 4)  sdmsg = 0
 ( 5)  mncred = 0
 ( 6)  mnopen = 0
 ( 7)  mninv = 0
 ( 8)  mnebrdi = 0
```

```
 ( 9)  sdtot = 0
 (10)  mngov = 0
 (11)  resfevd8 = 0
 (12)  time3 = 0
 (13)  time4 = 0

       F( 13,    56) =   14.42
            Prob > F =    0.0000
```

**Appendix 6.11b: Growth volatility model – FEVD estimated with 'xtfevd' command (treating cba, ebrdi and gov as invariant, slowly moving variables)**

```
. xtfevd lnsdgdpg cba mnlninf mnfb mncred sdmsg mnopen mninv mnebrdi sdtot mngov
time2 time3, invariant(cba mnebrdi mngov)

panel fixed effects regression with vector decomposition

degrees of freedom fevd    =       34          number of obs       =       70
mean squared error         = .2875269          F( 14, 34)          = 4.854013
root mean squared error    = .5362154          Prob > F            = .0001338
Residual Sum of Squares    = 20.12689          R-squared           = .7700023
Total Sum of Squares       = 87.50908          adj. R-squared      =   .53324
Estimation Sum of Squares = 67.38219

------------------------------------------------------------------------------
             |              fevd
    lnsdgdpg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     mnlninf |  -.4922498   1.693271    -0.29   0.773     -3.93339     2.94889
        mnfb |  -.0218301   .0687684    -0.32   0.753    -.1615844    .1179242
      mncred |   .0095414   .0228193     0.42   0.678    -.0368329    .0559158
       sdmsg |   .0102652   .0162387     0.63   0.532    -.0227357    .0432662
      mnopen |   .0134795   .0169688     0.79   0.432    -.0210052    .0479642
       mninv |  -.0043307   .0270016    -0.16   0.874    -.0592046    .0505433
       sdtot |  -.0092178   .0406634    -0.23   0.822    -.0918558    .0734201
       time2 |  -1.531839   .5167234    -2.96   0.006    -2.581947   -.4817303
       time3 |  -1.515427   .3594462    -4.22   0.000     -2.24591   -.7849449
         cba |  -.6589329   .5683701    -1.16   0.254       -1.814    .4961342
     mnebrdi |  -.5995651   1.029093    -0.58   0.564    -2.690933    1.491803
       mngov |  -.0397481   .0299994    -1.32   0.194    -.1007141     .021218
         eta |          1          .        .       .            .           .
       _cons |   4.760895   7.077149     0.67   0.506    -9.621603    19.14339
------------------------------------------------------------------------------
```

**Appendix 6.12: Growth volatility model - Dividing a CBA variable to strong and weak**

```
**STRONG AND WEAK CBA**

. *Stage 1 (panel robust SE)
. xi: xtreg lnsdgdpg strongcba weakcba mnlninf mnfb mncred sdmsg mnopen mninv mnebrdi
sdtot mngov i.time , fe robust
i.time            _Itime_1-4          (naturally coded; _Itime_1 omitted)
note: strongcba omitted because of collinearity
note: weakcba omitted because of collinearity
note: _Itime_2 omitted because of collinearity

Fixed-effects (within) regression              Number of obs      =        70
Group variable: ctyno                          Number of groups   =        24

R-sq:  within  = 0.7198                        Obs per group: min =         2
       between = 0.1614                                       avg =       2.9
       overall = 0.1938                                       max =         3

                                               F(11,23)           =     23.96
corr(u_i, Xb)  = -0.6293                       Prob > F           =    0.0000

                                 (Std. Err. adjusted for 24 clusters in ctyno)
------------------------------------------------------------------------------
             |               Robust
    lnsdgdpg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   strongcba |  (omitted)
     weakcba |  (omitted)
```

```
     mnlninf |  -.4922498   .6211893    -0.79   0.436    -1.777278    .7927781
        mnfb |  -.0218301   .0400767    -0.54   0.591    -.1047351    .0610748
      mncred |   .0095414   .0135365     0.70   0.488    -.0184608    .0375437
       sdmsg |   .0102652   .0080805     1.27   0.217    -.0064505     .026981
      mnopen |   .0134795   .0111331     1.21   0.238    -.0095511    .0365102
       mninv |  -.0043306   .0318648    -0.14   0.893     -.070248    .0615867
     mnebrdi |   .5279664   1.156774     0.46   0.652    -1.865002    2.920935
       sdtot |  -.0092178   .0402346    -0.23   0.821    -.0924494    .0740137
       mngov |   .0073202   .0395686     0.18   0.855    -.0745337    .0891741
    _Itime_2 |  (omitted)
    _Itime_3 |   .0164111   .3032203     0.05   0.957    -.6108479    .6436702
    _Itime_4 |   1.531839   .4783389     3.20   0.004     .5423193    2.521358
       _cons |  -2.177287   4.202452    -0.52   0.609    -10.87072    6.516148
-------------+----------------------------------------------------------------
     sigma_u |   1.127091
     sigma_e |  .75832308
         rho |  .68838322   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. *Save fixed effect (unit effects) from stage 1
. predict fixeff1, u
(299 missing values generated)

. *Stage 2 (regression of the FE vector on the time-invariant and slowly changing
explantory variables - by OLS)
. reg fixeff1 strongcba weakcba mnebrdi mngov

      Source |       SS       df       MS              Number of obs =      70
-------------+------------------------------           F(  4,    65) =   30.17
       Model |  54.2606052     4  13.5651513           Prob > F      =  0.0000
    Residual |  29.2266426    65  .449640655           R-squared     =  0.6499
-------------+------------------------------           Adj R-squared =  0.6284
       Total |  83.4872478    69  1.20996011           Root MSE      =  .67055

------------------------------------------------------------------------------
     fixeff1 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   strongcba |  -.8257747   .2896103    -2.85   0.006    -1.404166   -.2473829
     weakcba |  -.4850217    .295075    -1.64   0.105    -1.074327    .1042839
     mnebrdi |  -1.148424   .1617597    -7.10   0.000     -1.47148   -.8253675
       mngov |  -.0462107   .0096005    -4.81   0.000    -.0653843   -.0270371
       _cons |   5.441608   .5463912     9.96   0.000     4.350389    6.532827
------------------------------------------------------------------------------

. * Save the residuals from stage 2
. predict resfevd1, residuals
(299 missing values generated)

. *Stage 3 (estimation of pooled OLS by including all explanatory time-variant, time-
invariant variables and unexplained part of the FE
> vector - error term from the stage 2)
. regress lnsdgdpg strongcba weakcba mnlninf mnfb mncred sdmsg mnopen mninv mnebrdi
sdtot mngov resfevd1 i.time

      Source |       SS       df       MS              Number of obs =      70
-------------+------------------------------           F( 14,    55) =   13.15
       Model |    67.38219    14  4.81301357           Prob > F      =  0.0000
    Residual |  20.1268862    55  .365943386           R-squared     =  0.7700
-------------+------------------------------           Adj R-squared =  0.7115
       Total |  87.5090762    69  1.26824748           Root MSE      =  .60493

------------------------------------------------------------------------------
    lnsdgdpg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   strongcba |  -.8257747   .3518768    -2.35   0.023    -1.530951   -.1205979
     weakcba |  -.4850217   .2942845    -1.65   0.105    -1.074781    .1047377
     mnlninf |  -.4922498   .3465269    -1.42   0.161    -1.186705    .2022056
        mnfb |  -.0218301    .036671    -0.60   0.554    -.0953205    .0516603
      mncred |   .0095414   .0070769     1.35   0.183     -.004641    .0237239
       sdmsg |   .0102652   .0070593     1.45   0.152    -.0038819    .0244124
      mnopen |   .0134795   .0037182     3.63   0.001      .006028     .020931
       mninv |  -.0043306   .0149366    -0.29   0.773    -.0342643     .025603
     mnebrdi |  -.6204575   .2583066    -2.40   0.020    -1.138115   -.1027996
       sdtot |  -.0092178   .0156216    -0.59   0.558    -.0405242    .0220886
       mngov |  -.0388905   .0117629    -3.31   0.002    -.0624639   -.0153171
    resfevd1 |          1    .163098     6.13   0.000     .6731443    1.326856
             |
```

```
       time |
          3  |   .0164111   .1951499     0.08   0.933    -.3746781    .4075003
          4  |   1.531839   .2574752     5.95   0.000     1.015847    2.047831
             |
       _cons |   3.264321   1.598819     2.04   0.046     .0602167    6.468425
------------------------------------------------------------------------------

. *Diagnostic tests after 3rd stage*
. estat imtest

Cameron & Trivedi's decomposition of IM-test

---------------------------------------------------
              Source |       chi2     df      p
---------------------+-----------------------------
  Heteroskedasticity |      70.00     69    0.4438
            Skewness |      15.10     14    0.3716
            Kurtosis |       1.32      1    0.2499
---------------------+-----------------------------
               Total |      86.42     84    0.4066
---------------------------------------------------

. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of lnsdgdpg

         chi2(1)      =     0.97
         Prob > chi2  =   0.3245

. estat ovtest

Ramsey RESET test using powers of the fitted values of lnsdgdpg
       Ho:  model has no omitted variables
                  F(3, 52) =      0.76
                  Prob > F =      0.5222

.
. xtserial lnsdgdpg strongcba weakcba mnlninf mnfb mncred sdmsg mnopen mninv
mnebrdi sdtot mn
> gov

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      21) =      1.751
           Prob > F =      0.1999
```

```
. xtfevd lnsdgdpg strongcba weakcba mnlninf mnfb mncred sdmsg mnopen mninv mnebrdi
sdtot mngov, invariant(strongcba weakcba mnebrdi mngov)

panel fixed effects regression with vector decomposition

degrees of freedom fevd    =         35          number of obs        =        70
mean squared error         =   .433659           F( 13, 35)           = .7686513
root mean squared error    =  .6585279           Prob > F             = .6676881
Residual Sum of Squares    =  30.35613           R-squared            = .6531088
Total Sum of Squares       =  87.50908           adj. R-squared       = .3161288
Estimation Sum of Squares  =  57.15295

------------------------------------------------------------------------------
             |                fevd
    lnsdgdpg |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     mnlninf |    -.88089   1.864108    -0.47   0.639     -4.66523     2.90345
        mnfb |  -.0482196   .0779786    -0.62   0.540    -.2065245    .1100854
      mncred |   .0372983   .0199338     1.87   0.070    -.0031696    .0777662
       sdmsg |   .0172395    .021916     0.79   0.437    -.0272522    .0617313
      mnopen |   .0189091   .0217503     0.87   0.391    -.0252463    .0630645
       mninv |  -.0331048   .0331482    -1.00   0.325    -.1003993    .0341896
       sdtot |   .0066768   .0402087     0.17   0.869    -.0749513    .0883049
   strongcba |  -1.303729   1.118235    -1.17   0.252    -3.573867    .9664093
     weakcba |  -.3826583   .8603364    -0.44   0.659    -2.129234    1.363917
     mnebrdi |  -1.157013   1.167862    -0.99   0.329    -3.527898    1.213872
       mngov |  -.0543552   .0409103    -1.33   0.193    -.1374076    .0286971
         eta |          1          .        .       .            .           .
       _cons |   6.015632   8.727523     0.69   0.495    -11.70218    23.73345
------------------------------------------------------------------------------
```

**Appendices for estimations based on subjective assessments (perceptions and expectations) about the economic situation in a country**

```
. summarize ESagree CBA gdppc gdpg lgdpg inf linf un lun q22f_1 h_aged1
h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_edu_low h_retired
h_student h_unemployed h_employed h_inc_d1 h_inc_d2 h_inc_d3 h_inc_d4

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
     ESagree |     80472    .1805597    .3846553          0          1
         CBA |     80472    .1948752    .3961071          0          1
       gdppc |     80472    9323.208    5133.889    3377.22   21627.16
        gdpg |     80472    2.161013    4.704099      -7.53      15.73
       lgdpg |     80472    2.326327    4.735376      -8.87      14.09
-------------+--------------------------------------------------------
         inf |     80472    4.434921    2.871202       -.91      12.47
        linf |     80472    4.473237    2.832755        -.7      12.56
          un |     80472    13.93123     8.68461       4.27      34.75
         lun |     80472    13.67687    8.852218       4.21      34.97
      q22f_1 |     50637    3.637222     1.48625          1          9
-------------+--------------------------------------------------------
     h_aged1 |     80472    .3043667    .4601416          0          1
     h_aged2 |     80472    .3788398    .4851012          0          1
     h_aged3 |     80472    .2711875    .4445754          0          1
    h_female |     80472    .5265682    .4992967          0          1
  h_edu_high |     80472    .1711403    .3766338          0          1
-------------+--------------------------------------------------------
h_edu_medium |     80472    .6275475     .483461          0          1
   h_edu_low |     80472     .201014     .400761          0          1
   h_retired |     80472    .1872825    .3901406          0          1
   h_student |     80472    .0926409    .2899304          0          1
h_unemployed |     80472    .1818148    .3856942          0          1
-------------+--------------------------------------------------------
  h_employed |     80472    .5382618     .498537          0          1
    h_inc_d1 |     80472    .1733646    .3785646          0          1
    h_inc_d2 |     80472    .3150288    .4645302          0          1
    h_inc_d3 |     80472    .2721319    .4450602          0          1
    h_inc_d4 |     80472    .2394746    .4267655          0          1
```

## Appendix 6.13: Subjective assessments - Correlation matrix

```
. corr ESagree ExpESagree CBA q22f_1 gdppc gdpg lgdpg inf linf un lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed h_inc_d1
> h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu
(obs=44968)

             |  ESagree ExpESa~e      CBA   q22f_1    gdppc     gdpg    lgdpg      inf     linf       un      lun  h_aged2  h_aged3 h_female h_edu_~h h_edu_~m
-------------+----------------------------------------------------------------------------------------------------------------------------------------------------
     ESagree |   1.0000
  ExpESagree |   0.3667   1.0000
         CBA |  -0.0625  -0.0672   1.0000
      q22f_1 |  -0.1997  -0.2507   0.0038   1.0000
       gdppc |  -0.0339   0.0080  -0.3586   0.0213   1.0000
        gdpg |   0.1404   0.0618   0.0002  -0.0864  -0.1946   1.0000
       lgdpg |   0.1482   0.0409   0.0605  -0.0500  -0.1716   0.6558   1.0000
         inf |  -0.0773  -0.0773  -0.0813   0.1009  -0.2065  -0.2963   0.0312   1.0000
        linf |  -0.0788  -0.0691  -0.0306   0.0813  -0.1819  -0.4445  -0.0671   0.9499   1.0000
          un |   0.0397   0.0255   0.2002  -0.0632  -0.5980   0.2608   0.2215  -0.2138  -0.2089   1.0000
         lun |   0.0449   0.0279   0.1967  -0.0697  -0.5990   0.2725   0.2374  -0.2287  -0.2226   0.9946   1.0000
     h_aged2 |   0.0027  -0.0094  -0.0176  -0.0000  -0.0223   0.0143   0.0078   0.0302   0.0272   0.0009   0.0010   1.0000
     h_aged3 |  -0.0378  -0.0375   0.0112   0.0087   0.0330  -0.0519  -0.0433  -0.0021  -0.0021   0.0035   0.0025  -0.5112   1.0000
    h_female |  -0.0073  -0.0016   0.0065  -0.0015  -0.0015  -0.0058  -0.0008  -0.0177  -0.0162   0.0182   0.0184  -0.0039  -0.0053   1.0000
  h_edu_high |   0.0334   0.0589  -0.0097  -0.0424  -0.0565   0.0079  -0.0020   0.0499   0.0450  -0.0343  -0.0333   0.0162  -0.0750   0.0265   1.0000
h_edu_medium |  -0.0094  -0.0165   0.0292   0.0065   0.1358  -0.0086  -0.0047  -0.0680  -0.0574  -0.0574  -0.0588   0.0645  -0.1489  -0.0787  -0.6412   1.0000
   h_retired |  -0.0451  -0.0369  -0.0007   0.0198   0.0392  -0.0891  -0.0798   0.0236   0.0199  -0.0245  -0.0254  -0.3156   0.6834   0.0075  -0.0873  -0.1164
   h_student |   0.0156   0.0297   0.0142  -0.0013  -0.0447   0.0305   0.0231  -0.0025  -0.0066   0.0293   0.0282  -0.1937  -0.1530   0.0194  -0.0678   0.1124
h_unemployed |  -0.0144  -0.0319   0.0402   0.0359  -0.1666   0.0268   0.0345  -0.0169  -0.0124   0.2089   0.2086   0.0389  -0.1087   0.1702  -0.1027  -0.0482
    h_inc_d1 |  -0.0526  -0.0354   0.0909   0.0549  -0.0749  -0.0888  -0.0571   0.1192   0.1109  -0.0240  -0.0289   0.0042  -0.0670  -0.0237   0.0583  -0.0098
    h_inc_d3 |   0.0103   0.0275  -0.0012  -0.0211   0.0090   0.0141  -0.0022  -0.0402  -0.0331  -0.0107  -0.0096   0.0151  -0.0488  -0.0013  -0.0505   0.0834
    h_inc_d4 |   0.0555   0.0796  -0.0259  -0.0600   0.0241   0.0204   0.0121  -0.0640  -0.0591   0.0052   0.0100   0.0641  -0.1273  -0.0170   0.2043  -0.0275
  spring2008 |        .        .        .        .        .        .        .        .        .        .        .        .        .        .        .        .
    fall2008 |        .        .        .        .        .        .        .        .        .        .        .        .        .        .        .        .
  spring2009 |   0.0307   0.0035  -0.0116   0.0326  -0.0178  -0.2426   0.2934   0.4634   0.5042  -0.0734  -0.0904   0.0103  -0.0083  -0.0013  -0.0125  -0.0014
    fall2009 |   0.0051   0.0307   0.0021  -0.0413  -0.0108  -0.4827  -0.3921   0.0153   0.1730  -0.0720  -0.0488   0.0027   0.0021   0.0019   0.0066  -0.0121
  spring2010 |  -0.0186   0.0144  -0.0031  -0.0125  -0.0227  -0.0429  -0.3448  -0.2166  -0.2121   0.0546   0.0065  -0.0140   0.0089   0.0007  -0.0053   0.0114
    fall2010 |   0.0075  -0.0093   0.0043  -0.0097  -0.0235   0.2891   0.1077  -0.1970  -0.2761   0.0155   0.0675   0.0083  -0.0061  -0.0023   0.0095   0.0044
  spring2011 |  -0.0245  -0.0390   0.0082   0.0308   0.0749   0.4713   0.3341  -0.0605  -0.1820   0.0739   0.0639  -0.0071   0.0034   0.0011   0.0017  -0.0026
          EU |  -0.0383  -0.0031  -0.0111   0.0202   0.5473  -0.1754  -0.1533   0.0814   0.0773  -0.7051  -0.7009  -0.0134   0.0419  -0.0094   0.0461   0.0332
        ExYu |  -0.0357  -0.0419   0.1148   0.0388  -0.3320  -0.0511  -0.0165  -0.0186   0.0082   0.7436   0.7274   0.0027   0.0052   0.0211  -0.0637  -0.0009

             | h_reti~d h_stud~t h_unem~d h_inc_d1 h_inc_d3 h_inc_d4 spr~2008 fall2008 spr~2009 fall2009 spr~2010 fall2010 spr~2011       EU     ExYu
-------------+---------------------------------------------------------------------------------------------------------------------------------------
   h_retired |   1.0000
   h_student |  -0.1195   1.0000
h_unemployed |  -0.2336  -0.1163   1.0000
    h_inc_d1 |  -0.0594   0.0852   0.0173   1.0000
    h_inc_d3 |  -0.0468  -0.0020  -0.0253  -0.2705   1.0000
    h_inc_d4 |  -0.1459   0.0038  -0.1492  -0.2533  -0.3530   1.0000
  spring2008 |        .        .        .        .        .        .        .
    fall2008 |        .        .        .        .        .        .        .        .
  spring2009 |  -0.0083  -0.0084   0.0050   0.0135  -0.0032  -0.0197        .        .   1.0000
    fall2009 |   0.0115  -0.0213  -0.0031  -0.0028   0.0069   0.0058        .        .  -0.2444   1.0000
  spring2010 |   0.0033   0.0100   0.0012  -0.0201   0.0103   0.0081        .        .  -0.2505  -0.2483   1.0000
    fall2010 |  -0.0106   0.0050   0.0085  -0.0053   0.0079   0.0097        .        .  -0.2514  -0.2491  -0.2554   1.0000
  spring2011 |   0.0043   0.0143  -0.0116   0.0149  -0.0219  -0.0041        .        .  -0.2486  -0.2464  -0.2525  -0.2533   1.0000
          EU |   0.0497  -0.0553  -0.1639   0.0107   0.0075  -0.0321        .        .   0.0006   0.0094  -0.0042   0.0013  -0.0070   1.0000
        ExYu |   0.0049   0.0312   0.1568   0.0313  -0.0227  -0.0001        .        .  -0.0036  -0.0025   0.0053   0.0002   0.0006  -0.8122   1.0000
```

## Appendix 6.14: Subjective assessments of economic situation (SUR estimation (country used as cluster))

### Appendix 6.14a: Subjective assessments – Estiomation of Equation 6.7 (SUR estimation (country used as cluster)) – unweighted

```
. biprobit (ESagree = i.CBA i.q22f_1 gdppc gdpg lgdpg inf linf un lun
CBA#q22f_1 i.CBA#c.gdppc i.CBA#c.gdpg i.CBA#c.lgdpg i.CBA#c.inf i.CBA#c.linf
i.CBA#c.un i.CBA#c.lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium
h_retired h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008
fall2008 spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu)
ExpESagree = i.CBA i.q22f_1 gdppc gdpg lgdpg inf linf un lun CBA#q22f_1
i.CBA#c.gdppc i.CBA#c.gdpg i.CBA#c.lgdpg i.CBA#c.inf i.CBA#c.linf i.CBA#c.un
i.CBA#c.lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired
h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008
spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu), vce(cluster
country) nolog

note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity
note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity

Seemingly unrelated bivariate probit              Number of obs   =      40832
                                                  Wald chi2(6)    =          .
Log pseudolikelihood = -38656.081                 Prob > chi2     =          .

                               (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ESagree      |
       1.CBA |  -.0939387   1.096015    -0.09   0.932    -2.242089    2.054211
             |
      q22f_1 |
          2  |  -.1933874   .1229044    -1.57   0.116    -.4342755    .0475008
          3  |  -.4967098   .1223846    -4.06   0.000    -.7365792   -.2568403
```

```
           4  |  -.7816309   .1670688    -4.68   0.000    -1.10908   -.4541822
           5  |  -1.080655   .1607635    -6.72   0.000   -1.395745   -.7655639
              |
       gdppc  |  -.0000254   .0000182    -1.40   0.163   -.0000611    .0000103
        gdpg  |   .0674839   .0203872     3.31   0.001    .0275257    .1074421
       lgdpg  |   .0522686   .0300137     1.74   0.082   -.0065571    .1110943
         inf  |   .0215793   .0379625     0.57   0.570   -.0528258    .0959843
        linf  |  -.0927844   .0326011    -2.85   0.004   -.1566813   -.0288874
          un  |  -.0778433   .0312713    -2.49   0.013    -.139134   -.0165526
         lun  |   .0567817   .0315132     1.80   0.072   -.0049829    .1185464
              |
  CBA#q22f_1  |
         1 2  |   .0916801   .1641647     0.56   0.577   -.2300768    .4134371
         1 3  |   .1735826   .2033536     0.85   0.393   -.2249832    .5721484
         1 4  |   .1803468   .2411693     0.75   0.455   -.2923363      .65303
         1 5  |    .325337   .2098974     1.55   0.121   -.0860544    .7367285
              |
 CBA#c.gdppc  |
           1  |  -.0000937   .0001117    -0.84   0.402   -.0003127    .0001253
              |
  CBA#c.gdpg  |
           1  |  -.0332722   .0442916    -0.75   0.453   -.1200822    .0535377
              |
 CBA#c.lgdpg  |
           1  |  -.0468546    .032604    -1.44   0.151   -.1107573    .0170482
              |
   CBA#c.inf  |
           1  |   .1342061   .1708397     0.79   0.432   -.2006335    .4690457
              |
  CBA#c.linf  |
           1  |  -.0878488   .1486419    -0.59   0.555   -.3791816    .2034839
              |
    CBA#c.un  |
           1  |  -.0145683   .0509579    -0.29   0.775   -.1144439    .0853073
              |
   CBA#c.lun  |
           1  |   .0152795   .0691311     0.22   0.825    -.120215     .150774
              |
     h_aged2  |  -.0385482   .0265874    -1.45   0.147   -.0906586    .0135622
     h_aged3  |  -.0727358   .0428372    -1.70   0.090   -.1566951    .0112236
    h_female  |  -.0253912   .0158438    -1.60   0.109   -.0564446    .0056621
  h_edu_high  |   .0978325   .0831727     1.18   0.239   -.0651829     .260848
h_edu_medium  |   .0281025   .0622893     0.45   0.652   -.0939823    .1501874
   h_retired  |  -.0409382   .0510292    -0.80   0.422   -.1409537    .0590773
   h_student  |    .055946   .0482939     1.16   0.247   -.0387083    .1506003
h_unemployed  |  -.0376038    .043289    -0.87   0.385   -.1224487    .0472411
    h_inc_d1  |  -.0107848   .0506347    -0.21   0.831    -.110027    .0884575
    h_inc_d3  |   .0481595   .0395555     1.22   0.223   -.0293678    .1256868
    h_inc_d4  |   .1197827   .0271616     4.41   0.000    .0665469    .1730184
  spring2008  |          0  (omitted)
    fall2008  |          0  (omitted)
  spring2009  |     .74455   .1219226     6.11   0.000    .5055862    .9835138
    fall2009  |   .7579144   .1568354     4.83   0.000    .4505228    1.065306
  spring2010  |   .4080622   .1600781     2.55   0.011    .0943149    .7218094
    fall2010  |    .075537   .1265944     0.60   0.551   -.1725835    .3236574
  spring2011  |          0  (omitted)
          EU  |   .3696049   .1955842     1.89   0.059    -.013733    .7529428
        ExYu  |   .5335493   .2859823     1.87   0.062   -.0269656    1.094064
       _cons  |  -.3339893   .2631855    -1.27   0.204   -.8498234    .1818448
-------------+----------------------------------------------------------------
ExpESagree    |
       1.CBA  |   1.768284   .5968111     2.96   0.003    .5985558    2.938012
              |
      q22f_1  |
           2  |  -.1447494   .1361474    -1.06   0.288   -.4115933    .1220945
           3  |  -.4546894   .1615512    -2.81   0.005   -.7713241   -.1380548
           4  |  -.7658915   .1663286    -4.60   0.000    -1.09189   -.4398934
           5  |  -1.006841   .1561922    -6.45   0.000   -1.312972   -.7007101
              |
       gdppc  |  -1.37e-06   .0000135    -0.10   0.920   -.0000279    .0000252
        gdpg  |    .051463    .008277     6.22   0.000    .0352404    .0676855
       lgdpg  |  -.0144984   .0117677    -1.23   0.218   -.0375627    .0085659
         inf  |   .0253231   .0396355     0.64   0.523   -.0523611    .1030073
        linf  |  -.0727604   .0320945    -2.27   0.023   -.1356644   -.0098564
          un  |   .0306104   .0403014     0.76   0.448    -.048379    .1095997
         lun  |  -.0240526   .0359734    -0.67   0.504   -.0945593     .046454
              |
```

```
  CBA#q22f_1 |
         1 2  |  -.0333383   .1369319    -0.24   0.808    -.3017198    .2350433
         1 3  |   .0404658   .1646672     0.25   0.806     -.282276    .3632076
         1 4  |   .1018359    .179434     0.57   0.570    -.2498484    .4535201
         1 5  |     .04846   .2107456     0.23   0.818    -.3645937    .4615137
             |
 CBA#c.gdppc |
           1 |   -.000243   .0000755    -3.22   0.001    -.0003909   -.0000951
             |
  CBA#c.gdpg |
           1 |   .0569014   .0265918     2.14   0.032     .0047823    .1090204
             |
 CBA#c.lgdpg |
           1 |   .0127098    .014243     0.89   0.372     -.015206    .0406255
             |
   CBA#c.inf |
           1 |  -.0792672   .0947573    -0.84   0.403     -.264988    .1064537
             |
  CBA#c.linf |
           1 |   .1042902   .0833669     1.25   0.211    -.0591058    .2676863
             |
    CBA#c.un |
           1 |  -.0816272   .0087105    -9.37   0.000    -.0986996   -.0645549
             |
   CBA#c.lun |
           1 |   .0341368   .0177677     1.92   0.055    -.0006873    .0689609
             |
     h_aged2 |  -.0707196   .0293847    -2.41   0.016    -.1283126   -.0131266
     h_aged3 |  -.0948035   .0385373    -2.46   0.014    -.1703353   -.0192718
    h_female |  -.0006671    .011109    -0.06   0.952    -.0224404    .0211061
  h_edu_high |    .122323   .0506255     2.42   0.016     .0230988    .2215472
h_edu_medium |   .0076858   .0340247     0.23   0.821    -.0590014     .074373
   h_retired |   .0410001    .028878     1.42   0.156    -.0155997       .0976
   h_student |   .1339003   .0334103     4.01   0.000     .0684174    .1993833
h_unemployed |  -.0238648   .0329979    -0.72   0.470    -.0885395      .04081
    h_inc_d1 |   .1198922   .0466881     2.57   0.010     .0283853    .2113992
    h_inc_d3 |   .1741856   .0233923     7.45   0.000     .1283375    .2200338
    h_inc_d4 |   .2531831   .0341142     7.42   0.000     .1863206    .3200457
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .5277808   .0801648     6.58   0.000     .3706607     .684901
    fall2009 |   .5324743   .0952949     5.59   0.000     .3456998    .7192488
  spring2010 |   .2227363   .0484298     4.60   0.000     .1278157     .317657
    fall2010 |   .0599323   .0807129     0.74   0.458    -.0982621    .2181267
  spring2011 |          0  (omitted)
          EU |   .1357343   .0942332     1.44   0.150    -.0489593     .320428
        ExYu |   .0514488   .1578718     0.33   0.745    -.2579742    .3608718
       _cons |   .0268061   .2426928     0.11   0.912     -.448863    .5024752
-------------+----------------------------------------------------------------
     /athrho |   .6547694   .0518805    12.62   0.000     .5530855    .7564534
-------------+----------------------------------------------------------------
         rho |    .574872   .0347352                      .5028292    .6389832
------------------------------------------------------------------------------
Wald test of rho=0:                 chi2(1) =  159.283    Prob > chi2 = 0.0000
```

**Marginal effects after biprobit**

```
. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      40832
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 gdppc gdpg lgdpg inf linf un
lun h_aged2
               h_aged3 h_female h_edu_high h_edu_medium h_retired h_student
h_unemployed h_inc_d1
               h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009 fall2009 spring2010
fall2010
               spring2011 EU ExYu

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.0840565   .0126968    -6.62   0.000    -.1089418   -.0591712
             |
      q22f_1 |
          2  |  -.0529719   .0345667    -1.53   0.125    -.1207214    .0147775
          3  |  -.1275707   .0365776    -3.49   0.000    -.1992614   -.0558799
          4  |  -.1816679   .0421056    -4.31   0.000    -.2641933   -.0991425
          5  |  -.2162407   .0416067    -5.20   0.000    -.2977884    -.134693
             |
       gdppc |  -7.70e-06   3.02e-06    -2.55   0.011    -.0000136   -1.79e-06
        gdpg |   .0118509   .0032671     3.63   0.000     .0054475    .0182543
       lgdpg |   .0058952   .0037082     1.59   0.112    -.0013726    .0131631
         inf |   .0067412   .0052327     1.29   0.198    -.0035148    .0169971
        linf |  -.0180187   .0053245    -3.38   0.001    -.0284546   -.0075829
          un |  -.0107389   .0046953    -2.29   0.022    -.0199415   -.0015364
         lun |   .0076635   .0048274     1.59   0.112    -.0017981    .0171251
     h_aged2 |  -.0089037   .0050627    -1.76   0.079    -.0188264    .0010189
     h_aged3 |   -.014975   .0079353    -1.89   0.059     -.030528    .0005779
    h_female |  -.0036957   .0023721    -1.56   0.119     -.008345    .0009536
  h_edu_high |   .0198968   .0135978     1.46   0.143    -.0067543    .0465479
h_edu_medium |   .0044185   .0104119     0.42   0.671    -.0159884    .0248255
   h_retired |  -.0039709   .0080949    -0.49   0.624    -.0198366    .0118948
   h_student |   .0143991     .00746     1.93   0.054    -.0002222    .0290204
h_unemployed |   -.006554   .0069544    -0.94   0.346    -.0201844    .0070765
    h_inc_d1 |   .0041075    .008092     0.51   0.612    -.0117526    .0199676
    h_inc_d3 |   .0151785   .0066239     2.29   0.022      .002196    .0281611
    h_inc_d4 |   .0292463   .0051631     5.66   0.000     .0191268    .0393659
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .1323783   .0174772     7.57   0.000     .0981235     .166633
    fall2009 |   .1345286   .0241674     5.57   0.000     .0871614    .1818959
  spring2010 |   .0694094   .0265155     2.62   0.009       .01744    .1213788
    fall2010 |   .0137319   .0193567     0.71   0.478    -.0242065    .0516704
  spring2011 |          0  (omitted)
          EU |   .0597496   .0295293     2.02   0.043     .0018733    .1176259
        ExYu |   .0794266   .0356209     2.23   0.026     .0096108    .1492423
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

**Appendix 6.14b: Subjective assessments – Estiomation of Equation 6.7 (SUR estimation (country used as cluster)) – weighted**

```
. biprobit (ESagree = i.CBA i.q22f_1 gdppc gdpg lgdpg inf linf un lun
CBA#q22f_1 i.CBA#c.gdppc i.CBA#c.gdpg i.CBA#c.lgdpg i.CBA#c.inf i.CBA#c.linf
i.CBA#c.un i.CBA#c.lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium
h_retired h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008
fall2008 spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu)
(ExpESagree = i.CBA i.q22f_1 gdppc gdpg lgdpg inf linf un lun CBA#q22f_1
i.CBA#c.gdppc i.CBA#c.gdpg i.CBA#c.lgdpg i.CBA#c.inf i.CBA#c.linf i.CBA#c.un
i.CBA#c.lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired
h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008
spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu) [pweight =
weight], vce(cluster country) nolog

note: spring2008 omitted because of collinearity
```

```
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity
note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity

Seemingly unrelated bivariate probit            Number of obs   =      40832
                                                Wald chi2(6)    =          .
Log pseudolikelihood = -37435.157               Prob > chi2     =          .

                          (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ESagree      |
       1.CBA |  -.0813144   1.098671    -0.07   0.941     -2.23467    2.072041
             |
      q22f_1 |
          2  |  -.1835807   .1236662    -1.48   0.138     -.425962    .0588006
          3  |  -.4846145   .1201924    -4.03   0.000    -.7201873   -.2490418
          4  |  -.7592442   .1640373    -4.63   0.000    -1.080751    -.437737
          5  |  -1.068169   .1584092    -6.74   0.000    -1.378645   -.7576927
             |
       gdppc |  -.0000265   .0000187    -1.42   0.156    -.0000631    .0000101
        gdpg |   .0675421   .0198369     3.40   0.001     .0286626    .1064217
       lgdpg |   .0530103   .0310276     1.71   0.088    -.0078026    .1138233
         inf |   .0131946   .0433106     0.30   0.761    -.0716927    .0980819
        linf |  -.0863672   .0375056    -2.30   0.021    -.1598769   -.0128575
          un |  -.0693475   .0315386    -2.20   0.028     -.131162    -.007533
         lun |   .0503011   .0325574     1.54   0.122    -.0135102    .1141124
             |
  CBA#q22f_1 |
        1 2  |   .1023437   .1563998     0.65   0.513    -.2041943    .4088817
        1 3  |   .1848917   .1915993     0.96   0.335    -.1906362    .5604195
        1 4  |   .1376489   .2494291     0.55   0.581    -.3512232     .626521
        1 5  |   .3378396   .1997603     1.69   0.091    -.0536834    .7293626
             |
 CBA#c.gdppc |
          1  |  -.0000983    .000113    -0.87   0.385    -.0003198    .0001233
             |
  CBA#c.gdpg |
          1  |  -.0356236   .0481581    -0.74   0.459    -.1300117    .0587645
             |
 CBA#c.lgdpg |
          1  |  -.0461451   .0320774    -1.44   0.150    -.1090156    .0167254
             |
   CBA#c.inf |
          1  |   .1538337    .176447     0.87   0.383    -.1919961    .4996635
             |
  CBA#c.linf |
          1  |  -.1046361    .155022    -0.67   0.500    -.4084737    .1992015
             |
    CBA#c.un |
          1  |  -.0175849   .0508473    -0.35   0.729    -.1172439     .082074
             |
   CBA#c.lun |
          1  |   .0188023   .0689761     0.27   0.785    -.1163883     .153993
             |
     h_aged2 |  -.0338185   .0262051    -1.29   0.197    -.0851795    .0175426
     h_aged3 |  -.0563513    .040855    -1.38   0.168    -.1364256    .0237231
    h_female |  -.0237768   .0183893    -1.29   0.196    -.0598192    .0122655
  h_edu_high |   .1201054    .076492     1.57   0.116    -.0298162    .2700271
h_edu_medium |   .0415476   .0594362     0.70   0.485    -.0749452    .1580403
   h_retired |  -.0705393   .0391136    -1.80   0.071    -.1472005     .006122
   h_student |   .0649747   .0559882     1.16   0.246     -.04476     .1747095
h_unemployed |  -.0254136   .0445708    -0.57   0.569    -.1127708    .0619436
    h_inc_d1 |   .0030182   .0474837     0.06   0.949    -.0900481    .0960845
    h_inc_d3 |   .0594578   .0402124     1.48   0.139     -.019357    .1382725
    h_inc_d4 |   .1217082   .0277472     4.39   0.000     .0673248    .1760916
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .7616047    .126222     6.03   0.000     .5142142    1.008995
    fall2009 |   .7979278   .1501419     5.31   0.000      .503655    1.092201
  spring2010 |   .4298769   .1536603     2.80   0.005     .1287082    .7310456
    fall2010 |   .0927391   .1263528     0.73   0.463    -.1549079     .340386
```

```
  spring2011 |          0  (omitted)
          EU |    .410091   .1926013     2.13   0.033      .0325994    .7875826
        ExYu |   .5404449   .2847823     1.90   0.058     -.0177181    1.098608
       _cons |  -.4307795   .2731933    -1.58   0.115     -.9662284    .1046695
-------------+----------------------------------------------------------------
ExpESagree   |
       1.CBA |   1.466809   .5719684     2.56   0.010      .3457715    2.587846
             |
      q22f_1 |
          2  |  -.1555984   .1345757    -1.16   0.248     -.4193619    .1081652
          3  |  -.4613222   .1555926    -2.96   0.003      -.766278   -.1563664
          4  |  -.7680513   .1596939    -4.81   0.000     -1.081046    -.455057
          5  |  -1.023271   .1498681    -6.83   0.000     -1.317007    -.729535
             |
       gdppc |  -2.05e-06    .000013    -0.16   0.874     -.0000274    .0000233
        gdpg |   .0501434   .0083463     6.01   0.000       .033785    .0665018
       lgdpg |  -.0120658    .011982    -1.01   0.314     -.0355502    .0114185
         inf |   .0223086   .0435499     0.51   0.608     -.0630476    .1076649
        linf |  -.0682003   .0350265    -1.95   0.052     -.1368511    .0004504
          un |   .0350268   .0418053     0.84   0.402     -.0469102    .1169637
         lun |  -.0263125   .0380134    -0.69   0.489     -.1008174    .0481925
             |
  CBA#q22f_1 |
        1 2  |  -.0056534   .1357299    -0.04   0.967     -.2716791    .2603722
        1 3  |   .0653206    .161225     0.41   0.685     -.2506746    .3813158
        1 4  |   .1147825   .1774387     0.65   0.518     -.2329909    .4625559
        1 5  |   .0700396   .2104078     0.33   0.739     -.3423521    .4824313
             |
 CBA#c.gdppc |
          1  |  -.0002134   .0000721    -2.96   0.003     -.0003547   -.0000721
             |
  CBA#c.gdpg |
          1  |   .0502109   .0268229     1.87   0.061     -.0023611    .1027829
             |
 CBA#c.lgdpg |
          1  |    .008615   .0144125     0.60   0.550      -.019633     .036863
             |
   CBA#c.inf |
          1  |  -.0670055   .0926698    -0.72   0.470     -.2486351     .114624
             |
  CBA#c.linf |
          1  |   .0961332   .0818324     1.17   0.240     -.0642555    .2565218
             |
    CBA#c.un |
          1  |  -.0841303   .0090602    -9.29   0.000     -.1018879   -.0663728
             |
   CBA#c.lun |
          1  |   .0434161    .017567     2.47   0.013      .0089855    .0778467
             |
     h_aged2 |  -.0657137   .0315745    -2.08   0.037     -.1275985   -.0038289
     h_aged3 |  -.1048379   .0374164    -2.80   0.005     -.1781727    -.031503
    h_female |   .0023863   .0163009     0.15   0.884     -.0295628    .0343354
  h_edu_high |   .1210229   .0484257     2.50   0.012      .0261104    .2159355
h_edu_medium |    .007769   .0346903     0.22   0.823     -.0602228    .0757609
   h_retired |   .0314658   .0288029     1.09   0.275     -.0249869    .0879184
   h_student |   .1444603    .035454     4.07   0.000      .0749718    .2139487
h_unemployed |  -.0195781   .0329647    -0.59   0.553     -.0841878    .0450316
    h_inc_d1 |   .1119978   .0451494     2.48   0.013      .0235067     .200489
    h_inc_d3 |     .16563   .0264656     6.26   0.000      .1137584    .2175016
    h_inc_d4 |   .2489366   .0402373     6.19   0.000       .170073    .3278003
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .5194534   .0832414     6.24   0.000      .3563032    .6826036
    fall2009 |   .5311858   .0971086     5.47   0.000      .3408566    .7215151
  spring2010 |   .2297941   .0485064     4.74   0.000      .1347233    .3248648
    fall2010 |   .0705984   .0858341     0.82   0.411     -.0976333      .23883
  spring2011 |          0  (omitted)
          EU |   .1472248   .0919176     1.60   0.109     -.0329303    .3273799
        ExYu |   .0147525    .147887     0.10   0.921     -.2751008    .3046057
       _cons |   .0084825   .2362955     0.04   0.971     -.4546482    .4716132
-------------+----------------------------------------------------------------
     /athrho |   .6673776   .0534663    12.48   0.000      .5625855    .7721697
-------------+----------------------------------------------------------------
         rho |   .5832522    .035278                        .5098932    .6481893
------------------------------------------------------------------------------
Wald test of rho=0:                 chi2(1) =  155.805    Prob > chi2 = 0.0000
```

**Marginal effect after biprobit**

```
. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      40832
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 gdppc gdpg lgdpg inf linf un
lun h_aged2
               h_aged3 h_female h_edu_high h_edu_medium h_retired h_student
h_unemployed h_inc_d1
               h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009 fall2009 spring2010
fall2010
               spring2011 EU ExYu
```

| | dy/dx | Delta-method Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| 1.CBA | -.0818665 | .0120847 | -6.77 | 0.000 | -.105552 | -.058181 |
| q22f_1 | | | | | | |
| 2 | -.0499753 | .0335876 | -1.49 | 0.137 | -.1158058 | .0158551 |
| 3 | -.1231011 | .0348277 | -3.53 | 0.000 | -.1913622 | -.05484 |
| 4 | -.1764173 | .0404769 | -4.36 | 0.000 | -.2557506 | -.0970839 |
| 5 | -.2112781 | .0401294 | -5.26 | 0.000 | -.2899304 | -.1326259 |
| gdppc | -7.75e-06 | 3.03e-06 | -2.56 | 0.010 | -.0000137 | -1.82e-06 |
| gdpg | .0115336 | .0031857 | 3.62 | 0.000 | .0052897 | .0177775 |
| lgdpg | .0060215 | .003806 | 1.58 | 0.114 | -.0014382 | .0134812 |
| inf | .0059137 | .0061552 | 0.96 | 0.337 | -.0061502 | .0179777 |
| linf | -.0171371 | .0060487 | -2.83 | 0.005 | -.0289923 | -.0052819 |
| un | -.0093233 | .0048896 | -1.91 | 0.057 | -.0189068 | .0002601 |
| lun | .006724 | .0051349 | 1.31 | 0.190 | -.0033403 | .0167883 |
| h_aged2 | -.0078689 | .005027 | -1.57 | 0.118 | -.0177217 | .0019839 |
| h_aged3 | -.0128961 | .0073762 | -1.75 | 0.080 | -.0273532 | .001561 |
| h_female | -.0032836 | .0025453 | -1.29 | 0.197 | -.0082724 | .0017052 |
| h_edu_high | .0227459 | .0121273 | 1.88 | 0.061 | -.0010231 | .0465149 |
| h_edu_medium | .0062903 | .0097768 | 0.64 | 0.520 | -.0128718 | .0254525 |
| h_retired | -.0086129 | .0062977 | -1.37 | 0.171 | -.0209561 | .0037303 |
| h_student | .0159609 | .0085624 | 1.86 | 0.062 | -.0008211 | .0327429 |
| h_unemployed | -.0045338 | .0072876 | -0.62 | 0.534 | -.0188174 | .0097497 |
| h_inc_d1 | .0056144 | .007582 | 0.74 | 0.459 | -.0092461 | .0204748 |
| h_inc_d3 | .0161532 | .0067562 | 2.39 | 0.017 | .0029113 | .029395 |
| h_inc_d4 | .0288949 | .0054118 | 5.34 | 0.000 | .0182879 | .0395018 |
| spring2008 | 0 | (omitted) | | | | |
| fall2008 | 0 | (omitted) | | | | |
| spring2009 | .1327581 | .018096 | 7.34 | 0.000 | .0972905 | .1682257 |
| fall2009 | .1384861 | .0232351 | 5.96 | 0.000 | .0929461 | .1840261 |
| spring2010 | .0719989 | .0252399 | 2.85 | 0.004 | .0225297 | .1214681 |
| fall2010 | .0165057 | .018805 | 0.88 | 0.380 | -.0203515 | .0533628 |
| spring2011 | 0 | (omitted) | | | | |
| EU | .065353 | .0287886 | 2.27 | 0.023 | .0089284 | .1217777 |
| ExYu | .0778294 | .0347433 | 2.24 | 0.025 | .0097339 | .145925 |

Note: dy/dx for factor levels is the discrete change from the base level.

**Appendix 6.14c: Caluculating the marginal effect of CBA in two hypothetical populations - after biprobit (SUR) country as cluster, weighted**

```
. margins if CBA==0, at(CBA=(0 1))

Predictive margins                                Number of obs   =      32667
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()

1._at        : CBA             =           0

2._at        : CBA             =           1

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         _at |
          1  |   .1344986   .0121306    11.09   0.000      .110723    .1582742
          2  |   .0484029   .0052574     9.21   0.000     .0380986    .0587071
------------------------------------------------------------------------------

. margins if CBA==1, at(CBA=(0 1))

Predictive margins                                Number of obs   =
8165
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()

1._at        : CBA             =           0

2._at        : CBA             =           1

------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         _at |
          1  |   .1475188   .0124191    11.88   0.000     .1231777    .1718599
          2  |   .0823428   .0031651    26.02   0.000     .0761394    .0885462
------------------------------------------------------------------------------


margins, over(CBA) at(CBA=(0 1)) contrast (atcontrast(r._at) wald) vsquish

Contrasts of predictive margins
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
over         : CBA
1._at        : 0.CBA
                   CBA             =           0
               1.CBA
                   CBA             =           0
2._at        : 0.CBA
                   CBA             =           1
               1.CBA
                   CBA             =           1

------------------------------------------------
             |         df        chi2     P>chi2
-------------+----------------------------------
    _at@CBA  |
 (2 vs 1) 0  |          1       44.68     0.0000
 (2 vs 1) 1  |          1       30.33     0.0000
      Joint  |          2       45.92     0.0000
------------------------------------------------

---------------------------------------------------------------
```

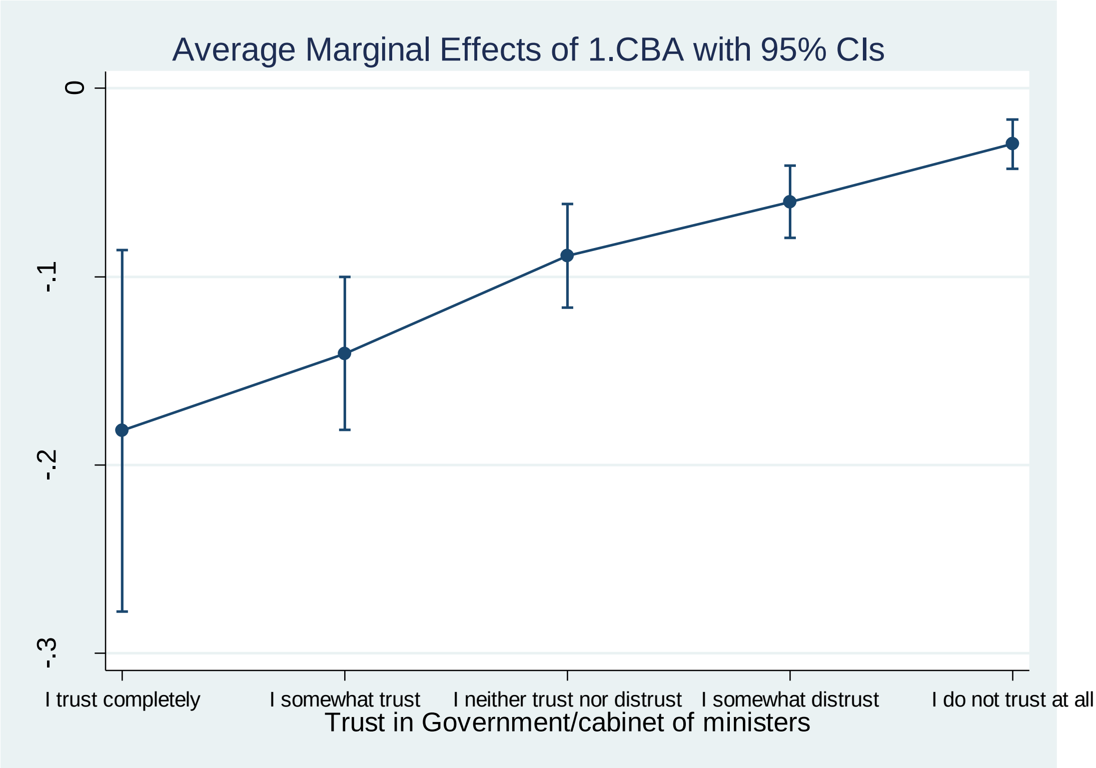
```
             |               Delta-method
             |   Contrast   Std. Err.     [95% Conf. Interval]
-------------+------------------------------------------------
      _at@CBA |
 (2 vs 1) 0  |  -.0860957   .0128808     -.1113416   -.0608499
 (2 vs 1) 1  |   -.065176   .0118341     -.0883704   -.0419816
--------------------------------------------------------------
```

.

**Appendix 6.14d: Marginal effect of CBA conditional on the level of trust in government - after biprobit (SUR) country as cluster, weighted**

```
. margins, dydx(CBA) at(q22f_1=(1(1)5)) vsquish

Average marginal effects                          Number of obs   =
40832
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
dy/dx w.r.t. : 1.CBA
1._at        : q22f_1          =           1
2._at        : q22f_1          =           2
3._at        : q22f_1          =           3
4._at        : q22f_1          =           4
5._at        : q22f_1          =           5

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |  -.1818534   .0489674    -3.71   0.000    -.2778278    -.085879
          2  |  -.1407803   .0207826    -6.77   0.000    -.1815134   -.1000472
          3  |  -.0889738   .0139914    -6.36   0.000    -.1163964   -.0615512
          4  |  -.0603518   .0097986    -6.16   0.000    -.0795568   -.0411468
          5  |  -.0295749   .0066971    -4.42   0.000     -.042701   -.0164488
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

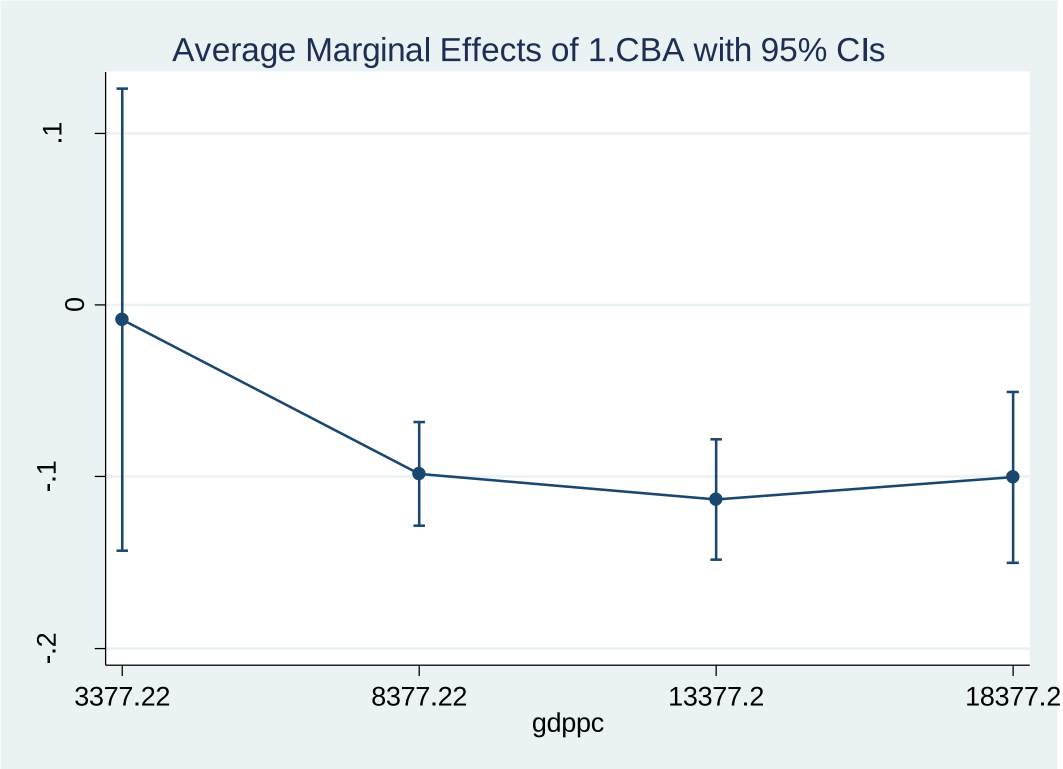
```
. marginsplot

  Variables that uniquely identify margins: q22f_1
```




```
. margins r.CBA, at(q22f_1=(1(1)5)) contrast(atcontrast(r)) vsquish

Contrasts of predictive margins
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
1._at        : q22f_1          =           1
2._at        : q22f_1          =           2
3._at        : q22f_1          =           3
4._at        : q22f_1          =           4
5._at        : q22f_1          =           5

------------------------------------------------------
                   |         df        chi2     P>chi2
-------------------+----------------------------------
            _at#CBA |
(2 vs 1) (1 vs 0)  |          1        0.88     0.3481
(3 vs 1) (1 vs 0)  |          1        4.16     0.0413
(4 vs 1) (1 vs 0)  |          1        5.66     0.0174
(5 vs 1) (1 vs 0)  |          1        9.85     0.0017
             Joint |          4       61.47     0.0000
------------------------------------------------------

--------------------------------------------------------------------
                   |            Delta-method
                   |   Contrast   Std. Err.     [95% Conf. Interval]
-------------------+------------------------------------------------
            _at#CBA |
(2 vs 1) (1 vs 0)  |   .0410731   .0437774     -.0447291    .1268752
(3 vs 1) (1 vs 0)  |   .0928796   .0455275      .0036474    .1821118
(4 vs 1) (1 vs 0)  |   .1215016   .0510894      .0213682    .2216349
(5 vs 1) (1 vs 0)  |   .1522785   .0485231      .0571749    .2473821
--------------------------------------------------------------------
```

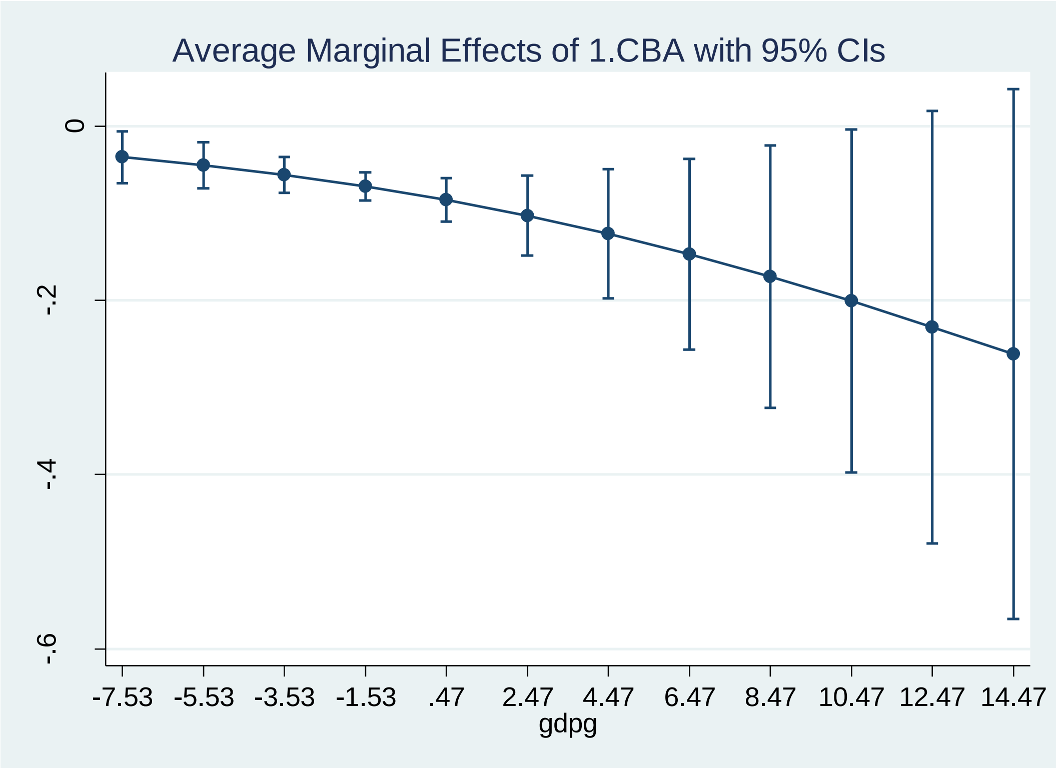
**Appendix 6.14e: Estimating the effect of CBA conditional on macroeconomic variables - after biprobit (SUR) country as cluster, weighted**

```
margins, dydx(CBA) at(gdppc=(3377.22(5000)21627.16)) vsquish

Average marginal effects                          Number of obs   =      40832
Model VCE     : Robust

Expression    : Pr(ESagree=1,ExpESagree=1), predict()
dy/dx w.r.t. : 1.CBA
1._at         : gdppc           =     3377.22
2._at         : gdppc           =     8377.22
3._at         : gdppc           =    13377.22
4._at         : gdppc           =    18377.22

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |   -.008627   .0686269    -0.13   0.900    -.1431333    .1258793
          2  |  -.0983082   .0153983    -6.38   0.000    -.1284883    -.068128
          3  |  -.1132628   .0179134    -6.32   0.000    -.1483725   -.0781532
          4  |  -.1003209   .0254228    -3.95   0.000    -.1501486   -.0504932
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.


. marginsplot

  Variables that uniquely identify margins: gdppc
```



```
. margins r.CBA, at(gdppc=(3377.22(5000)21627.16)) contrast(atcontrast(r))
vsquish

Contrasts of predictive margins
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
1._at        : gdppc          =     3377.22
2._at        : gdppc          =     8377.22
3._at        : gdppc          =    13377.22
4._at        : gdppc          =    18377.22

------------------------------------------------------
                   |         df        chi2     P>chi2
-------------------+----------------------------------
            _at#CBA |
(2 vs 1)  (1 vs 0)  |          1        1.32     0.2498
(3 vs 1)  (1 vs 0)  |          1        1.91     0.1671
(4 vs 1)  (1 vs 0)  |          1        1.52     0.2170
             Joint  |          3      125.84     0.0000
------------------------------------------------------
--------------------------------------------------------------------
                   |             Delta-method
                   |   Contrast   Std. Err.     [95% Conf. Interval]
-------------------+------------------------------------------------
            _at#CBA |
(2 vs 1)  (1 vs 0)  |  -.0896811   .0779219     -.2424053     .063043
(3 vs 1)  (1 vs 0)  |  -.1046358   .0757448     -.2530929    .0438213
(4 vs 1)  (1 vs 0)  |  -.0916939   .0742741     -.2372686    .0538807
--------------------------------------------------------------------


. margins, dydx(CBA) at(gdpg=(-7.53(2)15.73)) vsquish

Average marginal effects                          Number of obs   =      40832
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
dy/dx w.r.t. : 1.CBA
1._at        : gdpg           =       -7.53
2._at        : gdpg           =       -5.53
3._at        : gdpg           =       -3.53
4._at        : gdpg           =       -1.53
5._at        : gdpg           =         .47
6._at        : gdpg           =        2.47
7._at        : gdpg           =        4.47
8._at        : gdpg           =        6.47
9._at        : gdpg           =        8.47
10._at       : gdpg           =       10.47
11._at       : gdpg           =       12.47
12._at       : gdpg           =       14.47

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |  -.0358537   .0152298    -2.35   0.019    -.0657036   -.0060037
          2  |  -.0449764   .0133746    -3.36   0.001    -.0711901   -.0187627
          3  |  -.0560141   .0103988    -5.39   0.000    -.0763953   -.0356329
          4  |  -.0692166   .0083752    -8.26   0.000    -.0856317   -.0528014
          5  |  -.0848009   .0127807    -6.64   0.000    -.1098507   -.0597512
          6  |  -.1029272   .0233431    -4.41   0.000    -.1486787   -.0571756
          7  |  -.1236743   .0378695    -3.27   0.001    -.1978971   -.0494516
          8  |    -.14702   .0557326    -2.64   0.008    -.2562538   -.0377861
          9  |  -.1728258   .0766563    -2.25   0.024    -.3230695   -.0225822
         10  |  -.2008315   .1003847    -2.00   0.045    -.3975818   -.0040812
         11  |  -.2306572   .1266296    -1.82   0.069    -.4788468    .0175323
         12  |  -.2618159   .1550814    -1.69   0.091    -.5657698    .0421381
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

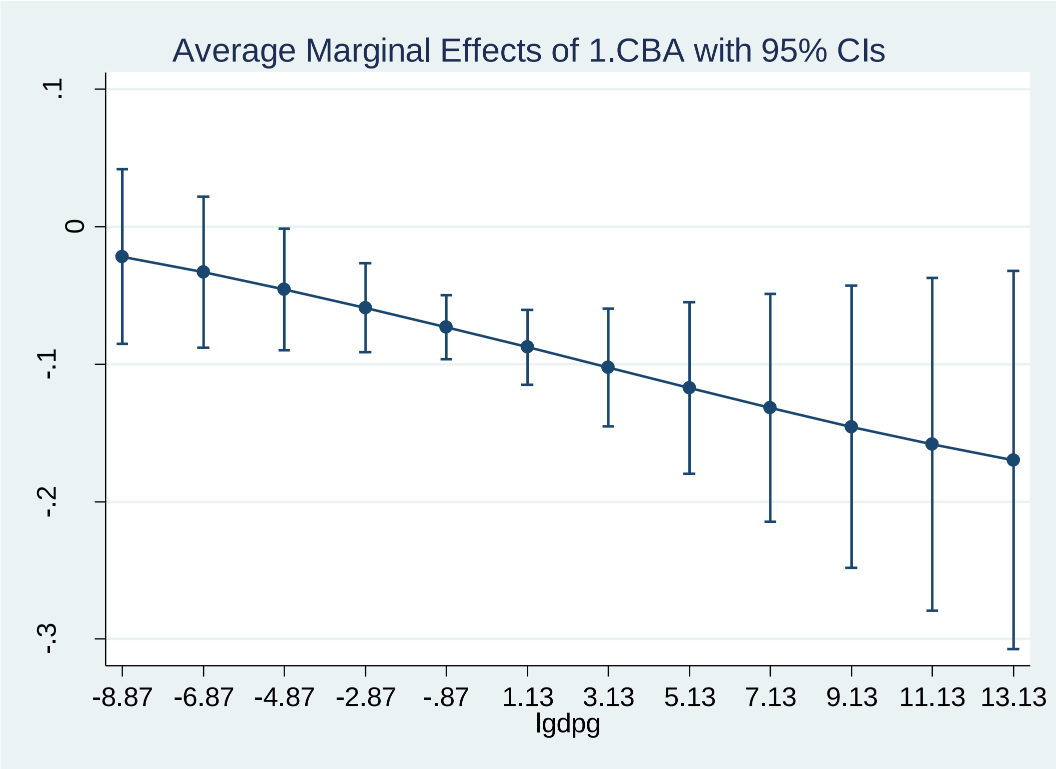
```
. marginsplot

  Variables that uniquely identify margins: gdpg
```




```
. margins r.CBA, at(gdpg=(-7.53(2)15.73)) contrast(atcontrast(r)) vsquish

Contrasts of predictive margins
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
1._at        : gdpg            =       -7.53
2._at        : gdpg            =       -5.53
3._at        : gdpg            =       -3.53
4._at        : gdpg            =       -1.53
5._at        : gdpg            =         .47
6._at        : gdpg            =        2.47
7._at        : gdpg            =        4.47
8._at        : gdpg            =        6.47
9._at        : gdpg            =        8.47
10._at       : gdpg            =       10.47
11._at       : gdpg            =       12.47
12._at       : gdpg            =       14.47

-------------------------------------------------------
                    |         df        chi2     P>chi2
--------------------+----------------------------------
            _at#CBA |
 (2 vs 1) (1 vs 0)  |          1        9.22     0.0024
 (3 vs 1) (1 vs 0)  |          1        6.82     0.0090
 (4 vs 1) (1 vs 0)  |          1        5.21     0.0225
 (5 vs 1) (1 vs 0)  |          1        4.14     0.0420
 (6 vs 1) (1 vs 0)  |          1        3.41     0.0649
 (7 vs 1) (1 vs 0)  |          1        2.90     0.0885
 (8 vs 1) (1 vs 0)  |          1        2.54     0.1112
 (9 vs 1) (1 vs 0)  |          1        2.27     0.1319
(10 vs 1) (1 vs 0)  |          1        2.07     0.1506
(11 vs 1) (1 vs 0)  |          1        1.91     0.1673
(12 vs 1) (1 vs 0)  |          1        1.78     0.1826
```

```
             Joint  |          6      792.64     0.0000
-------------------------------------------------------------

----------------------------------------------------------------------------
                      |             Delta-method
                      |   Contrast   Std. Err.     [95% Conf. Interval]
----------------------+-----------------------------------------------------
              _at#CBA |
 (2 vs 1) (1 vs 0)    |  -.0091228    .003004     -.0150104   -.0032351
 (3 vs 1) (1 vs 0)    |  -.0201605   .0077221     -.0352956   -.0050253
 (4 vs 1) (1 vs 0)    |  -.0333629   .0146193     -.0620162   -.0047096
 (5 vs 1) (1 vs 0)    |  -.0489472   .0240671     -.0961178   -.0017767
 (6 vs 1) (1 vs 0)    |  -.0670735   .0363314     -.1382818    .0041348
 (7 vs 1) (1 vs 0)    |  -.0878207   .0515614     -.1888792    .0132378
 (8 vs 1) (1 vs 0)    |  -.1111663   .0697848      -.247942    .0256093
 (9 vs 1) (1 vs 0)    |  -.1369722    .090914     -.3151603     .041216
(10 vs 1) (1 vs 0)    |  -.1649778   .1147634       -.38991    .0599544
(11 vs 1) (1 vs 0)    |  -.1948036   .1410763      -.471308    .0817008
(12 vs 1) (1 vs 0)    |  -.2259622   .1695573     -.5582884     .106364
----------------------------------------------------------------------------

. margins, dydx(CBA) at(lgdpg=(-8.87(2)14.09)) vsquish

Average marginal effects                          Number of obs   =      40832
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
dy/dx w.r.t. : 1.CBA
1._at        : lgdpg           =       -8.87
2._at        : lgdpg           =       -6.87
3._at        : lgdpg           =       -4.87
4._at        : lgdpg           =       -2.87
5._at        : lgdpg           =        -.87
6._at        : lgdpg           =        1.13
7._at        : lgdpg           =        3.13
8._at        : lgdpg           =        5.13
9._at        : lgdpg           =        7.13
10._at       : lgdpg           =        9.13
11._at       : lgdpg           =       11.13
12._at       : lgdpg           =       13.13

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |  -.0216954   .0324176    -0.67   0.503    -.0852326    .0418419
          2  |  -.0330956   .0281091    -1.18   0.239    -.0881884    .0219972
          3  |  -.0455488   .0225744    -2.02   0.044    -.0897937   -.0013038
          4  |  -.0589212   .0164331    -3.59   0.000    -.0911295   -.0267128
          5  |  -.0730298   .0119296    -6.12   0.000    -.0964114   -.0496483
          6  |  -.0876458   .0139574    -6.28   0.000    -.1150019   -.0602898
          7  |  -.1025013   .0218843    -4.68   0.000    -.1453936   -.0596089
          8  |  -.1172994   .0318779    -3.68   0.000    -.1797789     -.05482
          9  |  -.1317282   .0423225    -3.11   0.002    -.2146788   -.0487775
         10  |  -.1454752   .0524661    -2.77   0.006    -.2483068   -.0426435
         11  |  -.1582438   .0618359    -2.56   0.010      -.27944   -.0370476
         12  |  -.1697687   .0701282    -2.42   0.015    -.3072175     -.03232
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

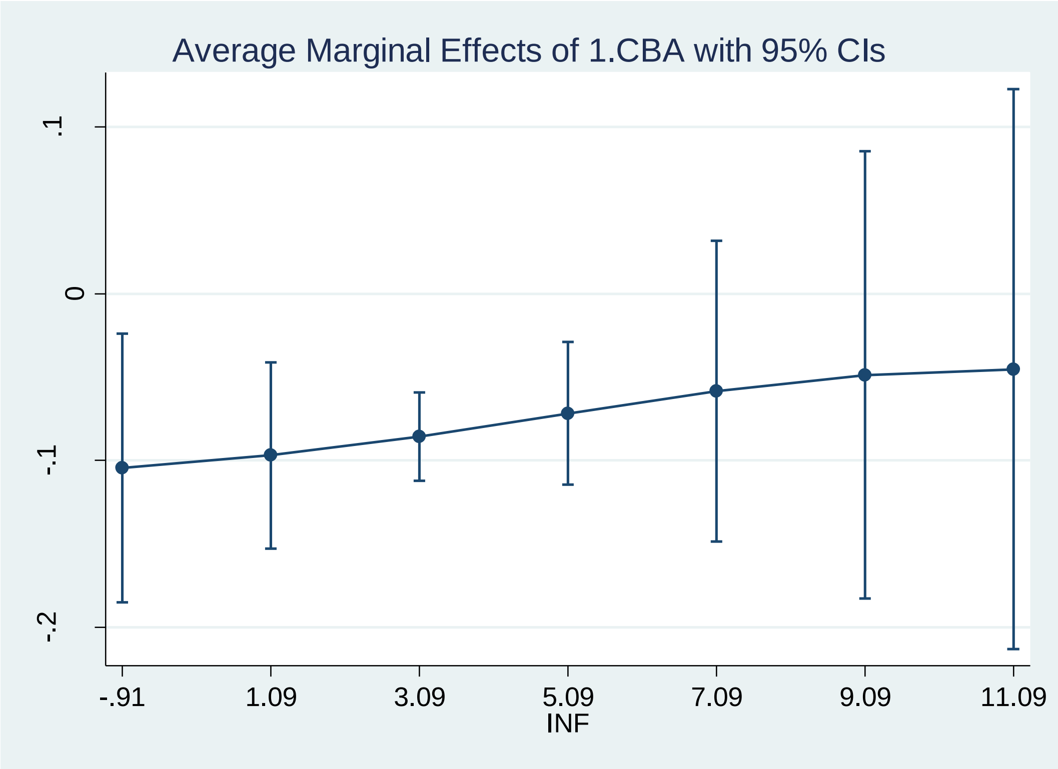
```
. marginsplot

  Variables that uniquely identify margins: lgdpg
```




```
margins r.CBA, at(lgdpg=(-8.87(2)14.09)) contrast(atcontrast(r)) vsquish

Contrasts of predictive margins
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
1._at        : lgdpg           =       -8.87
2._at        : lgdpg           =       -6.87
3._at        : lgdpg           =       -4.87
4._at        : lgdpg           =       -2.87
5._at        : lgdpg           =        -.87
6._at        : lgdpg           =        1.13
7._at        : lgdpg           =        3.13
8._at        : lgdpg           =        5.13
9._at        : lgdpg           =        7.13
10._at       : lgdpg           =        9.13
11._at       : lgdpg           =       11.13
12._at       : lgdpg           =       13.13

-------------------------------------------------------
                    |         df        chi2     P>chi2
--------------------+----------------------------------
            _at#CBA |
 (2 vs 1) (1 vs 0)  |          1        5.80     0.0160
 (3 vs 1) (1 vs 0)  |          1        4.70     0.0301
 (4 vs 1) (1 vs 0)  |          1        3.94     0.0470
 (5 vs 1) (1 vs 0)  |          1        3.41     0.0648
 (6 vs 1) (1 vs 0)  |          1        3.03     0.0817
 (7 vs 1) (1 vs 0)  |          1        2.76     0.0967
 (8 vs 1) (1 vs 0)  |          1        2.57     0.1092
 (9 vs 1) (1 vs 0)  |          1        2.43     0.1188
(10 vs 1) (1 vs 0)  |          1        2.35     0.1255
(11 vs 1) (1 vs 0)  |          1        2.30     0.1295
(12 vs 1) (1 vs 0)  |          1        2.28     0.1311
```

```
             Joint  |          5     1364.99     0.0000
------------------------------------------------------------

-----------------------------------------------------------------------------
                    |                 Delta-method
                    |   Contrast   Std. Err.     [95% Conf. Interval]
--------------------+--------------------------------------------------------
           _at#CBA |
 (2 vs 1) (1 vs 0)  |  -.0114003   .0047323     -.0206754   -.0021251
 (3 vs 1) (1 vs 0)  |  -.0238534   .0110002     -.0454135   -.0022933
 (4 vs 1) (1 vs 0)  |  -.0372258   .0187445     -.0739644   -.0004872
 (5 vs 1) (1 vs 0)  |  -.0513345   .0277964     -.1058145    .0031455
 (6 vs 1) (1 vs 0)  |  -.0659505   .0378849     -.1402035    .0083026
 (7 vs 1) (1 vs 0)  |  -.0808059   .0486527     -.1761634    .0145516
 (8 vs 1) (1 vs 0)  |  -.0956041   .0596829     -.2125805    .0213723
 (9 vs 1) (1 vs 0)  |  -.1100328   .0705342     -.2482774    .0282117
(10 vs 1) (1 vs 0)  |  -.1237798   .0807813     -.2821082    .0345486
(11 vs 1) (1 vs 0)  |  -.1365485   .0900562     -.3130555    .0399585
(12 vs 1) (1 vs 0)  |  -.1480734   .0980862     -.3403187     .044172
-----------------------------------------------------------------------------


. margins, dydx(CBA) at(inf=(-0.91(2)12.47)) vsquish

Average marginal effects                          Number of obs   =      40832
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
dy/dx w.r.t. : 1.CBA
1._at        : inf             =        -.91
2._at        : inf             =        1.09
3._at        : inf             =        3.09
4._at        : inf             =        5.09
5._at        : inf             =        7.09
6._at        : inf             =        9.09
7._at        : inf             =       11.09

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |  -.1044183   .0411343    -2.54   0.011       -.18504   -.0237966
          2  |  -.0969917   .0284478    -3.41   0.001     -.1527484    -.041235
          3  |  -.0856072   .0134736    -6.35   0.000      -.112015   -.0591993
          4  |  -.0718343   .0217926    -3.30   0.001     -.1145469   -.0291217
          5  |  -.0584731    .045969    -1.27   0.203     -.1485707    .0316245
          6  |  -.0487755   .0683443    -0.71   0.475     -.1827279    .0851769
          7  |  -.0452849   .0855945    -0.53   0.597      -.213047    .1224772
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

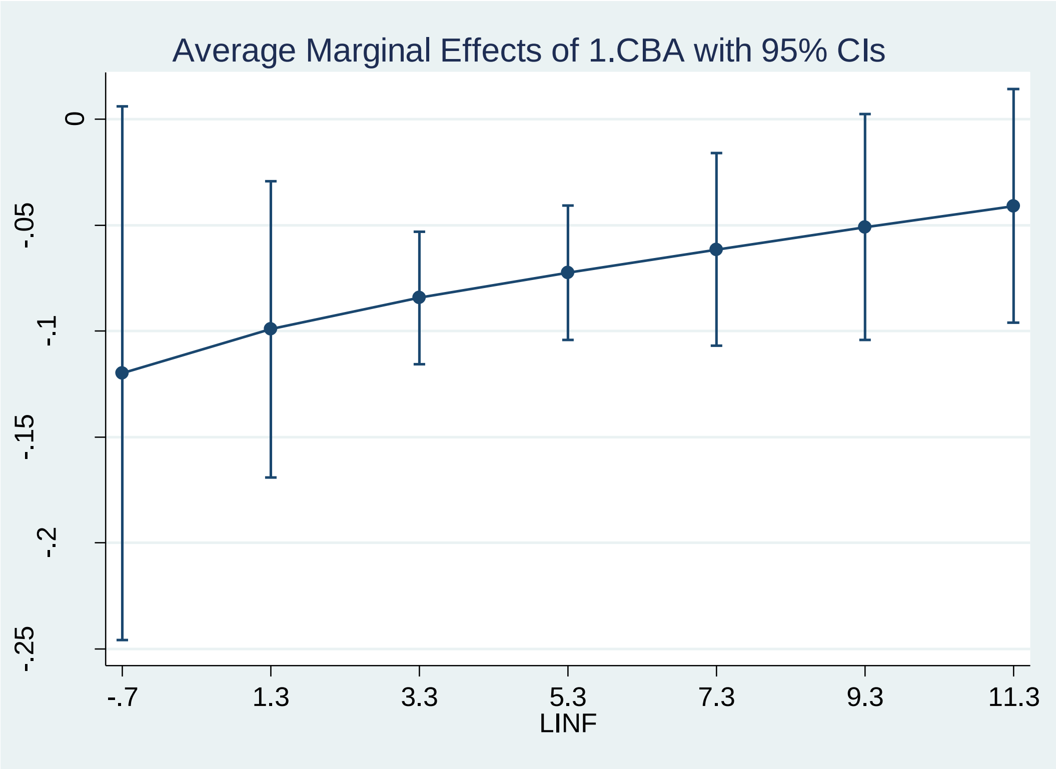
```
. marginsplot

  Variables that uniquely identify margins: inf
```




```
. margins r.CBA, at(inf=(-0.91(2)12.47)) contrast(atcontrast(r)) vsquish

Contrasts of predictive margins
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
1._at        : inf             =        -.91
2._at        : inf             =        1.09
3._at        : inf             =        3.09
4._at        : inf             =        5.09
5._at        : inf             =        7.09
6._at        : inf             =        9.09
7._at        : inf             =       11.09

------------------------------------------------------
                   |         df        chi2     P>chi2
-------------------+----------------------------------
           _at#CBA |
(2 vs 1) (1 vs 0)  |          1        0.31     0.5764
(3 vs 1) (1 vs 0)  |          1        0.35     0.5526
(4 vs 1) (1 vs 0)  |          1        0.35     0.5557
(5 vs 1) (1 vs 0)  |          1        0.32     0.5694
(6 vs 1) (1 vs 0)  |          1        0.29     0.5903
(7 vs 1) (1 vs 0)  |          1        0.24     0.6238
            Joint  |          5     1309.52     0.0000
------------------------------------------------------

--------------------------------------------------------------------
                   |            Delta-method
                   |   Contrast   Std. Err.     [95% Conf. Interval]
-------------------+------------------------------------------------
           _at#CBA |
(2 vs 1) (1 vs 0)  |   .0074265    .013293     -.0186272    .0334803
(3 vs 1) (1 vs 0)  |   .0188111   .0316753     -.0432713    .0808935
```

```
(4 vs 1) (1 vs 0)  |    .032584   .0552995      -.075801     .140969
(5 vs 1) (1 vs 0)  |   .0459452    .080761     -.1123435    .2042338
(6 vs 1) (1 vs 0)  |   .0556428   .1033419     -.1469036    .2581891
(7 vs 1) (1 vs 0)  |   .0591334   .1205631      -.177166    .2954328
--------------------------------------------------------------------------


. margins, dydx(CBA) at(linf=(-0.7(2)12.56)) vsquish

Average marginal effects                        Number of obs   =      40832
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
dy/dx w.r.t. : 1.CBA
1._at        : linf           =         -.7
2._at        : linf           =         1.3
3._at        : linf           =         3.3
4._at        : linf           =         5.3
5._at        : linf           =         7.3
6._at        : linf           =         9.3
7._at        : linf           =        11.3

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |  -.1197694   .0643349    -1.86   0.063    -.2458634    .0063247
          2  |  -.0990858   .0356352    -2.78   0.005    -.1689295   -.0292421
          3  |    -.08429   .0159189    -5.29   0.000    -.1154904   -.0530896
          4  |  -.0722945   .0162026    -4.46   0.000    -.1040511   -.0405379
          5  |   -.061335   .0232663    -2.64   0.008    -.1069361   -.0157339
          6  |  -.0508233   .0272491    -1.87   0.062    -.1042306    .0025839
          7  |  -.0408278   .0281222    -1.45   0.147    -.0959462    .0142906
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

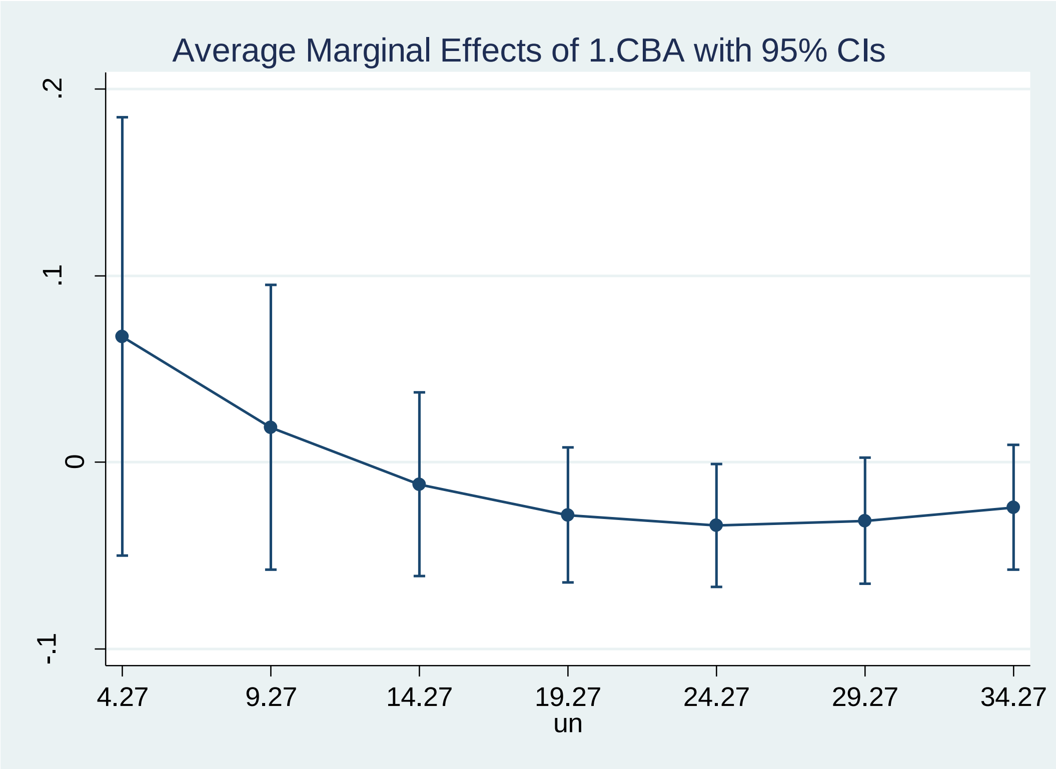
```
. marginsplot

  Variables that uniquely identify margins: linf

. margins r.CBA, at(linf=(-0.7(2)12.56)) contrast(atcontrast(r)) vsquish
```




```
margins r.CBA, at(linf=(-0.7(2)12.56)) contrast(atcontrast(r)) vsquish

Contrasts of predictive margins
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
1._at        : linf            =          -.7
2._at        : linf            =          1.3
3._at        : linf            =          3.3
4._at        : linf            =          5.3
5._at        : linf            =          7.3
6._at        : linf            =          9.3
7._at        : linf            =         11.3

------------------------------------------------------
                   |         df        chi2     P>chi2
-------------------+----------------------------------
            _at#CBA |
(2 vs 1) (1 vs 0)  |          1        0.47     0.4918
(3 vs 1) (1 vs 0)  |          1        0.42     0.5146
(4 vs 1) (1 vs 0)  |          1        0.45     0.5044
(5 vs 1) (1 vs 0)  |          1        0.53     0.4686
(6 vs 1) (1 vs 0)  |          1        0.66     0.4162
(7 vs 1) (1 vs 0)  |          1        0.85     0.3556
            Joint  |          5      401.49     0.0000
------------------------------------------------------

--------------------------------------------------------------------
                   |            Delta-method
                   |   Contrast   Std. Err.     [95% Conf. Interval]
-------------------+------------------------------------------------
            _at#CBA |
```

```
(2 vs 1) (1 vs 0)  |   .0206836   .0300897     -.0382912    .0796583
(3 vs 1) (1 vs 0)  |   .0354793   .0544359      -.071213    .1421717
(4 vs 1) (1 vs 0)  |   .0474749   .0711098     -.0918978    .1868475
(5 vs 1) (1 vs 0)  |   .0584344   .0806213     -.0995804    .2164492
(6 vs 1) (1 vs 0)  |    .068946   .0848075     -.0972736    .2351656
(7 vs 1) (1 vs 0)  |   .0789416   .0854503     -.0885379     .246421
--------------------------------------------------------------------

. margins, dydx(CBA) at(un=(4.27(5)34.75)) vsquish

Average marginal effects                          Number of obs   =      40832
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
dy/dx w.r.t. : 1.CBA
1._at        : un              =        4.27
2._at        : un              =        9.27
3._at        : un              =       14.27
4._at        : un              =       19.27
5._at        : un              =       24.27
6._at        : un              =       29.27
7._at        : un              =       34.27

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |   .0675096   .0599621     1.13   0.260    -.0500139    .1850331
          2  |   .0187886   .0389626     0.48   0.630    -.0575768    .0951539
          3  |  -.0117139   .0251068    -0.47   0.641    -.0609223    .0374945
          4  |  -.0282291    .018515    -1.52   0.127    -.0645178    .0080596
          5  |  -.0338424   .0168221    -2.01   0.044    -.0668131   -.0008716
          6  |  -.0313315   .0172285    -1.82   0.069    -.0650987    .0024358
          7  |  -.0242151   .0170558    -1.42   0.156    -.0576439    .0092138
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

```
. marginsplot

  Variables that uniquely identify margins: un

. margins r.CBA, at(un=(4.27(5)34.75)) contrast(atcontrast(r)) vsquish
```

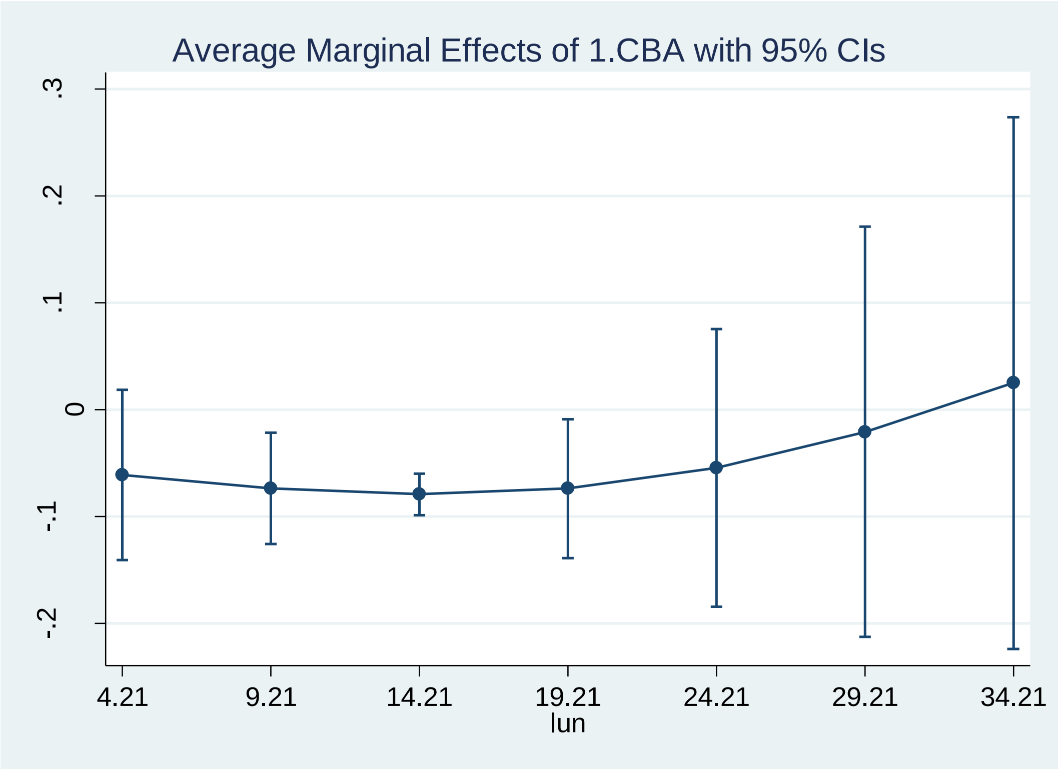



```
margins r.CBA, at(un=(4.27(5)34.75)) contrast(atcontrast(r)) vsquish

Contrasts of predictive margins
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
1._at        : un              =        4.27
2._at        : un              =        9.27
3._at        : un              =       14.27
4._at        : un              =       19.27
5._at        : un              =       24.27
6._at        : un              =       29.27
7._at        : un              =       34.27

------------------------------------------------------
                   |         df        chi2     P>chi2
-------------------+----------------------------------
           _at#CBA |
(2 vs 1) (1 vs 0)  |          1        4.21     0.0402
(3 vs 1) (1 vs 0)  |          1        3.45     0.0634
(4 vs 1) (1 vs 0)  |          1        2.96     0.0853
(5 vs 1) (1 vs 0)  |          1        2.53     0.1120
(6 vs 1) (1 vs 0)  |          1        2.10     0.1475
(7 vs 1) (1 vs 0)  |          1        1.74     0.1870
             Joint |          6      545.50     0.0000
------------------------------------------------------

--------------------------------------------------------------------
                   |            Delta-method
                   |   Contrast   Std. Err.     [95% Conf. Interval]
-------------------+------------------------------------------------
           _at#CBA |
```

```
(2 vs 1) (1 vs 0)  |   -.048721   .0237475     -.0952653   -.0021768
(3 vs 1) (1 vs 0)  |  -.0792235   .0426749     -.1628647    .0044177
(4 vs 1) (1 vs 0)  |  -.0957387   .0556312     -.2047739    .0132965
(5 vs 1) (1 vs 0)  |   -.101352    .063777     -.2263525    .0236486
(6 vs 1) (1 vs 0)  |   -.098841    .068237      -.232583    .0349009
(7 vs 1) (1 vs 0)  |  -.0917247    .069507     -.2279559    .0445066
---------------------------------------------------------------------------
```

```
margins, dydx(CBA) at(lun=(4.21(5)34.97)) vsquish

Average marginal effects                          Number of obs   =      40832
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
dy/dx w.r.t. : 1.CBA
1._at        : lun            =        4.21
2._at        : lun            =        9.21
3._at        : lun            =       14.21
4._at        : lun            =       19.21
5._at        : lun            =       24.21
6._at        : lun            =       29.21
7._at        : lun            =       34.21

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |  -.0612213   .0406891    -1.50   0.132    -.1409705     .018528
          2  |  -.0736985   .0265711    -2.77   0.006    -.1257769     -.02162
          3  |  -.0794044   .0098352    -8.07   0.000    -.0986811   -.0601278
          4  |   -.073949   .0331959    -2.23   0.026    -.1390118   -.0088863
          5  |  -.0544758   .0663135    -0.82   0.411    -.1844478    .0754962
          6  |  -.0207376   .0979595    -0.21   0.832    -.2127347    .1712595
          7  |   .0248721   .1270219     0.20   0.845    -.2240863    .2738304
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

```
. marginsplot

  Variables that uniquely identify margins: lun

. margins r.CBA, at(lun=(4.21(5)34.97)) contrast(atcontrast(r)) vsquish
```




```
margins r.CBA, at(lun=(4.21(5)34.97)) contrast(atcontrast(r)) vsquish

Contrasts of predictive margins
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
1._at        : lun             =        4.21
2._at        : lun             =        9.21
3._at        : lun             =       14.21
4._at        : lun             =       19.21
5._at        : lun             =       24.21
6._at        : lun             =       29.21
7._at        : lun             =       34.21

------------------------------------------------------
                   |         df        chi2     P>chi2
-------------------+----------------------------------
           _at#CBA |
(2 vs 1) (1 vs 0)  |          1        0.69     0.4065
(3 vs 1) (1 vs 0)  |          1        0.21     0.6459
(4 vs 1) (1 vs 0)  |          1        0.03     0.8571
(5 vs 1) (1 vs 0)  |          1        0.00     0.9480
(6 vs 1) (1 vs 0)  |          1        0.09     0.7608
(7 vs 1) (1 vs 0)  |          1        0.30     0.5862
             Joint |          5      162.48     0.0000
------------------------------------------------------

--------------------------------------------------------------------
                   |            Delta-method
                   |   Contrast   Std. Err.     [95% Conf. Interval]
-------------------+------------------------------------------------
           _at#CBA |
```

```
(2 vs 1) (1 vs 0)  |  -.0124772   .0150321     -.0419395    .0169851
(3 vs 1) (1 vs 0)  |  -.0181832   .0395708     -.0957405    .0593742
(4 vs 1) (1 vs 0)  |  -.0127278   .0706827     -.1512633    .1258077
(5 vs 1) (1 vs 0)  |   .0067454   .1033577     -.1958319    .2093228
(6 vs 1) (1 vs 0)  |   .0404837   .1329818     -.2201559    .3011232
(7 vs 1) (1 vs 0)  |   .0860933   .1581646     -.2239036    .3960903
--------------------------------------------------------------------
```

**Appendix 6.15: Subjective assessments of the economic situation in a country(SUR estimation (region used as cluster))**

**Appendix 6.15a: Subjective assessments – Estiomation of Equation 6.7 (SUR estimation (region used as cluster)) – unweighted**

```
. biprobit (ESagree = i.CBA i.q22f_1 gdppc gdpg lgdpg inf linf un lun
CBA#q22f_1 i.CBA#c.gdppc i.CBA#c.gdpg i.CBA#c.lgdpg i.CBA#c.inf i.CBA#c.linf
i.CBA#c.un i.CBA#c.lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium
h_retired h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008
fall2008 spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu)
(ExpESagree = i.CBA i.q22f_1 gdppc gdpg lgdpg inf linf un lun CBA#q22f_1
i.CBA#c.gdppc i.CBA#c.gdpg i.CBA#c.lgdpg i.CBA#c.inf i.CBA#c.linf i.CBA#c.un
i.CBA#c.lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired
h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008
spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu), vce(cluster
h_region) nolog

note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity
note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity

Seemingly unrelated bivariate probit            Number of obs   =      40832
                                                Wald chi2(67)   =          .
Log pseudolikelihood = -38656.081               Prob > chi2     =          .

                              (Std. Err. adjusted for 71 clusters in h_region)
------------------------------------------------------------------------------
             |               Robust
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ESagree      |
       1.CBA |  -.0939387   1.252844    -0.07   0.940    -2.549467     2.36159
             |
      q22f_1 |
          2  |  -.1933874   .0672376    -2.88   0.004    -.3251706   -.0616041
          3  |  -.4967098   .0734953    -6.76   0.000    -.6407578   -.3526617
          4  |  -.7816309   .0863562    -9.05   0.000    -.9508859   -.6123759
          5  |  -1.080655   .0813016   -13.29   0.000    -1.240003   -.9213065
             |
       gdppc |  -.0000254    .000011    -2.32   0.020    -.0000469   -3.93e-06
        gdpg |   .0674839   .0120569     5.60   0.000     .0438527     .091115
       lgdpg |   .0522686   .0169905     3.08   0.002     .0189679    .0855693
         inf |   .0215793   .0299885     0.72   0.472    -.0371972    .0803557
        linf |  -.0927844   .0285565    -3.25   0.001     -.148754   -.0368147
          un |  -.0778433   .0240877    -3.23   0.001    -.1250543   -.0306324
         lun |   .0567817   .0223874     2.54   0.011     .0129033    .1006602
             |
  CBA#q22f_1 |
        1 2  |   .0916801    .100391     0.91   0.361    -.1050827    .2884429
        1 3  |   .1735826   .1123297     1.55   0.122    -.0465796    .3937448
        1 4  |   .1803468   .1345539     1.34   0.180    -.0833741    .4440677
        1 5  |    .325337   .1232647     2.64   0.008     .0837427    .5669314
             |
 CBA#c.gdppc |
          1  |  -.0000937   .0001445    -0.65   0.517     -.000377    .0001896
             |
  CBA#c.gdpg |
          1  |  -.0332722   .0560646    -0.59   0.553    -.1431568    .0766123
             |
 CBA#c.lgdpg |
```

```
           1  |  -.0468546   .0279775    -1.67   0.094    -.1016895    .0079803
              |
   CBA#c.inf  |
           1  |   .1342061   .1580792     0.85   0.396    -.1756235    .4440357
              |
  CBA#c.linf  |
           1  |  -.0878488   .1312803    -0.67   0.503    -.3451536    .1694559
              |
    CBA#c.un  |
           1  |  -.0145683   .0532533    -0.27   0.784    -.1189428    .0898062
              |
   CBA#c.lun  |
           1  |   .0152795   .0584602     0.26   0.794    -.0993004    .1298594
              |
     h_aged2  |  -.0385482   .0244466    -1.58   0.115    -.0864626    .0093662
     h_aged3  |  -.0727358   .0321817    -2.26   0.024    -.1358108   -.0096607
    h_female  |  -.0253912   .0189583    -1.34   0.180    -.0625487    .0117663
  h_edu_high  |   .0978325   .0543099     1.80   0.072    -.0086129     .204278
h_edu_medium  |   .0281025   .0432101     0.65   0.515    -.0565877    .1127928
   h_retired  |  -.0409382   .0384131    -1.07   0.287    -.1162265    .0343501
   h_student  |    .055946   .0429312     1.30   0.193    -.0281976    .1400896
h_unemployed  |  -.0376038   .0294695    -1.28   0.202     -.095363    .0201554
    h_inc_d1  |  -.0107848   .0454972    -0.24   0.813    -.0999575     .078388
    h_inc_d3  |   .0481595   .0354837     1.36   0.175    -.0213872    .1177062
    h_inc_d4  |   .1197827   .0373483     3.21   0.001     .0465814     .192984
  spring2008  |          0  (omitted)
    fall2008  |          0  (omitted)
  spring2009  |     .74455   .0798972     9.32   0.000     .5879545    .9011456
    fall2009  |   .7579144   .1262302     6.00   0.000     .5105077    1.005321
  spring2010  |   .4080622   .0891309     4.58   0.000     .2333688    .5827555
    fall2010  |    .075537   .0741736     1.02   0.308    -.0698406    .2209145
  spring2011  |          0  (omitted)
          EU  |   .3696049   .1711011     2.16   0.031     .0342529    .7049569
        ExYu  |   .5335493   .1997304     2.67   0.008     .1420849    .9250138
       _cons  |  -.3339893   .1866906    -1.79   0.074    -.6998962    .0319176
-------------+----------------------------------------------------------------
ExpESagree    |
       1.CBA  |   1.768284   1.026355     1.72   0.085    -.2433355    3.779904
              |
      q22f_1  |
           2  |  -.1447494   .0765913    -1.89   0.059    -.2948656    .0053668
           3  |  -.4546894    .083817    -5.42   0.000    -.6189677   -.2904112
           4  |  -.7658915   .0865565    -8.85   0.000    -.9355391   -.5962439
           5  |  -1.006841   .0791888   -12.71   0.000    -1.162048   -.8516339
              |
       gdppc  |  -1.37e-06   8.46e-06    -0.16   0.872     -.000018    .0000152
        gdpg  |    .051463   .0094852     5.43   0.000     .0328723    .0700537
       lgdpg  |  -.0144984   .0082885    -1.75   0.080    -.0307436    .0017468
         inf  |   .0253231   .0276541     0.92   0.360     -.028878    .0795242
        linf  |  -.0727604   .0260822    -2.79   0.005    -.1238806   -.0216403
          un  |   .0306104   .0297124     1.03   0.303    -.0276249    .0888457
         lun  |  -.0240526   .0264856    -0.91   0.364    -.0759635    .0278583
              |
  CBA#q22f_1  |
         1 2  |  -.0333383   .1195692    -0.28   0.780    -.2676897    .2010132
         1 3  |   .0404658   .1142992     0.35   0.723    -.1835565    .2644881
         1 4  |   .1018359   .1168111     0.87   0.383    -.1271097    .3307815
         1 5  |     .04846   .1148247     0.42   0.673    -.1765922    .2735122
              |
 CBA#c.gdppc  |
           1  |   -.000243   .0001197    -2.03   0.042    -.0004776   -8.39e-06
              |
  CBA#c.gdpg  |
           1  |   .0569014   .0460026     1.24   0.216    -.0332621    .1470649
              |
 CBA#c.lgdpg  |
           1  |   .0127098   .0207599     0.61   0.540    -.0279788    .0533984
              |
   CBA#c.inf  |
           1  |  -.0792672     .12343    -0.64   0.521    -.3211855    .1626512
              |
  CBA#c.linf  |
           1  |   .1042902   .0990008     1.05   0.292    -.0897478    .2983282
              |
    CBA#c.un  |
           1  |  -.0816272   .0451657    -1.81   0.071    -.1701503    .0068958
              |
```

```
   CBA#c.lun |
          1  |   .0341368   .0455886     0.75   0.454    -.0552152    .1234889
             |
     h_aged2 |  -.0707196   .0232767    -3.04   0.002    -.1163412   -.0250981
     h_aged3 |  -.0948035   .0329844    -2.87   0.004    -.1594517   -.0301553
    h_female |  -.0006671   .0137877    -0.05   0.961    -.0276905    .0263562
  h_edu_high |    .122323   .0325876     3.75   0.000     .0584524    .1861935
h_edu_medium |   .0076858   .0258129     0.30   0.766    -.0429066    .0582782
   h_retired |   .0410001    .026243     1.56   0.118    -.0104352    .0924354
   h_student |   .1339003   .0419914     3.19   0.001     .0515988    .2162019
h_unemployed |  -.0238648   .0259293    -0.92   0.357    -.0746853    .0269558
    h_inc_d1 |   .1198922   .0362574     3.31   0.001     .0488291    .1909554
    h_inc_d3 |   .1741856   .0213341     8.16   0.000     .1323716    .2159996
    h_inc_d4 |   .2531831   .0302217     8.38   0.000     .1939497    .3124166
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .5277808   .0715521     7.38   0.000     .3875412    .6680204
    fall2009 |   .5324743   .0780413     6.82   0.000     .3795162    .6854324
  spring2010 |   .2227363   .0594285     3.75   0.000     .1062587     .339214
    fall2010 |   .0599323   .0500543     1.20   0.231    -.0381723     .158037
  spring2011 |          0  (omitted)
          EU |   .1357343   .1039016     1.31   0.191    -.0679091    .3393778
        ExYu |   .0514488   .1268875     0.41   0.685    -.1972461    .3001437
       _cons |   .0268061   .1457478     0.18   0.854    -.2588544    .3124665
-------------+----------------------------------------------------------------
     /athrho |   .6547694   .0288692    22.68   0.000     .5981868    .7113521
-------------+----------------------------------------------------------------
         rho |    .574872   .0193286                      .5357581     .611524
------------------------------------------------------------------------------
Wald test of rho=0:                 chi2(1) =  514.407    Prob > chi2 = 0.0000
```

**Marginal effects after biprobit**

```
. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      40832
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 gdppc gdpg lgdpg inf linf un
lun h_aged2
               h_aged3 h_female h_edu_high h_edu_medium h_retired h_student
h_unemployed h_inc_d1
               h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009 fall2009 spring2010
fall2010
               spring2011 EU ExYu

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.0840565   .0101568    -8.28   0.000    -.1039635   -.0641494
             |
     q22f_1 |
          2  |  -.0529719    .018186    -2.91   0.004    -.0886158   -.0173281
          3  |  -.1275707   .0195207    -6.54   0.000    -.1658305   -.0893108
          4  |  -.1816679    .020939    -8.68   0.000    -.2227075   -.1406282
          5  |  -.2162407   .0203108   -10.65   0.000    -.2560492   -.1764322
             |
       gdppc |  -7.70e-06   4.12e-06    -1.87   0.062    -.0000158    3.71e-07
        gdpg |   .0118509   .0023483     5.05   0.000     .0072483    .0164535
       lgdpg |   .0058952   .0021965     2.68   0.007     .0015901    .0102003
         inf |   .0067412   .0056088     1.20   0.229    -.0042519    .0177343
        linf |  -.0180187   .0052575    -3.43   0.001    -.0283232   -.0077143
          un |  -.0107389   .0040784    -2.63   0.008    -.0187324   -.0027455
         lun |   .0076635   .0038306     2.00   0.045     .0001558    .0151713
     h_aged2 |  -.0089037   .0040671    -2.19   0.029    -.0168752   -.0009323
     h_aged3 |   -.014975   .0057012    -2.63   0.009    -.0261492   -.0038009
    h_female |  -.0036957   .0029934    -1.23   0.217    -.0095627    .0021713
  h_edu_high |   .0198968    .008619     2.31   0.021     .0030038    .0367898
h_edu_medium |   .0044185   .0071804     0.62   0.538    -.0096548    .0184919
   h_retired |  -.0039709   .0061221    -0.65   0.517      -.01597    .0080283
   h_student |   .0143991   .0070147     2.05   0.040     .0006506    .0281476
h_unemployed |   -.006554   .0050135    -1.31   0.191    -.0163803    .0032724
    h_inc_d1 |   .0041075   .0075309     0.55   0.585    -.0106528    .0188677
    h_inc_d3 |   .0151785   .0058762     2.58   0.010     .0036613    .0266958
```

```
    h_inc_d4 |   .0292463   .0063418     4.61   0.000     .0168167     .041676
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .1323783   .0145969     9.07   0.000     .1037689    .1609876
    fall2009 |   .1345286   .0213605     6.30   0.000     .0926629    .1763943
  spring2010 |   .0694094    .015319     4.53   0.000     .0393848     .099434
    fall2010 |   .0137319    .011522     1.19   0.233    -.0088508    .0363147
  spring2011 |          0  (omitted)
          EU |   .0597496    .027881     2.14   0.032     .0051039    .1143953
        ExYu |   .0794266   .0307199     2.59   0.010     .0192167    .1396365
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

**Appendix 6.15b: Subjective assessments – Estiomation of Equation 6.7 (SUR estimation (region used as cluster)) – weighted**

```
. biprobit (ESagree = i.CBA i.q22f_1 gdppc gdpg lgdpg inf linf un lun
CBA#q22f_1 i.CBA#c.gdppc i.CBA#c.gdpg i.CBA#c.lgdpg i.CBA#c.inf i.CBA#c.linf
i.CBA#c.un i.CBA#c.lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium
h_retired h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008
fall2008 spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu)
(ExpESagree = i.CBA i.q22f_1 gdppc gdpg lgdpg inf linf un lun CBA#q22f_1
i.CBA#c.gdppc i.CBA#c.gdpg i.CBA#c.lgdpg i.CBA#c.inf i.CBA#c.linf i.CBA#c.un
i.CBA#c.lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired
h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008
spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu) [pweight =
weight], vce(cluster h_region) nolog

note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity
note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity

Seemingly unrelated bivariate probit             Number of obs   =      40832
                                                 Wald chi2(67)   =          .
Log pseudolikelihood = -37435.157                Prob > chi2     =          .

                             (Std. Err. adjusted for 71 clusters in h_region)
------------------------------------------------------------------------------
             |               Robust
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ESagree      |
       1.CBA |  -.0813144   1.312079    -0.06   0.951    -2.652942    2.490313
             |
      q22f_1 |
          2  |  -.1835807   .0711956    -2.58   0.010    -.3231216   -.0440398
          3  |  -.4846145   .0755439    -6.42   0.000    -.6326778   -.3365513
          4  |  -.7592442   .0876326    -8.66   0.000     -.931001   -.5874874
          5  |  -1.068169    .083968   -12.72   0.000    -1.232743   -.9035947
             |
       gdppc |  -.0000265   .0000114    -2.32   0.020    -.0000489   -4.10e-06
        gdpg |   .0675421   .0122778     5.50   0.000      .043478    .0916062
       lgdpg |   .0530103   .0173001     3.06   0.002     .0191027     .086918
         inf |   .0131946   .0308809     0.43   0.669    -.0473309    .0737201
        linf |  -.0863672   .0303306    -2.85   0.004    -.1458141   -.0269202
          un |  -.0693475     .02609    -2.66   0.008    -.1204829   -.0182121
         lun |   .0503011   .0246554     2.04   0.041     .0019775    .0986247
             |
  CBA#q22f_1 |
        1 2  |   .1023437   .1016792     1.01   0.314    -.0969438    .3016312
        1 3  |   .1848917   .1109106     1.67   0.096    -.0324891    .4022725
        1 4  |   .1376489   .1395508     0.99   0.324    -.1358657    .4111635
        1 5  |   .3378396   .1234671     2.74   0.006     .0958485    .5798307
             |
 CBA#c.gdppc |
          1  |  -.0000983   .0001518    -0.65   0.517    -.0003957    .0001992
             |
  CBA#c.gdpg |
          1  |  -.0356236   .0595859    -0.60   0.550    -.1524097    .0811626
             |
 CBA#c.lgdpg |
```

```
           1  |  -.0461451   .0280941    -1.64   0.100    -.1012086    .0089184
              |
   CBA#c.inf  |
           1  |   .1538337   .1608472     0.96   0.339     -.161421    .4690885
              |
  CBA#c.linf  |
           1  |  -.1046361   .1342144    -0.78   0.436    -.3676915    .1584193
              |
    CBA#c.un  |
           1  |  -.0175849   .0521555    -0.34   0.736    -.1198079     .084638
              |
   CBA#c.lun  |
           1  |   .0188023   .0571542     0.33   0.742    -.0932179    .1308225
              |
     h_aged2  |  -.0338185   .0254004    -1.33   0.183    -.0836023    .0159654
     h_aged3  |  -.0563513   .0322897    -1.75   0.081     -.119638    .0069354
    h_female  |  -.0237768   .0176309    -1.35   0.177    -.0583329    .0107792
  h_edu_high  |   .1201054   .0505143     2.38   0.017     .0210992    .2191116
h_edu_medium  |   .0415476   .0412567     1.01   0.314    -.0393141    .1224093
   h_retired  |  -.0705393   .0355889    -1.98   0.047    -.1402923   -.0007862
   h_student  |   .0649747   .0475452     1.37   0.172    -.0282122    .1581616
h_unemployed  |  -.0254136   .0313318    -0.81   0.417    -.0868229    .0359957
    h_inc_d1  |   .0030182   .0470339     0.06   0.949    -.0891666     .095203
    h_inc_d3  |   .0594578   .0361432     1.65   0.100    -.0113816    .1302971
    h_inc_d4  |   .1217082   .0374894     3.25   0.001     .0482302    .1951861
  spring2008  |          0  (omitted)
    fall2008  |          0  (omitted)
  spring2009  |   .7616047   .0853841     8.92   0.000     .5942549    .9289546
    fall2009  |   .7979278    .121426     6.57   0.000     .5599371    1.035918
  spring2010  |   .4298769   .0886764     4.85   0.000     .2560743    .6036796
    fall2010  |   .0927391   .0695475     1.33   0.182    -.0435715    .2290496
  spring2011  |          0  (omitted)
          EU  |    .410091   .1707413     2.40   0.016     .0754442    .7447377
        ExYu  |   .5404449   .2024105     2.67   0.008     .1437277    .9371621
       _cons  |  -.4307795   .2054549    -2.10   0.036    -.8334637   -.0280953
-------------+----------------------------------------------------------------
ExpESagree    |
       1.CBA  |   1.466809   1.077306     1.36   0.173     -.644672     3.57829
              |
      q22f_1  |
           2  |  -.1555984   .0771756    -2.02   0.044    -.3068599   -.0043369
           3  |  -.4613222   .0831979    -5.54   0.000    -.6243871   -.2982573
           4  |  -.7680513   .0870018    -8.83   0.000    -.9385717   -.5975309
           5  |  -1.023271   .0808946   -12.65   0.000    -1.181822   -.8647205
              |
       gdppc  |  -2.05e-06   8.50e-06    -0.24   0.810    -.0000187    .0000146
        gdpg  |   .0501434    .009483     5.29   0.000     .0315572    .0687297
       lgdpg  |  -.0120658   .0084296    -1.43   0.152    -.0285876     .004456
         inf  |   .0223086   .0295347     0.76   0.450    -.0355783    .0801956
        linf  |  -.0682003   .0283087    -2.41   0.016    -.1236843   -.0127163
          un  |   .0350268   .0317199     1.10   0.269    -.0271431    .0971967
         lun  |  -.0263125   .0280836    -0.94   0.349    -.0813554    .0287305
              |
  CBA#q22f_1  |
         1 2  |  -.0056534   .1252283    -0.05   0.964    -.2510964    .2397895
         1 3  |   .0653206   .1157788     0.56   0.573    -.1616017    .2922429
         1 4  |   .1147825   .1186538     0.97   0.333    -.1177748    .3473397
         1 5  |   .0700396   .1160028     0.60   0.546    -.1573217     .297401
              |
 CBA#c.gdppc  |
           1  |  -.0002134   .0001255    -1.70   0.089    -.0004594    .0000327
              |
  CBA#c.gdpg  |
           1  |   .0502109   .0483779     1.04   0.299    -.0446079    .1450298
              |
 CBA#c.lgdpg  |
           1  |    .008615   .0208565     0.41   0.680     -.032263    .0494929
              |
   CBA#c.inf  |
           1  |  -.0670055   .1332933    -0.50   0.615    -.3282556    .1942446
              |
  CBA#c.linf  |
           1  |   .0961332   .1076461     0.89   0.372    -.1148493    .3071157
              |
    CBA#c.un  |
           1  |  -.0841303    .043336    -1.94   0.052    -.1690673    .0008066
              |
```

```
    CBA#c.lun |
           1  |   .0434161   .0434881     1.00   0.318    -.0418191    .1286513
              |
      h_aged2 |  -.0657137   .0241908    -2.72   0.007    -.1131268   -.0183006
      h_aged3 |  -.1048379   .0330659    -3.17   0.002    -.1696458   -.0400299
     h_female |   .0023863   .0159919     0.15   0.881    -.0289573    .0337299
   h_edu_high |   .1210229   .0339545     3.56   0.000     .0544733    .1875725
 h_edu_medium |    .007769   .0262368     0.30   0.767    -.0436541    .0591922
    h_retired |   .0314658   .0279883     1.12   0.261    -.0233904    .0863219
    h_student |   .1444603   .0437445     3.30   0.001     .0587225     .230198
 h_unemployed |  -.0195781   .0281214    -0.70   0.486     -.074695    .0355388
     h_inc_d1 |   .1119978   .0345222     3.24   0.001     .0443355    .1796601
     h_inc_d3 |     .16563   .0238803     6.94   0.000     .1188255    .2124345
     h_inc_d4 |   .2489366   .0333536     7.46   0.000     .1835648    .3143085
   spring2008 |          0  (omitted)
     fall2008 |          0  (omitted)
   spring2009 |   .5194534   .0799731     6.50   0.000     .3627089    .6761978
     fall2009 |   .5311858   .0825463     6.44   0.000     .3693982    .6929735
   spring2010 |   .2297941   .0619744     3.71   0.000     .1083265    .3512616
     fall2010 |   .0705984   .0543799     1.30   0.194    -.0359842     .177181
   spring2011 |          0  (omitted)
           EU |   .1472248   .1079777     1.36   0.173    -.0644075    .3588571
         ExYu |   .0147525   .1363619     0.11   0.914    -.2525119    .2820168
        _cons |   .0084825    .153636     0.06   0.956    -.2926385    .3096035
-------------+----------------------------------------------------------------
      /athrho |   .6673776    .029976    22.26   0.000     .6086256    .7261296
-------------+----------------------------------------------------------------
          rho |   .5832522   .0197787                      .5431589    .6206918
------------------------------------------------------------------------------
Wald test of rho=0:                 chi2(1) =  495.672    Prob > chi2 = 0.0000
```

**Marginal effects after biprobit**

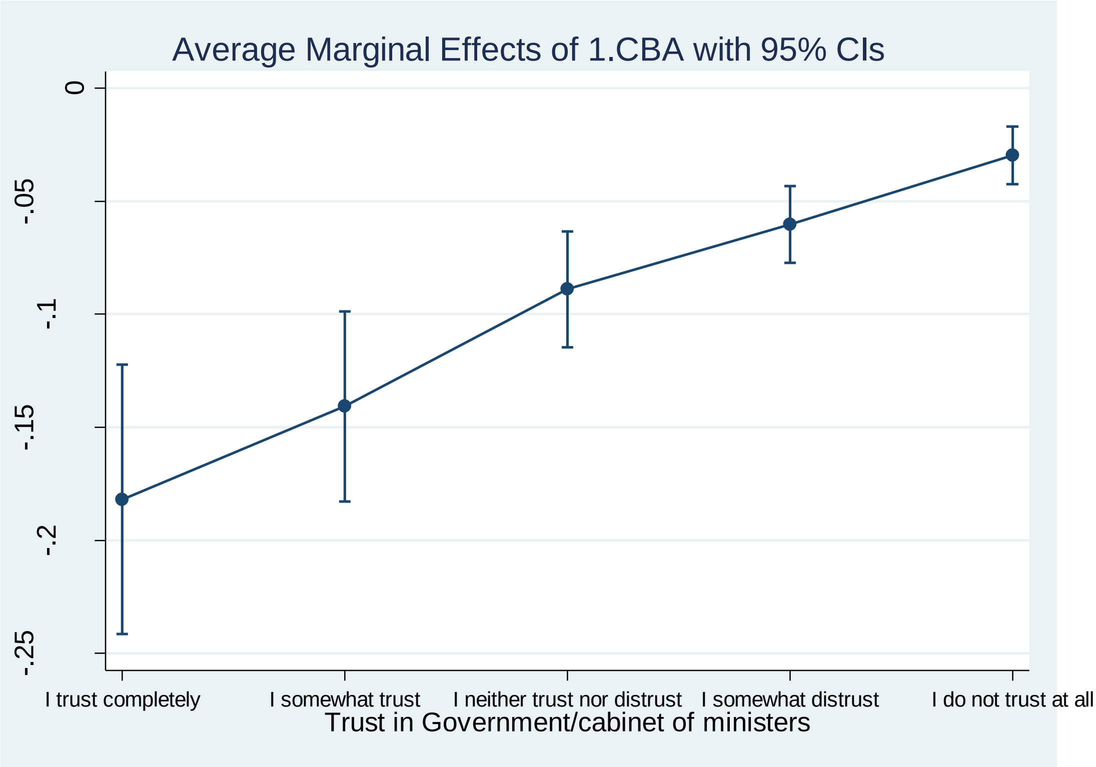
```
. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      40832
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 gdppc gdpg lgdpg inf linf un
lun h_aged2
               h_aged3 h_female h_edu_high h_edu_medium h_retired h_student
h_unemployed h_inc_d1
               h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009 fall2009 spring2010
fall2010
               spring2011 EU ExYu

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.0818665   .0102024    -8.02   0.000    -.1018628   -.0618702
             |
      q22f_1 |
          2  |  -.0499753   .0184461    -2.71   0.007     -.086129   -.0138217
          3  |  -.1231011   .0192749    -6.39   0.000    -.1608793    -.085323
          4  |  -.1764173   .0206181    -8.56   0.000     -.216828   -.1360066
          5  |  -.2112781   .0199858   -10.57   0.000    -.2504495   -.1721067
             |
       gdppc |  -7.75e-06   4.33e-06    -1.79   0.073    -.0000162    7.31e-07
        gdpg |   .0115336    .002421     4.76   0.000     .0067885    .0162787
       lgdpg |   .0060215   .0022291     2.70   0.007     .0016524    .0103905
         inf |   .0059137   .0057968     1.02   0.308    -.0054477    .0172752
        linf |  -.0171371   .0054936    -3.12   0.002    -.0279043   -.0063699
          un |  -.0093233   .0043647    -2.14   0.033     -.017878   -.0007687
         lun |    .006724   .0041802     1.61   0.108     -.001469    .0149169
     h_aged2 |  -.0078689   .0041438    -1.90   0.058    -.0159905    .0002528
     h_aged3 |  -.0128961   .0056564    -2.28   0.023    -.0239824   -.0018099
    h_female |  -.0032836   .0027391    -1.20   0.231    -.0086521    .0020849
  h_edu_high |   .0227459   .0078321     2.90   0.004     .0073953    .0380965
h_edu_medium |   .0062903    .006741     0.93   0.351    -.0069219    .0195025
   h_retired |  -.0086129   .0056455    -1.53   0.127    -.0196778     .002452
   h_student |   .0159609   .0076927     2.07   0.038     .0008835    .0310383
h_unemployed |  -.0045338    .005301    -0.86   0.392    -.0149235    .0058559
    h_inc_d1 |   .0056144   .0076539     0.73   0.463    -.0093871    .0206158
    h_inc_d3 |   .0161532   .0059706     2.71   0.007      .004451    .0278554
```

```
   h_inc_d4 |   .0288949   .0063144     4.58   0.000     .0165188    .0412709
 spring2008 |          0  (omitted)
   fall2008 |          0  (omitted)
 spring2009 |   .1327581   .0157048     8.45   0.000     .1019773    .1635389
   fall2009 |   .1384861   .0209065     6.62   0.000     .0975101    .1794621
 spring2010 |   .0719989   .0152103     4.73   0.000     .0421873    .1018106
   fall2010 |   .0165057   .0106724     1.55   0.122    -.0044119    .0374233
 spring2011 |          0  (omitted)
         EU |    .065353   .0276063     2.37   0.018     .0112457    .1194604
       ExYu |   .0778294   .0310239     2.51   0.012     .0170236    .1386352
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

**Appendix 6.15c: Marginal effect of CBA conditional on the level of trust in government - after biprobit (SUR) region as cluster, weighted**

```
. margins, dydx(CBA) at(q22f_1=(1(1)5)) vsquish

Average marginal effects                          Number of obs   =      40832
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
dy/dx w.r.t. : 1.CBA
1._at        : q22f_1          =           1
2._at        : q22f_1          =           2
3._at        : q22f_1          =           3
4._at        : q22f_1          =           4
5._at        : q22f_1          =           5

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1.CBA        |
         _at |
          1  |  -.1818534   .0304365    -5.97   0.000    -.2415078    -.122199
          2  |  -.1407803   .0214429    -6.57   0.000    -.1828077   -.0987529
          3  |  -.0889738   .0130735    -6.81   0.000    -.1145974   -.0633502
          4  |  -.0603518   .0086702    -6.96   0.000    -.0773452   -.0433585
          5  |  -.0295749   .0065103    -4.54   0.000    -.0423349   -.0168149
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

```
. marginsplot

  Variables that uniquely identify margins: q22f_1
```




.

**Appendix 6.16: Subjective assessments – Robustness check (SUR estimation (country used as cluster weighted))**

**Appendix 6.16a: SUR (with peprceptions/expectations about the fin. stab. of country)**

```
. biprobit (ESagree = i.CBA i.q11_7 i.q22f_1 gdppc gdpg lgdpg inf linf un
lun CBA#q22f_1 i.CBA#c.gdppc i.CBA#c.gdpg i.CBA#c.lgdpg i.CBA#c.inf
i.CBA#c.linf i.CBA#c.un i.CBA#c.lun h_aged2 h_aged3 h_female h_edu_high
h_edu_medium h_retired h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4
spring2008 fall2008 spring2009 fall2009 spring2010 fall2010 spring2011 EU
ExYu) (ExpESagree = i.CBA i.q11_7 i.q22f_1 gdppc gdpg lgdpg inf linf un lun
CBA#q22f_1 i.CBA#c.gdppc i.CBA#c.gdpg i.CBA#c.lgdpg i.CBA#c.inf i.CBA#c.linf
i.CBA#c.un i.CBA#c.lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium
h_retired h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008
fall2008 spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu)
[pweight = weight], vce(cluster country) nolog

note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity
note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity

Seemingly unrelated bivariate probit              Number of obs   =      39970
                                                  Wald chi2(6)    =          .
Log pseudolikelihood = -36114.974                 Prob > chi2     =          .

                               (Std. Err. adjusted for 10 clusters in country)
```

```
------------------------------------------------------------------------------
             |               Robust
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ESagree      |
       1.CBA |   .1544142   1.097663     0.14   0.888    -1.996965    2.305794
             |
       q11_7 |
          2  |  -.0465114   .0442382    -1.05   0.293    -.1332168     .040194
          3  |  -.2237367   .0484722    -4.62   0.000    -.3187405   -.1287329
          4  |  -.3928741    .068916    -5.70   0.000     -.527947   -.2578012
          5  |   -.491881   .0562325    -8.75   0.000    -.6020947   -.3816673
          6  |   -.682095   .0683423    -9.98   0.000    -.8160434   -.5481466
          8  |  -.4929967   .0586179    -8.41   0.000    -.6078857   -.3781077
             |
      q22f_1 |
          2  |  -.1757589   .1135554    -1.55   0.122    -.3983234    .0468057
          3  |  -.4494719   .1108862    -4.05   0.000    -.6668049   -.2321389
          4  |  -.7066106   .1530272    -4.62   0.000    -1.006538   -.4066827
          5  |  -.9791683   .1497142    -6.54   0.000    -1.272603   -.6857339
             |
       gdppc |  -.0000275   .0000177    -1.56   0.120    -.0000621    7.14e-06
        gdpg |   .0700218   .0194318     3.60   0.000     .0319361    .1081075
       lgdpg |   .0481137   .0312665     1.54   0.124    -.0131676     .109395
         inf |   .0249241   .0437918     0.57   0.569    -.0609063    .1107544
        linf |  -.0920495   .0389634    -2.36   0.018    -.1684163   -.0156827
          un |  -.0636624   .0284386    -2.24   0.025     -.119401   -.0079239
         lun |   .0428495    .029267     1.46   0.143    -.0145126    .1002117
             |
  CBA#q22f_1 |
        1 2  |   .1172668   .1523339     0.77   0.441    -.1813021    .4158356
        1 3  |   .1959322   .1859281     1.05   0.292    -.1684802    .5603447
        1 4  |   .1377933   .2445623     0.56   0.573    -.3415401    .6171266
        1 5  |    .331557   .2006026     1.65   0.098    -.0616168    .7247308
             |
 CBA#c.gdppc |
          1  |  -.0001316   .0001151    -1.14   0.253    -.0003572    .0000939
             |
  CBA#c.gdpg |
          1  |  -.0390955   .0477898    -0.82   0.413    -.1327618    .0545709
             |
 CBA#c.lgdpg |
          1  |  -.0376357   .0311245    -1.21   0.227    -.0986385    .0233672
             |
   CBA#c.inf |
          1  |   .1448533   .1750001     0.83   0.408    -.1981406    .4878471
             |
  CBA#c.linf |
          1  |  -.1065401   .1557467    -0.68   0.494    -.4117981    .1987178
             |
    CBA#c.un |
          1  |  -.0232533   .0493989    -0.47   0.638    -.1200734    .0735668
             |
   CBA#c.lun |
          1  |   .0242069   .0667793     0.36   0.717    -.1066782    .1550921
             |
     h_aged2 |  -.0337726   .0290089    -1.16   0.244     -.090629    .0230839
     h_aged3 |  -.0633796   .0394149    -1.61   0.108    -.1406314    .0138723
    h_female |  -.0150875   .0188216    -0.80   0.423    -.0519772    .0218023
  h_edu_high |   .0796964   .0759597     1.05   0.294    -.0691819    .2285747
h_edu_medium |   .0195348   .0589988     0.33   0.741    -.0961008    .1351703
   h_retired |  -.0620543   .0357979    -1.73   0.083    -.1322168    .0081082
   h_student |   .0764199   .0565827     1.35   0.177    -.0344802      .18732
h_unemployed |  -.0165192   .0417889    -0.40   0.693    -.0984239    .0653856
    h_inc_d1 |   .0029748   .0464195     0.06   0.949    -.0880057    .0939553
    h_inc_d3 |   .0360871   .0379972     0.95   0.342    -.0383861    .1105603
    h_inc_d4 |   .0827186   .0253676     3.26   0.001      .032999    .1324382
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .7840244   .1293858     6.06   0.000     .5304329    1.037616
    fall2009 |   .8272965   .1353677     6.11   0.000     .5619806    1.092612
  spring2010 |   .4407506   .1492194     2.95   0.003     .1482859    .7332153
    fall2010 |   .0971935   .1245279     0.78   0.435    -.1468766    .3412637
  spring2011 |          0  (omitted)
          EU |   .4501265   .1864638     2.41   0.016     .0846642    .8155888
        ExYu |   .5398108   .2725944     1.98   0.048     .0055357    1.074086
       _cons |  -.1936744   .2697992    -0.72   0.473    -.7224711    .3351224
```

```
-------------+----------------------------------------------------------------
ExpESagree   |
       1.CBA |   1.812919   .6233813     2.91   0.004     .5911145    3.034724
             |
       q11_7 |
          2  |  -.0941128   .0525655    -1.79   0.073    -.1971392    .0089136
          3  |   -.301125   .0547341    -5.50   0.000     -.408402   -.1938481
          4  |  -.5472021   .0709902    -7.71   0.000    -.6863403   -.4080639
          5  |  -.6263997   .0818443    -7.65   0.000    -.7868117   -.4659878
          6  |  -.6872733     .08061    -8.53   0.000    -.8452661   -.5292805
          8  |  -.6785404   .0782045    -8.68   0.000    -.8318184   -.5252624
             |
      q22f_1 |
          2  |  -.1559645   .1194936    -1.31   0.192    -.3901676    .0782386
          3  |  -.4368566   .1466541    -2.98   0.003    -.7242933     -.14942
          4  |  -.7265158   .1477463    -4.92   0.000    -1.016093   -.4369385
          5  |  -.9444108   .1417958    -6.66   0.000    -1.222326   -.6664962
             |
       gdppc |  -3.52e-06   .0000145    -0.24   0.808     -.000032    .0000249
        gdpg |   .0512198   .0084849     6.04   0.000     .0345896      .06785
       lgdpg |  -.0156935   .0121154    -1.30   0.195    -.0394393    .0080523
         inf |   .0334569   .0458027     0.73   0.465    -.0563148    .1232285
        linf |   -.068762    .034807    -1.98   0.048    -.1369824   -.0005416
          un |   .0511563   .0425439     1.20   0.229    -.0322283    .1345409
         lun |   -.044644   .0384074    -1.16   0.245    -.1199212    .0306332
             |
  CBA#q22f_1 |
        1 2  |   .0256265   .1175464     0.22   0.827    -.2047603    .2560133
        1 3  |   .0906518   .1468487     0.62   0.537    -.1971663    .3784699
        1 4  |   .1354479     .16012     0.85   0.398    -.1783815    .4492774
        1 5  |     .08483    .185469     0.46   0.647    -.2786826    .4483425
             |
 CBA#c.gdppc |
          1  |  -.0002627   .0000767    -3.42   0.001    -.0004131   -.0001123
             |
  CBA#c.gdpg |
          1  |   .0590862   .0256623     2.30   0.021      .008789    .1093833
             |
 CBA#c.lgdpg |
          1  |     .01844   .0144983     1.27   0.203    -.0099762    .0468561
             |
   CBA#c.inf |
          1  |  -.1134563   .0957244    -1.19   0.236    -.3010726    .0741601
             |
  CBA#c.linf |
          1  |    .123245   .0841898     1.46   0.143     -.041764    .2882539
             |
    CBA#c.un |
          1  |  -.0944517   .0142892    -6.61   0.000     -.122458   -.0664453
             |
   CBA#c.lun |
          1  |   .0515095   .0223653     2.30   0.021     .0076744    .0953446
             |
     h_aged2 |  -.0736684   .0330666    -2.23   0.026    -.1384778   -.0088591
     h_aged3 |  -.1150697   .0393074    -2.93   0.003    -.1921108   -.0380286
    h_female |   .0154243   .0164267     0.94   0.348    -.0167716    .0476201
  h_edu_high |    .068159   .0513734     1.33   0.185     -.032531     .168849
h_edu_medium |  -.0167283   .0368666    -0.45   0.650    -.0889855    .0555289
   h_retired |   .0471759   .0279349     1.69   0.091    -.0075755    .1019273
   h_student |   .1592117   .0379082     4.20   0.000      .084913    .2335104
h_unemployed |  -.0092597   .0322585    -0.29   0.774    -.0724851    .0539658
    h_inc_d1 |   .1239819   .0454602     2.73   0.006     .0348815    .2130822
    h_inc_d3 |   .1465609   .0238269     6.15   0.000     .0998609    .1932608
    h_inc_d4 |   .2148013   .0370724     5.79   0.000     .1421408    .2874618
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .5386393   .0892219     6.04   0.000     .3637676     .713511
    fall2009 |   .5638787    .090571     6.23   0.000     .3863628    .7413947
  spring2010 |   .2339405   .0457647     5.11   0.000     .1442434    .3236375
    fall2010 |   .0984916   .0825811     1.19   0.233    -.0633643    .2603475
  spring2011 |          0  (omitted)
          EU |   .2023327   .0950962     2.13   0.033     .0159476    .3887179
        ExYu |   .0235969   .1628609     0.14   0.885    -.2956045    .3427984
       _cons |    .337212   .2476796     1.36   0.173    -.1482312    .8226551
-------------+----------------------------------------------------------------
     /athrho |   .6412994   .0532155    12.05   0.000     .5369988    .7455999
-------------+----------------------------------------------------------------
```

```
         rho |   .5657836   .0361806                      .4907128    .6325166
------------------------------------------------------------------------------
Wald test of rho=0:                 chi2(1) =  145.226    Prob > chi2 = 0.0000
```

```
. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      39970
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
dy/dx w.r.t. : 1.CBA 2.q11_7 3.q11_7 4.q11_7 5.q11_7 6.q11_7 8.q11_7 2.q22f_1
3.q22f_1 4.q22f_1 5.q22f_1 gdppc gdpg lgdpg inf linf un lun h_aged2 h_aged3 h_female
h_edu_high h_edu_medium h_retired h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4
spring2008 fall2008 spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.0807687   .0124343    -6.50   0.000    -.1051394    -.056398
             |
       q11_7 |
          2  |  -.0139002   .0095116    -1.46   0.144    -.0325425    .0047421
          3  |  -.0544248   .0111533    -4.88   0.000    -.0762848   -.0325647
          4  |   -.088723   .0140704    -6.31   0.000    -.1163005   -.0611454
          5  |  -.1031062   .0121889    -8.46   0.000     -.126996   -.0792163
          6  |  -.1234991    .012853    -9.61   0.000    -.1486905   -.0983076
          8  |  -.1052968   .0131382    -8.01   0.000    -.1310472   -.0795463
             |
      q22f_1 |
          2  |  -.0447741   .0290895    -1.54   0.124    -.1017886    .0122404
          3  |  -.1084718   .0306453    -3.54   0.000    -.1685355   -.0484081
          4  |  -.1578457   .0357847    -4.41   0.000    -.2279825    -.087709
          5  |  -.1889213   .0358357    -5.27   0.000     -.259158   -.1186846
             |
       gdppc |  -9.00e-06   3.07e-06    -2.94   0.003     -.000015   -2.99e-06
        gdpg |   .0117595   .0030406     3.87   0.000        .0058    .0177189
       lgdpg |   .0053614   .0037617     1.43   0.154    -.0020113    .0127341
         inf |   .0074522   .0061531     1.21   0.226    -.0046077     .019512
        linf |  -.0175774   .0060519    -2.90   0.004     -.029439   -.0057159
          un |  -.0079014   .0044346    -1.78   0.075    -.0165931    .0007902
         lun |   .0049576    .004671     1.06   0.289    -.0041973    .0141126
     h_aged2 |  -.0081025     .00537    -1.51   0.131    -.0186276    .0024225
     h_aged3 |  -.0141548   .0071086    -1.99   0.046    -.0280874   -.0002222
    h_female |  -.0014285    .002624    -0.54   0.586    -.0065715    .0037145
  h_edu_high |   .0143293    .012059     1.19   0.235    -.0093059    .0379645
h_edu_medium |   .0019966   .0097451     0.20   0.838    -.0171034    .0210965
   h_retired |  -.0066127   .0054436    -1.21   0.224     -.017282    .0040566
   h_student |    .017995   .0085785     2.10   0.036     .0011814    .0348086
h_unemployed |  -.0027494   .0066707    -0.41   0.680    -.0158237    .0103248
    h_inc_d1 |   .0060401   .0072268     0.84   0.403    -.0081241    .0202043
    h_inc_d3 |   .0117335   .0061029     1.92   0.055     -.000228    .0236949
    h_inc_d4 |   .0214034   .0045409     4.71   0.000     .0125033    .0303035
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .1349878   .0189421     7.13   0.000      .097862    .1721136
    fall2009 |   .1422346   .0203821     6.98   0.000     .1022865    .1821827
  spring2010 |   .0727635   .0238312     3.05   0.002     .0260551    .1194719
    fall2010 |    .018172   .0180758     1.01   0.315    -.0172559    .0535999
  spring2011 |          0  (omitted)
          EU |   .0726529   .0267319     2.72   0.007     .0202594    .1250463
        ExYu |   .0771981   .0314543     2.45   0.014     .0155487    .1388474
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

**Appendix 6.16b: SUR (with peprceptions/expectations about the fin. stability of a country financial situation of a household)**

```
. biprobit (ESagree = i.CBA i.q11_7 i.q1_15 i.q22f_1 gdppc gdpg lgdpg inf
linf un lun CBA#q22f_1 i.CBA#c.gdppc i.CBA#c.gdpg i.CBA#c.lgdpg i.CBA#c.inf
i.CBA#c.linf i.CBA#c.un i.CBA#c.lun h_aged2 h_aged3 h_female h_edu_high
h_edu_medium h_retired h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4
spring2008 fall2008 spring2009 fall2009 spring2010 fall2010 spring2011 EU
ExYu) (ExpESagree = i.CBA i.q11_7 i.q1_19 i.q22f_1 gdppc gdpg lgdpg inf linf
un lun CBA#q22f_1 i.CBA#c.gdppc i.CBA#c.gdpg i.CBA#c.lgdpg i.CBA#c.inf
i.CBA#c.linf i.CBA#c.un i.CBA#c.lun h_aged2 h_aged3 h_female h_edu_high
h_edu_medium h_retired h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4
spring2008 fall2008 spring2009 fall2009 spring2010 fall2010 spring2011 EU
ExYu) [pweight = weight], vce(cluster country) nolog

note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity
note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity

Seemingly unrelated bivariate probit            Number of obs   =      39970
                                                Wald chi2(6)    =          .
Log pseudolikelihood = -34203.631               Prob > chi2     =          .

                              (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ESagree      |
       1.CBA |  -.1520624   .9837009    -0.15   0.877    -2.080081    1.775956
             |
       q11_7 |
          2  |    -.02873   .0476476    -0.60   0.547    -.1221175    .0646576
          3  |  -.1545973   .0465852    -3.32   0.001    -.2459027   -.0632919
          4  |  -.2779233   .0654515    -4.25   0.000    -.4062059   -.1496407
          5  |  -.3558385   .0625037    -5.69   0.000    -.4783435   -.2333335
          6  |  -.4922696   .0602984    -8.16   0.000    -.6104524   -.3740868
          8  |  -.3362193   .0537945    -6.25   0.000    -.4416547   -.2307839
             |
       q1_15 |
          2  |  -.0553798   .0617069    -0.90   0.369    -.1763231    .0655635
          3  |  -.2770282   .0811622    -3.41   0.001    -.4361032   -.1179531
          4  |  -.6316818   .1066597    -5.92   0.000    -.8407309   -.4226326
          5  |  -.8145978   .0928597    -8.77   0.000    -.9965995   -.6325962
          6  |  -1.098572   .1149829    -9.55   0.000    -1.323935     -.87321
             |
      q22f_1 |
          2  |  -.1736488   .1084165    -1.60   0.109    -.3861412    .0388436
          3  |  -.4212887   .1043778    -4.04   0.000    -.6258655   -.2167119
          4  |  -.6610554   .1436401    -4.60   0.000    -.9425848    -.379526
          5  |  -.9014311   .1424219    -6.33   0.000    -1.180573   -.6222892
             |
       gdppc |  -.0000221   .0000151    -1.47   0.142    -.0000517    7.43e-06
        gdpg |   .0536944   .0157783     3.40   0.001     .0227695    .0846194
       lgdpg |   .0512756   .0285378     1.80   0.072    -.0046574    .1072086
         inf |   .0092604   .0396722     0.23   0.815    -.0684957    .0870164
        linf |  -.0651006   .0341711    -1.91   0.057    -.1320748    .0018735
          un |  -.0394455   .0297812    -1.32   0.185    -.0978156    .0189245
         lun |   .0226835   .0304169     0.75   0.456    -.0369326    .0822995
             |
  CBA#q22f_1 |
        1 2  |   .1466195   .1737006     0.84   0.399    -.1938274    .4870664
        1 3  |   .2028699    .212207     0.96   0.339    -.2130481    .6187879
        1 4  |   .1412054    .262629     0.54   0.591    -.3735379    .6559487
        1 5  |    .318604   .2201637     1.45   0.148     -.112909     .750117
             |
 CBA#c.gdppc |
          1  |  -.0000797   .0001044    -0.76   0.445    -.0002843    .0001249
             |
  CBA#c.gdpg |
```

```
           1  |  -.0481084   .0486374    -0.99   0.323     -.143436    .0472193
              |
 CBA#c.lgdpg |
           1  |  -.0365886   .0281136    -1.30   0.193    -.0916903    .0185131
              |
   CBA#c.inf |
           1  |   .1612807    .173886     0.93   0.354    -.1795295    .5020909
              |
  CBA#c.linf |
           1  |  -.1399554   .1564709    -0.89   0.371    -.4466327    .1667219
              |
    CBA#c.un |
           1  |  -.0313068   .0467105    -0.67   0.503    -.1228577    .0602441
              |
   CBA#c.lun |
           1  |   .0381451   .0604623     0.63   0.528    -.0803588    .1566489
              |
     h_aged2 |  -.0049769   .0292533    -0.17   0.865    -.0623123    .0523584
     h_aged3 |  -.0294567   .0405984    -0.73   0.468     -.109028    .0501146
    h_female |  -.0189161   .0184043    -1.03   0.304    -.0549879    .0171557
  h_edu_high |   .0039003   .0645757     0.06   0.952    -.1226658    .1304664
h_edu_medium |  -.0115074   .0541267    -0.21   0.832    -.1175937     .094579
   h_retired |  -.0353782   .0287802    -1.23   0.219    -.0917864      .02103
   h_student |   .0466227   .0591498     0.79   0.431    -.0693088    .1625542
h_unemployed |   .0447296   .0326045     1.37   0.170    -.0191741    .1086332
    h_inc_d1 |  -.0994695   .0521576    -1.91   0.057    -.2016966    .0027575
    h_inc_d3 |  -.0294131   .0380971    -0.77   0.440     -.104082    .0452558
    h_inc_d4 |  -.0617243   .0290752    -2.12   0.034    -.1187108   -.0047379
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .6050469   .1248855     4.84   0.000     .3602758    .8498181
    fall2009 |   .6588362   .1205954     5.46   0.000     .4224736    .8951987
  spring2010 |   .4209644   .1380082     3.05   0.002     .1504734    .6914554
    fall2010 |   .1060336   .1124205     0.94   0.346    -.1143065    .3263737
  spring2011 |          0  (omitted)
          EU |    .375276   .1475771     2.54   0.011     .0860302    .6645219
        ExYu |   .4353452   .2226044     1.96   0.051    -.0009515    .8716419
       _cons |   .2506427   .2491495     1.01   0.314    -.2376814    .7389667
-------------+----------------------------------------------------------------
ExpESagree   |
       1.CBA |    1.95127   .7002705     2.79   0.005     .5787655    3.323776
              |
       q11_7 |
          2  |   -.096872   .0480908    -2.01   0.044    -.1911282   -.0026158
          3  |  -.2706846   .0514646    -5.26   0.000    -.3715534   -.1698158
          4  |  -.4690208   .0670074    -7.00   0.000    -.6003529   -.3376887
          5  |  -.5077971   .0746689    -6.80   0.000    -.6541455   -.3614488
          6  |  -.5467712    .070426    -7.76   0.000    -.6848037   -.4087387
          8  |  -.5515888    .072827    -7.57   0.000    -.6943271   -.4088505
              |
       q1_19 |
          2  |   .0365802   .0443279     0.83   0.409    -.0503009    .1234614
          3  |   -.107519   .0414414    -2.59   0.009    -.1887426   -.0262955
          4  |  -.5722645   .0395419   -14.47   0.000    -.6497652   -.4947637
          5  |  -.8093817   .0600572   -13.48   0.000    -.9270917   -.6916718
          6  |  -1.029151   .0682891   -15.07   0.000    -1.162995   -.8953065
              |
      q22f_1 |
          2  |  -.1252155   .1195193    -1.05   0.295    -.3594691    .1090381
          3  |  -.3583385   .1415783    -2.53   0.011    -.6358269   -.0808502
          4  |  -.6200489   .1386685    -4.47   0.000    -.8918342   -.3482635
          5  |  -.8055048   .1349871    -5.97   0.000    -1.070075   -.5409349
              |
       gdppc |   .0000143   .0000184     0.78   0.437    -.0000218    .0000504
        gdpg |   .0387282    .008598     4.50   0.000     .0218763      .05558
       lgdpg |  -.0194126   .0125687    -1.54   0.122    -.0440468    .0052217
         inf |   .0277417   .0397477     0.70   0.485    -.0501622    .1056457
        linf |  -.0422456   .0249794    -1.69   0.091    -.0912044    .0067132
          un |   .0998336   .0486402     2.05   0.040     .0045006    .1951666
         lun |  -.0841439   .0424628    -1.98   0.048    -.1673696   -.0009183
              |
  CBA#q22f_1 |
        1 2  |  -.0325263   .1154851    -0.28   0.778    -.2588729    .1938204
        1 3  |   .0131179   .1377567     0.10   0.924    -.2568802    .2831159
        1 4  |   .0435243   .1556898     0.28   0.780    -.2616221    .3486707
        1 5  |   .0145816   .1674684     0.09   0.931    -.3136504    .3428135
              |
```

```
CBA#c.gdppc |
          1  |    -.00025   .0000873    -2.86   0.004    -.0004211   -.0000789
             |
 CBA#c.gdpg |
          1  |   .0837947   .0288821     2.90   0.004     .0271867    .1404026
             |
CBA#c.lgdpg |
          1  |   .0275129   .0170577     1.61   0.107    -.0059195    .0609454
             |
  CBA#c.inf |
          1  |  -.1772083   .1156104    -1.53   0.125    -.4038005     .049384
             |
 CBA#c.linf |
          1  |   .1665561   .1007165     1.65   0.098    -.0308446    .3639568
             |
   CBA#c.un |
          1  |  -.1126915   .0191067    -5.90   0.000    -.1501399   -.0752431
             |
  CBA#c.lun |
          1  |   .0662842   .0248332     2.67   0.008     .0176121    .1149563
             |
     h_aged2 |  -.0246121   .0370814    -0.66   0.507    -.0972903    .0480662
     h_aged3 |  -.0229294    .042397    -0.54   0.589     -.106026    .0601672
    h_female |    .022447   .0155183     1.45   0.148    -.0079684    .0528624
  h_edu_high |   .0176508    .046142     0.38   0.702    -.0727859    .1080875
h_edu_medium |  -.0457273   .0307056    -1.49   0.136    -.1059091    .0144545
   h_retired |   .0991414    .030323     3.27   0.001     .0397094    .1585733
   h_student |   .1176668   .0355125     3.31   0.001     .0480636    .1872701
h_unemployed |   .0184153   .0339238     0.54   0.587    -.0480742    .0849047
    h_inc_d1 |   .0561855   .0380301     1.48   0.140    -.0183522    .1307232
    h_inc_d3 |   .1073541     .02077     5.17   0.000     .0666456    .1480626
    h_inc_d4 |   .1310351   .0337248     3.89   0.000     .0649356    .1971345
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .4057003   .0886031     4.58   0.000     .2320415    .5793591
    fall2009 |     .44267   .0797663     5.55   0.000      .286331     .599009
  spring2010 |   .2052799   .0419681     4.89   0.000      .123024    .2875358
    fall2010 |   .1618184    .089841     1.80   0.072    -.0142667    .3379035
  spring2011 |          0  (omitted)
          EU |   .1077225    .123189     0.87   0.382    -.1337235    .3491685
        ExYu |  -.1727395   .2271256    -0.76   0.447    -.6178976    .2724186
       _cons |   .3902073   .3120597     1.25   0.211    -.2214184    1.001833
-------------+----------------------------------------------------------------
     /athrho |   .5376547   .0494761    10.87   0.000     .4406833     .634626
-------------+----------------------------------------------------------------
         rho |   .4912106   .0375381                      .4142107    .5612294
------------------------------------------------------------------------------
Wald test of rho=0:                 chi2(1) =  118.091    Prob > chi2 = 0.0000

. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      39970
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
dy/dx w.r.t. : 1.CBA 2.q11_7 3.q11_7 4.q11_7 5.q11_7 6.q11_7 8.q11_7 2.q1_15 3.q1_15
4.q1_15 5.q1_15 6.q1_15 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 gdppc gdpg lgdpg inf linf
un lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student
h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009 fall2009
spring2010 fall2010 spring2011 EU ExYu 2.q1_19 3.q1_19 4.q1_19 5.q1_19 6.q1_19

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.0733105   .0089496    -8.19   0.000    -.0908515   -.0557695
             |
       q11_7 |
          2  |  -.0094121   .0082297    -1.14   0.253    -.0255419    .0067178
          3  |   -.036096   .0082454    -4.38   0.000    -.0522566   -.0199353
          4  |  -.0602145    .010363    -5.81   0.000    -.0805256   -.0399034
          5  |  -.0701235   .0092437    -7.59   0.000    -.0882407   -.0520062
          6  |  -.0847133   .0087122    -9.72   0.000    -.1017889   -.0676378
          8  |  -.0699509   .0092032    -7.60   0.000    -.0879889   -.0519129
             |
       q1_15 |
```

```
          2  |  -.0086552   .0097412    -0.89   0.374    -.0277476    .0104371
          3  |  -.0424625   .0130444    -3.26   0.001    -.0680291   -.0168959
          4  |  -.0909231   .0164796    -5.52   0.000    -.1232225   -.0586238
          5  |  -.1119814   .0146423    -7.65   0.000    -.1406798    -.083283
          6  |   -.138537   .0155009    -8.94   0.000    -.1689183   -.1081557
             |
      q22f_1 |
          2  |  -.0369557   .0250901    -1.47   0.141    -.0861314      .01222
          3  |  -.0877597   .0263516    -3.33   0.001     -.139408   -.0361115
          4  |  -.1296362   .0302154    -4.29   0.000    -.1888573   -.0704152
          5  |  -.1553521    .030426    -5.11   0.000    -.2149858   -.0957183
             |
       gdppc |  -5.57e-06   2.79e-06    -2.00   0.046     -.000011   -1.07e-07
        gdpg |   .0081927   .0022445     3.65   0.000     .0037936    .0125919
       lgdpg |   .0050812   .0029836     1.70   0.089    -.0007666     .010929
         inf |   .0043317   .0056736     0.76   0.445    -.0067884    .0154518
        linf |  -.0116998   .0052028    -2.25   0.025    -.0218971   -.0015025
          un |  -.0019338   .0043386    -0.45   0.656    -.0104373    .0065698
         lun |   .0003179   .0046034     0.07   0.945    -.0087045    .0093404
     h_aged2 |  -.0017393    .004844    -0.36   0.720    -.0112333    .0077547
     h_aged3 |  -.0047585   .0065313    -0.73   0.466    -.0175597    .0080427
    h_female |  -.0013793   .0022031    -0.63   0.531    -.0056973    .0029388
  h_edu_high |   .0012892   .0094159     0.14   0.891    -.0171657    .0197441
h_edu_medium |  -.0035173    .008045    -0.44   0.662    -.0192853    .0122507
   h_retired |  -1.62e-06   .0041029    -0.00   1.000    -.0080433      .00804
   h_student |   .0112017    .007898     1.42   0.156    -.0042781    .0266815
h_unemployed |   .0064859   .0049151     1.32   0.187    -.0031475    .0161194
    h_inc_d1 |  -.0100424   .0064945    -1.55   0.122    -.0227714    .0026866
    h_inc_d3 |    .001123   .0053403     0.21   0.833    -.0093438    .0115897
    h_inc_d4 |  -.0018942   .0042938    -0.44   0.659      -.01031    .0065215
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .0947967   .0176186     5.38   0.000     .0602648    .1293286
    fall2009 |   .1032649    .016641     6.21   0.000     .0706492    .1358807
  spring2010 |    .062483   .0190822     3.27   0.001     .0250825    .0998835
    fall2010 |   .0207046   .0142792     1.45   0.147    -.0072821    .0486913
  spring2011 |          0  (omitted)
          EU |   .0523064   .0171571     3.05   0.002     .0186791    .0859337
        ExYu |    .047252   .0188233     2.51   0.012     .0103591     .084145
             |
       q1_19 |
          2  |   .0012276   .0014847     0.83   0.408    -.0016823    .0041375
          3  |  -.0039216   .0014477    -2.71   0.007    -.0067591   -.0010842
          4  |  -.0260858   .0021262   -12.27   0.000     -.030253   -.0219186
          5  |  -.0400489   .0036369   -11.01   0.000     -.047177   -.0329208
          6  |  -.0538146    .004028   -13.36   0.000    -.0617094   -.0459199
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

**Appendix 6.16c: SUR (Semi-annual macroeconomic data instead of quarterly (country as a cluster)**

```
. *with samiannual
. biprobit (ESagree = i.CBA i.q22f_1 gdppc sagdpg sainf saun i.CBA#i.q22f_1
i.CBA#c.gdppc i.CBA#c.sagdpg i.CBA#c.sainf i.CBA#c.saun h_aged2 h_aged3
h_female h_edu_high h_edu_medium h_retired h_student h_unemployed h_inc_d1
h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009 fall2009 spring2010
fall2010 spring2011 EU ExYu) (ExpESagree = i.CBA i.q22f_1 gdppc sagdpg sainf
saun i.CBA#i.q22f_1 i.CBA#c.gdppc i.CBA#c.sagdpg i.CBA#c.sainf i.CBA#c.saun
h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student
h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009
fall2009 spring2010 fall2010 spring2011 EU ExYu) [pweight = weight],
vce(cluster country) nolog

note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity
note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity

Seemingly unrelated bivariate probit              Number of obs   =      46943
```

```
                                                  Wald chi2(6)    =          .
Log pseudolikelihood = -44107.109                 Prob > chi2     =          .

                               (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ESagree      |
       1.CBA |   .4850851   1.517036     0.32   0.749    -2.488251    3.458421
             |
      q22f_1 |
          2  |  -.1924566   .1247761    -1.54   0.123    -.4370132       .0521
          3  |  -.4980603   .1238231    -4.02   0.000     -.740749   -.2553716
          4  |  -.7476508   .1742412    -4.29   0.000    -1.089157   -.4061444
          5  |  -1.058127   .1606086    -6.59   0.000    -1.372914   -.7433397
          8  |  -.6756066   .1349833    -5.01   0.000     -.940169   -.4110441
          9  |  -.3933069   .1595948    -2.46   0.014    -.7061068   -.0805069
             |
       gdppc |  -.0000257   .0000162    -1.58   0.114    -.0000575    6.13e-06
      sagdpg |   .1104907   .0330365     3.34   0.001     .0457403    .1752411
       sainf |  -.0739961    .028746    -2.57   0.010    -.1303373   -.0176549
        saun |  -.0162531    .012851    -1.26   0.206    -.0414406    .0089344
             |
  CBA#q22f_1 |
        1 2  |   .0804692   .1619766     0.50   0.619    -.2369991    .3979375
        1 3  |   .1894933   .1841924     1.03   0.304    -.1715171    .5505037
        1 4  |    .140461   .2555431     0.55   0.583    -.3603943    .6413162
        1 5  |   .3348885   .1916877     1.75   0.081    -.0408125    .7105896
        1 8  |   .7369746   .2631085     2.80   0.005     .2212915    1.252658
        1 9  |   .1274537   .3493869     0.36   0.715    -.5573321    .8122395
             |
 CBA#c.gdppc |
          1  |  -.0001265   .0001512    -0.84   0.403    -.0004228    .0001699
             |
CBA#c.sagdpg |
          1  |  -.0214902   .0226874    -0.95   0.344    -.0659567    .0229763
             |
 CBA#c.sainf |
          1  |  -.0090728   .0310732    -0.29   0.770    -.0699752    .0518295
             |
  CBA#c.saun |
          1  |  -.0159739   .0258727    -0.62   0.537    -.0666835    .0347356
             |
     h_aged2 |  -.0468915   .0287165    -1.63   0.102    -.1031749    .0093918
     h_aged3 |  -.0792976   .0445098    -1.78   0.075    -.1665351      .00794
    h_female |  -.0236856    .014774    -1.60   0.109    -.0526421    .0052709
  h_edu_high |   .0872418    .061164     1.43   0.154    -.0326375    .2071211
h_edu_medium |   .0109913   .0519866     0.21   0.833    -.0909007    .1128832
   h_retired |  -.0510175   .0449317    -1.14   0.256    -.1390819     .037047
   h_student |   .1112822   .0578165     1.92   0.054    -.0020362    .2246005
h_unemployed |  -.0027833   .0433381    -0.06   0.949    -.0877245    .0821579
    h_inc_d1 |  -.0140408   .0402533    -0.35   0.727    -.0929357    .0648542
    h_inc_d3 |   .0647854   .0414079     1.56   0.118    -.0163727    .1459434
    h_inc_d4 |   .1340585   .0284226     4.72   0.000     .0783513    .1897657
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .6277682   .1428561     4.39   0.000     .3477754    .9077609
    fall2009 |   .6780951   .1870201     3.63   0.000     .3115423    1.044648
  spring2010 |    .336058   .1584717     2.12   0.034     .0254592    .6466569
    fall2010 |   .1556302   .0974324     1.60   0.110    -.0353337    .3465942
  spring2011 |          0  (omitted)
          EU |   .3354602   .1790581     1.87   0.061    -.0154873    .6864076
        ExYu |   .4176772   .2808134     1.49   0.137    -.1327071    .9680614
       _cons |  -.3658572   .2420076    -1.51   0.131    -.8401834     .108469
-------------+----------------------------------------------------------------
ExpESagree   |
       1.CBA |   1.050494   .9646246     1.09   0.276    -.8401351    2.941124
             |
      q22f_1 |
          2  |  -.1575553    .129619    -1.22   0.224    -.4116037    .0964932
          3  |  -.4638736    .151031    -3.07   0.002    -.7598889   -.1678583
          4  |  -.7628214   .1579837    -4.83   0.000    -1.072464    -.453179
          5  |  -1.026688   .1443854    -7.11   0.000    -1.309679   -.7436983
          8  |  -.7127662   .1560734    -4.57   0.000    -1.018665   -.4068679
          9  |  -.6460577    .136873    -4.72   0.000    -.9143239   -.3777916
             |
```

```
       gdppc |  -2.46e-06   .0000131    -0.19   0.851    -.0000282    .0000233
      sagdpg |   .0283869   .0117702     2.41   0.016     .0053178     .051456
       sainf |  -.0456076   .0139266    -3.27   0.001    -.0729032   -.0183119
        saun |   .0081032   .0078252     1.04   0.300    -.0072339    .0234404
             |
   CBA#q22f_1 |
         1 2  |   .0257085   .1327313     0.19   0.846      -.23444    .2858571
         1 3  |   .0951469   .1628554     0.58   0.559    -.2240438    .4143376
         1 4  |   .1368712   .1803777     0.76   0.448    -.2166625    .4904049
         1 5  |   .0998462   .2215163     0.45   0.652    -.3343178    .5340102
         1 8  |   .2474875   .1997444     1.24   0.215    -.1440042    .6389793
         1 9  |   .3427923   .3651045     0.94   0.348    -.3727994    1.058384
             |
  CBA#c.gdppc |
           1  |  -.0001534   .0001086    -1.41   0.158    -.0003663    .0000595
             |
CBA#c.sagdpg |
           1  |   .0156733   .0227404     0.69   0.491    -.0288971    .0602437
             |
  CBA#c.sainf |
           1  |   .0004253    .027532     0.02   0.988    -.0535364    .0543871
             |
   CBA#c.saun |
           1  |  -.0324155   .0194814    -1.66   0.096    -.0705984    .0057674
             |
     h_aged2 |  -.0748153   .0330042    -2.27   0.023    -.1395023   -.0101284
     h_aged3 |  -.1171265   .0433681    -2.70   0.007    -.2021265   -.0321265
    h_female |  -.0099938   .0164758    -0.61   0.544    -.0422857    .0222981
  h_edu_high |   .1063401   .0472278     2.25   0.024     .0137754    .1989048
h_edu_medium |  -.0076289   .0374782    -0.20   0.839    -.0810849    .0658271
   h_retired |    .031766   .0307227     1.03   0.301    -.0284493    .0919812
   h_student |   .1779555   .0346399     5.14   0.000     .1100626    .2458483
h_unemployed |  -.0065881   .0298336    -0.22   0.825    -.0650609    .0518846
    h_inc_d1 |   .0964881   .0398768     2.42   0.016      .018331    .1746452
    h_inc_d3 |   .1691396   .0231845     7.30   0.000     .1236988    .2145804
    h_inc_d4 |   .2495905   .0391256     6.38   0.000     .1729058    .3262752
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .3302846   .0659485     5.01   0.000     .2010279    .4595413
    fall2009 |   .3801239   .0607004     6.26   0.000     .2611532    .4990946
  spring2010 |   .2070716   .0540348     3.83   0.000     .1011653    .3129779
    fall2010 |   .0596824   .0552054     1.08   0.280    -.0485182     .167883
  spring2011 |          0  (omitted)
          EU |   .1126538   .1018009     1.11   0.268    -.0868723      .31218
        ExYu |  -.0332062   .1528895    -0.22   0.828    -.3328641    .2664516
       _cons |   .1463411   .2492888     0.59   0.557     -.342256    .6349382
-------------+----------------------------------------------------------------
     /athrho |   .6749724   .0519107    13.00   0.000     .5732293    .7767155
-------------+----------------------------------------------------------------
         rho |   .5882412   .0339482                       .517727    .6508175
------------------------------------------------------------------------------
Wald test of rho=0:                 chi2(1) =  169.067    Prob > chi2 = 0.0000

. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      46943
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 8.q22f_1 9.q22f_1 gdppc
sagdpg sainf saun
               h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student
h_unemployed
               h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009 fall2009
spring2010 fall2010
               spring2011 EU ExYu

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.0825686   .0113451    -7.28   0.000    -.1048046   -.0603327
             |
      q22f_1 |
          2  |  -.0533748   .0344267    -1.55   0.121    -.1208499    .0141002
          3  |  -.1272763   .0360319    -3.53   0.000    -.1978975   -.0566552
```

```
           4  |  -.1778841   .0425142     -4.18   0.000    -.2612104   -.0945579
           5  |  -.2145547   .0410014     -5.23   0.000    -.2949159   -.1341935
           8  |  -.1503883   .0379742     -3.96   0.000    -.2248163   -.0759603
           9  |   -.120905   .0367084     -3.29   0.001    -.1928522   -.0489578
              |
       gdppc  |  -7.97e-06   3.99e-06     -2.00   0.046    -.0000158   -1.46e-07
      sagdpg  |   .0170776   .0049627      3.44   0.001     .0073509    .0268043
       sainf  |  -.0131493   .0031815     -4.13   0.000     -.019385   -.0069137
        saun  |  -.0026086   .0016575     -1.57   0.116    -.0058573    .0006401
     h_aged2  |  -.0103647   .0054258     -1.91   0.056     -.020999    .0002696
     h_aged3  |  -.0170851   .0081443     -2.10   0.036    -.0330477   -.0011226
    h_female  |  -.0039259   .0021294     -1.84   0.065    -.0080993    .0002476
  h_edu_high  |   .0177358   .0102091      1.74   0.082    -.0022737    .0377453
h_edu_medium  |   .0012439   .0090305      0.14   0.890    -.0164555    .0189433
   h_retired  |  -.0059454   .0075092     -0.79   0.429    -.0206632    .0087724
   h_student  |   .0246165   .0090544      2.72   0.007     .0068703    .0423627
h_unemployed  |  -.0007164   .0072198     -0.10   0.921    -.0148669    .0134342
    h_inc_d1  |   .0024975   .0066573      0.38   0.708    -.0105505    .0155456
    h_inc_d3  |   .0174186    .006941      2.51   0.012     .0038146    .0310227
    h_inc_d4  |   .0313137   .0055366      5.66   0.000     .0204622    .0421652
  spring2008  |          0  (omitted)
    fall2008  |          0  (omitted)
  spring2009  |   .1071329   .0206143      5.20   0.000     .0667297    .1475362
    fall2009  |   .1168221   .0285709      4.09   0.000     .0608241    .1728202
  spring2010  |   .0587763   .0261185      2.25   0.024      .007585    .1099677
    fall2010  |   .0255136   .0153913      1.66   0.097    -.0046528    .0556799
  spring2011  |          0  (omitted)
          EU  |    .054241   .0280776      1.93   0.053      -.00079     .109272
        ExYu  |   .0593624   .0369713      1.61   0.108       -.0131    .1318248
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

**Appendix 6.16d: SUR (large dataset; trust in govrenment variable excluded)**

```
.
. generate EU=0

. replace EU=1 if country==4 | country==6 | country==7 | country==10 |
country==11
(34925 real changes made)

.
. generate ExYu=0

. replace ExYu=1 if country==2 | country==3 | country==5 | country==8
(27317 real changes made)

.
. biprobit (ESagree = i.CBA gdppc gdpg lgdpg inf linf un lun i.CBA#c.gdppc
i.CBA#c.gdpg i.CBA#c.lgdpg i.CBA#c.inf i.CBA#c.linf i.CBA#c.un i.CBA#c.lun
h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student
h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009
fall2009 spring2010 fall2010 spring2011 EU ExYu) (ExpESagree = i.CBA gdppc
gdpg lgdpg inf linf un lun i.CBA#c.gdppc i.CBA#c.gdpg i.CBA#c.lgdpg
i.CBA#c.inf i.CBA#c.linf i.CBA#c.un i.CBA#c.lun h_aged2 h_aged3 h_female
h_edu_high h_edu_medium h_retired h_student h_unemployed h_inc_d1 h_inc_d3
h_inc_d4 spring2008 fall2008 spring2009 fall2009 spring2010 fall2010
spring2011 EU ExYu) [pweight = weight], vce(cluster country) nolog

Seemingly unrelated bivariate probit            Number of obs   =      69540
                                                Wald chi2(6)    =          .
Log pseudolikelihood = -68976.912               Prob > chi2     =          .

                               (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ESagree      |
       1.CBA |   .3230513   .6748362     0.48   0.632    -.9996033    1.645706
       gdppc |   .0000175   .0000145     1.21   0.226    -.0000108    .0000458
        gdpg |   .0609695    .011313     5.39   0.000     .0387964    .0831426
       lgdpg |   .0773295   .0247174     3.13   0.002     .0288843    .1257747
```

```
         inf |   .0444308   .0482019     0.92   0.357    -.0500432    .1389048
        linf |  -.0820098   .0389017    -2.11   0.035    -.1582558   -.0057638
          un |  -.0363613    .020406    -1.78   0.075    -.0763562    .0036337
         lun |   .0394456   .0228982     1.72   0.085    -.0054342    .0843253
             |
 CBA#c.gdppc |
           1 |  -.0000346   .0000662    -0.52   0.601    -.0001644    .0000951
             |
  CBA#c.gdpg |
           1 |  -.0438725   .0169048    -2.60   0.009    -.0770054   -.0107397
             |
 CBA#c.lgdpg |
           1 |  -.0456315   .0204798    -2.23   0.026    -.0857711   -.0054919
             |
   CBA#c.inf |
           1 |   .0323852   .0428293     0.76   0.450    -.0515587    .1163291
             |
  CBA#c.linf |
           1 |  -.0535471   .0475234    -1.13   0.260    -.1466913    .0395971
             |
    CBA#c.un |
           1 |  -.0103551    .025538    -0.41   0.685    -.0604086    .0396984
             |
   CBA#c.lun |
           1 |  -.0005205   .0251521    -0.02   0.983    -.0498177    .0487767
             |
     h_aged2 |  -.0632679   .0230333    -2.75   0.006    -.1084123   -.0181235
     h_aged3 |  -.0726609   .0440095    -1.65   0.099    -.1589179    .0135961
    h_female |  -.0069546   .0206698    -0.34   0.737    -.0474667    .0335576
  h_edu_high |   .1758221   .0534595     3.29   0.001     .0710435    .2806007
h_edu_medium |   .0602424   .0457131     1.32   0.188    -.0293536    .1498385
   h_retired |  -.0320623   .0347539    -0.92   0.356    -.1001788    .0360541
   h_student |   .0547223   .0443765     1.23   0.218     -.032254    .1416987
h_unemployed |  -.0382679   .0331504    -1.15   0.248    -.1032416    .0267057
    h_inc_d1 |    .020354   .0407612     0.50   0.618    -.0595365    .1002446
    h_inc_d3 |    .091128   .0364521     2.50   0.012     .0196831    .1625729
    h_inc_d4 |   .1410363   .0390573     3.61   0.000     .0644854    .2175872
  spring2008 |  -.1437447   .1610413    -0.89   0.372    -.4593798    .1718905
    fall2008 |  -.1127657   .1689643    -0.67   0.505    -.4439297    .2183983
  spring2009 |   .6769159   .1305004     5.19   0.000     .4211397    .9326921
    fall2009 |   .8655046   .2311431     3.74   0.000     .4124725    1.318537
  spring2010 |   .4920515   .1368972     3.59   0.000     .2237378    .7603651
    fall2010 |   .1440123   .0790338     1.82   0.068     -.010891    .2989157
  spring2011 |  -.0853101   .1262675    -0.68   0.499    -.3327898    .1621696
          EU |   .1521179   .1956914     0.78   0.437    -.2314301    .5356659
        ExYu |   .1705624   .2471597     0.69   0.490    -.3138617    .6549864
       _cons |  -1.669059   .1874445    -8.90   0.000    -2.036443   -1.301674
-------------+----------------------------------------------------------------
ExpESagree   |
       1.CBA |   .4274507   .3059433     1.40   0.162    -.1721871    1.027089
       gdppc |  -4.33e-06   6.42e-06    -0.67   0.500    -.0000169    8.26e-06
        gdpg |   .0548651   .0134355     4.08   0.000     .0285319    .0811982
       lgdpg |   .0072638   .0088638     0.82   0.413     -.010109    .0246366
         inf |   .0223325   .0336745     0.66   0.507    -.0436682    .0883333
        linf |  -.0619043   .0288608    -2.14   0.032    -.1184704   -.0053382
          un |  -.0246605   .0238779    -1.03   0.302    -.0714603    .0221394
         lun |   .0320967    .023616     1.36   0.174    -.0141898    .0783833
             |
 CBA#c.gdppc |
           1 |  -.0000467   .0000364    -1.28   0.200     -.000118    .0000247
             |
  CBA#c.gdpg |
           1 |    -.02981   .0129549    -2.30   0.021    -.0552012   -.0044188
             |
 CBA#c.lgdpg |
           1 |   .0093996   .0146513     0.64   0.521    -.0193164    .0381155
             |
   CBA#c.inf |
           1 |  -.0163402    .039789    -0.41   0.681    -.0943253    .0616448
             |
  CBA#c.linf |
           1 |  -.0064674   .0450122    -0.14   0.886    -.0946898     .081755
             |
    CBA#c.un |
           1 |   .0315683   .0122664     2.57   0.010     .0075265      .05561
             |
   CBA#c.lun |
```

```
           1  |  -.0541712    .014103     -3.84   0.000    -.0818127   -.0265298
              |
      h_aged2 |  -.0861097   .0291112     -2.96   0.003    -.1431666   -.0290529
      h_aged3 |  -.0930957   .0497509     -1.87   0.061    -.1906056    .0044142
     h_female |   .0067644   .0168468      0.40   0.688    -.0262547    .0397836
   h_edu_high |   .1757704   .0334324      5.26   0.000     .1102442    .2412966
 h_edu_medium |    .036093   .0269249      1.34   0.180    -.0166789     .088865
    h_retired |   .0033406    .031128      0.11   0.915    -.0576691    .0643504
    h_student |   .1342767   .0347919      3.86   0.000     .0660858    .2024677
 h_unemployed |   -.080341   .0305464     -2.63   0.009     -.140211   -.0204711
     h_inc_d1 |   .0675206   .0360117      1.87   0.061    -.0030611    .1381023
     h_inc_d3 |   .1612331   .0282673      5.70   0.000     .1058303    .2166359
     h_inc_d4 |   .2344869   .0333191      7.04   0.000     .1691827    .2997912
   spring2008 |   .0202557   .1242649      0.16   0.871    -.2232991    .2638104
     fall2008 |   -.041388   .1143738     -0.36   0.717    -.2655566    .1827806
   spring2009 |   .4660043   .1206812      3.86   0.000     .2294736    .7025351
     fall2009 |   .5641897   .1385925      4.07   0.000     .2925533     .835826
   spring2010 |   .2677478    .119732      2.24   0.025     .0330774    .5024183
     fall2010 |    .004991   .1051216      0.05   0.962    -.2010436    .2110256
   spring2011 |  -.0962644   .0921134     -1.05   0.296    -.2768033    .0842745
           EU |   .2551145   .0545893      4.67   0.000     .1481214    .3621076
         ExYu |   .1485295   .0584215      2.54   0.011     .0340254    .2630336
        _cons |  -.6183298    .173079     -3.57   0.000    -.9575583   -.2791013
-------------+----------------------------------------------------------------
      /athrho |   .7735342    .036155     21.39   0.000     .7026717    .8443968
-------------+----------------------------------------------------------------
          rho |   .6489798   .0209274                       .6060608    .6881309
------------------------------------------------------------------------------
Wald test of rho=0:                 chi2(1) =  457.743    Prob > chi2 = 0.0000

. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      69540
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
dy/dx w.r.t. : 1.CBA gdppc gdpg lgdpg inf linf un lun h_aged2 h_aged3 h_female
h_edu_high h_edu_medium
               h_retired h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008
fall2008
               spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.0967493   .0286505     -3.38   0.001    -.1529033   -.0405953
       gdppc |   1.33e-06   3.29e-06      0.40   0.687    -5.13e-06    7.78e-06
        gdpg |   .0118074   .0020787      5.68   0.000     .0077333    .0158816
       lgdpg |   .0120086   .0035404      3.39   0.001     .0050695    .0189477
         inf |   .0093236   .0081959      1.14   0.255      -.00674    .0253872
        linf |  -.0185455   .0065182     -2.85   0.004    -.0313209   -.0057701
          un |  -.0074254   .0030401     -2.44   0.015    -.0133839   -.0014669
         lun |    .007892   .0035957      2.19   0.028     .0008445    .0149394
     h_aged2 |  -.0154019   .0052595     -2.93   0.003    -.0257103   -.0050935
     h_aged3 |  -.0173519    .009961     -1.74   0.082    -.0368751    .0021713
    h_female |  -.0007508   .0041074     -0.18   0.855    -.0088012    .0072996
  h_edu_high |   .0391139   .0099387      3.94   0.000     .0196344    .0585934
h_edu_medium |   .0120008   .0087308      1.37   0.169    -.0051112    .0291128
   h_retired |   -.005078   .0071692     -0.71   0.479    -.0191294    .0089735
   h_student |    .016793   .0083703      2.01   0.045     .0003875    .0331985
h_unemployed |  -.0109563   .0070264     -1.56   0.119    -.0247279    .0028152
    h_inc_d1 |   .0072665   .0079046      0.92   0.358    -.0082263    .0227593
    h_inc_d3 |    .024344   .0075955      3.21   0.001     .0094572    .0392308
    h_inc_d4 |   .0368029   .0078158      4.71   0.000     .0214842    .0521215
  spring2008 |  -.0224596   .0324795     -0.69   0.489    -.0861184    .0411991
    fall2008 |  -.0209444   .0326644     -0.64   0.521    -.0849655    .0430767
  spring2009 |   .1383563      .0216      6.41   0.000     .0960211    .1806915
    fall2009 |   .1750654   .0383886      4.56   0.000     .0998252    .2503057
  spring2010 |   .0964502   .0251719      3.83   0.000     .0471142    .1457863
    fall2010 |   .0239693    .015484      1.55   0.122    -.0063788    .0543174
  spring2011 |  -.0196157   .0235512     -0.83   0.405    -.0657753    .0265438
          EU |   .0398225   .0353403      1.13   0.260    -.0294432    .1090881
        ExYu |   .0366677   .0414749      0.88   0.377    -.0446216    .1179569
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

**Appendix 6.16e: SUR (without interaction terms)**

```
. biprobit (ESagree = i.CBA i.q22f_1 gdppc gdpg lgdpg inf linf un lun
h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student
h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009
fall2009 spring2010 fall2010 spring2011 EU ExYu) (ExpESagree = i.CBA
i.q22f_1 gdppc gdpg lgdpg inflinf un lun h_aged2 h_aged3 h_female h_edu_high
h_edu_medium h_retired h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4
spring2008 fall2008 spring2009 fall2009 spring2010 fall2010 spring2011 EU
ExYu) [pweight = weight], vce(cluster country) nolog

note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity
note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity

Seemingly unrelated bivariate probit              Number of obs   =      39970
                                                  Wald chi2(6)    =          .
Log pseudolikelihood = -36778.608                 Prob > chi2     =          .

                               (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ESagree      |
       1.CBA |  -.3604046   .0832703    -4.33   0.000    -.5236114   -.1971977
             |
      q22f_1 |
          2  |  -.1607931   .1069597    -1.50   0.133    -.3704302     .048844
          3  |  -.4499396   .1065291    -4.22   0.000    -.6587329   -.2411464
          4  |  -.7277317   .1430519    -5.09   0.000    -1.008108   -.4473552
          5  |  -.9924866   .1428234    -6.95   0.000    -1.272415    -.712558
             |
       gdppc |  -.0000275   .0000207    -1.33   0.185    -.0000681    .0000131
        gdpg |   .0714228   .0199492     3.58   0.000     .0323231    .1105225
       lgdpg |   .0439408   .0186283     2.36   0.018       .00743    .0804516
         inf |  -.0112575   .0459026    -0.25   0.806    -.1012249    .0787099
        linf |  -.0620738   .0388355    -1.60   0.110      -.13819    .0140423
          un |   -.051128   .0350309    -1.46   0.144    -.1197874    .0175313
         lun |   .0328467   .0362353     0.91   0.365    -.0381732    .1038667
     h_aged2 |   -.034135   .0285047    -1.20   0.231    -.0900032    .0217332
     h_aged3 |  -.0611878   .0399508    -1.53   0.126    -.1394898    .0171143
    h_female |  -.0220066   .0189605    -1.16   0.246    -.0591685    .0151552
  h_edu_high |   .1182564   .0740654     1.60   0.110    -.0269092     .263422
h_edu_medium |   .0340926   .0566372     0.60   0.547    -.0769143    .1450995
   h_retired |  -.0756958   .0377122    -2.01   0.045    -.1496103   -.0017814
   h_student |   .0638665   .0581384     1.10   0.272    -.0500828    .1778157
h_unemployed |  -.0275756   .0452603    -0.61   0.542    -.1162842     .061133
    h_inc_d1 |  -.0066037   .0480164    -0.14   0.891    -.1007141    .0875067
    h_inc_d3 |    .049142   .0381362     1.29   0.198    -.0256036    .1238875
    h_inc_d4 |   .1062814   .0263306     4.04   0.000     .0546744    .1578884
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .7635746   .1249571     6.11   0.000     .5186631    1.008486
    fall2009 |   .8117251   .1511758     5.37   0.000      .515426    1.108024
  spring2010 |   .4386554   .1397555     3.14   0.002     .1647396    .7125711
    fall2010 |   .1345271   .1204429     1.12   0.264    -.1015367    .3705909
  spring2011 |          0  (omitted)
          EU |   .3868562   .2095316     1.85   0.065    -.0238182    .7975305
        ExYu |   .4826099   .3027416     1.59   0.111    -.1107527    1.075972
       _cons |  -.4503718   .3128697    -1.44   0.150    -1.063585    .1628416
-------------+----------------------------------------------------------------
ExpESagree   |
       1.CBA |  -.2794196   .0944549    -2.96   0.003    -.4645478   -.0942914
             |
      q22f_1 |
          2  |  -.1694278   .1048986    -1.62   0.106    -.3750253    .0361696
          3  |  -.4688665    .124472    -3.77   0.000    -.7128272   -.2249059
          4  |  -.7677041   .1276139    -6.02   0.000    -1.017823   -.5175854
```

```
           5 |  -1.019928   .1215659    -8.39   0.000    -1.258193   -.7816631
             |
       gdppc |  -3.52e-06   .0000159    -0.22   0.825    -.0000347    .0000276
        gdpg |   .0372219   .0092767     4.01   0.000     .0190399    .0554038
       lgdpg |   .0033771   .0105703     0.32   0.749    -.0173403    .0240945
         inf |    .008195    .045145     0.18   0.856    -.0802876    .0966776
        linf |  -.0409841   .0367834    -1.11   0.265    -.1130782      .03111
          un |   .0260437   .0400858     0.65   0.516    -.0525231    .1046105
         lun |  -.0200711   .0358229    -0.56   0.575    -.0902826    .0501405
     h_aged2 |  -.0692563    .033073    -2.09   0.036    -.1340783   -.0044344
     h_aged3 |  -.1081874   .0389704    -2.78   0.006     -.184568   -.0318068
    h_female |   .0052444   .0166692     0.31   0.753    -.0274266    .0379154
  h_edu_high |   .1203898   .0490952     2.45   0.014      .024165    .2166146
h_edu_medium |   .0031809   .0350573     0.09   0.928    -.0655301    .0718919
   h_retired |   .0225218     .02602     0.87   0.387    -.0284765      .07352
   h_student |     .14185   .0376559     3.77   0.000     .0680457    .2156543
h_unemployed |  -.0233756   .0333848    -0.70   0.484    -.0888086    .0420575
    h_inc_d1 |   .1071295   .0474088     2.26   0.024     .0142099     .200049
    h_inc_d3 |   .1636228   .0248537     6.58   0.000     .1149105    .2123351
    h_inc_d4 |   .2394056   .0401861     5.96   0.000     .1606422     .318169
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .4523603   .0914784     4.94   0.000     .2730659    .6316547
    fall2009 |   .4914643   .1125304     4.37   0.000     .2709089    .7120197
  spring2010 |   .2328489   .0550078     4.23   0.000     .1250355    .3406623
    fall2010 |   .0801262   .0779256     1.03   0.304     -.072605    .2328575
  spring2011 |          0  (omitted)
          EU |   .1491864   .1258423     1.19   0.236      -.09746    .3958328
        ExYu |  -.0001684   .1718339    -0.00   0.999    -.3369566    .3366198
       _cons |   .0459747   .2715678     0.17   0.866    -.4862885    .5782378
-------------+----------------------------------------------------------------
     /athrho |   .6634994   .0529445    12.53   0.000       .55973    .7672687
-------------+----------------------------------------------------------------
         rho |   .5806875   .0350917                      .5077771    .6453384
------------------------------------------------------------------------------
Wald test of rho=0:                 chi2(1) =   157.05    Prob > chi2 = 0.0000

. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      39970
Model VCE    : Robust

Expression   : Pr(ESagree=1,ExpESagree=1), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 gdppc gdpg lgdpg inf linf un
lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed
h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009 fall2009 spring2010
fall2010 spring2011 EU ExYu

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.0580669   .0114917    -5.05   0.000    -.0805902   -.0355435
             |
      q22f_1 |
           2 |  -.0497464    .033889    -1.47   0.142    -.1161676    .0166747
           3 |  -.1236915   .0352366    -3.51   0.000     -.192754   -.0546289
           4 |  -.1764183   .0408244    -4.32   0.000    -.2564328   -.0964039
           5 |  -.2100096   .0409045    -5.13   0.000     -.290181   -.1298382
             |
       gdppc |  -4.11e-06   2.54e-06    -1.62   0.106    -9.09e-06    8.71e-07
        gdpg |   .0119835   .0032195     3.72   0.000     .0056733    .0182937
       lgdpg |   .0064663   .0027003     2.39   0.017     .0011739    .0117587
         inf |  -.0012361   .0064358    -0.19   0.848      -.01385    .0113778
        linf |  -.0108157   .0064733    -1.67   0.095    -.0235031    .0018716
          un |  -.0061326   .0057715    -1.06   0.288    -.0174446    .0051793
         lun |   .0037848   .0060828     0.62   0.534    -.0081372    .0157068
     h_aged2 |  -.0081163    .005432    -1.49   0.135    -.0187629    .0025303
     h_aged3 |   -.013808   .0074215    -1.86   0.063    -.0283538    .0007379
    h_female |  -.0029165   .0027254    -1.07   0.285    -.0082582    .0024251
  h_edu_high |    .022569   .0117148     1.93   0.054    -.0003916    .0455296
h_edu_medium |   .0050431     .00945     0.53   0.594    -.0134786    .0235647
   h_retired |  -.0098238   .0057424    -1.71   0.087    -.0210786     .001431
   h_student |   .0157552   .0089786     1.75   0.079    -.0018426     .033353
h_unemployed |  -.0050447   .0074047    -0.68   0.496    -.0195576    .0094682
    h_inc_d1 |   .0040246   .0076919     0.52   0.601    -.0110512    .0191004
```

```
    h_inc_d3 |   .0146516   .0063968     2.29   0.022     .0021141    .0271891
    h_inc_d4 |   .0263741   .0052426     5.03   0.000     .0160987    .0366494
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .1306408   .0181919     7.18   0.000     .0949854    .1662962
    fall2009 |     .13937   .0241901     5.76   0.000     .0919582    .1867817
  spring2010 |   .0737957   .0231027     3.19   0.001     .0285153    .1190761
    fall2010 |   .0230363   .0187669     1.23   0.220    -.0137462    .0598188
  spring2011 |          0  (omitted)
          EU |   .0624743   .0308578     2.02   0.043      .001994    .1229545
        ExYu |   .0692908   .0380818     1.82   0.069    -.0053481    .1439297
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

**Appendix 6.17: Subjective assessments - Single equations - Perceptions about economic situation in a country (country as a cluster)**

**Appendix 6.17a: Subjective assessments - Single equation - Perceptions about economic situation in a country (country as a cluster), unweighted and weighted**

```
. **with trust in government and interactions; controlled for group dummies
(EU and ExYu)
. probit ESagree i.CBA i.q22f_1 gdppc gdpg lgdpg inf linf un lun CBA#q22f_1
i.CBA#c.gdppc i.CBA#c.gdpg i.CBA#c.lgdpg i.CBA#c.inf i.CBA#c.linf i.CBA#c.un
i.CBA#c.lun h_aged2 h_aged3  h_female h_edu_high h_edu_medium h_retired
h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008
spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu, vce(cluster
country) nolog

note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity

Probit regression                                 Number of obs   =      40832
                                                  Wald chi2(8)    =          .
                                                  Prob > chi2     =          .
Log pseudolikelihood = -15384.869                 Pseudo R2       =     0.1266

                               (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
     ESagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   -.095989   1.137832    -0.08   0.933    -2.326098     2.13412
             |
      q22f_1 |
          2  |  -.2058163   .1203126    -1.71   0.087    -.4416247    .0299921
          3  |  -.5025882   .1197214    -4.20   0.000    -.7372377   -.2679386
          4  |  -.7856292   .1652838    -4.75   0.000     -1.10958   -.4616789
          5  |  -1.085066   .1579536    -6.87   0.000    -1.394649   -.7754823
             |
       gdppc |  -.0000285   .0000204    -1.39   0.163    -.0000685    .0000115
        gdpg |   .0703399   .0218462     3.22   0.001     .0275221    .1131578
       lgdpg |    .056306   .0325195     1.73   0.083    -.0074311    .1200431
         inf |   .0189342   .0437553     0.43   0.665    -.0668246     .104693
        linf |  -.0886961   .0341788    -2.60   0.009    -.1556852   -.0217069
          un |  -.0926051     .03017    -3.07   0.002    -.1517372   -.0334729
         lun |   .0682598   .0292681     2.33   0.020     .0108955    .1256242
             |
  CBA#q22f_1 |
        1 2  |   .0878657   .1620743     0.54   0.588    -.2297941    .4055256
        1 3  |   .1690795   .2084812     0.81   0.417    -.2395361    .5776952
        1 4  |    .173777   .2484106     0.70   0.484    -.3130989    .6606528
        1 5  |   .3431324   .2070592     1.66   0.097    -.0626962    .7489609
             |
 CBA#c.gdppc |
          1  |  -.0000924   .0001176    -0.79   0.432    -.0003228    .0001381
             |
  CBA#c.gdpg |
          1  |  -.0458023   .0494897    -0.93   0.355    -.1428004    .0511958
```

```
              |
  CBA#c.lgdpg |
            1 |  -.0483161   .0350753    -1.38   0.168    -.1170625    .0204303
              |
    CBA#c.inf |
            1 |   .1530653   .1897935     0.81   0.420    -.2189231    .5250537
              |
   CBA#c.linf |
            1 |  -.1118962   .1653132    -0.68   0.498    -.4359041    .2121116
              |
     CBA#c.un |
            1 |  -.0069534   .0523672    -0.13   0.894    -.1095912    .0956844
              |
    CBA#c.lun |
            1 |   .0082925   .0710106     0.12   0.907    -.1308857    .1474708
              |
      h_aged2 |  -.0436536   .0278716    -1.57   0.117    -.0982809    .0109736
      h_aged3 |  -.0740553   .0429716    -1.72   0.085    -.1582782    .0101675
     h_female |  -.0276321   .0149333    -1.85   0.064    -.0569008    .0016366
   h_edu_high |   .0858167   .0838598     1.02   0.306    -.0785455    .2501789
 h_edu_medium |   .0190583   .0623159     0.31   0.760    -.1030786    .1411951
    h_retired |  -.0410111   .0536627    -0.76   0.445    -.1461881    .0641658
    h_student |   .0466245   .0511638     0.91   0.362    -.0536546    .1469036
 h_unemployed |  -.0371475    .046627    -0.80   0.426    -.1285349    .0542398
     h_inc_d1 |  -.0244587   .0513707    -0.48   0.634    -.1251434     .076226
     h_inc_d3 |   .0463902   .0385488     1.20   0.229    -.0291642    .1219445
     h_inc_d4 |    .118223   .0281371     4.20   0.000     .0630753    .1733707
   spring2008 |          0  (omitted)
     fall2008 |          0  (omitted)
   spring2009 |   .7390459    .128094     5.77   0.000     .4879862    .9901056
     fall2009 |   .7534122   .1462741     5.15   0.000     .4667202    1.040104
   spring2010 |   .4359496   .1619743     2.69   0.007     .1184858    .7534133
     fall2010 |    .067209   .1363799     0.49   0.622    -.2000907    .3345086
   spring2011 |          0  (omitted)
           EU |    .398559   .2043824     1.95   0.051    -.0020231    .7991412
         ExYu |   .6026106   .3134964     1.92   0.055    -.0118311    1.217052
        _cons |  -.2800597   .3067428    -0.91   0.361    -.8812644    .3211451
------------------------------------------------------------------------------

. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      40832
Model VCE    : Robust

Expression   : Pr(ESagree), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 gdppc gdpg lgdpg inf linf un
lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed
h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009 fall2009 spring2010
fall2010 spring2011 EU ExYu

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.0961481   .0126898    -7.58   0.000    -.1210196   -.0712765
             |
      q22f_1 |
           2 |  -.0596066   .0336362    -1.77   0.076    -.1255324    .0063193
           3 |  -.1352757   .0355204    -3.81   0.000    -.2048944   -.0656571
           4 |  -.1940064   .0437023    -4.44   0.000    -.2796612   -.1083515
           5 |  -.2353001    .042192    -5.58   0.000    -.3179949   -.1526053
             |
       gdppc |  -9.17e-06   4.81e-06    -1.90   0.057    -.0000186    2.66e-07
        gdpg |    .013038   .0046884     2.78   0.005     .0038489    .0222272
       lgdpg |    .010028   .0055054     1.82   0.069    -.0007624    .0208185
         inf |   .0093112   .0074569     1.25   0.212     -.005304    .0239264
        linf |  -.0223914   .0068846    -3.25   0.001    -.0358849   -.0088978
          un |  -.0195241   .0049218    -3.97   0.000    -.0291706   -.0098777
         lun |   .0145025   .0043166     3.36   0.001     .0060421    .0229629
     h_aged2 |  -.0090886   .0057778    -1.57   0.116    -.0204128    .0022356
     h_aged3 |  -.0154182    .009032    -1.71   0.088    -.0331205    .0022842
    h_female |   -.005753   .0031127    -1.85   0.065    -.0118538    .0003479
  h_edu_high |   .0178669   .0173564     1.03   0.303     -.016151    .0518848
h_edu_medium |   .0039679   .0129477     0.31   0.759    -.0214091    .0293449
   h_retired |  -.0085385   .0111467    -0.77   0.444    -.0303856    .0133087
   h_student |   .0097071    .010766     0.90   0.367    -.0113939    .0308082
```

```
h_unemployed |  -.0077341   .0096856    -0.80   0.425    -.0267175    .0112494
     h_inc_d1 |  -.0050923   .0106487    -0.48   0.633    -.0259633    .0157788
     h_inc_d3 |   .0096584   .0080719     1.20   0.231    -.0061624    .0254791
     h_inc_d4 |   .0246138   .0062243     3.95   0.000     .0124144    .0368132
   spring2008 |          0  (omitted)
     fall2008 |          0  (omitted)
   spring2009 |   .1538681   .0247116     6.23   0.000     .1054343    .2023019
     fall2009 |   .1568592   .0289602     5.42   0.000     .1000983    .2136201
   spring2010 |    .090764   .0352505     2.57   0.010     .0216743    .1598536
     fall2010 |   .0139928    .028649     0.49   0.625    -.0421582    .0701438
   spring2011 |          0  (omitted)
           EU |   .0829793   .0428412     1.94   0.053    -.0009878    .1669465
         ExYu |   .1254625   .0631999     1.99   0.047      .001593    .2493321
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

```
. probit ESagree i.CBA i.q22f_1 gdppc gdpg lgdpg inf linf un lun CBA#q22f_1
i.CBA#c.gdppc i.CBA#c.gdpg i.CBA#c.lgdpg i.CBA#c.inf i.CBA#c.linf i.CBA#c.un
i.CBA#c.lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired
h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008
spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu [pweight =
weight], vce(cluster country) nolog

note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity
```

```
Probit regression                                 Number of obs   =      40832
                                                  Wald chi2(8)    =          .
                                                  Prob > chi2     =          .
Log pseudolikelihood = -14865.717                 Pseudo R2       =     0.1276

                              (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
     ESagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.0574936   1.145192    -0.05   0.960    -2.302029    2.187042
             |
      q22f_1 |
          2  |  -.1965323    .121788    -1.61   0.107    -.4352324    .0421678
          3  |  -.4898408   .1186708    -4.13   0.000    -.7224313   -.2572504
          4  |  -.7622636   .1634706    -4.66   0.000     -1.08266   -.4418672
          5  |  -1.070521   .1570058    -6.82   0.000    -1.378247    -.762795
             |
       gdppc |  -.0000293   .0000209    -1.40   0.161    -.0000703    .0000117
        gdpg |   .0710486   .0213166     3.33   0.001     .0292689    .1128283
       lgdpg |    .056462   .0335151     1.68   0.092    -.0092265    .1221505
         inf |   .0107269   .0496344     0.22   0.829    -.0865548    .1080085
        linf |  -.0820572   .0394599    -2.08   0.038    -.1593971   -.0047172
          un |  -.0843601   .0301353    -2.80   0.005    -.1434242    -.025296
         lun |   .0619836   .0302604     2.05   0.041     .0026744    .1212929
             |
  CBA#q22f_1 |
        1 2  |   .1001737   .1548983     0.65   0.518    -.2034213    .4037687
        1 3  |     .17934   .1981966     0.90   0.366    -.2091182    .5677982
        1 4  |     .12819   .2594812     0.49   0.621    -.3803838    .6367639
        1 5  |   .3553745    .197757     1.80   0.072    -.0322221     .742971
             |
 CBA#c.gdppc |
          1  |  -.0000993   .0001196    -0.83   0.406    -.0003337    .0001351
             |
  CBA#c.gdpg |
          1  |  -.0487551   .0535585    -0.91   0.363    -.1537279    .0562177
             |
 CBA#c.lgdpg |
          1  |  -.0467484   .0345349    -1.35   0.176    -.1144356    .0209388
             |
   CBA#c.inf |
          1  |   .1730873   .1963833     0.88   0.378    -.2118169    .5579916
             |
  CBA#c.linf |
          1  |  -.1300101   .1726961    -0.75   0.452    -.4684882     .208468
             |
```

```
   CBA#c.un |
          1  |  -.0101282   .0522681    -0.19   0.846    -.1125718    .0923155
             |
   CBA#c.lun |
          1  |   .0115107   .0708774     0.16   0.871    -.1274065    .1504279
             |
     h_aged2 |  -.0401163   .0271062    -1.48   0.139    -.0932435    .0130108
     h_aged3 |  -.0554025   .0410449    -1.35   0.177    -.1358491     .025044
    h_female |  -.0280654   .0178092    -1.58   0.115    -.0629709      .00684
  h_edu_high |   .1103671   .0763332     1.45   0.148    -.0392432    .2599774
h_edu_medium |   .0332574   .0592729     0.56   0.575    -.0829153    .1494301
   h_retired |  -.0723894   .0414008    -1.75   0.080    -.1535335    .0087547
   h_student |   .0546859   .0603628     0.91   0.365    -.0636229    .1729948
h_unemployed |  -.0229488   .0486117    -0.47   0.637    -.1182259    .0723283
    h_inc_d1 |  -.0120356   .0469279    -0.26   0.798    -.1040127    .0799415
    h_inc_d3 |   .0568039   .0381286     1.49   0.136    -.0179268    .1315346
    h_inc_d4 |   .1177731   .0279758     4.21   0.000     .0629417    .1726046
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .7590503   .1340593     5.66   0.000     .4962989    1.021802
    fall2009 |   .7971931   .1392404     5.73   0.000     .5242869    1.070099
  spring2010 |   .4606127   .1562883     2.95   0.003     .1542932    .7669322
    fall2010 |   .0846217   .1366048     0.62   0.536    -.1831187    .3523621
  spring2011 |          0  (omitted)
          EU |   .4372395   .2017855     2.17   0.030     .0417471    .8327319
        ExYu |   .6112134   .3105738     1.97   0.049        .0025    1.219927
       _cons |  -.3818205    .317191    -1.20   0.229    -1.003503    .2398624
------------------------------------------------------------------------------

. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      40832
Model VCE    : Robust

Expression   : Pr(ESagree), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 gdppc gdpg lgdpg inf linf un
lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed
h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009 fall2009 spring2010
fall2010 spring2011 EU ExYu

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.0947886   .0126258    -7.51   0.000    -.1195347   -.0700425
             |
      q22f_1 |
          2  |  -.0553019   .0333255    -1.66   0.097    -.1206186    .0100149
          3  |  -.1293352   .0345602    -3.74   0.000     -.197072   -.0615983
          4  |  -.1871685   .0428705    -4.37   0.000    -.2711931   -.1031439
          5  |  -.2279306   .0413407    -5.51   0.000    -.3089569   -.1469042
             |
       gdppc |  -9.53e-06   4.99e-06    -1.91   0.056    -.0000193    2.52e-07
        gdpg |   .0128841   .0046445     2.77   0.006     .0037809    .0219872
       lgdpg |   .0099563     .00564     1.77   0.078    -.0010979    .0210105
         inf |   .0083183   .0087065     0.96   0.339    -.0087462    .0253827
        linf |  -.0214608    .007865    -2.73   0.006    -.0368759   -.0060457
          un |  -.0177003    .004909    -3.61   0.000    -.0273217   -.0080789
         lun |    .013149   .0046076     2.85   0.004     .0041183    .0221797
     h_aged2 |   -.008247   .0055669    -1.48   0.138    -.0191579    .0026638
     h_aged3 |  -.0113895   .0084907    -1.34   0.180     -.028031    .0052519
    h_female |  -.0057696   .0036802    -1.57   0.117    -.0129826    .0014433
  h_edu_high |    .022689   .0154771     1.47   0.143    -.0076456    .0530236
h_edu_medium |    .006837    .012131     0.56   0.573    -.0169394    .0306133
   h_retired |  -.0148817   .0085059    -1.75   0.080     -.031553    .0017897
   h_student |   .0112422   .0125456     0.90   0.370    -.0133467    .0358311
h_unemployed |  -.0047178   .0099801    -0.47   0.636    -.0242783    .0148428
    h_inc_d1 |  -.0024743   .0096265    -0.26   0.797    -.0213418    .0163933
    h_inc_d3 |   .0116776   .0078997     1.48   0.139    -.0038054    .0271607
    h_inc_d4 |   .0242115   .0061014     3.97   0.000      .012253      .03617
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .1560439   .0256385     6.09   0.000     .1057934    .2062944
    fall2009 |   .1638852   .0268989     6.09   0.000     .1111643    .2166061
  spring2010 |   .0946918   .0338752     2.80   0.005     .0282975     .161086
    fall2010 |   .0173963    .028405     0.61   0.540    -.0382764    .0730691
  spring2011 |          0  (omitted)
```

```
          EU |   .0898868   .0417957     2.15   0.032     .0079686    .1718049
        ExYu |   .1256519   .0615976     2.04   0.041     .0049229    .2463809
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

**Appendix 6.17b Subjective assessments - Single equation – *Perceptions about economic situation in a country (region as cluster), unweighted and weighted**

```
. **with trust in government and interactions; controlled for group dummies
(EU and ExYu)
. probit ESagree i.CBA i.q22f_1 gdppc gdpg lgdpg inf linf un lun CBA#q22f_1
i.CBA#c.gdppc i.CBA#c.gdpg i.CBA#c.lgdpg i.CBA#c.inf i.CBA#c.linf i.CBA#c.un
i.CBA#c.lun h_aged2 h_aged3  h_female h_edu_high h_edu_medium h_retired
h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008
spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu, vce(cluster
h_region) nolog

note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity

Probit regression                                 Number of obs   =      40832
                                                  Wald chi2(40)   =    3149.77
                                                  Prob > chi2     =     0.0000
Log pseudolikelihood = -15384.869                 Pseudo R2       =     0.1266

                              (Std. Err. adjusted for 71 clusters in h_region)
------------------------------------------------------------------------------
             |               Robust
     ESagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   -.095989   1.308138    -0.07   0.942    -2.659893    2.467915
             |
      q22f_1 |
          2  |  -.2058163   .0660267    -3.12   0.002    -.3352262   -.0764064
          3  |  -.5025882   .0719346    -6.99   0.000    -.6435773    -.361599
          4  |  -.7856292   .0855292    -9.19   0.000    -.9532634   -.6179951
          5  |  -1.085066   .0793783   -13.67   0.000    -1.240644    -.929487
             |
       gdppc |  -.0000285   .0000116    -2.46   0.014    -.0000512   -5.80e-06
        gdpg |   .0703399   .0129019     5.45   0.000     .0450527    .0956272
       lgdpg |    .056306   .0181793     3.10   0.002     .0206752    .0919368
         inf |   .0189342   .0304633     0.62   0.534    -.0407728    .0786412
        linf |  -.0886961   .0280016    -3.17   0.002    -.1435783   -.0338139
          un |  -.0926051   .0244225    -3.79   0.000    -.1404723   -.0447378
         lun |   .0682598   .0217753     3.13   0.002      .025581    .1109387
             |
  CBA#q22f_1 |
        1 2  |   .0878657   .1010178     0.87   0.384    -.1101256    .2858571
        1 3  |   .1690795   .1122181     1.51   0.132     -.050864    .3890231
        1 4  |    .173777   .1347471     1.29   0.197    -.0903225    .4378764
        1 5  |   .3431324   .1219251     2.81   0.005     .1041636    .5821011
             |
 CBA#c.gdppc |
          1  |  -.0000924   .0001485    -0.62   0.534    -.0003835    .0001988
             |
  CBA#c.gdpg |
          1  |  -.0458023   .0611966    -0.75   0.454    -.1657454    .0741408
             |
 CBA#c.lgdpg |
          1  |  -.0483161   .0291407    -1.66   0.097    -.1054307    .0087986
             |
   CBA#c.inf |
          1  |   .1530653   .1734378     0.88   0.377    -.1868666    .4929971
             |
  CBA#c.linf |
          1  |  -.1118962   .1445257    -0.77   0.439    -.3951615     .171369
             |
    CBA#c.un |
          1  |  -.0069534   .0555826    -0.13   0.900    -.1158932    .1019864
             |
   CBA#c.lun |
```

```
           1  |   .0082925   .0596545     0.14   0.889    -.1086281    .1252132
              |
     h_aged2  |  -.0436536   .0242097    -1.80   0.071    -.0911038    .0037966
     h_aged3  |  -.0740553   .0320281    -2.31   0.021    -.1368292   -.0112815
    h_female  |  -.0276321   .0186152    -1.48   0.138    -.0641172     .008853
  h_edu_high  |   .0858167   .0550798     1.56   0.119    -.0221377    .1937712
h_edu_medium  |   .0190583   .0434274     0.44   0.661    -.0660579    .1041745
   h_retired  |  -.0410111   .0396971    -1.03   0.302    -.1188161    .0367938
   h_student  |   .0466245   .0443676     1.05   0.293    -.0403343    .1335833
h_unemployed  |  -.0371475   .0317967    -1.17   0.243     -.099468    .0251729
    h_inc_d1  |  -.0244587   .0462816    -0.53   0.597     -.115169    .0662516
    h_inc_d3  |   .0463902   .0356506     1.30   0.193    -.0234837     .116264
    h_inc_d4  |    .118223   .0384369     3.08   0.002     .0428881    .1935579
  spring2008  |          0  (omitted)
    fall2008  |          0  (omitted)
  spring2009  |   .7390459   .0800796     9.23   0.000     .5820929     .895999
    fall2009  |   .7534122   .1203731     6.26   0.000     .5174853     .989339
  spring2010  |   .4359496   .0894597     4.87   0.000     .2606118    .6112873
    fall2010  |    .067209   .0759245     0.89   0.376    -.0816004    .2160183
  spring2011  |          0  (omitted)
          EU  |    .398559   .1722928     2.31   0.021     .0608714    .7362466
        ExYu  |   .6026106   .2073612     2.91   0.004     .1961901    1.009031
       _cons  |  -.2800597   .1962038    -1.43   0.153    -.6646121    .1044928
------------------------------------------------------------------------------

. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      40832
Model VCE    : Robust

Expression   : Pr(ESagree), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 gdppc gdpg lgdpg inf linf un
lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed
h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009 fall2009 spring2010
fall2010 spring2011 EU ExYu

------------------------------------------------------------------------------
              |            Delta-method
              |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
--------------+----------------------------------------------------------------
       1.CBA  |  -.0961481   .0174977    -5.49   0.000     -.130443   -.0618531
              |
      q22f_1  |
           2  |  -.0596066   .0183486    -3.25   0.001    -.0955692    -.023644
           3  |  -.1352757     .01978    -6.84   0.000    -.1740439   -.0965076
           4  |  -.1940064   .0220441    -8.80   0.000     -.237212   -.1508008
           5  |  -.2353001    .020773   -11.33   0.000    -.2760145   -.1945857
              |
       gdppc  |  -9.17e-06   5.75e-06    -1.59   0.111    -.0000204    2.11e-06
        gdpg  |    .013038   .0032103     4.06   0.000     .0067459    .0193302
       lgdpg  |    .010028   .0031994     3.13   0.002     .0037573    .0162987
         inf  |   .0093112   .0075984     1.23   0.220    -.0055813    .0242037
        linf  |  -.0223914   .0068022    -3.29   0.001    -.0357235   -.0090593
          un  |  -.0195241   .0048864    -4.00   0.000    -.0291013   -.0099469
         lun  |   .0145025   .0043823     3.31   0.001     .0059133    .0230916
     h_aged2  |  -.0090886   .0050368    -1.80   0.071    -.0189605    .0007833
     h_aged3  |  -.0154182   .0066571    -2.32   0.021    -.0284658   -.0023706
    h_female  |   -.005753   .0038535    -1.49   0.135    -.0133056    .0017997
  h_edu_high  |   .0178669   .0114287     1.56   0.118     -.004533    .0402668
h_edu_medium  |   .0039679   .0090358     0.44   0.661    -.0137419    .0216777
   h_retired  |  -.0085385   .0082613    -1.03   0.301    -.0247302    .0076533
   h_student  |   .0097071   .0092564     1.05   0.294    -.0084351    .0278494
h_unemployed  |  -.0077341   .0065988    -1.17   0.241    -.0206674    .0051993
    h_inc_d1  |  -.0050923   .0096518    -0.53   0.598    -.0240095     .013825
    h_inc_d3  |   .0096584   .0074462     1.30   0.195     -.004936    .0242527
    h_inc_d4  |   .0246138   .0080836     3.04   0.002     .0087702    .0404574
  spring2008  |          0  (omitted)
    fall2008  |          0  (omitted)
  spring2009  |   .1538681   .0171591     8.97   0.000     .1202369    .1874993
    fall2009  |   .1568592    .025587     6.13   0.000     .1067096    .2070087
  spring2010  |    .090764   .0195193     4.65   0.000     .0525069     .129021
    fall2010  |   .0139928   .0159591     0.88   0.381    -.0172864     .045272
  spring2011  |          0  (omitted)
          EU  |   .0829793   .0356383     2.33   0.020     .0131295    .1528291
        ExYu  |   .1254625   .0424667     2.95   0.003     .0422294    .2086957
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

```
. probit ESagree i.CBA i.q22f_1 gdppc gdpg lgdpg inf linf un lun CBA#q22f_1
i.CBA#c.gdppc i.CBA#c.gdpg i.CBA#c.lgdpg i.CBA#c.inf i.CBA#c.linf i.CBA#c.un
i.CBA#c.lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired
h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008
spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu [pweight =
weight], vce(cluster h_region) nolog

note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity

Probit regression                                 Number of obs   =      40832
                                                  Wald chi2(40)   =    2629.13
                                                  Prob > chi2     =     0.0000
Log pseudolikelihood = -14865.717                 Pseudo R2       =     0.1276

                              (Std. Err. adjusted for 71 clusters in h_region)
------------------------------------------------------------------------------
             |               Robust
     ESagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.0574936   1.379043    -0.04   0.967    -2.760369    2.645381
             |
      q22f_1 |
          2  |  -.1965323   .0703781    -2.79   0.005    -.3344708   -.0585937
          3  |  -.4898408   .0743114    -6.59   0.000    -.6354884   -.3441933
          4  |  -.7622636   .0873391    -8.73   0.000    -.9334451   -.5910822
          5  |  -1.070521   .0828203   -12.93   0.000    -1.232846    -.908196
             |
       gdppc |  -.0000293    .000012    -2.44   0.015    -.0000528   -5.80e-06
        gdpg |   .0710486   .0131177     5.42   0.000     .0453383    .0967589
       lgdpg |    .056462   .0184503     3.06   0.002     .0203002    .0926239
         inf |   .0107269   .0318367     0.34   0.736     -.051672    .0731257
        linf |  -.0820572   .0301413    -2.72   0.006    -.1411331   -.0229813
          un |  -.0843601   .0267643    -3.15   0.002    -.1368173    -.031903
         lun |   .0619836   .0243554     2.54   0.011     .0142478    .1097194
             |
  CBA#q22f_1 |
        1 2  |   .1001737   .1026825     0.98   0.329    -.1010804    .3014278
        1 3  |     .17934   .1109207     1.62   0.106    -.0380606    .3967407
        1 4  |     .12819   .1395907     0.92   0.358    -.1454028    .4017828
        1 5  |   .3553745   .1225794     2.90   0.004     .1151233    .5956257
             |
 CBA#c.gdppc |
          1  |  -.0000993   .0001573    -0.63   0.528    -.0004075    .0002089
             |
  CBA#c.gdpg |
          1  |  -.0487551   .0656639    -0.74   0.458     -.177454    .0799438
             |
 CBA#c.lgdpg |
          1  |  -.0467484   .0291148    -1.61   0.108    -.1038123    .0103155
             |
   CBA#c.inf |
          1  |   .1730873   .1774443     0.98   0.329    -.1746971    .5208717
             |
  CBA#c.linf |
          1  |  -.1300101   .1487593    -0.87   0.382     -.421573    .1615528
             |
    CBA#c.un |
          1  |  -.0101282   .0544103    -0.19   0.852    -.1167704     .096514
             |
   CBA#c.lun |
          1  |   .0115107    .058257     0.20   0.843     -.102671    .1256924
             |
     h_aged2 |  -.0401163   .0247819    -1.62   0.105    -.0886879    .0084552
     h_aged3 |  -.0554025   .0325578    -1.70   0.089    -.1192146    .0084096
    h_female |  -.0280654   .0175301    -1.60   0.109    -.0624237    .0062928
  h_edu_high |   .1103671   .0510669     2.16   0.031     .0102778    .2104564
h_edu_medium |   .0332574   .0412709     0.81   0.420    -.0476321    .1141468
   h_retired |  -.0723894   .0369472    -1.96   0.050    -.1448046    .0000259
   h_student |   .0546859   .0495242     1.10   0.269    -.0423797    .1517515
h_unemployed |  -.0229488   .0344047    -0.67   0.505    -.0903808    .0444832
    h_inc_d1 |  -.0120356   .0473683    -0.25   0.799    -.1048758    .0808046
    h_inc_d3 |   .0568039   .0362173     1.57   0.117    -.0141806    .1277884
    h_inc_d4 |   .1177731    .038637     3.05   0.002      .042046    .1935003
```

```
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .7590503   .0868719     8.74   0.000     .5887846     .929316
    fall2009 |   .7971931   .1156142     6.90   0.000     .5705935    1.023793
  spring2010 |   .4606127   .0897072     5.13   0.000     .2847898    .6364357
    fall2010 |   .0846217   .0724038     1.17   0.243    -.0572871    .2265305
  spring2011 |          0  (omitted)
          EU |   .4372395   .1718079     2.54   0.011     .1005022    .7739769
        ExYu |   .6112134   .2091369     2.92   0.003     .2013125    1.021114
       _cons |  -.3818205    .212969    -1.79   0.073    -.7992321    .0355911
------------------------------------------------------------------------------

. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      40832
Model VCE    : Robust

Expression   : Pr(ESagree), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 gdppc gdpg lgdpg inf linf un
lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed
h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009 fall2009 spring2010
fall2010 spring2011 EU ExYu

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.0947886   .0168003    -5.64   0.000    -.1277166   -.0618606
             |
      q22f_1 |
          2  |  -.0553019   .0191125    -2.89   0.004    -.0927618    -.017842
          3  |  -.1293352   .0199989    -6.47   0.000    -.1685323    -.090138
          4  |  -.1871685   .0222268    -8.42   0.000    -.2307322   -.1436048
          5  |  -.2279306   .0209472   -10.88   0.000    -.2689863   -.1868748
             |
       gdppc |  -9.53e-06   6.09e-06    -1.56   0.118    -.0000215    2.41e-06
        gdpg |   .0128841   .0033413     3.86   0.000     .0063353    .0194329
       lgdpg |   .0099563   .0032339     3.08   0.002     .0036179    .0162946
         inf |   .0083183   .0079014     1.05   0.292    -.0071682    .0238047
        linf |  -.0214608    .007125    -3.01   0.003    -.0354255   -.0074961
          un |  -.0177003   .0053704    -3.30   0.001     -.028226   -.0071746
         lun |    .013149   .0049528     2.65   0.008     .0034416    .0228564
     h_aged2 |   -.008247   .0050973    -1.62   0.106    -.0182375    .0017434
     h_aged3 |  -.0113895   .0066924    -1.70   0.089    -.0245064    .0017273
    h_female |  -.0057696   .0035858    -1.61   0.108    -.0127977    .0012584
  h_edu_high |    .022689   .0103945     2.18   0.029     .0023162    .0430618
h_edu_medium |    .006837    .008459     0.81   0.419    -.0097424    .0234163
   h_retired |  -.0148817   .0075831    -1.96   0.050    -.0297443    -.000019
   h_student |   .0112422   .0101892     1.10   0.270    -.0087283    .0312127
h_unemployed |  -.0047178    .007055    -0.67   0.504    -.0185453    .0091098
    h_inc_d1 |  -.0024743    .009745    -0.25   0.800     -.021574    .0166255
    h_inc_d3 |   .0116776   .0074862     1.56   0.119     -.002995    .0263502
    h_inc_d4 |   .0242115   .0080264     3.02   0.003     .0084801     .039943
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .1560439   .0186316     8.38   0.000     .1195266    .1925612
    fall2009 |   .1638852   .0244887     6.69   0.000     .1158883    .2118822
  spring2010 |   .0946918   .0195627     4.84   0.000     .0563496    .1330339
    fall2010 |   .0173963   .0150748     1.15   0.249    -.0121498    .0469425
  spring2011 |          0  (omitted)
          EU |   .0898868   .0350826     2.56   0.010     .0211261    .1586474
        ExYu |   .1256519   .0423637     2.97   0.003     .0426206    .2086832
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

**Appendix 6.18: Subjective assessments - Single equations - Expectations about economic situation in a country (country as a cluster)**

**Appendix 6.18a: Subjective assessments - Single equation - Expectations about economic situation in a country (country as cluster) weighted and unweighted**

```
. **with trust in government and interactions; controlled for group dummies
(EU and ExYu)
. probit ExpESagree i.CBA i.q22f_1 gdppc gdpg lgdpg inf linf un lun
CBA#q22f_1 i.CBA#c.gdppc i.CBA#c.gdpg i.CBA#c.lgdpg i.CBA#c.inf i.CBA#c.linf
i.CBA#c.un i.CBA#c.lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium
h_retired h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008
fall2008 spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu,
vce(cluster country) nolog

note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity

Probit regression                                 Number of obs   =      40832
                                                  Wald chi2(8)    =          .
                                                  Prob > chi2     =          .
Log pseudolikelihood = -25058.004                 Pseudo R2       =     0.0862

                              (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
  ExpESagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |    1.77919   .6056883     2.94   0.003     .5920632    2.966318
             |
     q22f_1 |
          2  |  -.1377106    .137593    -1.00   0.317     -.407388    .1319667
          3  |  -.4499712   .1638365    -2.75   0.006    -.7710848   -.1288576
          4  |  -.7626509   .1680983    -4.54   0.000    -1.092117   -.4331844
          5  |  -1.002083   .1577211    -6.35   0.000    -1.311211   -.6929556
             |
       gdppc |  -6.17e-07   .0000139    -0.04   0.965    -.0000279    .0000266
        gdpg |   .0519816   .0084203     6.17   0.000     .0354781    .0684851
       lgdpg |  -.0152657   .0121843    -1.25   0.210    -.0391465    .0086151
         inf |   .0262861   .0410186     0.64   0.522    -.0541089    .1066812
        linf |  -.0731254   .0328771    -2.22   0.026    -.1375634   -.0086874
          un |   .0317725   .0403704     0.79   0.431     -.047352    .1108969
         lun |  -.0248064    .036042    -0.69   0.491    -.0954474    .0458347
             |
  CBA#q22f_1 |
         1 2 |  -.0360406   .1382351    -0.26   0.794    -.3069765    .2348953
         1 3 |   .0374416   .1673515     0.22   0.823    -.2905613    .3654444
         1 4 |   .1014195   .1818753     0.56   0.577    -.2550496    .4578885
         1 5 |   .0494376   .2140633     0.23   0.817    -.3701188    .4689941
             |
 CBA#c.gdppc |
          1  |  -.0002429   .0000768    -3.16   0.002    -.0003935   -.0000923
             |
  CBA#c.gdpg |
          1  |   .0585344   .0263434     2.22   0.026     .0069024    .1101665
             |
 CBA#c.lgdpg |
          1  |   .0131603    .014709     0.89   0.371    -.0156688    .0419893
             |
   CBA#c.inf |
          1  |  -.0849588   .0961891    -0.88   0.377     -.273486    .1035684
             |
  CBA#c.linf |
          1  |   .1091577   .0843956     1.29   0.196    -.0562545      .27457
             |
    CBA#c.un |
          1  |  -.0835897   .0091317    -9.15   0.000    -.1014875   -.0656918
             |
   CBA#c.lun |
          1  |   .0357339   .0182738     1.96   0.051    -.0000821    .0715499
```

```
             |
     h_aged2 |  -.0714252   .0293443    -2.43   0.015     -.128939   -.0139115
     h_aged3 |  -.0950748    .038848    -2.45   0.014    -.1712155   -.0189341
    h_female |  -.0008272   .0116472    -0.07   0.943    -.0236552    .0220009
  h_edu_high |   .1230199   .0502314     2.45   0.014     .0245681    .2214717
h_edu_medium |   .0081703   .0341406     0.24   0.811    -.0587441    .0750846
   h_retired |   .0410903    .029205     1.41   0.159    -.0161505     .098331
   h_student |   .1330883   .0324766     4.10   0.000     .0694353    .1967413
h_unemployed |   -.022706   .0335226    -0.68   0.498    -.0884091    .0429971
    h_inc_d1 |   .1208637   .0465022     2.60   0.009     .0297211    .2120063
    h_inc_d3 |   .1758661   .0233378     7.54   0.000     .1301249    .2216073
    h_inc_d4 |   .2546854   .0335568     7.59   0.000     .1889153    .3204554
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .5332758   .0816041     6.53   0.000     .3733348    .6932169
    fall2009 |     .53567   .0964144     5.56   0.000     .3467013    .7246388
  spring2010 |   .2251846   .0494836     4.55   0.000     .1281985    .3221706
    fall2010 |   .0640221   .0820847     0.78   0.435     -.096861    .2249051
  spring2011 |          0  (omitted)
          EU |   .1335062   .0943206     1.42   0.157    -.0513587    .3183711
        ExYu |     .04716   .1604327     0.29   0.769    -.2672823    .3616024
       _cons |   .0059773   .2465066     0.02   0.981    -.4771668    .4891214
------------------------------------------------------------------------------

. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      40832
Model VCE    : Robust

Expression   : Pr(ExpESagree), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 gdppc gdpg lgdpg inf linf un
lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed
h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009 fall2009 spring2010
fall2010 spring2011 EU ExYu

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   -.198459   .0134693   -14.73   0.000    -.2248584   -.1720597
             |
      q22f_1 |
          2  |  -.0548045   .0400125    -1.37   0.171    -.1332275    .0236185
          3  |  -.1697527   .0478708    -3.55   0.000    -.2635777   -.0759277
          4  |  -.2815875   .0492456    -5.72   0.000     -.378107   -.1850679
          5  |  -.3646377   .0470404    -7.75   0.000    -.4568351   -.2724403
             |
       gdppc |  -.0000165   6.80e-06    -2.43   0.015    -.0000298   -3.17e-06
        gdpg |   .0220995   .0027456     8.05   0.000     .0167183    .0274807
       lgdpg |  -.0044573   .0035098    -1.27   0.204    -.0113364    .0024219
         inf |   .0035025   .0101077     0.35   0.729    -.0163084    .0233133
        linf |  -.0182623    .008724    -2.09   0.036    -.0353611   -.0011635
          un |   .0055128   .0140086     0.39   0.694    -.0219435    .0329692
         lun |  -.0062819   .0131431    -0.48   0.633     -.032042    .0194782
     h_aged2 |  -.0249788   .0102399    -2.44   0.015    -.0450486   -.0049091
     h_aged3 |  -.0332496   .0135947    -2.45   0.014    -.0598946   -.0066045
    h_female |  -.0002893   .0040746    -0.07   0.943    -.0082754    .0076969
  h_edu_high |   .0430225    .017503     2.46   0.014     .0087174    .0773277
h_edu_medium |   .0028573   .0119439     0.24   0.811    -.0205524     .026267
   h_retired |   .0143701   .0101889     1.41   0.158    -.0055997    .0343399
   h_student |   .0465437    .011143     4.18   0.000     .0247038    .0683835
h_unemployed |  -.0079407   .0117174    -0.68   0.498    -.0309063    .0150249
    h_inc_d1 |   .0422685   .0162895     2.59   0.009     .0103417    .0741952
    h_inc_d3 |   .0615039    .008394     7.33   0.000     .0450519    .0779559
    h_inc_d4 |   .0890686   .0120277     7.41   0.000     .0654947    .1126425
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .1864973    .028861     6.46   0.000     .1299307    .2430639
    fall2009 |   .1873346   .0332047     5.64   0.000     .1222545    .2524146
  spring2010 |   .0787516   .0172779     4.56   0.000     .0448876    .1126156
    fall2010 |   .0223898   .0287242     0.78   0.436    -.0339087    .0786883
  spring2011 |          0  (omitted)
          EU |   .0466898   .0329984     1.41   0.157    -.0179859    .1113655
        ExYu |   .0164928   .0561121     0.29   0.769     -.093485    .1264706
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

```
. probit ExpESagree i.CBA i.q22f_1 gdppc gdpg lgdpg inf linf un lun
CBA#q22f_1 i.CBA#c.gdppc i.CBA#c.gdpg i.CBA#c.lgdpg i.CBA#c.inf i.CBA#c.linf
i.CBA#c.un i.CBA#c.lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium
h_retired h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008
fall2008 spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu EU
ExYu[pweight = weight], vce(cluster country) nolog

note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity
note: EU omitted because of collinearity
note: ExYu omitted because of collinearity

Probit regression                                 Number of obs   =      40832
                                                  Wald chi2(8)    =          .
                                                  Prob > chi2     =          .
Log pseudolikelihood = -24359.927                 Pseudo R2       =     0.0880

                               (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
  ExpESagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   1.485591   .5816606     2.55   0.011     .3455574    2.625625
             |
      q22f_1 |
          2  |  -.1477704   .1358238    -1.09   0.277    -.4139802    .1184395
          3  |   -.456481    .157838    -2.89   0.004    -.7658379   -.1471241
          4  |  -.7645512   .1613295    -4.74   0.000    -1.080751   -.4483512
          5  |  -1.017984   .1512693    -6.73   0.000    -1.314467    -.721502
             |
       gdppc |  -1.18e-06   .0000133    -0.09   0.930    -.0000273     .000025
        gdpg |   .0508649    .008547     5.95   0.000      .034113    .0676168
       lgdpg |  -.0129965   .0124497    -1.04   0.297    -.0373976    .0114045
         inf |   .0235332   .0451069     0.52   0.602    -.0648748    .1119412
        linf |  -.0687025   .0359283    -1.91   0.056    -.1391206    .0017157
          un |   .0361811   .0418335     0.86   0.387     -.045811    .1181732
         lun |  -.0270294   .0380412    -0.71   0.477    -.1015888      .04753
             |
  CBA#q22f_1 |
         1 2 |  -.0094146   .1367814    -0.07   0.945    -.2775012     .258672
         1 3 |   .0615952   .1639351     0.38   0.707    -.2597116     .382902
         1 4 |   .1132402   .1797205     0.63   0.529    -.2390054    .4654858
         1 5 |   .0704982   .2138114     0.33   0.742    -.3485645    .4895609
             |
 CBA#c.gdppc |
          1  |   -.000214   .0000737    -2.90   0.004    -.0003585   -.0000695
             |
  CBA#c.gdpg |
          1  |   .0518602   .0266204     1.95   0.051    -.0003149    .1040353
             |
 CBA#c.lgdpg |
          1  |   .0092571   .0149411     0.62   0.536     -.020027    .0385412
             |
   CBA#c.inf |
          1  |  -.0731861   .0945357    -0.77   0.439    -.2584726    .1121004
             |
  CBA#c.linf |
          1  |   .1012788   .0831865     1.22   0.223    -.0617636    .2643213
             |
    CBA#c.un |
          1  |  -.0861229   .0093273    -9.23   0.000    -.1044041   -.0678416
             |
   CBA#c.lun |
          1  |   .0449326    .017967     2.50   0.012     .0097179    .0801473
             |
     h_aged2 |  -.0662319   .0316636    -2.09   0.036    -.1282914   -.0041725
     h_aged3 |  -.1053276   .0379397    -2.78   0.006    -.1796881   -.0309671
    h_female |   .0021836   .0166505     0.13   0.896    -.0304508     .034818
  h_edu_high |   .1212856   .0480526     2.52   0.012     .0271042    .2154671
h_edu_medium |   .0078786   .0347091     0.23   0.820      -.06015    .0759072
   h_retired |   .0314923   .0290781     1.08   0.279    -.0254998    .0884844
   h_student |   .1443992   .0345856     4.18   0.000     .0766127    .2121858
h_unemployed |  -.0184873   .0335612    -0.55   0.582     -.084266    .0472914
    h_inc_d1 |   .1127532   .0449837     2.51   0.012     .0245867    .2009196
```

```
      h_inc_d3 |   .1675145   .0262941     6.37   0.000     .1159791    .2190499
      h_inc_d4 |   .2500885   .0397753     6.29   0.000     .1721303    .3280467
    spring2008 |          0  (omitted)
      fall2008 |          0  (omitted)
    spring2009 |   .5260226   .0850481     6.19   0.000     .3593315    .6927137
      fall2009 |   .5354261   .0979377     5.47   0.000     .3434718    .7273804
    spring2010 |   .2321196   .0500412     4.64   0.000     .1340407    .3301985
      fall2010 |   .0750792   .0871805     0.86   0.389    -.0957915      .24595
    spring2011 |          0  (omitted)
            EU |   .1443451   .0917998     1.57   0.116    -.0355793    .3242695
          ExYu |   .0098705   .1506125     0.07   0.948    -.2853246    .3050656
            EU |          0  (omitted)
          ExYu |          0  (omitted)
         _cons |  -.0141503   .2406294    -0.06   0.953    -.4857751    .4574746
------------------------------------------------------------------------------

. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      40832
Model VCE    : Robust

Expression   : Pr(ExpESagree), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 gdppc gdpg lgdpg inf linf un
lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed
h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009 fall2009 spring2010
fall2010 spring2011 EU ExYu

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.1884554    .015449   -12.20   0.000    -.2187348   -.1581759
             |
      q22f_1 |
          2  |  -.0566183   .0395615    -1.43   0.152    -.1341573    .0209208
          3  |   -.170312   .0460897    -3.70   0.000    -.2606462   -.0799777
          4  |  -.2809025   .0472296    -5.95   0.000    -.3734708   -.1883341
          5  |   -.367357   .0452013    -8.13   0.000    -.4559499   -.2787641
             |
       gdppc |  -.0000148   6.81e-06    -2.18   0.029    -.0000282   -1.49e-06
        gdpg |   .0211732   .0028235     7.50   0.000     .0156392    .0267071
       lgdpg |  -.0038923   .0035654    -1.09   0.275    -.0108803    .0030958
         inf |   .0032432   .0113015     0.29   0.774    -.0189073    .0253936
        linf |  -.0170458   .0092959    -1.83   0.067    -.0352654    .0011739
          un |   .0067661   .0144083     0.47   0.639    -.0214737    .0350059
         lun |  -.0063633   .0137248    -0.46   0.643    -.0332634    .0205369
     h_aged2 |  -.0230165   .0109773    -2.10   0.036    -.0445316   -.0015014
     h_aged3 |  -.0366027   .0131813    -2.78   0.005    -.0624377   -.0107678
    h_female |   .0007588   .0057837     0.13   0.896    -.0105771    .0120947
  h_edu_high |   .0421484   .0165599     2.55   0.011     .0096916    .0746051
h_edu_medium |   .0027379   .0120631     0.23   0.820    -.0209054    .0263812
   h_retired |    .010944   .0100865     1.09   0.278    -.0088252    .0307131
   h_student |   .0501806   .0118455     4.24   0.000     .0269638    .0733975
h_unemployed |  -.0064246   .0116532    -0.55   0.581    -.0292644    .0164153
    h_inc_d1 |   .0391832   .0156755     2.50   0.012     .0084598    .0699067
    h_inc_d3 |   .0582135   .0093554     6.22   0.000     .0398773    .0765497
    h_inc_d4 |   .0869091   .0141448     6.14   0.000     .0591858    .1146323
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .1827998   .0297817     6.14   0.000     .1244287    .2411709
    fall2009 |   .1860676   .0335815     5.54   0.000     .1202491    .2518862
  spring2010 |   .0806646   .0173387     4.65   0.000     .0466813    .1146479
    fall2010 |    .026091   .0302892     0.86   0.389    -.0332747    .0854567
  spring2011 |          0  (omitted)
          EU |   .0501618    .031971     1.57   0.117    -.0125001    .1128238
        ExYu |   .0034301   .0523441     0.07   0.948    -.0991625    .1060227
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

**Appendix 6.18b: Subjective assessments - *Expectations about economic situation in a country (region as a cluster)**

```
. **with trust in government and interactions; controlled for group dummies
(EU and ExYu)
. probit ExpESagree i.CBA i.q22f_1 gdppc gdpg lgdpg inf linf un lun
CBA#q22f_1 i.CBA#c.gdppc i.CBA#c.gdpg i.CBA#c.lgdpg i.CBA#c.inf i.CBA#c.linf
i.CBA#c.un i.CBA#c.lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium
h_retired h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008
fall2008 spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu,
vce(cluster h_region) nolog

note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity

Probit regression                                 Number of obs   =      40832
                                                  Wald chi2(40)   =    2352.86
                                                  Prob > chi2     =     0.0000
Log pseudolikelihood = -25058.004                 Pseudo R2       =     0.0862

                              (Std. Err. adjusted for 71 clusters in h_region)
------------------------------------------------------------------------------
             |               Robust
  ExpESagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |    1.77919   1.030858     1.73   0.084    -.2412536    3.799635
             |
      q22f_1 |
          2  |  -.1377106   .0780543    -1.76   0.078    -.2906942     .015273
          3  |  -.4499712   .0854116    -5.27   0.000    -.6173748   -.2825675
          4  |  -.7626509   .0878159    -8.68   0.000    -.9347669   -.5905349
          5  |  -1.002083    .080207   -12.49   0.000    -1.159286   -.8448805
             |
       gdppc |  -6.17e-07   8.55e-06    -0.07   0.942    -.0000174    .0000161
        gdpg |   .0519816   .0096623     5.38   0.000     .0330439    .0709193
       lgdpg |  -.0152657   .0085012    -1.80   0.073    -.0319277    .0013963
         inf |   .0262861   .0279387     0.94   0.347    -.0284727    .0810449
        linf |  -.0731254   .0262145    -2.79   0.005     -.124505   -.0217458
          un |   .0317725   .0297882     1.07   0.286    -.0266114    .0901563
         lun |  -.0248064   .0265951    -0.93   0.351    -.0769317     .027319
             |
  CBA#q22f_1 |
        1 2  |  -.0360406   .1213543    -0.30   0.766    -.2738906    .2018094
        1 3  |   .0374416   .1156026     0.32   0.746    -.1891353    .2640185
        1 4  |   .1014195   .1178352     0.86   0.389    -.1295332    .3323721
        1 5  |   .0494376    .115984     0.43   0.670    -.1778869    .2767622
             |
 CBA#c.gdppc |
          1  |  -.0002429   .0001203    -2.02   0.043    -.0004786   -7.21e-06
             |
  CBA#c.gdpg |
          1  |   .0585344   .0460364     1.27   0.204    -.0316952     .148764
             |
 CBA#c.lgdpg |
          1  |   .0131603   .0206851     0.64   0.525    -.0273817    .0537022
             |
   CBA#c.inf |
          1  |  -.0849588   .1237212    -0.69   0.492    -.3274478    .1575302
             |
  CBA#c.linf |
          1  |   .1091577   .0991041     1.10   0.271    -.0850827    .3033981
             |
    CBA#c.un |
          1  |  -.0835897    .045244    -1.85   0.065    -.1722664     .005087
             |
   CBA#c.lun |
          1  |   .0357339   .0455494     0.78   0.433    -.0535413    .1250091
             |
     h_aged2 |  -.0714252   .0233012    -3.07   0.002    -.1170948   -.0257557
     h_aged3 |  -.0950748   .0331393    -2.87   0.004    -.1600266   -.0301229
    h_female |  -.0008272   .0140228    -0.06   0.953    -.0283114     .026657
  h_edu_high |   .1230199   .0325285     3.78   0.000     .0592653    .1867745
h_edu_medium |   .0081703   .0257818     0.32   0.751    -.0423611    .0587016
```

```
   h_retired |   .0410903     .02631     1.56   0.118    -.0104764    .0926569
   h_student |   .1330883    .041291     3.22   0.001     .0521595    .2140171
h_unemployed |   -.022706   .0258999    -0.88   0.381    -.0734688    .0280569
    h_inc_d1 |   .1208637   .0361829     3.34   0.001     .0499465    .1917809
    h_inc_d3 |   .1758661   .0212802     8.26   0.000     .1341578    .2175745
    h_inc_d4 |   .2546854    .030133     8.45   0.000     .1956257     .313745
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .5332758   .0738645     7.22   0.000     .3885041    .6780476
    fall2009 |     .53567   .0791627     6.77   0.000     .3805141     .690826
  spring2010 |   .2251846   .0596552     3.77   0.000     .1082625    .3421067
    fall2010 |   .0640221    .050568     1.27   0.205    -.0350894    .1631335
  spring2011 |          0  (omitted)
          EU |   .1335062   .1029714     1.30   0.195    -.0683139    .3353264
        ExYu |     .04716   .1270599     0.37   0.711    -.2018728    .2961929
       _cons |   .0059773   .1465767     0.04   0.967    -.2813077    .2932624
------------------------------------------------------------------------------

. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      40832
Model VCE    : Robust

Expression   : Pr(ExpESagree), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 gdppc gdpg lgdpg inf linf un
lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed
h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009 fall2009 spring2010
fall2010 spring2011 EU ExYu

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   -.198459     .02283    -8.69   0.000     -.243205    -.153713
             |
      q22f_1 |
          2  |  -.0548045    .024099    -2.27   0.023    -.1020377   -.0075713
          3  |  -.1697527    .025867    -6.56   0.000     -.220451   -.1190544
          4  |  -.2815875   .0264067   -10.66   0.000    -.3333437   -.2298312
          5  |  -.3646377   .0241902   -15.07   0.000    -.4120496   -.3172259
             |
       gdppc |  -.0000165   8.50e-06    -1.94   0.052    -.0000331    1.75e-07
        gdpg |   .0220995   .0041138     5.37   0.000     .0140366    .0301624
       lgdpg |  -.0044573   .0027461    -1.62   0.105    -.0098396    .0009251
         inf |   .0035025   .0112918     0.31   0.756     -.018629    .0256339
        linf |  -.0182623    .010022    -1.82   0.068    -.0379051    .0013805
          un |   .0055128   .0102007     0.54   0.589    -.0144802    .0255058
         lun |  -.0062819   .0094874    -0.66   0.508    -.0248769    .0123131
     h_aged2 |  -.0249788    .008117    -3.08   0.002    -.0408879   -.0090697
     h_aged3 |  -.0332496   .0115285    -2.88   0.004     -.055845   -.0106541
    h_female |  -.0002893   .0049043    -0.06   0.953    -.0099016     .009323
  h_edu_high |   .0430225   .0113297     3.80   0.000     .0208167    .0652283
h_edu_medium |   .0028573   .0090187     0.32   0.751    -.0148191    .0205337
   h_retired |   .0143701   .0091824     1.56   0.118    -.0036271    .0323673
   h_student |   .0465437   .0143898     3.23   0.001     .0183402    .0747471
h_unemployed |  -.0079407    .009051    -0.88   0.380    -.0256804    .0097989
    h_inc_d1 |   .0422685   .0125456     3.37   0.001     .0176795    .0668574
    h_inc_d3 |   .0615039   .0074016     8.31   0.000     .0469971    .0760108
    h_inc_d4 |   .0890686   .0104814     8.50   0.000     .0685255    .1096117
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .1864973    .025809     7.23   0.000     .1359125    .2370821
    fall2009 |   .1873346   .0275761     6.79   0.000     .1332864    .2413827
  spring2010 |   .0787516   .0208933     3.77   0.000     .0378014    .1197017
    fall2010 |   .0223898   .0177054     1.26   0.206    -.0123121    .0570917
  spring2011 |          0  (omitted)
          EU |   .0466898   .0359301     1.30   0.194    -.0237319    .1171115
        ExYu |   .0164928   .0444329     0.37   0.710     -.070594    .1035796
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

```
. probit ExpESagree i.CBA i.q22f_1 gdppc gdpg lgdpg inf linf un lun
CBA#q22f_1 i.CBA#c.gdppc i.CBA#c.gdpg i.CBA#c.lgdpg i.CBA#c.inf i.CBA#c.linf
i.CBA#c.un i.CBA#c.lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium
h_retired h_student h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008
fall2008 spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu EU
ExYu[pweight = weight], vce(cluster h_region) nolog

note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity
note: EU omitted because of collinearity
note: ExYu omitted because of collinearity

Probit regression                                 Number of obs   =      40832
                                                  Wald chi2(40)   =    1589.30
                                                  Prob > chi2     =     0.0000
Log pseudolikelihood = -24359.927                 Pseudo R2       =     0.0880

                              (Std. Err. adjusted for 71 clusters in h_region)
------------------------------------------------------------------------------
             |               Robust
  ExpESagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |   1.485591    1.08212     1.37   0.170    -.6353256    3.606508
             |
      q22f_1 |
          2  |  -.1477704   .0785415    -1.88   0.060    -.3017088     .006168
          3  |   -.456481   .0848056    -5.38   0.000     -.622697   -.2902651
          4  |  -.7645512   .0881741    -8.67   0.000    -.9373692   -.5917331
          5  |  -1.017984   .0818372   -12.44   0.000    -1.178382   -.8575866
             |
       gdppc |  -1.18e-06   8.59e-06    -0.14   0.891     -.000018    .0000157
        gdpg |   .0508649   .0097057     5.24   0.000      .031842    .0698878
       lgdpg |  -.0129965    .008677    -1.50   0.134    -.0300031      .00401
         inf |   .0235332   .0298818     0.79   0.431    -.0350342    .0821005
        linf |  -.0687025   .0284587    -2.41   0.016    -.1244805   -.0129244
          un |   .0361811   .0317653     1.14   0.255    -.0260778      .09844
         lun |  -.0270294   .0281807    -0.96   0.337    -.0822626    .0282038
             |
  CBA#q22f_1 |
        1 2  |  -.0094146   .1268644    -0.07   0.941    -.2580643    .2392351
        1 3  |   .0615952   .1169419     0.53   0.598    -.1676067     .290797
        1 4  |   .1132402   .1197147     0.95   0.344    -.1213962    .3478766
        1 5  |   .0704982    .117294     0.60   0.548    -.1593939    .3003903
             |
 CBA#c.gdppc |
          1  |   -.000214   .0001262    -1.70   0.090    -.0004613    .0000333
             |
  CBA#c.gdpg |
          1  |   .0518602   .0483749     1.07   0.284    -.0429529    .1466733
             |
 CBA#c.lgdpg |
          1  |   .0092571   .0207531     0.45   0.656    -.0314182    .0499324
             |
   CBA#c.inf |
          1  |  -.0731861     .13324    -0.55   0.583    -.3343317    .1879595
             |
  CBA#c.linf |
          1  |   .1012788   .1074815     0.94   0.346     -.109381    .3119387
             |
    CBA#c.un |
          1  |  -.0861229   .0434267    -1.98   0.047    -.1712377    -.001008
             |
   CBA#c.lun |
          1  |   .0449326     .04344     1.03   0.301    -.0402082    .1300735
             |
     h_aged2 |  -.0662319   .0242253    -2.73   0.006    -.1137126   -.0187513
     h_aged3 |  -.1053276   .0331586    -3.18   0.001    -.1703173   -.0403379
    h_female |   .0021836    .016262     0.13   0.893    -.0296894    .0340566
  h_edu_high |   .1212856   .0339593     3.57   0.000     .0547267    .1878446
h_edu_medium |   .0078786   .0261823     0.30   0.763    -.0434377    .0591949
   h_retired |   .0314923   .0279108     1.13   0.259    -.0232118    .0861964
   h_student |   .1443992    .043209     3.34   0.001     .0597111    .2290873
h_unemployed |  -.0184873   .0280643    -0.66   0.510    -.0734923    .0365178
    h_inc_d1 |   .1127532    .034475     3.27   0.001     .0451835    .1803229
```

```
    h_inc_d3 |   .1675145   .0236991     7.07   0.000      .121065     .213964
    h_inc_d4 |   .2500885   .0331809     7.54   0.000     .1850551    .3151219
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .5260226   .0824906     6.38   0.000     .3643439    .6877013
    fall2009 |   .5354261   .0837331     6.39   0.000     .3713121      .69954
  spring2010 |   .2321196   .0624414     3.72   0.000     .1097367    .3545025
    fall2010 |   .0750792   .0547768     1.37   0.170    -.0322814    .1824398
  spring2011 |          0  (omitted)
          EU |   .1443451   .1067198     1.35   0.176    -.0648218    .3535121
        ExYu |   .0098705   .1361078     0.07   0.942    -.2568959    .2766369
          EU |          0  (omitted)
        ExYu |          0  (omitted)
       _cons |  -.0141503   .1543724    -0.09   0.927    -.3167145     .288414
------------------------------------------------------------------------------

. margins, dydx(_all) post

Average marginal effects                          Number of obs   =      40832
Model VCE    : Robust

Expression   : Pr(ExpESagree), predict()
dy/dx w.r.t. : 1.CBA 2.q22f_1 3.q22f_1 4.q22f_1 5.q22f_1 gdppc gdpg lgdpg inf linf un
lun h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed
h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009 fall2009 spring2010
fall2010 spring2011 EU ExYu

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.1884554   .0274797    -6.86   0.000    -.2423145   -.1345962
             |
      q22f_1 |
          2  |  -.0566183   .0244431    -2.32   0.021    -.1045258   -.0087107
          3  |   -.170312   .0257581    -6.61   0.000    -.2207968   -.1198271
          4  |  -.2809025   .0265004   -10.60   0.000    -.3328424   -.2289626
          5  |   -.367357    .024527   -14.98   0.000     -.415429    -.319285
             |
       gdppc |  -.0000148   8.96e-06    -1.66   0.098    -.0000324    2.72e-06
        gdpg |   .0211732   .0042272     5.01   0.000      .012888    .0294583
       lgdpg |  -.0038923   .0028167    -1.38   0.167     -.009413    .0016284
         inf |   .0032432   .0121457     0.27   0.789     -.020562    .0270483
        linf |  -.0170458    .010815    -1.58   0.115    -.0382428    .0041513
          un |   .0067661   .0107917     0.63   0.531    -.0143852    .0279175
         lun |  -.0063633   .0099939    -0.64   0.524    -.0259509    .0132243
     h_aged2 |  -.0230165   .0083827    -2.75   0.006    -.0394463   -.0065867
     h_aged3 |  -.0366027   .0114402    -3.20   0.001     -.059025   -.0141804
    h_female |   .0007588   .0056502     0.13   0.893    -.0103154    .0118331
  h_edu_high |   .0421484   .0116852     3.61   0.000     .0192457     .065051
h_edu_medium |   .0027379   .0090953     0.30   0.763    -.0150885    .0205643
   h_retired |    .010944   .0096831     1.13   0.258    -.0080346    .0299226
   h_student |   .0501806   .0149752     3.35   0.001     .0208298    .0795314
h_unemployed |  -.0064246    .009742    -0.66   0.510    -.0255186    .0126694
    h_inc_d1 |   .0391832   .0118693     3.30   0.001     .0159198    .0624466
    h_inc_d3 |   .0582135   .0081975     7.10   0.000     .0421467    .0742803
    h_inc_d4 |   .0869091   .0114319     7.60   0.000      .064503    .1093151
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .1827998    .028691     6.37   0.000     .1265664    .2390332
    fall2009 |   .1860676   .0289667     6.42   0.000      .129294    .2428413
  spring2010 |   .0806646   .0217351     3.71   0.000     .0380646    .1232646
    fall2010 |    .026091   .0190492     1.37   0.171    -.0112448    .0634268
  spring2011 |          0  (omitted)
          EU |   .0501618   .0370076     1.36   0.175    -.0223717    .1226953
        ExYu |   .0034301   .0473009     0.07   0.942    -.0892779    .0961381
------------------------------------------------------------------------------
Note: dy/dx for factor levels is the discrete change from the base level.
```

**Appendix 6.19: Multinomial probits (with 'do not know' category and without interaction terms) and comparison with probits without the interaction terms**

**Perceptions about the economic situation in a country**

```
. tab q1_01, missing

   Currently, the |
         economic |
  situation of [MY |
  COUNTRY] is very |
              good |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree |        571        1.17        1.17
            Agree |      1,714        3.50        4.66
   Somewhat agree |      4,810        9.82       14.48
Somewhat disagree |      7,744       15.81       30.29
         Disagree |     13,956       28.48       58.77
Strongly disagree |     19,149       39.08       97.85
      Do not know |        845        1.72       99.58
        No answer |        208        0.42      100.00
------------------+-----------------------------------
            Total |     48,997      100.00

. drop if q1_01==9
(208 observations deleted)
```

**Multinomial perceptions model (dnk incdluded, interation terms excluded)**

```
. *for multinomial (perceptions about the economic situation)
. generate MESagree=0

. replace MESagree=1 if  q1_01==4 |  q1_01==5 |  q1_01==6
(40849 real changes made)

. replace MESagree=2 if  q1_01==8
(845 real changes made)

. replace MESagree=3 if  q1_01==1 |  q1_01==2 |  q1_01==3
(7095 real changes made)

. drop if MESagree==0
(0 observations deleted)

. mprobit MESagree i.CBA i.q22f_1 gpdpc gdpg lgdpg inf linf un lun h_aged2
h_aged3 h_female h_e
> du_high h_edu_medium h_retired h_student h_unemployed h_inc_d1 h_inc_d3
h_inc_d4 spring2008 f
> all2008 spring2009 fall2009 spring2010 fall2010 spring2011 EU ExYu
[pweight = weight], vce(cl
> uster country) nolog
note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity

Multinomial probit regression                     Number of obs   =      48789
                                                  Wald chi2(7)    =          .
Log pseudolikelihood = -20979.722                 Prob > chi2     =          .

                            (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
    MESagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1            |  (base outcome)
-------------+----------------------------------------------------------------
2            |
       1.CBA |   -.421208   .1739341    -2.42   0.015    -.7621125   -.0803035
```

```
             |
     q22f_1 |
          2  |  -.3085397   .1253617    -2.46   0.014    -.5542442   -.0628352
          3  |  -.3280448   .1092325    -3.00   0.003    -.5421366   -.1139529
          4  |  -.5589871    .132154    -4.23   0.000    -.8180042     -.29997
          5  |  -.5721847   .1270423    -4.50   0.000     -.821183   -.3231864
          8  |   1.011981   .1617604     6.26   0.000     .6949369    1.329026
             |
       gpdpc |  -.0000758    .000043    -1.76   0.078      -.00016    8.41e-06
        gdpg |   .0820697   .0330147     2.49   0.013     .0173621    .1467774
       lgdpg |   .0920704   .0343485     2.68   0.007     .0247486    .1593922
         inf |   .0209492   .0865296     0.24   0.809    -.1486456    .1905441
        linf |  -.1092435   .0666642    -1.64   0.101    -.2399029    .0214159
          un |  -.0898081    .074125    -1.21   0.226    -.2350904    .0554742
         lun |    .000667   .0677844     0.01   0.992    -.1321879    .1335219
     h_aged2 |  -.1388631   .0548727    -2.53   0.011    -.2464117   -.0313145
     h_aged3 |  -.0600093   .0657616    -0.91   0.361    -.1888997    .0688811
    h_female |   .1446382   .0506566     2.86   0.004      .045353    .2439234
  h_edu_high |  -.4207703   .1285525    -3.27   0.001    -.6727286    -.168812
h_edu_medium |  -.2759745   .1006606    -2.74   0.006    -.4732655   -.0786834
   h_retired |   .1039608   .0777917     1.34   0.181    -.0485081    .2564296
   h_student |   .1388329   .0950523     1.46   0.144    -.0474661    .3251319
h_unemployed |   .0632302   .0918092     0.69   0.491    -.1167125     .243173
    h_inc_d1 |   .1148062   .0677948     1.69   0.090    -.0180693    .2476816
    h_inc_d3 |  -.2160305    .073195    -2.95   0.003      -.35949   -.0725711
    h_inc_d4 |  -.1786169   .1032621    -1.73   0.084    -.3810068     .023773
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .9215578    .244806     3.76   0.000     .4417467    1.401369
    fall2009 |   1.282406   .1691299     7.58   0.000     .9509174    1.613894
  spring2010 |    .852405   .1781438     4.78   0.000     .5032496    1.201561
    fall2010 |   .1149388   .1658123     0.69   0.488    -.2100473    .4399249
  spring2011 |          0  (omitted)
          EU |   2.194222    .335137     6.55   0.000     1.537366    2.851079
        ExYu |   2.674077   .5924567     4.51   0.000     1.512883    3.835271
       _cons |  -2.634832   .6414322    -4.11   0.000    -3.892016   -1.377648
-------------+----------------------------------------------------------------
3            |
       1.CBA |  -.5571321   .1249791    -4.46   0.000    -.8020865   -.3121776
             |
      q22f_1 |
          2  |  -.2518528   .1449305    -1.74   0.082    -.5359114    .0322059
          3  |  -.6427567   .1549757    -4.15   0.000    -.9465035     -.33901
          4  |  -1.012043   .2116585    -4.78   0.000    -1.426886   -.5971998
          5  |  -1.376904   .2027385    -6.79   0.000    -1.774264   -.9795438
          8  |   -.680827   .2030977    -3.35   0.001    -1.078891   -.2827629
             |
       gpdpc |  -.0000518   .0000319    -1.62   0.104    -.0001143    .0000107
        gdpg |   .0999652   .0273532     3.65   0.000     .0463538    .1535765
       lgdpg |   .0644139   .0274204     2.35   0.019     .0106709    .1181569
         inf |  -.0696822   .0806376    -0.86   0.388    -.2277291    .0883646
        linf |   -.042264   .0721621    -0.59   0.558     -.183699    .0991711
          un |  -.0767206   .0510029    -1.50   0.133    -.1766845    .0232432
         lun |   .0452086   .0547463     0.83   0.409     -.062092    .1525093
     h_aged2 |  -.0638336    .041661    -1.53   0.125    -.1454877    .0178204
     h_aged3 |  -.0872652   .0549975    -1.59   0.113    -.1950584     .020528
    h_female |  -.0413644   .0180435    -2.29   0.022     -.076729   -.0059997
  h_edu_high |   .1304651   .0953655     1.37   0.171    -.0564479    .3173781
h_edu_medium |   .0299316   .0728441     0.41   0.681    -.1128401    .1727034
   h_retired |  -.0802017    .060778    -1.32   0.187    -.1993244    .0389209
   h_student |   .0774172   .0854287     0.91   0.365     -.09002     .2448543
h_unemployed |  -.0228555      .0705    -0.32   0.746    -.1610329    .1153219
    h_inc_d1 |   -.051076    .058061    -0.88   0.379    -.1648734    .0627214
    h_inc_d3 |   .0675252    .052945     1.28   0.202    -.0362452    .1712955
    h_inc_d4 |   .1646683    .035982     4.58   0.000     .0941449    .2351917
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .9621442   .2229591     4.32   0.000     .5251523    1.399136
    fall2009 |   .9604317   .1765764     5.44   0.000     .6143483    1.306515
  spring2010 |   .5583662    .186741     2.99   0.003     .1923605    .9243719
    fall2010 |    .152989     .16933     0.90   0.366    -.1788917    .4848697
  spring2011 |          0  (omitted)
          EU |   .6147369    .273182     2.25   0.024     .0793101    1.150164
        ExYu |   .7793424   .4403949     1.77   0.077    -.0838157    1.642501
       _cons |  -.4254379   .4844977    -0.88   0.380    -1.375036    .5241602
------------------------------------------------------------------------------
```

***Probit perceptions model (no dnk) interaction terms excluded**

```
. drop if q1_01==8
(845 observations deleted)

.
. generate ESagree=0

. replace ESagree=1 if  q1_01==1 |  q1_01==2 |  q1_01==3
(7095 real changes made)


tab q1_01 ESagree, missing

   Currently, the |
         economic |
  situation of [MY |
  COUNTRY] is very |        ESagree
             good |         0          1 |     Total
------------------+----------------------+----------
   Strongly agree |         0        571 |       571
            Agree |         0      1,714 |     1,714
   Somewhat agree |         0      4,810 |     4,810
Somewhat disagree |     7,744          0 |     7,744
         Disagree |    13,956          0 |    13,956
Strongly disagree |    19,149          0 |    19,149
------------------+----------------------+----------
            Total |    40,849      7,095 |    47,944

. probit ESagree i.CBA i.q22f_1 gpdpc gdpg lgdpg inf linf un lun h_aged2
h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed
h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009 fall2009
spring2010 fall2010 spring2011 EU ExYu [pweight = weight], vce(cluster
country) nolog

note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity

Probit regression                                 Number of obs   =      47944
                                                  Wald chi2(8)    =          .
                                                  Prob > chi2     =          .
Log pseudolikelihood = -17157.756                 Pseudo R2       =     0.1204

                              (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
     ESagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.3882001   .0883593    -4.39   0.000    -.5613812   -.2150189
             |
      q22f_1 |
          2  |  -.1770382   .1027016    -1.72   0.085    -.3783297    .0242533
          3  |  -.4585276   .1102165    -4.16   0.000    -.6745479   -.2425074
          4  |  -.7197175   .1502158    -4.79   0.000    -1.014135   -.4252999
          5  |  -.9822554   .1441878    -6.81   0.000    -1.264858   -.6996524
          8  |  -.5244681   .1380446    -3.80   0.000    -.7950306   -.2539055
             |
       gpdpc |  -.0000352   .0000222    -1.59   0.112    -.0000786    8.25e-06
        gdpg |   .0712601   .0198284     3.59   0.000     .0323971    .1101231
       lgdpg |   .0448614   .0194202     2.31   0.021     .0067986    .0829243
         inf |  -.0489688   .0566941    -0.86   0.388    -.1600872    .0621497
        linf |  -.0296208   .0509037    -0.58   0.561    -.1293901    .0701486
          un |  -.0535161   .0363592    -1.47   0.141    -.1247788    .0177467
         lun |   .0323824   .0393257     0.82   0.410    -.0446946    .1094595
     h_aged2 |  -.0427379    .029417    -1.45   0.146    -.1003941    .0149184
     h_aged3 |  -.0629649   .0397159    -1.59   0.113    -.1408066    .0148767
    h_female |  -.0322482   .0132472    -2.43   0.015    -.0582122   -.0062842
  h_edu_high |   .0997339   .0667408     1.49   0.135    -.0310756    .2305434
h_edu_medium |   .0253639    .052037     0.49   0.626    -.0766267    .1273546
   h_retired |  -.0599637   .0421937    -1.42   0.155    -.1426619    .0227344
```

```
   h_student |   .0557709   .0608125     0.92   0.359    -.0634193    .1749611
h_unemployed |  -.0128946   .0501739    -0.26   0.797    -.1112337    .0854445
    h_inc_d1 |  -.0383262   .0408755    -0.94   0.348    -.1184408    .0417883
    h_inc_d3 |   .0550249   .0385762     1.43   0.154    -.0205831    .1306329
    h_inc_d4 |   .1215234   .0257322     4.72   0.000     .0710893    .1719576
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .6821184   .1585472     4.30   0.000     .3713716    .9928651
    fall2009 |   .6778877   .1279946     5.30   0.000     .4270229    .9287525
  spring2010 |   .3899604   .1346854     2.90   0.004     .1259818     .653939
    fall2010 |   .1109357     .120145     0.92   0.356    -.1245443    .3464156
  spring2011 |          0  (omitted)
          EU |   .4182277   .1948645     2.15   0.032     .0363003    .8001551
        ExYu |   .5284134   .3074271     1.72   0.086    -.0741327     1.13096
       _cons |  -.3279713   .3380073    -0.97   0.332    -.9904534    .3345109
------------------------------------------------------------------------------

.
```

**Expectations about the economic siatution in a country**

```
. tab q1_02, missing

    Over the next |
  five years, the |
         economic |
 situation of [MY |
    COUNTRY] will |
          improve |      Freq.     Percent        Cum.
------------------+-----------------------------------
   Strongly agree |      1,257        2.57        2.57
            Agree |      4,766        9.73       12.29
   Somewhat agree |     11,567       23.61       35.90
Somewhat disagree |      9,163       18.70       54.60
         Disagree |      9,889       20.18       74.78
Strongly disagree |      8,162       16.66       91.44
      Do not know |      3,815        7.79       99.23
        No answer |        378        0.77      100.00
------------------+-----------------------------------
            Total |     48,997      100.00
```

**Multinomial expectations model (with dnk group and no interaction terms)**

```
drop if q1_02==9

. *for multinomial (expectations about the economic situation)
. generate MExpESagree=0

. replace MExpESagree=1 if  q1_02==4 |  q1_02==5 |  q1_02==6
(27214 real changes made)

. replace MExpESagree=2 if  q1_02==8
(3815 real changes made)

. replace MExpESagree=3 if  q1_02==1 |  q1_02==2 |  q1_02==3
(17590 real changes made)

. drop if MExpESagree==0
(0 observations deleted)

. mprobit MExpESagree i.CBA i.q22f_1 gpdpc gdpg lgdpg inf linf un lun
h_aged2 h_aged3 h_female h_edu_high h_edu_medium h_retired h_student
h_unemployed h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009
fall2009 spring2010 fall2010 spring2011 EU ExYu EU ExYu[pweight = weight],
vce(cluster country) nolog

note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity
note: EU omitted because of collinearity
note: ExYu omitted because of collinearity
```

```
Multinomial probit regression                     Number of obs   =      48619
                                                  Wald chi2(7)    =          .
Log pseudolikelihood = -39482.517                 Prob > chi2     =          .

                            (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
 MExpESagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
1            |  (base outcome)
-------------+----------------------------------------------------------------
2            |
       1.CBA |  -.5763391   .1065122    -5.41   0.000    -.7850993    -.367579
             |
      q22f_1 |
          2  |  -.1210399     .12147    -1.00   0.319    -.3591168    .1170369
          3  |  -.1668611   .1075108    -1.55   0.121    -.3775783    .0438562
          4  |  -.4028524   .1100234    -3.66   0.000    -.6184943   -.1872106
          5  |  -.5275517   .0994335    -5.31   0.000    -.7224378   -.3326656
          8  |   .6917325   .1445285     4.79   0.000     .4084619    .9750032
             |
       gpdpc |  -.0000496   .0000119    -4.17   0.000    -.0000729   -.0000262
        gdpg |   .0280574     .01735     1.62   0.106     -.005948    .0620629
       lgdpg |   .0582985   .0118387     4.92   0.000     .0350952    .0815019
         inf |  -.0066684   .0542421    -0.12   0.902     -.112981    .0996441
        linf |  -.0471587   .0458579    -1.03   0.304    -.1370386    .0427211
          un |  -.0679785   .0443266    -1.53   0.125    -.1548571    .0189001
         lun |   .0188422   .0412534     0.46   0.648     -.062013    .0996974
     h_aged2 |  -.0525363   .0327051    -1.61   0.108    -.1166371    .0115645
     h_aged3 |  -.0398542   .0361226    -1.10   0.270    -.1106532    .0309448
    h_female |   .1568288   .0317182     4.94   0.000     .0946623    .2189953
  h_edu_high |  -.2111094   .0890122    -2.37   0.018    -.3855702   -.0366487
h_edu_medium |  -.1717483   .0606605    -2.83   0.005    -.2906408   -.0528559
   h_retired |   .1026231   .0576181     1.78   0.075    -.0103063    .2155524
   h_student |   .1047327   .0731371     1.43   0.152    -.0386134    .2480787
h_unemployed |   .0860522   .0655549     1.31   0.189    -.0424331    .2145375
    h_inc_d1 |   .1869073    .075973     2.46   0.014     .0380031    .3358116
    h_inc_d3 |  -.1091793   .0238394    -4.58   0.000    -.1559037   -.0624549
    h_inc_d4 |  -.0688452   .0517224    -1.33   0.183    -.1702191    .0325288
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .3786784   .1424221     2.66   0.008     .0995363    .6578206
    fall2009 |   .6857763   .1168952     5.87   0.000      .456666    .9148867
  spring2010 |   .4348849   .1076785     4.04   0.000     .2238389    .6459309
    fall2010 |  -.0178572   .0963085    -0.19   0.853    -.2066184     .170904
  spring2011 |          0  (omitted)
          EU |   1.197418   .1345005     8.90   0.000     .9338014    1.461034
        ExYu |   1.201814   .1707367     7.04   0.000     .8671758    1.536451
          EU |          0  (omitted)
        ExYu |          0  (omitted)
       _cons |  -1.002482   .2092178    -4.79   0.000    -1.412542   -.5924228
-------------+----------------------------------------------------------------
3            |
       1.CBA |  -.3448771   .1306258    -2.64   0.008    -.6008989   -.0888553
             |
      q22f_1 |
          2  |  -.2072232   .1383268    -1.50   0.134    -.4783388    .0638923
          3  |  -.6197928   .1663803    -3.73   0.000    -.9458921   -.2936935
          4  |  -1.034944   .1756033    -5.89   0.000    -1.379121   -.6907684
          5  |  -1.378223    .162283    -8.49   0.000    -1.696292   -1.060154
          8  |  -.9096707    .180996    -5.03   0.000    -1.264416    -.554925
             |
       gpdpc |  -1.94e-06   .0000224    -0.09   0.931    -.0000459     .000042
        gdpg |   .0463567   .0134452     3.45   0.001     .0200045    .0727089
       lgdpg |   .0016412   .0141042     0.12   0.907    -.0260027     .029285
         inf |   .0164777   .0589506     0.28   0.780    -.0990633    .1320188
        linf |  -.0589067   .0478743    -1.23   0.219    -.1527387    .0349253
          un |   .0246969   .0491029     0.50   0.615     -.071543    .1209368
         lun |  -.0139726    .044882    -0.31   0.756    -.1019397    .0739945
     h_aged2 |  -.1014515   .0443303    -2.29   0.022    -.1883372   -.0145657
     h_aged3 |   -.140167   .0564601    -2.48   0.013    -.2508267   -.0295072
    h_female |   .0009766   .0237605     0.04   0.967    -.0455931    .0475463
  h_edu_high |   .1737109   .0583485     2.98   0.003       .05935    .2880719
h_edu_medium |   .0153793   .0470527     0.33   0.744    -.0768424     .107601
   h_retired |   .0279712   .0392608     0.71   0.476    -.0489785     .104921
   h_student |    .186568   .0495761     3.76   0.000     .0894005    .2837354
```

```
h_unemployed |  -.0191213   .0480737    -0.40   0.691    -.1133441    .0751015
    h_inc_d1 |   .1427985   .0611855     2.33   0.020     .0228772    .2627198
    h_inc_d3 |   .2155027   .0309938     6.95   0.000     .1547559    .2762495
    h_inc_d4 |   .3273626   .0524275     6.24   0.000     .2246066    .4301187
  spring2008 |          0  (omitted)
    fall2008 |          0  (omitted)
  spring2009 |   .6076461   .1286704     4.72   0.000     .3554568    .8598355
    fall2009 |    .639581   .1448706     4.41   0.000     .3556399    .9235222
  spring2010 |   .3140802   .0819859     3.83   0.000     .1533908    .4747695
    fall2010 |   .1288611   .1050833     1.23   0.220    -.0770983    .3348205
  spring2011 |          0  (omitted)
          EU |   .1895243   .1698542     1.12   0.265    -.1433839    .5224324
        ExYu |  -.0559184   .2485309    -0.22   0.822    -.5430301    .4311932
          EU |          0  (omitted)
        ExYu |          0  (omitted)
       _cons |  -.0154098   .3987294    -0.04   0.969     -.796905    .7660854
------------------------------------------------------------------------------
```

**Probit expectations model – no dnk and no interactions**

```
. drop if q1_02==8
(3815 observations deleted)

. generate ExpESagree=0

. replace ExpESagree=1 if  q1_02==1 |  q1_02==2 |  q1_02==3
(17590 real changes made)

. tab q1_02 ExpESagree, missing

    Over the next |
  five years, the |
         economic |
 situation of [MY |
    COUNTRY] will |      ExpESagree
          improve |         0          1 |     Total
------------------+----------------------+----------
   Strongly agree |         0      1,257 |     1,257
            Agree |         0      4,766 |     4,766
   Somewhat agree |         0     11,567 |    11,567
Somewhat disagree |     9,163          0 |     9,163
         Disagree |     9,889          0 |     9,889
Strongly disagree |     8,162          0 |     8,162
------------------+----------------------+----------
            Total |    27,214     17,590 |    44,804
. probit ExpESagree i.CBA i.q22f_1 gpdpc gdpg lgdpg inf linf un lun h_aged2
h_aged3 h_female h_edu_high h_edu_medium h_retired h_student h_unemployed
h_inc_d1 h_inc_d3 h_inc_d4 spring2008 fall2008 spring2009 fall2009
spring2010 fall2010 spring2011 EU ExYu [pweight = weight], vce(cluster
country) nolog

note: spring2008 omitted because of collinearity
note: fall2008 omitted because of collinearity
note: spring2011 omitted because of collinearity

Probit regression                                 Number of obs   =      44804
                                                  Wald chi2(8)    =          .
                                                  Prob > chi2     =          .
Log pseudolikelihood = -26825.424                 Pseudo R2       =     0.0837

                             (Std. Err. adjusted for 10 clusters in country)
------------------------------------------------------------------------------
             |               Robust
  ExpESagree |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       1.CBA |  -.2447416   .0959269    -2.55   0.011    -.4327549   -.0567282
             |
     q22f_1 |
          2  |  -.1503669   .0995376    -1.51   0.131    -.3454569    .0447232
          3  |  -.4491461   .1189124    -3.78   0.000    -.6822101   -.2160821
          4  |  -.7523661   .1257815    -5.98   0.000    -.9988933   -.5058389
          5  |  -1.001901   .1165112    -8.60   0.000    -1.230259   -.7735437
```

```
           8  |  -.6805531   .1287364    -5.29   0.000    -.9328719   -.4282343
              |
        gpdpc |  -5.47e-07   .0000169    -0.03   0.974    -.0000336    .0000325
         gdpg |   .0339117   .0101298     3.35   0.001     .0140576    .0537658
        lgdpg |   .0010238   .0103951     0.10   0.922    -.0193503    .0213979
          inf |   .0119211   .0434042     0.27   0.784    -.0731496    .0969917
         linf |  -.0433036   .0344837    -1.26   0.209    -.1108903    .0242832
           un |    .021135   .0356618     0.59   0.553     -.048761    .0910309
          lun |  -.0127816   .0325319    -0.39   0.694     -.076543    .0509798
      h_aged2 |  -.0692598   .0324587    -2.13   0.033    -.1328777   -.0056418
      h_aged3 |  -.1016431    .040072    -2.54   0.011    -.1801826   -.0231035
     h_female |  -.0014063   .0173503    -0.08   0.935    -.0354123    .0325996
   h_edu_high |   .1263511   .0437932     2.89   0.004     .0405179    .2121842
 h_edu_medium |   .0112717   .0346779     0.33   0.745    -.0566957    .0792391
    h_retired |   .0173363   .0279129     0.62   0.535    -.0373719    .0720445
    h_student |   .1393883   .0355079     3.93   0.000     .0697942    .2089824
 h_unemployed |  -.0093097   .0341093    -0.27   0.785    -.0761628    .0575434
     h_inc_d1 |   .1001607   .0433827     2.31   0.021     .0151321    .1851893
     h_inc_d3 |   .1620532   .0224766     7.21   0.000     .1179999    .2061064
     h_inc_d4 |    .242279   .0383755     6.31   0.000     .1670643    .3174937
   spring2008 |          0  (omitted)
     fall2008 |          0  (omitted)
   spring2009 |   .4447649   .0939907     4.73   0.000     .2605464    .6289834
     fall2009 |   .4705363   .1078354     4.36   0.000     .2591828    .6818899
   spring2010 |   .2269547   .0609604     3.72   0.000     .1074745     .346435
     fall2010 |   .0936596   .0756222     1.24   0.216    -.0545573    .2418764
   spring2011 |          0  (omitted)
           EU |   .1288353   .1265158     1.02   0.309     -.119131    .3768017
         ExYu |  -.0507254   .1825957    -0.28   0.781    -.4086064    .3071557
        _cons |  -.0265767   .2960729    -0.09   0.928     -.606869    .5537155
------------------------------------------------------------------------------
```