

# BEYOND THE CRISIS: PROSPECTS FOR EMERGING EUROPE

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## Highlights

- This paper assesses the impact of the 2008-09 global financial and economic crisis on the medium-term growth prospects of the countries of central and eastern Europe, the Caucasus and Central Asia, which began an economic transition about two decades ago. We use cross-country growth regressions, putting special emphasis on a proper consideration of the crisis and robustness. We find that the crisis has had a major impact on the within-sample fit of the models used and that the positive impact of EU enlargement on growth is smaller than previous research has shown. The crisis has also altered the future growth prospects of the countries studied, even in the optimistic but unrealistic case of a return to pre-crisis capital inflows and credit booms.



## **1. Introduction**

Before the crisis, the countries of central and eastern Europe, the Caucasus and Central Asia (CEECCA)<sup>1</sup> seemed to be making rapid and reasonably smooth economic progress, following an extraordinarily deep recession after the collapse of the communist regimes. The development model of most CEECCA countries had many common features, such as deep political, institutional, trade and financial integration with the EU and significant labour mobility to EU15 countries. However, there were also substantial differences between countries, which became more notable in the run-up to the global crisis: in a few CEECCA countries catching up was generally accompanied by macroeconomic stability, but most countries of the region became increasingly vulnerable due to huge credit, housing and consumption booms, high current-account deficits and quickly rising external debt. It was widely expected even before the crisis that these vulnerabilities must be corrected at some point, but the magnitude of the corrections when they did happen were amplified by the global financial and economic crisis.

Beyond the crisis, a major question is if the crisis is likely to have lasting economic effects. This paper assesses pre-crisis growth drivers and the medium term prospects of the CEECCA region using cross-country growth regressions, which estimate – in cross-section and panel regression frameworks – empirical relationships between growth and a number of potential growth drivers.

Many papers have adopted cross-country growth regressions for CEECCA countries; see for example Schadler et al (2006), Falcetti, Lysenko and Sanfey (2006), Abiad et al (2007), Vamvakidis (2008), Cihak and Fonteyne (2009), Iradian (2009), European Commission

and post-crisis recovery is also generally slower for CEECCA countries than in other emerging and developing economies (Bruegel and wiiw, 2010). Making estimates for a sample period that proved to be unsustainable will obviously bias the results toward the



research question. The third research question is analysed in section 5. Section 6 presents a summary.

## **2. Methodology and model selection issues**

The execution of cross-country growth regressions typically involves a large degree of discretion. One issue is related to the length of the sample period: the longer the sample, the



used<sup>5</sup>. In a seminal article, Levine and Renelt (1992) find in a growth regression framework that very few economic variables are robustly correlated with economic growth rates. They could only detect positive and robust correlation between average growth rates and two variables: the investment rate (share of investment in GDP) and trade openness (the share of trade in GDP). But they could not detect robust correlation for a broad array of other potential explanatory variables. The extensive survey presented in Durlauf, Johnson and Temple (2005) broadly confirms these findings and concludes that “*growth econometrics is an area of research that is still in its infancy*” (p. 651).

When we have looked for a single best model, we have indeed found considerable sensitivity to the time period, the country sample and the set of variables, which is in line with the findings of Levine and Renelt (1992) and the literature survey of Durlauf, Johnson and Temple (2005)<sup>6</sup>. We try to overcome these issues by concentrating on sample periods that start well after the collapse

- (3) middle-income countries with population above 1 million (ie GDP per capita at PPP compared to the US between 12.5 percent and 67.4 percent, though we also add those CEECCA countries that have lower income);
- (4) CEECCA countries only.

Exclusion of very small countries can be justified on the basis that their economies could be less diversified and hence could strongly be affected by particular shocks related to their main business activity. The exclusion of both poor and rich countries can be justified on the basis that economic growth in countries with reasonably similar levels of development might show more similarity to one other than to much richer or poorer countries. The cut-off values indicated above were determined on the basis of CEE10 countries: we calculated their minimum (23.0 percent for Bulgaria) and maximum (56.9 percent for Slovenia) and the standard deviation, which was subtracted from the minimum and added to the maximum to determine a possible range<sup>8</sup>. However, we also include in this middle-income country group those seven CIS countries that have lower per capita income, as well as Mongolia, in order to be able to analyse all CEECCA countries using the same model.

Considering the variables to be analysed, initial GDP per capita at purchasing power parity (PPP) was found in the literature to be the most robust explanatory variable and we of course also include it, having found that it is indeed a robust explanatory variable. We have also considered variables that are frequently used in the empirical growth literature, such as the investment rate, trade openness, educational indicators, the dependency ratio, inflation, fiscal balance, research and development expenditures and patents.

The four key pillars of the development model of most CEECCA countries were financial, trade and institutional integration with the western world and labour mobility<sup>9</sup>. We have therefore employed the following variables related to these factors:

- Capital flows: inward FDI per GDP (both stock and inflow); investment rate (gross fixed capital formation over GDP); stock and change in private sector credit/GDP.
- Foreign trade: trade openness (exports plus imports over GDP); change in the terms of trade; share of fuel and food in total exports.

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<sup>8</sup> We used the average GDP per capita at PPP compared to the US in the 2000-10 period.

<sup>9</sup> There are clear differences within the CEECCA region, however. The CEE10 have reached the highest level of integration, followed by the countries of the western Balkans that have either EU 'candidate' or 'potential candidate' status. The six 'Eastern Partnership' countries, which were part of the Soviet TD-90 the m(PPP) wvo th2inte.5(ury



- Institutional development: governance indicators compiled by the World Bank; Transparency International's corruption pe

(1992): the investment rate and trade openness. We then added only one other possible growth determinant at a time. When a variable had a correctly signed (judged from economic principles) and significant parameter estimate in most of the 12 samples – controlling for the initial GDP per capita and period fixed effects – we regarded it as a useful candidate for the growth regressions.

The results of this exercise are shown in *Table 1*. Among the 33 variables considered we have selected 13 candidates for the growth regressions. When selecting the variables we aimed for balance; that is, we do not want to over-represent any particular kind of indicator, such as institutional quality, for which many variants tend to correlate well with GDP growth. We selected seven initial conditions: GDP historical gap, secondary school enrolment, dependency rate, legal system and property rights, freedom of trade, share of fuel exports, and the stock of inward FDI. We also selected six contemporaneous correlates: fiscal balance/GDP, investment/GDP, exports plus imports/GDP, change in the terms of trade, growth in credit to private sector/GDP, and FDI inflow/GDP. The inclusion of contemporaneous correlates obviously raises the issue of endogeneity, which could be handled, for example, by properly-selected instruments. However,

model' is among our estimated models and the distribution of the growth fits is reasonably dense, we may regard our result as robust.

**Table 1: Partial correlation with growth**

	All countries			Countries with population above 1 million			Middle income countries with population above 1 million			CEECCA countries		
	CS	CS	P	CS	CS	P	CS	CS	P	CS	CS	P
	2000-2007	2000-2010	1995-2010	2000-2007	2000-2010	1995-2010	2000-2007	2000-2010	1995-2010	2000-2007	2000-2010	1995-2010
<b>initial conditions</b>												
GDP historical gap (compared to previous maximum relative to US)	-2.33	-2.36	-1.52	-2.31	-1.55	-0.78	-4.04	-3.05	-2.63	-4.57	-2.27	-4.10
t	-1.54	-1.71	-1.40	-1.66	-1.38	-0.73	-2.75	-2.62	-1.60	-1.50	-0.86	-1.05
Nobs.	178	177	531	146	145	435	66	66	198	30	30	90
Secondary enrolment (net)	0.00	-0.02	-0.02	0.03	0.01	0.01	0.07	0.03	0.04	0.05	-0.02	0.04
t	-0.10	-1.45	-1.52	2.28	0.90	1.20	3.68	2.17	2.95	1.00	-0.37	1.19
Nobs.	141	140	332	113	112	267	56	56	132	26	26	57
Tertiary enrolment	-0.02	-0.04	-0.04	0.01	-0.01	-0.02	0.04	0.01	-0.02	0.02	-0.03	-0.05
t	-1.03	-2.35	-3.58	0.74	-0.90	-2.72	1.99	0.68	-1.56	0.49	-0.99	-1.83
Nobs.	132	131	372	117	116	336	57	57	169	25	25	75
Dependency rate	-2.80	0.07	-0.89	-5.46	-2.17	-2.85	-4.87	-0.36	-4.07	3.82	7.10	-6.74
t	-1.67	0.05	-0.70	-3.48	-1.80	-2.14	-1.86	-0.17	-1.25	0.67	1.51	-0.74
Nobs.	173	172	516	145	144	432	65	65	195	30	30	90
Corruption perception	-0.49	-0.36	-0.70	-0.41	-0.23	-0.30	-0.45	-0.27	-0.30	-0.33	-0.63	-0.53
t	-2.52	-2.04	-2.80	-2.09	-1.44	-2.73	-1.69	-1.19	-2.18	-0.42	-0.91	-1.33
Nobs.	87	86	238	86	85	225	45	45	111	20	20	49
Voice & Accountability	-1.21	-1.32	-1.31	-0.69	-0.85	-0.75	-0.64	-0.89	-0.93	-0.75	-1.25	-1.36
t	-3.51	-4.30	-4.74	-2.05	-3.39	-3.18	-1.55	-2.77	-3.36	-0.89	-1.98	-2.42
Nobs.	176	175	352	145	144	290	66	66	132	29	29	58
Political stability	-0.42	-0.61	-0.52	-0.14	-0.29	-0.10	0.03	-0.15	-0.24	0.72	0.29	0.20
t	-1.34	-2.16	-2.06	-0.42	-1.17	-0.38	0.07	-0.52	-0.86	0.95	0.54	0.32
Nobs.	173	172	349	145	144	290	66	66	132	29	29	58
Government effectiveness	-0.87	-1.19	-1.09	-0.16	-0.46	-0.20	-0.54	-0.77	-0.85	-0.10	-1.28	-1.20
t	-1.56	-2.23	-2.37	-0.29	-1.11	-0.49	-0.94	-1.79	-2.39	-0.06	-1.15	-1.28
Nobs.	175	174	351	144	143	289	66	66	132	29	29	58
Regulatory quality	-1.18	-1.39	-1.46	-0.77	-0.95	-0.94	-0.85	-1.03	-1.08	-0.73	-1.34	-1.25
t	-2.33	-3.17	-3.61	-1.66	-2.80	-2.88	-1.67	-2.73	-3.10	-0.79	-2.05	-1.97
Nobs.	176	175	352	145	144	290	66	66	132	29	29	58
Rule of law	-0.93	-1.13	-0.99	-0.23	-0.38	-0.06	-0.36	-0.46	-0.59	-0.16	-0.71	-1.11
t	-1.94	-2.40	-2.40	-0.48	-1.04	-0.16	-0.76	-1.30	-1.86	-0.16	-1.05	-1.54
Nobs.	175	174	351	144	143	289	66	66	132	29	29	58
Control of corruption	-1.38	-1.46	-1.29	-0.84	-0.76	-0.54	-0.73	-0.66	-0.82	-0.65	-1.27	-1.91
t	-2.60	-2.94	-2.93	-1.78	-2.08	-1.37	-1.52	-1.79	-2.42	-0.50	-1.29	-1.96
Nobs.	175	174	351	144	143	289	66	66	132	29	29	58
Size of government	0.08	0.07	0.07	0.07	0.06	0.05	-0.25	-0.10	-0.08	0.01	-0.18	-0.05
t	0.71	0.70	0.90	0.57	0.57	0.65	-2.22	-1.09	-0.62	0.02	-1.41	-0.15
Nobs.	121	120	376	112	111	348	49	49	157	15	15	56
Legal system & property rights	-0.14	-0.20	0.06	-0.01	-0.07	0.21	0.11	0.04	0.24	0.83	0.21	0.47
t	-0.89	-1.46	0.52	-0.03	-0.45	1.55	0.49	0.30	1.94	0.85	0.29	1.29
Nobs.	127	126	392	118	117	364	55	55	169	21	21	68
Freedom of trade	0.06	-0.09	0.00	0.05	-0.16	-0.01	0.83	0.26	0.39	0.77	0.19	0.51
t	0.18	-0.35	0.03	0.11	-0.57	-0.04	2.52	1.20	2.16	1.85	0.65	1.45
Nobs.	126	125	385	117	116	358	55	55	169	21	21	68
Labour market regulations	0.20	0.20	0.16	0.17	0.20	0.18	-0.30	-0.10	0.03	-0.99	-0.52	0.05
t	1.11	1.43	1.62	0.95	1.41	1.82	-0.69	-0.29	0.18	-1.35	-0.73	0.19
Nobs.	77	76	265	77	76	256	45	45	133	18	18	56
Business regulations	0.10	-0.01	-0.04	0.07	-0.02	0.13	-0.24	-0.14	0.07	0.11	-0.65	0.36
t	0.42	-0.03	-0.25	0.29	-0.10	0.71	-0.78	-0.68	0.33	0.15	-1.76	0.75
Nobs.	72	71	256	72	71	247	40	40	124	13	13	47
Economic freedom index	-0.19	-0.25	0.17	-0.14	-0.19	0.23	-0.17	-0.05	0.34	0.83	-0.24	0.87
t	-0.62	-1.03	0.87	-0.44	-0.76	1.16	-0.60	-0.28	1.67	1.33	-1.23	1.88
Nobs.	121	120	380	112	111	352	49	49	157	15	15	56

Mean tariff rate	-0.03	-0.15	-0.02	-0.08	-0.21	-0.02	0.27	0.00	0.12	0.94	-0.19	0.49
t	-0.26	-1.39	-0.22	-0.70	-2.34	-0.21	1.41	-0.02	0.89	1.78	-1.02	0.85
Nobs.	109	108	343	102	101	322	48	48	150	14	14	50
Hidden barriers	-0.16	-0.22	0.10	-0.06	-0.13	0.14	-0.06	-0.08	0.00	0.10	-0.24	-0.05
t	-1.18	-2.03	1.05	-0.49	-1.39	1.40	-0.37	-1.07	0.01	0.21	-1.07	-0.17
Nobs.	75	74	248	74	73	238	41	41	127	13	13	47
Share of fuel exports	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.03	0.02	0.09	0.08	0.08
t	3.42	3.82	4.12	2.59	3.02	2.92	1.66	2.17	2.10	5.76	5.21	3.33
Nobs.	159	158	405	131	130	341	64	64	167	28	28	69

Share of food exports (Nobs)-11(.)T7.6638 0 0 7.6638 218.94 692.6003 Tm5-.02404c[-1.(0.)11)--1565.8(1)7.8(58)-1565.8(4)7.8(0)0(5)

are shown: the sample covering the pre-crisis ‘boom years’ only (2000-07) and the sample which also includes the bust (2000-10).

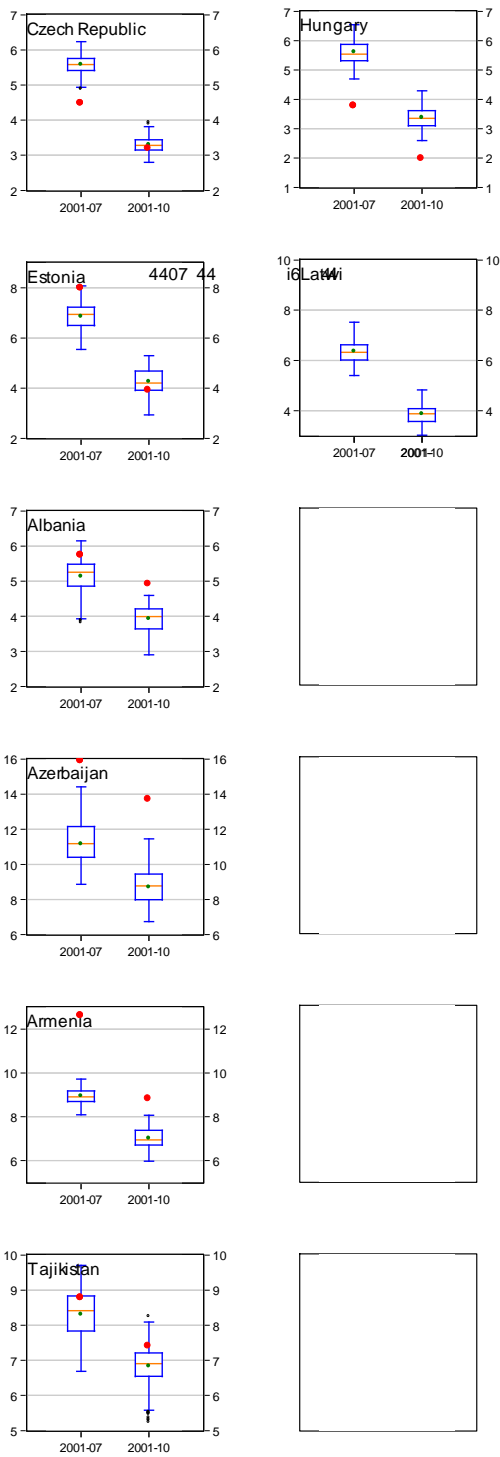
The main message of the figure is the downward revision of both actual growth and fitted values of growth from the regressions. For most countries the downward revision is between one and three percent per year. In some cases, actual growth fits well with the distribution of the 715 estimates, but there are outliers. We would like to highlight, however, that the goal was not find a perfect fit for all countries but to estimate models that can be used to assess the ‘potential’ rate of growth.

For example, in the cases of Estonia, Latvia and Lithuania, actual growth was well above the distribution of estimates in the 2000-07 period. When extending the sample, however, the actual growth of Estonia and Latvia fall within the interquartile range of the distribution of 715 fitted values of growth from the regressions and is close to the range in the case of Lithuania. Consequently, our calculations indicate that the three Baltic countries grew above potential in the pre-crisis period (this has likely contributed to the huge current-account deficits of these countries), but considering the whole 2000s, average growth may not have been far from potential.

Azerbaijan, Turkmenistan and, to a lesser extent, Armenia provide a different example. For these countries, actual growth was above the fitted values of growth from all models, not just in the pre-crisis period but in the whole 2000s as well. The first two of these countries are major hydrocarbon exporters. Even though our models controlled for the terms of trade and the share of fuel exports in total exports, our models do not match the reality in these countries.

Hungary presents a different picture since actual growth is below the level of growth predicted by the model in both sample periods. This finding could be explained by the fact that GDP growth had already slowed down in the mid-2000s partly due to domestic policies (fiscal austerity to eliminate the nearly double digit – as a percentage of GDP – budget deficit of 2002-06), and partly due to structural weaknesses. The country may have therefore grown below potential already before the crisis.

**Figure 2: The effect of the crisis on in-sample fit from 715 growth regressions: cross section estimates for 2001-07 and for 2001-10**



The box-plot represents the distribution of the fits (point estimates) derived from the regressions. The box portion of a box-plot represents the first and third quartiles (middle 50 percent of the estimates), the median is depicted using an orange line through the centre of the box, while the mean is drawn using a green circle. The whiskers and staples ('error bars') show the values that are outside the first and third quartiles, but within 1.5 times the interquartile range (ie 1.5 times the difference between first and third quartiles). Outliers, if any, are indicated with separate symbols outside the staples. Box widths are proportional to the sample size (number of available regression).

#### **4. How large is the EU accession 'growth dividend'?**

EU accession can (1) directly improve the fundamentals that drive economic growth, such as higher capital inflows, higher trade flows, a better legal environment, etc, but (2) can also have a 'growth dividend' beyond the effects of enlargement on the fundamental determinants of growth. This dividend can be due to, for example, enhanced credibility, which is not captured by any other variable included in the model. To our knowledge, earlier papers that have adopted growth regressions have only considered this second factor using dummy variable approaches, which we also use in Section 4.1. But in Section 4.2 we consider as well the first factor using a counterfactual simulation.

##### **4.1 Dummy variable approach**

It is a common practice to include regional dummies in cross-country growth regressions. When the estimated parameter of such a dummy is significantly larger than zero, one may argue that the country group under consideration grew faster than what would have been implied by the countries' fundamental growth determinants, ie the country group is different from the rest of world in a sense. For example, the European Commission (2009) reports the result, based on the detailed analysis of Böwer and Turrini (2010), that EU enlargement contributed to 1.75 percent excess annual growth (in every year between 2000 and 2008) of CEE10 countries beyond the effects of enlargement on the fundamental determinants of growth. This result was achieved with a panel regression in which a dummy variable was added to the growth performance of the CEE10 states for the 2000-08 period<sup>14</sup>. Regarding CIS countries, Åslund and Jenish (2006) found that these countries had exhibited extraordinary growth performances since 2000. As we have argued, these and all other estimates for sample periods ending before the crisis are likely biased upwards, because they were based on the period of fast growth covering only the boom part of the 2000s, which proved to be unsustainable for many CEECCA countries. We now study the impact of the sample period on the results.

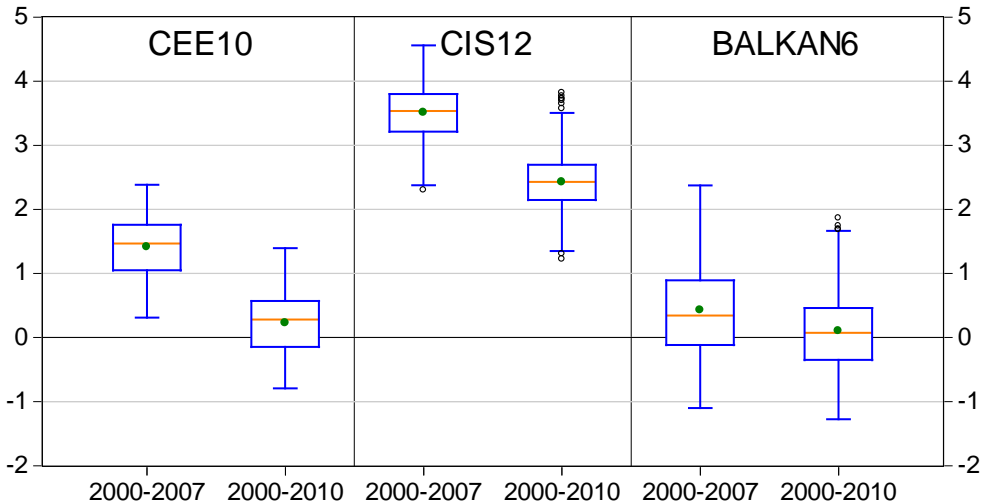
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<sup>14</sup> The sample period of Böwer and Turrini (2010) covers actual data till 2007 and the spring 2008 forecast for 2008.

To start, we estimated our 715 regressions as pure cross-section models for growth from 2000 till 2007 (ie pre-crisis sample) and for a longer period ending in 2010 that also includes the impact of the crisis. *Figure 3* plots the distribution of the parameter estimates of three regional dummies of CEECCA countries. The estimated parameter of the dummy for the new EU member states is found to be positive in the pre-crisis period (and even the 1.75 percentage point estimate of the European Commission (2009) and Böwer and Turrini (2010) fits well within the distribution), but considering the whole 2000s, the parameter estimates of the dummy are much lower. Both the mean and the median of the 715 estimates are positive and correspond to a 0.3-0.4 percent annual ‘growth dividend’, but zero is included in the interquartile range.

Regarding the CIS countries, the figure suggests that their growth rate was indeed higher than what would have predicted by fundamentals, considering both the pre-crisis period and the full sample, though the estimates are somewhat lower in the full period. The dummy representing western Balkan countries has mostly positive parameter estimates but zero lies within the distribution.

**Figure 3: Distribution of the parameter estimates of the regional dummies from 715 cross section regressions: comparison of the 2000-07 and 2000-10 samples**



Note. The figure shows the empirical distribution of the parameter estimates of the three regional dummies from 715 different regressions in the form of box-plots. See the note to *Figure 2* on the interpretation of the box-plot.

To further test the time profile of country group dummies, we estimated the models in a panel setup (with five-year non-overlapping periods) and allowed the parameter of the country group dummy to change over time. Results are shown in *Figure 4*. The new EU member



states grew above their fundamentals from 2000 to 2005 and below from 2005 to 2010. The magnitudes are similar to our previous estimates: the excess growth in 2001-05 was estimated to be around 1.5-1.8 percent per year (considering the interquartile range of the distribution of the estimated parameters), which is again very much in line with the findings of the European

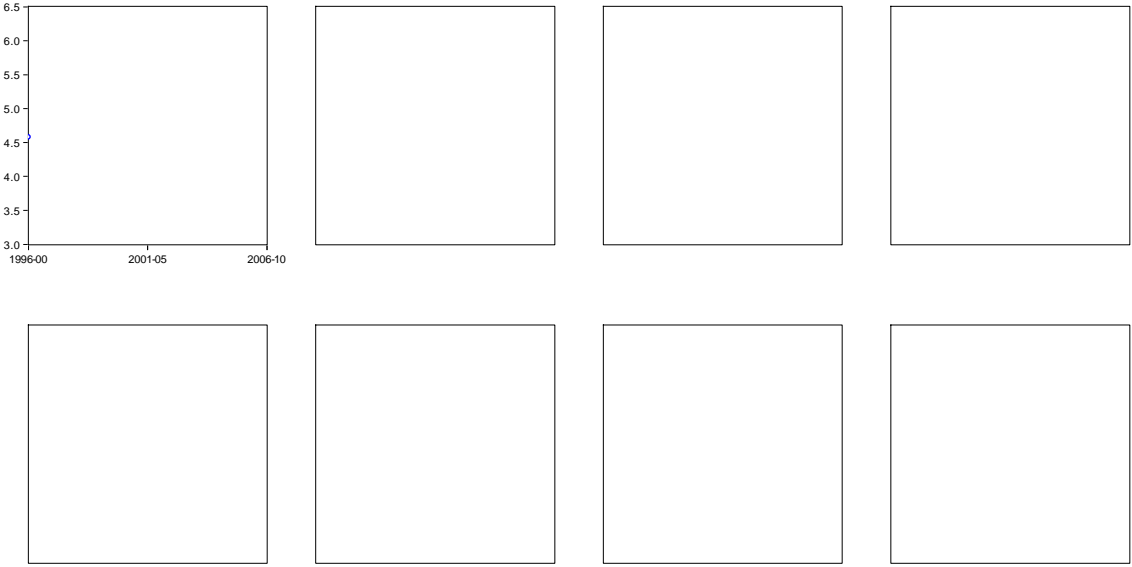
We have set up the counterfactual scenario for the fundamentals based on the development of 44 non-EU middle income countries<sup>15</sup>. To this end, we calculated the country-group average of the eight variables for the CEE10 and for the control group and assumed under the hypothesis of no EU enlargement that the change in the variables of the CEE10 compared to their pre-2000 values would have been identical to the change in the same variables of the control group. *Figure 5* shows, for the group averages, the actual developments in CEE10 (blue line), the actual developments in the control group (green line), and the counterfactual scenario for the CEE10 (red line). The assumed impact of EU enlargement on these fundamentals is shown by the difference between the blue and red lines. We applied these average impacts to each individual CEE10 countries.

For example, in the counterfactual scenario under which no EU enlargement occurred, FDI inflow/GDP would have been 5.3 percent instead of 5.9 percent in 2001-05 and 5.8 percent instead of 6.2 percent in 2006-10. The figure suggests that for five of the eight variables, EU accession has clearly led to growth-enhancing development of the fundamentals (ie the blue line is above the red line). The index for legal systems and property rights would have been broadly similar under the counterfactual scenario. It is only the fiscal balance that would have been better under the counterfactual scenario.

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<sup>15</sup> The income thresholds we applied were defined in Section 2. We did not include the four EU15 countries falling within the thresholds (Greece, Italy, Portugal and Spain). The 44 countries are: Albania, Algeria, Argentina, Azerbaijan, Belarus, Bosnia/Herzegovina, Botswana, Brazil, Chile, Colombia, Costa Rica, Croatia, Dominican Republic, Ecuador, El Salvador, Gabon, Iran, Israel, Jamaica, Kazakhstan, South Korea, Lebanon, Libya, Macedonia, Malaysia, Mauritius, Mexico, Namibia, New Zealand, Oman, Panama, Peru, Russia, Saudi Arabia, Serbia, South Africa, Taiwan, Thailand, Trinidad and Tobago, Tunisia, Turkey, Ukraine, Uruguay, and Venezuela.

**Figure 5: Counterfactual scenario for eight variables of the CEE10 countries under no EU accession**



**Table 2: The growth effects of the incremental improvement of fundamentals in the CEE10 states due to EU enlargement (percent)**

	<b>2001-2005</b>	<b>2006-2010</b>
Max	0.68	0.88
Upper 25%	0.21	0.33
Mean	0.11	0.15
Median	0.11	0.15
Lower 25%	-0.01	-0.01
Min	-0.26	-0.52

Note. Values show the distribution of 715 estimates for the effects of the incremental improvement of fundamentals due to EU enlargement on annual real GDP growth, which were derived as the difference between

that pre-crisis developments will resume, ie for most variables the average changes from 2000 to 2007 are extrapolated using the 2010 starting values. For the pessimistic scenario, we assume that capital inflows will be permanently reduced, foreign trade and domestic credit will expand only in line with GDP, the investment rate will stabilise at a low level and the budget balance will not improve after 2010. *Table 3* details the assumptions behind these two scenarios. For the interim scenario, we assume that the key variables take the simple average of their values in the optimistic and pessimistic scenarios. The period fixed effects (which are included in the panel regression) are assumed to be zero for 2011-15.

***Table 3. Detailed assumptions of the scenarios***

participation. Third, reductions in total factor productivity (TFP) can result from sectoral reallocations from high-to low-productivity sectors, skill mismatches and lower research and development expenditures.

But it is also likely, in line with theory and empirical research, that actual output falls below potential GDP, ie the output gap becomes negative after the crisis. European Commission (2010) estimates that the 2010 output gap in the new EU member states ranges from -10.7 in Latvia to -2.1 in Poland. The growth scenarios we present consider the slope of potential output, but do not consider the possible growth-enhancing impact of closing the negative output gaps.

**Figure 6: Schematic depiction of actual and potential output**

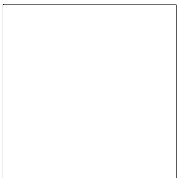
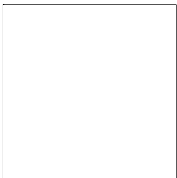
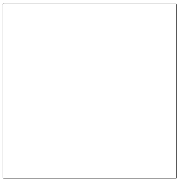
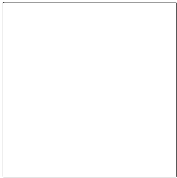
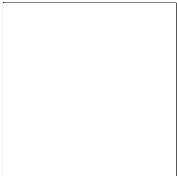
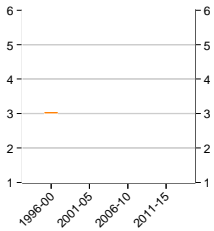
We also note that variables related to vulnerabilities, such as the current account balance, external debt, or inflation, are not included in the regression because of the difficulties in addressing modeling issues related to causality, time profile and functional form<sup>16</sup>. Instead, our models can be interpreted as being conditioned on the average models caacs6cm..7(f)3.7acs6cm on th9 T

*Figure 7* shows the distribution of  $f$



below pre-crisis actual growth, especially in those countries that experienced substantial credit and consumption booms. But medium te

**Figure 7: Actual GDP growth and fitted values of growth from 715 regressions for 1996-2010 and projections (interim scenario) for 2011-15**



**Table 4: Average annual actual and potential growth: in-sample fit and projections**

	1990-95										
	Actual	Fit	Actual	Fit	Actual	Fit	Actual	pessimistic	interim	optimistic	
<b>Bulgaria</b>		2.24		4.65		3.33		3.68	3.76	3.82	-0.89
	<b>-7.30</b>	<b>3.31</b>	<b>-0.56</b>	<b>5.26</b>	<b>5.28</b>	<b>4.03</b>	<b>2.63</b>	<b>4.74</b>	<b>4.83</b>	<b>4.91</b>	<b>-0.43</b>
		4.33		5.87		4.74		6.45	6.55	6.63	0.68
<b>Czech Republic</b>		2.57		3.41		1.59		1.99	2.03	2.06	-1.38
	<b>-1.13</b>	<b>3.09</b>	<b>1.48</b>	<b>4.20</b>	<b>3.74</b>	<b>2.50</b>	<b>2.48</b>	<b>2.96</b>	<b>3.06</b>	<b>3.17</b>	<b>-1.13</b>
		3.67		4.94		3.19		4.11	4.16	4.29	-0.78
<b>Estonia</b>		3.49		4.55		2.50		3.17	3.27	3.32	-1.28
	<b>-7.44</b>	<b>4.26</b>	<b>6.68</b>	<b>5.32</b>	<b>7.93</b>	<b>3.58</b>	<b>-0.31</b>	<b>4.15</b>	<b>4.30</b>	<b>4.45</b>	<b>-1.02</b>
		5.06		6.24		4.76		5.63	5.77	5.98	-0.47
<b>Hungary</b>		3.03		3.91		2.16		2.87	2.98	3.05	-0.93
	<b>-1.99</b>	<b>3.56</b>	<b>4.02</b>	<b>4.55</b>	<b>4.30</b>	<b>2.85</b>	<b>-0.24</b>	<b>3.47</b>	<b>3.56</b>	<b>3.64</b>	<b>-0.99</b>
		4.11		5.17		3.65		4.22	4.27	4.30	-0.91
<b>Latvia</b>		3.36		4.52		2.85		3.04	3.40	3.64	-1.12
	<b>-12.06</b>	<b>3.93</b>	<b>5.42</b>	<b>5.06</b>	<b>8.19</b>	<b>3.26</b>	<b>-1.49</b>	<b>3.76</b>	<b>3.99</b>	<b>4.21</b>	<b>-1.07</b>
		4.57		5.62		3.75		4.64	4.71	5.12	-0.92
<b>Lithuania</b>		2.93		4.46		2.72		2.66	3.09	3.41	-1.36
	<b>-10.68</b>	<b>3.64</b>	<b>4.68</b>	<b>4.90</b>	<b>7.82</b>	<b>3.13</b>	<b>0.36</b>	<b>3.51</b>	<b>3.69</b>	<b>3.88</b>	<b>-1.21</b>
		4.47		5.69		3.72		4.31	4.37	4.50	-1.31
<b>Poland</b>		2.87		3.91		2.47		2.57	2.69	2.75	-1.21
	<b>2.14</b>	<b>3.40</b>	<b>5.41</b>	<b>4.30</b>	<b>3.08</b>	<b>2.83</b>	<b>4.47</b>	<b>3.12</b>	<b>3.19</b>	<b>3.27</b>	<b>-1.11</b>
		4.04		4.70		3.24		3.83	3.89	3.97	-0.81
<b>Romania</b>		2.79		4.39		2.87		3.15	3.40	3.51	-0.98
	<b>-2.13</b>	<b>3.39</b>	<b>-1.26</b>	<b>4.95</b>	<b>5.74</b>	<b>3.38</b>	<b>2.87</b>	<b>3.92</b>	<b>4.02</b>	<b>4.11</b>	<b>-0.93</b>
		4.33		5.47		3.96		4.73	4.76	4.97	-0.70
<b>Slovakia</b>		2.70		3.88		2.45		2.28	2.39	2.48	-1.50
	<b>-2.91</b>	<b>3.55</b>	<b>3.30</b>	<b>4.62</b>	<b>4.93</b>	<b>3.15</b>	<b>4.80</b>	<b>3.23</b>	<b>3.34</b>	<b>3.44</b>	<b>-1.28</b>
		4.46		5.38		3.86		4.18	4.23	4.30	-1.15
<b>Slovenia</b>		2.46		3.05		1.16		1.51	1.60	1.65	-1.45
	<b>-0.60</b>	<b>2.87</b>	<b>4.39</b>	<b>3.59</b>	<b>3.63</b>	<b>1.89</b>	<b>1.85</b>	<b>2.26</b>	<b>2.38</b>	<b>2.50</b>	<b>-1.21</b>
		3.32		4.04		2.51		3.01	3.08	3.21	-0.96
<b>Albania</b>		2.62		3.85		2.66		3.72	3.88	3.96	0.03
	<b>-2.69</b>	<b>3.52</b>	<b>5.46</b>	<b>4.94</b>	<b>5.88</b>	<b>3.65</b>	<b>4.86</b>	<b>4.46</b>	<b>4.53</b>	<b>4.60</b>	<b>-0.41</b>
		4.44		5.78		4.53		5.43	5.44	5.50	-0.34
<b>Bosnia &amp; Herzegovina</b>		4.33		4.91		2.96		3.35	3.47	3.52	-1.44
	<b>-26.65</b>	<b>5.36</b>	<b>29.52</b>	<b>5.48</b>	<b>4.46</b>	<b>3.77</b>	<b>2.99</b>	<b>4.48</b>	<b>4.56</b>	<b>4.63</b>	<b>-0.93</b>
		6.22		6.26		4.58		5.58	5.64	5.66	-0.62
<b>Croatia</b>		2.49		3.80		2.53		3.00	3.07	3.12	-0.73
	<b>-6.26</b>	<b>3.09</b>	<b>3.41</b>	<b>4.36</b>	<b>4.78</b>	<b>2.90</b>	<b>1.30</b>	<b>3.52</b>	<b>3.58</b>	<b>3.63</b>	<b>-0.78</b>
		3.85		4.77		3.30		4.32	4.37	4.42	-0.41
<b>Macedonia FYR</b>		2.95		4.42		2.82		3.55	3.60	3.64	-0.82
	<b>-4.67</b>	<b>3.71</b>	<b>2.95</b>	<b>4.97</b>	<b>1.41</b>	<b>3.63</b>	<b>3.15</b>	<b>4.30</b>	<b>4.35</b>	<b>4.40</b>	<b>-0.61</b>
		4.66		5.66		4.35		5.29	5.31	5.32	-0.35
<b>Montenegro</b>			<b>3.06</b>		<b>2.81</b>		<b>3.27</b>				
	<b>-10.76</b>										
<b>Serbia</b>		2.67		3.55		2.40		2.90	2.97	3.03	-0.58
	<b>-13.67</b>	<b>3.44</b>	<b>2.57</b>	<b>4.46</b>	<b>5.19</b>	<b>3.13</b>	<b>3.29</b>	<b>3.78</b>	<b>3.84</b>	<b>3.91</b>	<b>-0.62</b>
		4.54		5.23		3.68		4.63	4.64	4.68	-0.59
<b>Turkey</b>		2.67		3.51		2.31		2.76	2.85	2.95	-0.66
	<b>3.21</b>	<b>3.27</b>	<b>4.12</b>	<b>4.19</b>	<b>4.55</b>	<b>2.93</b>	<b>2.45</b>	<b>3.28</b>	<b>3.35</b>	<b>3.43</b>	<b>-0.84</b>
		3.88		4.75		3.58		3.94	3.96	4.07	-0.78
<b>Armenia</b>		4.18		6.01		4.50		4.92	4.99	5.04	-1.02
	<b>-13.03</b>	<b>5.03</b>	<b>5.15</b>	<b>7.03</b>	<b>12.25</b>	<b>5.82</b>	<b>3.68</b>	<b>6.55</b>	<b>6.60</b>	<b>6.65</b>	<b>-0.44</b>

Note: the mean (numbers in bold) and the 95 percent range are shown for the fitted values and the projections.

## **7. Conclusions**

In this paper, we used cross country growth



led to the development of positive output gaps, while our models obviously project potential growth and implicitly assume that the output gap will be zero. Second, the crisis has altered the estimated parameters of the models and the full-sample estimate associates less benign effects with capital inflows. And third, CEECCA countries achieved economic catching up toward the EU15 level when the full period of 2001-10 is considered, which reduces conditional convergence-driven future growth. Even though actual growth rates might exceed potential growth rates in the coming years, as negative output gaps are diminishing, policymakers have to take into account reduced potential growth rates, and focus even more on growth-enhancing economic and structural policies.

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