**Table 1. Variable descriptions**

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable name** | **Description** | **Expected sign** | **Data source** |
| emsh | Exports of goods of country *i* over total exports of goods of EU-28 (in percentages) | Dep. variable | Own calculations based on UNCTAD database (2013) |
| sedut | The percentage of population aged 15 and over who have attained secondary education  | + | Barro and Lee (2014)  |
| tedut | The percentage of population aged 15 and over who have attained tertiary education  | + |
| avyrs | The average number of years of schooling of the population aged 15 and over | + |
| cskills | Average test score in mathematics and science, primary through end of secondary school, all years (scaled to the PISA scale divided by 100) (averaged across time) | + | Hanushek and Woessmann (2009) |
| meanscores | Mean scores of students at international assessments (primary and secondary education) (averaged across time) | + | Altinok et al. (2014) |
| studperf | Adjusted mean scores of students of secondary education in various assessments (1965-2010) | + | Altinok et al. (2014) |
| patappr | Number of patent applications by residents  | + | WDI – World Bank (2014) |
| fdi | Inward foreign direct investment stock (% GDP)  | + | UNCTAD (2014) |
| gdpc | GDP per capita (constant 2005 US$) | + | WDI – World Bank (2014) |
| pop | Total population (in thousands) | + | Penn World Table 7.1 (Heston et al., 2012)  |
| rulc | Real unit labour cost index (2005=100) | - | Eurostat (2014) |
| transindN | Transition indicator (average of a set of single indicators - normalized from 0 to 1)  | + | EBRD (2014) |
| ecofree | Index of Economic Freedom (overall score based on a set of 10 factors)  | + | The Heritage Foundation (2014) |
| unem  | Skills mismatch: Long-term unemployment (% of total unemployment)  | - | WDI – World Bank (2014) |
| serv | Services, etc. , value added (% of GDP) | - | WDI – World Bank (2014) |

**Table 2. Descriptive statistics**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **CEECs** | **EEA17** | **t-test** | **K. Wallis** |
|  | Obs. | Mean | Std. Dev. | Obs. | Mean | Std. Dev. | p-value | p. values |
| emsh | 134 | .7916021  | .7617393  | 215 | 6.816349  | 8.240806  | 0.0000 | 0.0001 |
| sedut | 134 | 70.73351  | 10.51806  | 215 | 53.21805  | 10.92474  | 0.0000 | 0.0001 |
| tedut | 134 | 15.89873  | 5.333638  | 215 | 20.71307  | 5.294638  | 0.0000 | 0.0001 |
| avyrs | 134 | 11.11112 | .9684657 | 215 | 10.19423 | 1.199015 | 0.0000 | 0.0001 |
| sqravyrs | 134 | 124.3879 | 21.46285 | 215 | 105.3533 | 23.40039 | 0.0000 | 0.0001 |
| patappr | 134 | 526.5746  | 598.8432  | 215 | 6915.116  | 12452.54  | 0.0000 | 0.0001 |
| cskills | 140 | 4.929907 | .1911162 | 226 | 4.916854 | .1796002 | 0.5101 | 0.3147 |
| meanscores | 140 | 566.0786 | 20.14482 | 226 | 574.8496 | 20.0868 | 0.0001 | 0.0001 |
| studperf | 123 | 561.4645  | 22.43789  | 199 | 565.772  | 22.28011  | 0.0937 | 0.0514 |
| fdi | 134 | 40.00946  | 21.98783  | 215 | 50.62089  | 51.14798  | 0.0236 | 0.9393 |
| gdpc | 134 | 8997.269  | 4175.677  | 215 | 38962.33  | 14453.93  | 0.0000 | 0.0001 |
| pop | 134 | 9106.06  | 9274.889  | 215 | 22956.18  | 26202.81  | 0.0000 | 0.0001 |
| unem | 134 | 46.4403 | 13.02313 | 215 | 31.97395 | 13.67586 | 0.0000 | 0.0001 |
| ecofree | 134 | 63.22015  | 7.539927  | 215 | 69.90419  | 5.87904  | 0.0000 | 0.0001 |
| serv | 134 | 62.11145 | 6.210989 | 215 | 70.61646 | 5.981306 | 0.0000 | 0.0001 |
| rulc | 134 | 102.2284  | 5.823399  | 215 | 101.846  | 3.904008  | 0.4635 | 0.7050 |
| transindN | 134 | .8220978 | .0879235 | NA | NA | NA | NA | NA |

Notes:

(1) The null hypothesis for the t-test is that there is no difference in the mean values between CEECs and EEA17.

(2) The null hypothesis for Kruskal-Wallis test is that the two groups of countries (i.e. CEECs and EEA17) come from the same population.

**Table 3. IV estimation results**

|  |  |  |
| --- | --- | --- |
|  | **Specification 1** | **Specification 2** |
|  | **CEECs**  | **EEA17** | **CEECs** | **EEA17** |
| VARIABLES | lnemsh | lnemsh | lnemsh | lnemsh |
|  |  |  |  |  |
| lnsedut | 1.164\*\*\* | 0.0542 |  |  |
|  | (0.43) | (0.177) |  |  |
|  |  |  |  |  |
| lntedut | 0.515\* | 0.290\* |  |  |
|  | (0.283) | (0.154) |  |  |
|  |  |  |  |  |
| avyrs |  |  | -0.305 | -0.208 |
|  |  |  | (0.885) | (0.177) |
|  |  |  |  |  |
| sqravyrs |  |  | 0.0346 | 0.0095 |
|  |  |  | (0.0353) | (0.00871) |
|  |  |  |  |  |
| lnpatappr | 0.16 | 0.146\*\* | 0.0713 | 0.133\*\* |
|  | (0.105) | (0.0565) | (0.144) | (0.0547) |
|  |  |  |  |  |
| lnfdi | 0.0553 | 0.0065 | 0.0395 | 0.0108\*\* |
|  | (0.0831) | (0.0047) | (0.073) | (0.00444) |
|  |  |  |  |  |
| lngdpc | 0.940\*\*\* | 0.0498 | 0.645\*\* | 0.0974 |
|  | (0.284) | (0.244) | (0.252) | (0.237) |
|  |  |  |  |  |
| lnpop | 5.427\*\*\* | -0.115 | 5.147\* | 0.26 |
|  | (1.67) | (0.419) | (2.783) | (0.37) |
|  |  |  |  |  |
| unem | -0.00303 | 0.000703 | -0.003 | 0.000764 |
|  | (0.00205) | (0.00083) | (0.002) | (0.0008) |
|  |  |  |  |  |
| lnecofree | -0.964\*\*\* | -0.139 | -0.958\*\* | -0.21 |
|  | (0.352) | (0.225) | (0.38) | (0.23) |
|  |  |  |  |  |
| lnrulc | -0.735\* | -0.556\* | -0.863\*\* | -0.583\*\* |
|  | (0.407) | (0.289) | (0.432) | (0.281) |
|  |  |  |  |  |
| serv | 0.0167 | -0.0364\*\*\* | 0.0157 | -0.0365\*\*\* |
|  | (0.0114) | (0.00508) | (0.0113) | (0.005) |
|  |  |  |  |  |
| transindN | 0.274 |  | 0.653 |  |
|  | (0.47) |  | (0.51) |  |
|  |  |  |  |  |
| No. of obs. | 134 | 215 | 134 | 215 |
| R-squared | 0.899 | 0.639 | 0.910 | 0.643 |
| No. of countries | 10 | 17 | 10 | 17 |

Notes: (1) Year dummies are included in the estimations but are not reported in the table

 (2) \*\*\*p<0.01, \*\*p<0.05, \*p<0.1; Robust standard errors in parentheses;

**Table 4. FEVD and HT estimation results**

|  |  |  |
| --- | --- | --- |
|  | **Specification 1** | **Specification 2** |
|  | CEECs | EEA17 | CEECs | EEA17 | CEECs | EEA17 | CEECs | EEA17 |
|  | **FEVD** | **FEVD** | **HT** | **HT** | **FEVD** | **FEVD** | **HT** | **HT** |
| VARIABLES | lnemsh | lnemsh | lnemsh | lnemsh | lnemsh | lnemsh | lnemsh | lnemsh |
|  |  |  |  |  |  |  |  |  |
| **cskills** | **12.32** | **3.226** | **8.654** | **3.151\*\*\*** | **12.14** | **3.000** | **7.363** | **3.168\*\*\*** |
|  | **(21.94)** | **(3.895)** | **(8.281)** | **(1.202)** | **(28.27)** | **(11.07)** | **(9.167)** | **(0.987)** |
|  |  |  |  |  |  |  |  |  |
| **meanscores** | **0.136** | **0.0282** | **0.101** | **0.0297\*\*\*** | **0.139** | **0.0281** | **0.0916** | **0.0296\*\*\*** |
|  | **(0.278)** | **(0.0728)** | **(0.0771)** | **(0.00942)** | **(0.421)** | **(0.428)** | **(0.0857)** | **(0.00739)** |
|  |  |  |  |  |  |  |  |  |
| lnsedut | 1.094 | 0.00503 | 0.884\*\*\* | 0.0247 |  |  |  |  |
|  | (10.34) | (4.714) | (0.258) | (0.0912) |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| lntedut | 0.347 | 0.109 | 0.381\* | 0.0517 |  |  |  |  |
|  | (16.94) | (1.732) | (0.208) | (0.0860) |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| avyrs |  |  |  |  | -0.119 | -0.233 | -0.644 | -0.229\* |
|  |  |  |  |  | (22.65) | (6.610) | (0.448) | (0.127) |
|  |  |  |  |  |  |  |  |  |
| sqravyrs |  |  |  |  | 0.0257 | 0.0101 | 0.0463\*\* | 0.00984\* |
|  |  |  |  |  | (0.955) | (0.319) | (0.0200) | (0.00585) |
|  |  |  |  |  |  |  |  |  |
| lnpatappr | 0.168 | 0.0889 | 0.115\* | 0.0883\*\*\* | 0.128 | 0.0856 | 0.0650 | 0.0893\*\*\* |
|  | (3.686) | (0.887) | (0.0597) | (0.0183) | (3.857) | (0.806) | (0.0556) | (0.0184) |
|  |  |  |  |  |  |  |  |  |
| lnfdi | -0.0211 | 0.00579 | -0.0209 | 0.00525\* | -0.0146 | 0.00750 | -0.0169 | 0.00625\*\* |
|  | (5.258) | (0.0532) | (0.0569) | (0.00289) | (4.118) | (0.133) | (0.0519) | (0.00274) |
|  |  |  |  |  |  |  |  |  |
| lngdpc | 1.004 | 0.114 | 0.917\*\*\* | 0.162 | 0.695 | 0.122 | 0.703\*\*\* | 0.198 |
|  | (16.09) | (4.863) | (0.212) | (0.163) | (14.96) | (9.565) | (0.207) | (0.159) |
|  |  |  |  |  |  |  |  |  |
| lnpop | 5.620 | 0.176 | 4.056\*\*\* | 0.540\*\*\* | 5.959 | 0.361 | 3.939\*\*\* | 0.585\*\*\* |
|  | (6.916) | (0.813) | (0.886) | (0.141) | (4.805) | (0.305) | (1.054) | (0.118) |
|  |  |  |  |  |  |  |  |  |
| unem | -0.00251 | 0.00128 | -0.00211 | 0.00145\* | -0.00260 | 0.00117 | -0.00261\* | 0.00138 |
|  | (0.0708) | (0.0155) | (0.00146) | (0.000850) | (0.0725) | (0.0149) | (0.00142) | (0.000853) |
|  |  |  |  |  |  |  |  |  |
| lnecofree | -0.682 | -0.237 | -0.619\*\* | -0.227 | -0.728 | -0.298 | -0.646\*\*\* | -0.291\* |
|  | (12.44) | (3.116) | (0.273) | (0.156) | (10.76) | (1.990) | (0.249) | (0.154) |
|  |  |  |  |  |  |  |  |  |
| lnrulc | -0.723 | -0.580 | -0.614\*\* | -0.578\*\*\* | -0.857 | -0.628 | -0.785\*\*\* | -0.623\*\*\* |
|  | (9.883) | (4.647) | (0.255) | (0.215) | (13.66) | (7.294) | (0.242) | (0.215) |
|  |  |  |  |  |  |  |  |  |
| serv | 0.0197 | -0.0356 | 0.0155\*\* | -0.0368\*\*\* | 0.0191 | -0.0347 | 0.0175\*\*\* | -0.0358\*\*\* |
|  | (0.162) | (0.112) | (0.00658) | (0.00361) | (0.158) | (0.0786) | (0.00587) | (0.00361) |
|  |  |  |  |  |  |  |  |  |
| transindN | 0.169 |  | -0.0203 |  | 0.540 |  | 0.391 |  |
|  | (24.48) |  | (0.407) |  | (23.35) |  | (0.398) |  |
|  |  |  |  |  |  |  |  |  |
| No. of Obs. | 140 | 226 | 140 | 226 | 140 | 226 | 140 | 226 |
| No. of countries  | 10 | 17 | 10 | 17 | 10 | 17 | 10 | 17 |

Notes: (1) Although the full set of results is reported in this table, the main focus is on the coefficients of the time-invariant variables

 (2) Year dummies are included in the estimations but are not reported in the table

 (3) \*\*\*p<0.01, \*\*p<0.05, \*p<0.1; Standard errors in parentheses;

 (4) To avoid collinearity the **meanscores** variable is included in an alternative model specification.

**Table 5. IV Estimation results (including the new education quality measure)**

|  |  |  |
| --- | --- | --- |
|  | **Specification 1** | **Specification 2** |
|  | **CEECs** | **EEA17** | **CEECs** | **EEA17** |
| VARIABLES | lnemsh | lnemsh | lnemsh | lnemsh |
|  |  |  |  |  |
| lnsedut | 0.914\*\* | -0.113 |  |  |
|  | (0.434) | (0.195) |  |  |
|  |  |  |  |  |
| lntedut | 0.667\* | 0.184\* |  |  |
|  | (0.369) | (0.106) |  |  |
|  |  |  |  |  |
| avyrs |  |  | -0.0610 | -0.197 |
|  |  |  | (1.431) | (0.154) |
|  |  |  |  |  |
| sqravyrs |  |  | 0.0236 | 0.00930 |
|  |  |  | (0.0570) | (0.00722) |
|  |  |  |  |  |
| **lnstudperf** | **-1.066** | **1.870\*\*** | **-1.045** | **1.212\*** |
|  | **(1.444)** | **(0.937)** | **(1.175)** | **(0.651)** |
|  |  |  |  |  |
| lnpatappr | 0.0546 | -0.0655 | 0.0279 | -0.0333 |
|  | (0.127) | (0.0652) | (0.151) | (0.0639) |
|  |  |  |  |  |
| lnfdi | 0.0569 | -0.0179 | 0.0267 | -0.00802 |
|  | (0.0771) | (0.0122) | (0.0787) | (0.00862) |
|  |  |  |  |  |
| lngdpc | 1.014\*\* | 0.165 | 0.745\*\*\* | 0.152 |
|  | (0.411) | (0.275) | (0.263) | (0.228) |
|  |  |  |  |  |
| lnpop | 2.453 | -0.0614 | 3.412 | 0.236 |
|  | (1.771) | (0.349) | (4.334) | (0.287) |
|  |  |  |  |  |
| unem | -0.00196 | 0.00118 | -0.00202 | 0.00108 |
|  | (0.00217) | (0.000775) | (0.00220) | (0.000722) |
|  |  |  |  |  |
| lnecofree | -0.928\*\* | -0.737\*\*\* | -0.980\*\* | -0.662\*\*\* |
|  | (0.356) | (0.262) | (0.404) | (0.220) |
|  |  |  |  |  |
| serv | 0.0131 | -0.0320\*\*\* | 0.0140 | -0.0295\*\*\* |
|  | (0.0157) | (0.00531) | (0.0152) | (0.00458) |
|  |  |  |  |  |
| lnrulc | -0.663 | -0.475 | -0.891\*\* | -0.586\* |
|  | (0.422) | (0.356) | (0.430) | (0.308) |
|  |  |  |  |  |
| transindN | 0.552 |  | 1.027\*\* |  |
|  | (0.505) |  | (0.457) |  |
|  |  |  |  |  |
| No. of obs. | 123 | 199 | 123 | 199 |
| R-squared | 0.897 | 0.647 | 0.913 | 0.683 |
| No. of countries | 10 | 17 | 10 | 17 |

Notes: (1) Year dummies are included in the estimations but are not reported in the table

 (2) \*\*\*p<0.01, \*\*p<0.05, \*p<0.1; Robust standard errors in parentheses;