Working Paper Series
10/2016

CAPITAL FLOWS AND GROWTH DYNAMICS IN CENTRAL AND EASTERN EUROPE

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doi.10.23656/25045520/102016/0037

ISBN 978-9949-493-93-7 (hard copy)
ISBN 978-9949-493-94-4 (pdf)

Eesti Pank. Working Paper Series, ISSN 1406-7161; 10/2016 (hard copy)
Eesti Pank. Working Paper Series, ISSN 2504-5520; 10/2016 (pdf)

Capital Flows and Growth Dynamics in Central and Eastern Europe

Karsten Staehr*

Abstract

This paper assesses the importance of capital flows as measured by the current account balance for the growth dynamics of the EU countries from Central and Eastern Europe. Economic growth in these countries was on average relatively high before the global financial crisis but markedly lower after the crisis. Panel data econometrics using annual data for 1997–2015 points to the contemporaneous current account balance having a sizeable negative effect on annual GDP growth. Estimations using many control variables and instrumental variables suggest that the negative effect is mainly demand driven. Counterfactual simulations show that growth rates in all CEE countries would have been lower in the absence of capital flows, and this applies particularly to the countries with the most disadvantageous starting points.

JEL Codes: P17, P21, P36

Keywords: business cycles, output performance, capital flows, current account balance, transition economies

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The views expressed are those of the author and do not necessarily represent the official views of Eesti Pank or other part of the Eurosystem.

* The author would like to thank Hubert Gabrisch, Meelis Kiisel, Jaanika Meriküll, Martti Randveer, Tairi Rõõm, Gerti Shijaku and Lenno Uusküla for their useful comments to earlier drafts.

Non-technical summary

The growth performance of the 11 EU countries from Central and Eastern Europe has varied considerably since the key transition reforms were completed in the mid-1990s. Most of the countries experienced economic booms before the global financial crisis, substantial setbacks during the crisis, and modest growth in the years afterwards. This pattern has been mirrored in many cases in the dynamics of the current account balance, raising the question of whether the developments are connected.

Economic theories identify demand side effects both from economic growth to the current account balance and in the opposite direction. Higher rates of economic growth may increase demand for imports, reducing net exports and so worsening the current account balance. Capital inflows associated with a deterioration of the current account balance may partly increase demand for non-traded production, resulting in higher rates of economic growth.

This paper examines the relationship between the current account balance and annual GDP growth in 11 EU countries from Central and Eastern Europe using a time sample from 1997 to 2015. The panel data estimations include country fixed effects, the lagged dependent variable, and a large number of control variables for various demand and supply shocks. The upshot from all the specifications is that an improvement in the current account balance leads to lower economic growth and the negative effect is significant in both economic and statistical terms. The negative effect remains when the current account balance is instrumented using the current account balances in other European periphery countries as instruments. This suggests that the causality largely runs from changes in the current account balance to economic growth.

Counterfactual simulations of annual GDP growth over the years 1996–2015 suggest that average economic growth would have been lower in the CEE countries if they would only have had limited access to external resources, meaning that the current account would have exhibited a modest deficit or been in balance each year. Average growth would particularly have been negatively affected in the countries with relatively disadvantageous starting points such as the Baltic states, Bulgaria, Romania and Slovakia. Access to external resources appears to have been of lesser importance for economic growth in other countries with more advantageous starting points, such as the Czech Republic and Slovenia, and even Poland.

Contents

1. Introduction

This paper assesses the importance of capital flows as measured by the current account balance for the growth dynamics of the 11 countries from Central and Eastern Europe (CEE) which joined the EU in 2004, 2007 or 2013. These countries had planned economies until 1989–1991, but reforms that liberalised and opened the economies meant the countries all had functioning market economies by the mid-1990s. A key objective of the reforms was to increase the rates of economic growth and attain fast convergence to income levels in the Western European EU countries (EU15).

The analysis is motivated by the diverse growth performance of the countries as emphasised in numerous studies (Becker et al., 2010; Mitra et al., 2010; Atoyan, 2010; Staehr, 2015). Though most CEE countries have seen relatively rapid growth and fast convergence, some have seen modest growth and slower convergence. Many CEE countries have also experienced large fluctuations in GDP growth with ensuing consequences for unemployment and migration. Moreover, the growth performance has overall been unimpressive in the period since the global financial crisis.

It is pertinent to link the growth performance of the CEE countries together with their access to capital flows or resources made available from abroad. Until 2008 all the CEE countries experienced substantial capital inflows as witnessed by large current account deficits. The capital inflows may have contributed to an expansion of the productive capacity, but in the short term also increased demand from domestic consumption and investment. During the global financial crisis many CEE countries experienced a *sudden stop* as large current account deficits contracted or even turned into surpluses (Calvo, 1998). Finally, after the crisis the CEE countries have generally had modest current account deficits but also rates of economic growth substantially below pre-crisis levels.

This paper seeks to assess to which extent developments in the current account balance can be tied to the growth performance of the CEE countries. The main concern is whether economic growth in these countries has depended on access to external resources. This concern is evidently not important only for the CEE countries but also applies to other emerging economies.[1]

[1] *The Economist* (2015, p. 60) brings up the concern when assessing the growth performance of Turkey after the global financial crisis: "Dani Rodrik, an economist at Harvard University, points to what he calls the deteriorating quality of Turkish growth. Over recent years, any given level of growth has been associated with a rising current-account deficit, not a falling one".

The neo-classical model of capital flows predicates that capital will flow from high-income countries to lower-income countries where the marginal product of capital is higher. Lucas (1990) notices that this prediction can often not be confirmed in empirical studies and asks why capital in many cases flows from low-income to high-income countries. Kaminsky et al. (2005) find that capital flows are often pro-cyclical in emerging-market economies, which seems to contradict the predictions of the neo-classical model. Using a sample of four middle-income countries, Kim (2000) finds that capital flows are largely driven by external factors while domestic factors are of little importance. The same conclusion is reached by Calvo et al. (1996) on a broader sample of emerging-market economies and in studies focusing on the CEE countries (Lane and Milesi-Ferretti, 2007; von Hagen and Siedschlag, 2008).

Economic theory provides a number of explanations for a possible relationship between economic growth and the contemporaneous current account balance. There are theories positing causality in either direction.

Theories identifying a relationship from economic growth to current account developments are often associated with the theory of the "balance of payment constraint" (Thirlwall, 1979; Thirlwall and Hussain, 1982). The starting point is that demand-driven economic growth may affect net exports. Higher growth implies lower net exports and deterioration of the current account balance, and in many cases resulting in current account deficits. A current account deficit can be financed either by capital inflows or by drawing down international reserves so short-term economic growth may be constrained by the availability of external resources. This view, emphasising that that the current account or balance of payments may constrain output growth, is also behind the lending policies of the World Bank and the IMF as formalised in the *Two-Gap Model* (Chenery and Strout, 1966; Taylor, 1994).

Several theories depict channels from capital flows to contemporaneous economic growth. An inflow of capital makes additional resources available for the domestic economy and may thus increase consumption and investment demand, and part of the increased demand will be directed towards the non-traded sector and consequently boost total GDP (Corden and Neary, 1982; Corden, 1984; Giavazzi and Spaventa, 2011). These effects may be magnified if the capital inflow leads to expectations of higher asset prices which further stimulate demand for non-traded products (Gabrisch, 2011).

Empirical studies tend to find evidence of links between capital flows and economic growth in emerging-market economies. Calvo (1998) discusses the effects of capital flows and documents how a sudden stop where capital inflows are reduced or reversed abruptly can have severe detrimental effects on the real economy.

Cavallo et al. (2016) find that large and persistent capital inflows lifted economic growth in emerging-market economies but also made the countries vulnerable to sudden stops.[2] Cardarelli et al. (2010) discuss the macroeconomic consequences of capital inflows in emerging-market economies and find that inflows have often been associated with a pattern of rapid GDP growth followed by declining growth. Prasad et al. (2007) do not find evidence of capital inflows contributing to economic growth, but their sample includes a number of East Asian countries that rely on an export-oriented economic model.

Igan et al. (2016) examine the effect of capital inflows on output growth in various industry sectors in 22 emerging-market economies. Capital inflows have the greatest positive effect in the sectors which are most dependent on external finance, but the relationship breaks down after the onset of the global financial crisis.

A contribution of key import for this study is Darvas and Simon (2015). They consider the impact of the current account balance on the business cycle in order to devise more informative measures of potential output in the EU countries. They find that deviations of the current account from its "equilibrium" level are negatively correlated with economic growth, and they consequently remove this effect when computing their revised measure of potential output.

A number of studies of the growth dynamics in Central and Eastern Europe have also emphasised the importance of current account developments. Bajo-Rubio and Diaz-Roldan (2009) use trade elasticities to compute estimates of the average growth rate that would have prevailed under a regime without access to international capital flows. They find that economic growth in their sample finishing in 2007 was indeed constrained by the balance of payment constraint. Brixiova et al. (2010) discuss the boom-bust cycle in Estonia and argue that it has in large part been driven by international capital flows. Ghosh et al. (2011) find that capital inflows into the post-communist countries were beneficial to economic growth but also made the countries vulnerable to external shocks. A similar conclusion is reached in the study by Staehr (2012) where the focus is on the performance of Latvia before and during the global financial crisis.

In conclusion, the literature provides theoretical arguments linking demand and GDP growth with the contemporaneous current account balance and this relationship has been confirmed in various empirical studies. This paper contributes to the literature in at least three ways. First, it focuses on

[2] Obstfeld (2009) discusses the conditions under which emerging markets might liberalise international capital movements while not increasing the likelihood of financial crises.

the EU countries from Central and Eastern Europe, which affords it a sizeable but still relatively homogeneous sample. Second, it establishes the *extent* to which capital flows drive economic growth in the region, using panel data estimations that include numerous control variables. Third, it uses counterfactual simulations to provide quantitative measures of the effect of capital flows on economic growth over two decades from 1996 to 2015.

The rest of the paper is organised as follows. Section 2 takes a first look at the growth performance of the CEE countries and the process of economic convergence. Section 3 presents the data used in the paper. Section 4 presents the main results from the econometric analyses. Section 5 shows the results when more control variables, including control variables for supply shocks, are included. Section 6 reports the results from some additional analyses. Section 7 provides counterfactual growth estimates adjusted for capital flows. Finally, Section 8 concludes the paper.

2. A first look at data

The sample consists of the 11 post-communist countries that joined the EU in 2004, 2007 or 2013. The choice of sample ensures the availability of reliable and comparable data. This section takes a first look at the dynamics of GDP growth and the current account balance in the CEE countries since the mid-1990s. Figure 1 shows the rate of GDP growth for three geographical groups of CEE countries; the Baltic group, consisting of Estonia, Latvia and Lithuania; the Central European group, consisting of the Czech Republic, Hungary, Poland, Slovenia and Slovakia; and the Balkan group, consisting of Bulgaria, Croatia and Romania.

Economic growth in the three regions has on average been relatively rapid but has also fluctuated widely. This pattern is most pronounced for the Baltic and Balkan groups, which are comprised of countries that were particularly affected first by the Russian crisis and later by the global financial crisis. The strong growth performance of the Baltic countries from 2000 to 2007 is noticeable and so is the output collapse in the same countries in 2009 after the outbreak of the global financial crisis. The recovery after the crisis has been relatively timid in all the country groups, with growth rates of around 2–3 per cent in 2013 and 2015.

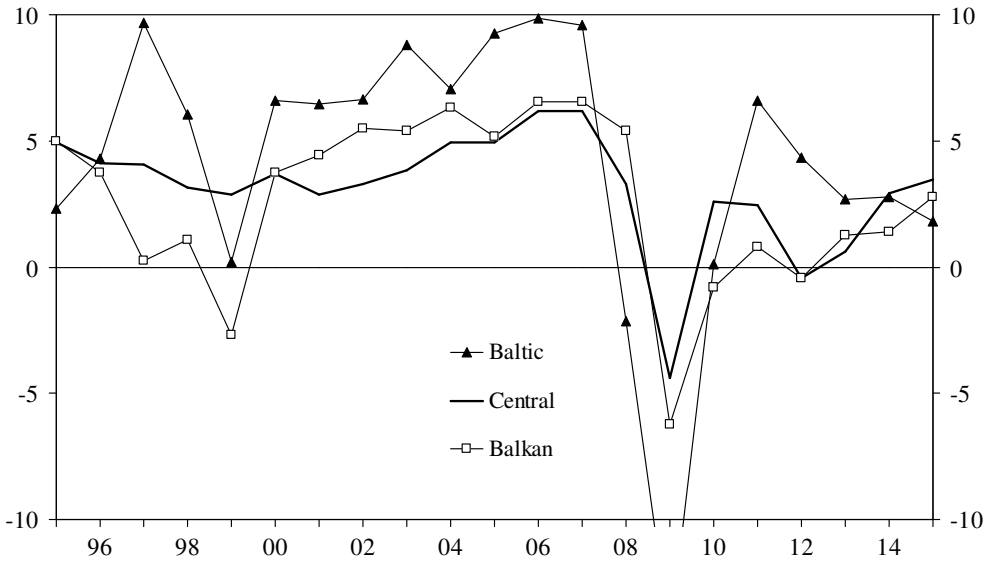

Figure 1: GDP growth for three groups of CEE countries, per cent per year, 1995–2015

Note: Unweighted averages of growth rates within the groups.

Source: Ameco (2016, code: *OVGD*).

The current account balance measures the net transfer of resources to and from a country; a current account surplus indicates a net outflow of resources, while a current account deficit indicates a net inflow of resources. Given the definition of the current account balance in official statistics, current account balance and capital flows are often used interchangeably (Giavazzi and Spaventa, 2011). A current account surplus signifies a net capital outflow, while a deficit implies a net capital inflow.

Figure 2 shows the current account balance in per cent of GDP for the three groups of CEE countries. The large and increasing deficits in the Baltic and Balkan groups during the boom period before the global financial crisis are notable. The very large and rapid reversals of the current account balance in 2008 and particularly in 2009 are also notable. These sudden stops affected the Baltic group the hardest, but the Balkan group and to a lesser extent the group of Central European countries were also affected. The sudden stops precipitated severe economic downturns, as has occurred in similar events in other emerging economies (Calvo, 1998).

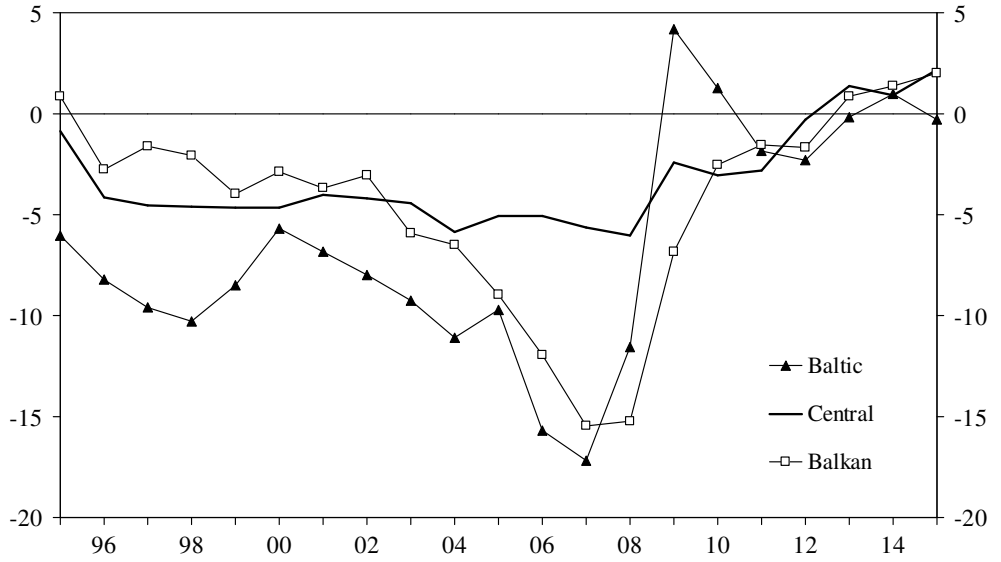

Figure 2: Current account balance for three groups of CEE countries, per cent of GDP, 1995–2015

Note: Unweighted averages of current account balances within the groups.

Source: Ameco (2016, code: *UBCA*).

The co-variation of the current account balance and economic growth can be ascertained by using annual data for the 11 CEE countries individually. Figure 3 shows a crossplot of the two variables and it is immediately clear that there is a negative relationship between the two variables; current account surpluses have appeared in periods of relatively low GDP growth and large current account deficits in periods of relatively high GDP growth. The slope coefficient is estimated at –0.353 with a standard error of 0.045, confirming a statistically significant negative relationship between the two variables.[3] The following sections will explore in greater detail the relationship between the current account balance and GDP growth for the 11 CEE countries.

[3] This result is very robust and pertains or is even strengthened when extreme observations are excluded. See also footnote 5.

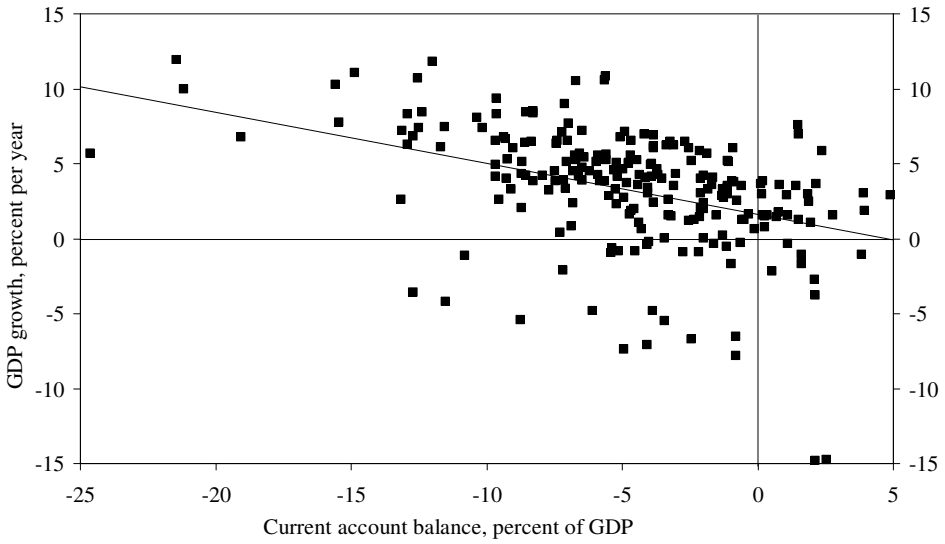

Figure 3: Current account balance and GDP growth for CEE countries, annual data, 1995–2015
Source: Ameco (2016, codes: *OVGD*, *UBCA*).

3. Data

The dataset used in the econometric analysis comprises annual data from 1995 to 2015 for the 11 CEE countries. All variables are from Ameco (2016) and were downloaded on 15 June 2016.[4] The variable CA is the current account balance as a share of GDP and Y is real GDP. A range of variables or transformations of them are used as control variables. The variable FD is an index of real foreign demand computed as the real imports of the country's trading partners weighted by the export shares to the partners in the previous year. The variable ULC is the real unit labour costs, BB is the *cyclically adjusted* general government budget balance, I is real investment or gross fixed capital formation, and ISHR is investment or gross fixed capital formation as a ratio to GDP.

The impulse dummies DUM2008 and DUM2009 take the value 1 in 2008 and 2009 respectively, the two years in which the CEE countries were most severely affected by the global financial crisis. The impulse dummies are included to ensure that the estimation results are not driven by the developments during the crisis. Finally, the current account balance as a share of GDP for various EU countries outside the CEE region and GDP per capita in

[4] The Ameco codes are provided in brackets after the variable name: CA (*UBCA*), Y (*OVGD*), FD (*VMGSW*), ULC (*QLCD*), BB (*UBLGAP*), I (*OIGT*) and ISHR (*UIGT*/*UVGD*).

purchasing power parity terms relative to that of the EU15 are used in the instrumental variables estimations.

All the variables except the current account CA, the cyclically adjusted budget balance BB, and the investment share are transformed into relative changes. The prefix L indicates the natural logarithm and Δ denotes the first difference operator. Using this notation, ΔLY denotes real GDP growth for instance.

Table 1 shows the summary results from panel unit root tests. A lag length of 1 is chosen for comparability across variables and to economise on the degrees of freedom. The current account balance is found to be panel stationary according to the ADF-Fisher test while the other tests reported cannot reject a panel unit root. However, all four reported tests find the current account balance CA to be stationary if the last year is excluded so that the sample is 1995–2014. Exclusion of a few extreme observations for which CA is outside the interval –0.25 to 0.10 would result in none of four reported tests rejecting the assertion that CA is panel stationary. It is on the whole reasonable to treat CA as a stationary variable. The differenced log variables are all stationary and so are the cyclically adjusted budget balance and arguably also the investment share.

Table 1: Panel unit root tests, 1995–2015

	(1.1)	(1.2)	(1.3)	(1.4)
	Levin-Lin-Chu	**Im, Pesaran & Shin**	**ADF-Fisher**	**PP-Fisher**
CA	–0.361 [0.359]	–1.280 [0.100]	34.957 [0.039]	28.397 [0.163]
ΔLY	–6.300 [0.000]	–4.264 [0.000]	56.033 [0.000]	59.720 [0.000]
ΔLFD	–8.324 [0.000]	–6.105 [0.000]	77.198 [0.000]	115.946 [0.000]
ΔLULC	–7.150 [0.000]	–6.857 [0.000]	87.934 [0.000]	108.605 [0.000]
BB	–6.989 [0.000]	–7.264 [0.000]	92.248 [0.000]	378.812 [0.000]
ΔLI	–7.503 [0.000]	–6.591 [0.000]	85.081 [0.000]	77.947 [0.000]
ISHR	–3.284 [0.000]	–2.649 [0.004]	41.464 [0.007]	22.414 [0.435]

Notes: In all the tests the null hypothesis is that the variable exhibits a unit root in all countries, while the alternative is that the variable is stationary in at least one country. The Levin-

Lin-Chu test assumes a common autoregressive parameter across all countries, while the Im-Pesaran-Shu test and the Fisher tests allow for country-specific autoregressive coefficients. The lag length is taken to be 1. The spectral estimations use the Barlett kernel with automatic Newey-West bandwidth selection. The lag length is set at one year. p-values are shown in square brackets.

4. First estimations

The empirical analysis starts from very simple models seeking to establish patterns between the rate of GDP growth, ΔLY, and the contemporaneous current account balance, CA. The sample for the estimations is 1997 to 2015 and includes country fixed effects and typically also dummies for the global financial crisis in 2008 and 2009 as the extreme gyrations during the crisis would otherwise affect results unduly (Igan et al., 2016). Table 2 shows the results.

Table 2: Fixed effect estimations of GDP growth in the CEE countries

	(2.1)	(2.2)	(2.3)	(2.4)
ΔLY(–1)	..	0.210*** (0.053)	0.268*** (0.054)	0.269*** (0.054)
CA	–0.363*** (0.039)	–0.270*** (0.044)	–0.191*** (0.047)	–0.175*** (0.047)
ΔLFD	..	..	0.243*** (0.059)	0.245*** (0.060)
ΔLULC(–1)	..	..	–0.080* (0.042)	–0.086** (0.042)
ΔBB	..	..	..	–0.210** (0.082)
DUM2008	–0.035*** (0.009)	–0.038*** (0.009)	–0.024*** (0.009)	–0.024*** (0.009)
DUM2009	–0.110*** (0.009)	–0.111*** (0.008)	–0.057*** (0.015)	–0.057*** (0.015)
R^2	0.609	0.638	0.695	0.710
Country FE	Yes	Yes	Yes	Yes
Time	97–15	97–15	97–15	97–15
Obs.	209	209	208	197

Notes: The dependent variable is ΔLY. Standard errors are shown in brackets. Country fixed effects are used in all estimations. Superscripts ***, **, * denote that the estimated coefficient is statistically significant at the 1, 5 and 10 per cent level respectively.

Column (2.1) shows that the negative relationship between economic growth and the contemporaneous current account balance shown in Figure 3 remains when country fixed effects and crisis dummies are included. The coefficients of the dummy variables are negative and large in numerical terms, reflecting the severity of the global financial crisis in the CEE countries. The estimated coefficient of CA is –0.363, which is very close to the slope coefficient of the regression line in Figure 3.

The inclusion of country fixed effects does not affect the estimation results noticeably but is nevertheless important for the interpretation of the model, since they allow the GDP growth rate and the current account to be interpreted as deviations in their country-specific means. The economic interpretation may thus be that the deviation of the current account balance from its country-specific mean is associated with the deviation of GDP growth from its country-specific mean. This interpretation also underscores that the correlation established is in the time domain of business cycle fluctuations and not necessarily in the longer term.

The next step is to include additional control variables. To account for possible otherwise unexplained persistence in the rate of GDP growth, the lagged GDP growth $\Delta LY(-1)$ is added to the specifications. The inclusion of the lagged dependent variable may lead to biased estimates in panels estimated using a fixed effects estimation (Nickell, 1981). The biases are typically small however, when the autoregressive coefficient is moderate. Moreover, simulation studies of dynamic panels with a small number of cross sections show that the standard fixed effect estimator performs well in comparison to various GMM estimators (Bun and Kiviet, 2001; Judson and Owen, 1999). The specifications with the lagged variable are therefore estimated using standard fixed effects.

Column (2.2) shows the result for a parsimonious specification with the lagged dependent variable, country fixed effects and crisis dummies. The coefficient of the lagged dependent variable is around 0.2, suggesting relatively modest persistence. The coefficient of CA is negative and precisely estimated. The short-term effect of CA is somewhat smaller than in the model without the lagged dependent variable in Column (2.1), but the longer-term effect is essentially the same.

The trade performance may affect both annual GDP growth and the current account balance. Column (2.3) shows the results when relative changes in foreign demand, ΔLFD, and relative changes in lagged real unit labour costs, $\Delta LULC$, are included. As expected, the coefficient of ΔLFD is positive and precisely estimated, while the coefficient of $\Delta LULC(-1)$ is negative but only statistically significant at the 10 per cent level. The coefficient of CA

declines in numerical terms but retains its economic and statistical significance.

Inclusion of various other control variables does not change the results qualitatively. Column (2.4) shows the results when the cyclically adjusted budget balance, BB, is included. The coefficient is negative and statistically significant, suggesting that a discretionary tightening of the fiscal stance affects economic growth negatively. The estimated coefficient of CA remains largely unchanged.

The model in (2.4) is the baseline specification depicting how GDP growth is linked to the contemporaneous current account balance, and the model will therefore be subjected to numerous robustness checks. The results are robust to the removal of some years from either end of the sample. Experiments with the exclusion of extreme observations show that the results are not driven by outliers.[5] Moreover, estimation of separate effects for positive and negative values of CA does not uncover any substantial non-linearities (not shown).

At this stage it is worth reconsidering the economic contents of the empirical model in Column (2.4). Year-on-year economic growth is explained by the current account balance, while the large number of control variables removes the effects from foreign demand, unit labour costs and the discretionary fiscal stance, and the lagged dependent variable removes otherwise unexplained persistence or hysteresis effects. Country fixed effects remove time-invariant effects and imply that all variables can be interpreted as deviations from their country means. In other words, the specifications in Table 2 can be seen to model shocks to the growth rate by autoregression and a number of demand shocks including one associated with the contemporaneous current account balance.

5. Additional control variables

This section discusses the results of estimations where additional control variables are added to the baseline specification in (2.4). The added variables are largely meant to control for possible supply side effects that may be attributed to capital flows. Table 3 shows the results.

[5] If for instance only observations where the current account balance CA is between –0.25 and 0.05 are included, the estimated coefficient of CA is –0.206 with a standard deviation of 0.056.

Table 3: Fixed effect estimations of GDP growth with additional control variables

	(3.1)	(3.2)	(3.3)	(3.4)
ΔLY(–1)	0.288*** (0.060)	0.307*** (0.057)	0.290*** (0.067)	0.268*** (0.066)
CA	–0.339*** (0.063)	–0.221*** (0.064)	–0.190*** (0.048)	–0.241*** (0.053)
ΔLFD	0.248*** (0.056)	0.254*** (0.052)	0.265*** (0.060)	0.249*** (0.060)
ΔLULC(–1)	–0.048 (0.041)	–0.037 (0.038)	–0.046 (0.046)	–0.046 (0.044)
ΔBB	–0.196** (0.076)	–0.138* (0.073)	–0.191** (0.082)	–0.216*** (0.081)
CA(–1)	0.202** (0.085)	0.114 (0.084)	..	..
CA(–2)	0.063 (0.069)	0.014 (0.064)	..	..
CA(–3)	–0.032 (0.049)	–0.009 (0.045)	..	..
ΔLI(–1)	..	..	0.005 (0.018)	..
ΔLI(–2)	..	..	–0.034** (0.015)	..
ISHR(–1)	..	..	..	–0.001 (0.001)
ISHR(–2)	..	..	..	–0.002 (0.001)
ISHR(–3)	..	..	..	0.001 (0.001)
DUM2008	–0.019** (0.008)	..	–0.024*** (0.009)	–0.021** (0.009)
DUM2009	–0.040*** (0.014)	..	–0.051*** (0.015)	–0.050*** (0.015)
R^2	0.741	0.586	0.704	0.710
Country FE	Yes	Yes	Yes	Yes
Time	97–15	Not 08–09	97–15	97–15
Obs.	196	174	197	197

Notes: The dependent variable is ΔLY. Standard errors are shown in brackets. Superscripts ***, **, * denote that the estimated coefficient is statistically significant at the 1, 5 and 10 per cent level respectively.

Lags of the current account balance may affect contemporaneous GDP growth through a supply channel if they affect investments or other factors that influence GDP growth in subsequent years. Column (3.1) reports the results when one, two and three lags of the current account balance are included. Among these variables, only the coefficient of the one year lagged balance is statistically and economically significant. Moreover, the estimated coefficient of the contemporaneous current account balance increases in numerical terms, while the coefficients of the crisis dummies decrease in numerical terms.

The results in Column (3.1) suggest that both the level and the first difference of the current account have explanatory power. It is notable however that the sign of the coefficient of the lagged current account balance is positive which is in contradiction to the conception that current account deficits would increase productive capacity leading to *higher* GDP growth in subsequent years.

The positive coefficient estimate makes it difficult to link the lagged current account balance to supply side effects. The statistical and economic significance of the coefficient is indeed predicated on the inclusion of the global financial crisis 2008–2009 when sudden stops coincided with large output declines as discussed in Section 1. Column (3.2) excludes the two crisis years and the lagged current account balance loses its economic and statistical significance entirely while the two and three year lags remain statistically insignificant.[6]

The inclusion of control variables directly reflecting supply shocks similarly has no qualitative effect on the main results. Column (3.3) reports the results when lags of the relative change in real investments are added, while Column (3.4) reports the results when lags of the investment share are included. The investment variables have little explanatory power and the signs of the estimated coefficients often differ from what might be expected.[7] Experiments with additional lags in the investment variables (and corresponding reductions in the sample size) confirm that investments shocks have no or only modest explanatory power (not shown).

The estimations in Table 3 confirm the presence of an economically and statistically significant negative relationship between economic growth and

[6] The same conclusion is reached if extreme observations of the current account balance are excluded from the sample, in which case the coefficient of the lagged current account balance also fails to attain statistical and economic significance (not shown).

[7] To account for possible convergence effects, the logarithm of GDP per capita was also included in some estimations. The variable is panel non-stationary and attained neither statistical nor economic significance, suggesting that convergence effects *per se* have little explanatory power in the sample of CEE countries.

the contemporaneous current account balance. The result survives the inclusion of lagged values of the current account balance. Moreover, investment variables do not appear to have any explanatory power. These findings confirm that the short-term effect of the current account balance is mainly demand driven.

6. Instrumentation

The results in Sections 4 and 5 make it clear that economic growth is closely related to current account developments in the sample of CEE countries considered here. However, the estimations do not identify the direction of causality. This section presents additional estimations that seek to shed light on this issue.

Studies from emerging markets typically find that current account developments are driven in large part by external factors, while developments in the domestic economy have modest explanatory power (Calvo et al., 1996; Kim, 2000; Diaz Sanchez and Varoudakis, 2013). This may suggest that the current account balance is in large part exogenous from the viewpoint of the individual country and hence that the direction of causality mainly goes from the current account balance to economic growth. In line with this hypothesis the baseline model in Column (2.4) is estimated with the current account balance instrumented.

The instruments chosen are the current account balances from other countries in the European periphery. Current account developments in other periphery countries are likely to be relevant for the CEE countries as both groups consist of emerging-market economies. Moreover, the CEE countries are small and developments in these countries are therefore unlikely to affect the current account balance in the larger countries.

The results are somewhat sensitive to the choice of instruments, so results using different sets of instruments are presented in Table 4. Column (4.1) shows the results when the current account balances from Greece, Spain, Cyprus and Portugal are used as instruments. The results are qualitatively similar to those in the baseline model in Column (2.4); the coefficient of the current account balance is slightly larger in numerical terms and, as expected, the coefficients are generally less precisely estimated. The Sargan-Hansen test of over-identifying restrictions is satisfied at the 5 per cent level. Column (4.2) shows the results when time dummies for the years 2010 to 2015 are added to the instruments in (4.1), but the changes are negligible.

Column (4.3) shows the results when the set of instruments includes not only the current account balances of the four periphery countries but also the

one and two-year lagged GDP per capita in purchasing power parity terms for the 11 CEE countries. The coefficient of CA is marginally higher in numerical terms and the coefficient of the lagged dependent variable is marginally smaller.

Less developed countries are typically more susceptible to shifts in capital flows and the current account balance than wealthier countries are (Calvo et al., 1996). To incorporate this and to make the instruments country specific, the current account balances of the periphery countries and large countries are divided by the GDP per capita in purchasing power parity terms for the 11 CEE countries. Column (4.4) shows the results when the instrument set contains the current account balances of the four periphery countries, the current account balances divided by the GDP per capita, and the GPD per capita. The addition of more instruments implies that the test of over-identifying restrictions is satisfied only at the 1 per cent level. The results are qualitatively like those found when other instrument sets are used, cf. Columns (4.1)–(4.3).

Table 4: Instrumental variables fixed effect estimations of GDP growth

	(4.1)	(4.2)	(4.3)	(4.4)
ΔLY(–1)	0.218***	0.227***	0.194**	0.190***
	(0.060)	(0.075)	(0.082)	(0.064)
CA	–0.252**	–0.232**	–0.289**	–0.295***
	(0.109)	(0.102)	(0.117)	(0.081)
ΔLFD	0.204*	0.211**	0.184*	0.181*
	(0.110)	(0.105)	(0.111)	(0.094)
ΔLULC(–1)	–0.089	–0.088	–0.090	–0.090
	(0.065)	(0.065)	(0.064)	(0.065)
ΔBB	–0.194**	–0.197**	–0.186**	–0.185**
	(0.085)	(0.083)	(0.083)	(0.081)
DUM2008	–0.030***	–0.029***	–0.032***	–0.032***
	(0.009)	(0.008)	(0.007)	(0.007)
DUM2009	–0.065***	–0.064***	–0.069***	–0.069***
	(0.022)	(0.022)	(0.020)	(0.020)
R^2	0.690	0.692	0.685	0.683
Prob. (*J*-statistic)	0.073	0.074	0.051	0.022
Country FE	Yes	Yes	Yes	Yes
Time	97–15	97–15	97–15	97–15
Obs.	197	197	197	197

Notes: The dependent variable is ΔLY. The instrumentation is explained in the text. Standard errors are shown in brackets. Superscripts ***, **, * denote that the estimated coefficient is statistically significant at the 1, 5 and 10 per cent level respectively.

The conclusion is that current account developments in the CEE countries that are driven by external developments have at least as large an effect on the current account balance as the effect estimated using ordinary fixed effect estimation. This suggests that exogenous changes in the current account balance may have had a large impact on economic growth in the CEE countries.

7. Revisiting the growth performance

The estimations in Sections 4–6 showed annual GDP growth to be related to the current account balance. This section presents the results of counterfactual simulation exercises seeking to ascertain the quantitative importance of the current account balance for economic growth in the CEE countries in 1996–2015. The simulations seek to answer the question of how the average of the mean growth rate and its variability would have been affected if the current account balance had taken a fixed value throughout the two decades. The simulation exercises do not rest on any explicit identification of the direction of causality in the estimation model. The important point is that GDP is restricted by the availability of a fixed amount of external resources.

The simulations assume an autoregressive coefficient of 0.25 and a coefficient for CA of –0.2. These coefficients are well within the confidence intervals of all the estimations in Tables 2–4. Two different values are considered for the current account balance, CA = –0.04 and CA = 0. The first value is the maximum deficit allowed over a three-year period by the EU's scoreboard in the Macroeconomic Imbalance Procedure. The second value would signify a case of extreme financial suppression where the current account must be balanced each year. None of these counterfactuals are arguably very realistic but they may be seen as useful benchmarks for illustrating the effects on GDP growth of access to external resources.

Table 5 shows the results. Column (5.1) reports the average and the standard deviation of ΔLY over the years 1996–2015 for each of the 11 CEE countries. Column (5.2) presents the results when the current account balance is assumed to be –0.04 each year. The main difference appears for some of the countries that have the lowest GDP per capita at the beginning of the sample, including the Baltic states and Romania, for which the mean GDP growth is around half a percentage point lower in the scenario where the current account balance is fixed at 4 per cent of GDP. The compounded effect on GDP would be quite sizeable. For Slovenia, which had the highest GDP per capita in 1995, strict adherence to a current account deficit of 4 per cent of GDP would have entailed higher mean growth.

Table 5: Mean and standard deviation of ΔLY for 1996–2015, data and counterfactual scenarios

		(5.1)	(5.2)	(5.3)
		Data	**If CA = –0.04**	**If CA = 0**
Bulgaria	Mean	0.026	0.024	0.013
	St. dev.	*(0.038)*	*(0.036)*	*(0.036)*
Czech Rep.	Mean	0.023	0.024	0.014
	St. dev.	*(0.028)*	*(0.028)*	*(0.028)*
Estonia	Mean	0.040	0.033	0.023
	St. dev.	*(0.062)*	*(0.057)*	*(0.057)*
Croatia	Mean	0.019	0.021	0.010
	St. dev.	*(0.035)*	*(0.034)*	*(0.034)*
Latvia	Mean	0.040	0.031	0.021
	St. dev.	*(0.061)*	*(0.053)*	*(0.053)*
Lithuania	Mean	0.042	0.037*)*	0.026
	St. dev.	*(0.056)*	*(0.053*	*(0.053)*
Hungary	Mean	0.022	0.022*)*	0.011
	St. dev.	*(0.027)*	*(0.026*	*(0.026)*
Poland	Mean	0.039	0.041*)*	0.030
	St. dev.	*(0.017)*	*(0.016)*	*(0.016)*
Romania	Mean	0.026	0.022	0.012
	St. dev.	*(0.042)*	*(0.040)*	*(0.040)*
Slovenia	Mean	0.025	0.033	0.023
	St. dev.	*(0.033)*	*(0.032)*	*(0.032)*
Slovakia	Mean	0.038	0.035	0.024
	St. dev.	*(0.033)*	*(0.030)*	*(0.031)*

Note: Column (5.1) shows summary statistics from the dataset, Columns (5.2) and (5.3) show simulation results assuming an autoregressive coefficient of 0.25 and a marginal effect for CA of –0.2.

By construction, the variability of GDP growth is reduced when the variability is eliminated from the current account balance. The effect is the largest for the Baltic states, for which the standard deviation is reduced by 1–1.5 percentage points. The Czech Republic stands out for having essentially no reduction in the variability of GDP growth, reflecting the very stable current account balance of the country. Other countries typically see a reduction in the standard deviation of between 0.1 and 0.5 percentage point.

Column (5.3) shows the results when the current account target is set at 0 per cent of GDP. The effects on mean growth are of course much larger, and the mean growth for Bulgaria, Croatia, Hungary and Romania in the counterfactual scenario is only around 1 per cent per year. The effects are sizeable for most other countries too. These results rest on a somewhat extreme assumption but they do illustrate how growth in the CEE countries depends on external funding.

The results in Table 5 are summarised in Figure 4. The average GDP growth over 1996–2015 is shown together with the average growth of the counterfactuals assuming a current account deficit of 4 per cent of GDP and a balanced current account. The figure clearly illustrates the effect of capital inflows on average growth in most CEE countries.[8]

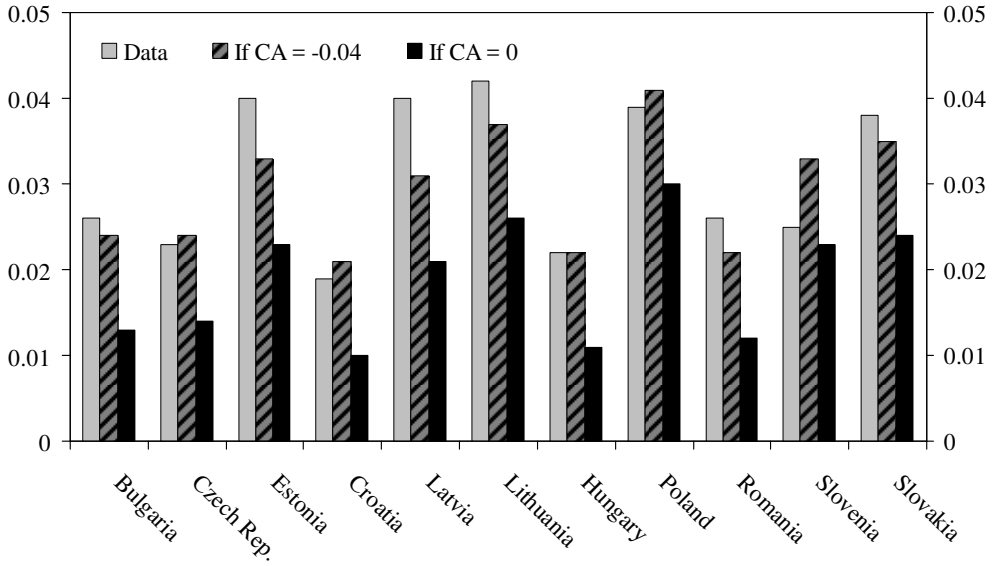

Figure 4: Mean of ΔLY for 1996-2015, data and counterfactual scenarios

Source: Simulations assuming an autoregressive coefficient of 0.25 and a marginal effect for CA of –0.2.

The findings presented in Table 5 and Figure 4 are based on calculations that rest on numerous assumptions and should therefore be interpreted with caution. They do, however, point to the importance of the current account or external resources for the growth performance of the countries, especially those that started the convergence process from the most disadvantageous

[8] The importance for average growth is even larger if only the pre-crisis years 1996–2007 are considered, as this period saw very substantial current account deficits in most CEE countries, while the current accounts have been roughly in balance since 2010; see Figure 2.

positions. The results also highlight the trade-off associated with the availability of external finance: the countries where capital flows have been most important for mean GDP growth are also the ones where the impact on the variability of growth has been the largest. Corresponding results have been found for other emerging-market economies (Ghosh et al., 2011).

8. Final comments

The growth performance of the 11 EU countries from Central and Eastern Europe has varied considerably since the key transition reforms were completed in the mid-1990s. Most of the countries experienced economic booms before the global financial crisis, substantial setback during the crisis and modest growth in the years afterwards. This pattern has in many cases been mirrored in the dynamics of the current account balance, raising the issue whether the developments are connected.

Economic theories identify demand side effects from economic growth to the current account balance as well as in the opposite direction. Higher rates of economic growth may increase demand for import, reduce net export and hence worsen the current account balance. Capital inflows associated with a worsening of the current account balance may partly increase demand for non-traded production resulting in higher rates of economic growth.

This paper examines the relationship between the current account balance and annual GDP growth in 11 EU countries from Central and Eastern Europe using the time sample from 1997 to 2015. The panel data estimations include country fixed effects, the lagged dependent variable and a large number of control variables for various demand and supply shocks. The upshot from all the specifications is that an improvement in the current account balance leads to lower economic growth and the negative effect is significant in both economic and statistical terms. The negative effect remains when the current account balance is instrumented using the current account balances in other European periphery countries as instruments. This suggests that the causality largely runs from changes in the current account balance to economic growth.

Counterfactual simulations of annual GDP growth over the years 1996–2015 suggest that average economic growth would have been lower in the CEE countries if the countries had only had limited access to external resources meaning that the current account would have exhibited a modest deficit or been in balance each year. Average growth would in particular have been negatively affected in the countries with relatively disadvantageous starting points such as the Baltic states, Bulgaria, Romania and Slovakia. For other countries with more advantageous starting points, such as the Czech

Republic and Slovenia but also Poland, access to external resources appear to have been of less importance for economic growth.

The simulation results are broadly in line with the narrative that emerged after the global financial crisis. The pre-crisis period saw rapid economic growth together with large current account deficits and an accumulation of imbalances that made the countries vulnerable to the fallout from the global crisis (Blanchard and Faruqee, 2010). The post-crisis years have witnessed relatively low rates of economic growth in most CEE countries, accompanied by modest current account deficits or even surpluses, in part reflecting general trends in the financing of emerging markets (IMF, 2016)

The severe financial disruptions and disappointing growth performance experienced in many countries in Central and Eastern Europe after the global financial crisis have led scholars and policy-advisors to rethink economic and structural policies for the region (Fabrizio et al., 2009; Atoyan, 2010; Ghosh et al., 2011). Among the policy recommendations are measures to avoid excessive reliance on external resource flows.

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