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Drivers of European Transition Countries' External Current Accounts: An LSDVC Approach

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The sizable and persistent external imbalances of European transition countries have attracted surprisingly little empirical attention. Although increasing external account deficits may be accompanied by accelerated growth rates, they also come with substantial risks. This article identifies and compares the main determinants of the widening and persistent external current account deficits of fifteen European transition countries vis-à-vis the EU-15 countries. It assesses the validity of the intertemporal approach of current account determination through bias-corrected least-squares dummy variable models (using three dynamic panel techniques) and data for thirty European countries during the 1994–2013 period. It concludes that the external accounts of European transition countries have been counter-cyclical and largely driven by faster growth of government consumption and investment as compared to their trading partners. After the outbreak of the global economic crisis, their external accounts improved due to lower private consumption and a significant rise in precautionary savings.

Keywords: consumption and investment smoothing, current account, intertemporal trade

JEL Classification: F30, F32, F36

Why were the current account deficits of the European transition economies so large and persistent over the last two decades? What were the main drivers of these external imbalances? Are they justified from an intertemporal perspective? Is the experience of the European transition countries different from that of the peripheral euro area countries? Although we are still in the aftermath of the European sovereign debt crisis, financial integration in Europe can actually be observed. European capital—in its different definitions—flows from richer to poorer

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countries, or, in other terms, from low- to high-growth countries. Yet the exposure to external finance, in some cases, has gone too far and might have come at the expense of increased macroeconomic fragility, as evidenced by the harmful implications of sudden stops of foreign capital in several capital-importing European transition countries. Hence, the excess external imbalances have to be carefully monitored and managed, as they can be detrimental to growth.

This article brings new evidence to address these questions by exploring the factors that determine current account behavior in the "old" European Union member-states (EU) vis-à-vis fifteen South Eastern European (SEE) transition countries. The latter group consists of ten new EU member-states, as of May 2004 (EU-10), and five SEE transition countries (SEE-5).[1]

The core objectives of the article are threefold: (1) to contrast and compare the main determinants of the external accounts from an intertemporal perspective in European transition countries vis-à-vis EU-15 countries; (2) to identify the relative importance of various factors driving these external imbalances, and (3) to propose some policy-relevant recommendations.

From a theoretical perspective, the use of the intertemporal approach to current account determination is strongly justified by the substantial liberalization of the capital account transactions of both EU-10 and SEE-5 countries. Additionally, from an empirical strategy, the effects of the recent economic turmoil on the consistency of our empirical specifications are investigated. Using annual data over the 1994–2013 period for thirty European countries, dynamic panels and bias-corrected least-squares dummy variable (LSDVC) estimations are employed.

The contribution of this article to the literature on global imbalances is twofold: (1) it examines whether the external accounts of the European transition countries are justified from an intertemporal perspective, and (2) it applies some sophisticated econometric techniques on a larger dataset covering thirty European countries and a more recent time span.

The structure of this article is organized as follows. The next section presents some stylized facts regarding current account behavior in the European transition countries. A survey of the theoretical and empirical literature is provided in the third section, whereas the intertemporal analytical framework is elaborated in the next section. The estimation techniques, empirical results, and consistency checks are presented in the fifth section, followed by some concluding remarks.

SOME STYLIZED FACTS

European capital flows from richer to poorer countries, but this pattern is different from what is happening in the rest of the world (e.g., Abiad, Leigh, and Mody 2009; Gill and Raiser 2012). Part of the explanation comes from the reassuring effect, which is based on Mundell's intuition and the endogenous optimum currency area theory (Warin, Wunnava, and Janicki 2009). Evidence of this effect may be found in the 2008 global economic crisis. Unlike the experience with the Asian and Latin American crises, capital was not dramatically pulled out of the capital-importing European countries.

Descriptive statistical analysis of the external current accounts of the European transition economies reveals a number of interesting facts. In terms of magnitude, the current account deficits of SEE-5 economies during the 1994–2013 period were sizable, with a cross-country

[1] EU-15: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom. EU-10: Czech Republic, Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovak Republic, Slovenia. SEE-5: Albania, Bulgaria, Croatia, Macedonia, and Romania.

average of 5.9 percent of GDP. These imbalances have been much higher than those in the other European debtor countries: EU-10 countries have recorded deficits of 4.4 percent of GDP and peripheral euro area economies of 4.5 percent of GDP.[2] The conventional wisdom has been that as long as the economy is growing and foreigners perceive the country as attractive, the size of the current account imbalance is not too alarming. However, large current account deficits raise the risk of a sudden stopping of net international capital flows (e.g., Blanchard and Milesi-Ferretti 2012; Globan 2015), and concomitant current account adjustments can have painful macroeconomic implications (e.g., Engler, Fidora, and Thimann 2009). For instance, high current account deficits in Latvia led to a serious balance-of-payments crisis in the second half of 2008. Another issue of serious concern is current account volatility. The external accounts of SEE-5 countries display a high standard deviation (5.02) as a consequence of volatile international capital flows, the history of stop-and-go macroeconomic policies, exposure to strong external shocks, and a number of domestic distortions. In sum, the risks posed by external imbalances call for a thorough understanding of their determinants and the sources of financing.

Disaggregating the external imbalances from a saving-investment perspective also offers valuable insights. The current account deficits of the SEE-5 countries reflect savings-investment imbalances in both the government and non-government sectors (Figures 1 and 2). From a saving perspective, the gross national saving rates of SEE-5 economies have recently increased slightly beyond those of the EU-15 and EU-10 economies (Figure 3). Yet it would be premature to conclude that savings convergence took place, because the saving rates across the EU-15 countries are much more depressed in the midst of the global economic crisis. From an

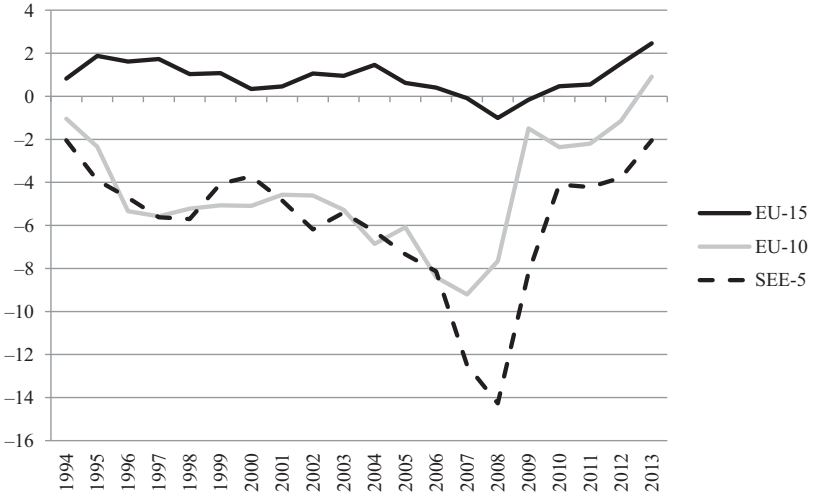

FIGURE 1 Current Account Balances (in percent of GDP, 1994–2013). *Source*: Authors' calculations based on data from IMF World Economic Outlook database, October 2015.*Note*: Non-weighted cross-country averages.

[2] In line with Lehwald (2013), the peripheral euro area countries are Greece, Ireland, Portugal, and Spain.

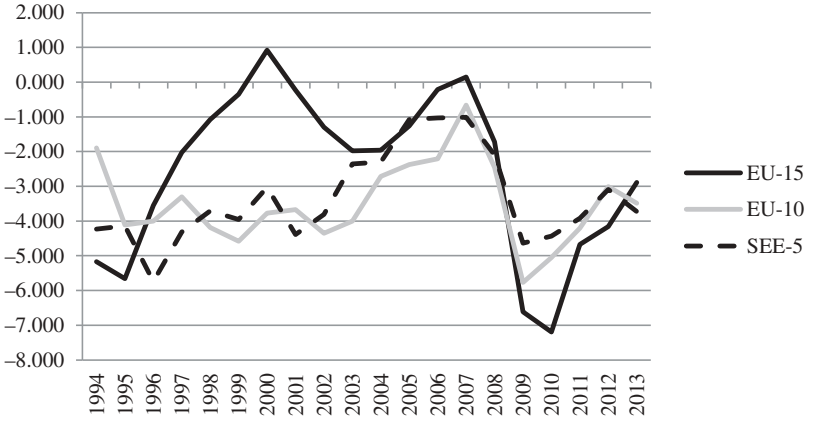

FIGURE 2 General Government Budget Balances (in percent of GDP, 1994–2013).*Source*: Authors' calculations based on data from IMF World Economic Outlook database, October 2015.
Note: Non-weighted cross-country averages.

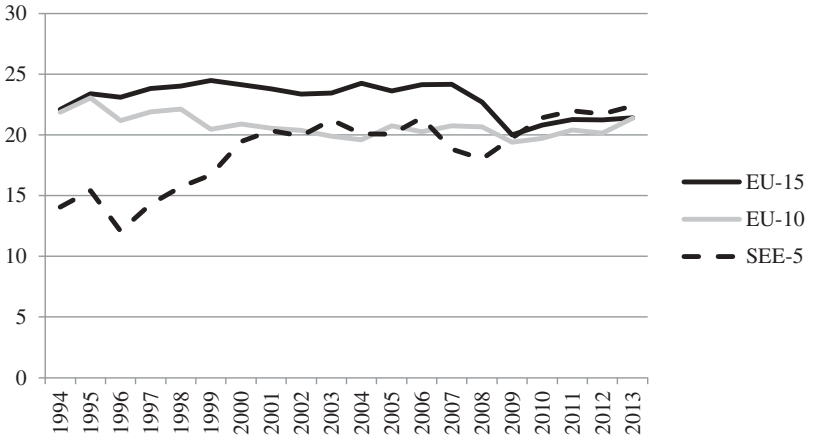

FIGURE 3 Gross National Saving Rates (in percent of GDP, 1994–2013). *Source*: Authors' calculations based on data from IMF World Economic Outlook database, October 2015.
Note: Non-weighted cross-country averages.

investment perspective, national investment rates in the SEE-5 economies were below the levels observed in the advanced EU-15 and EU-10 economies during the 1990s (Figure 4). Political instability, financing constraint, and regulatory uncertainty were strong impediments to economy-wide capital accumulation (e.g., Brada, Kutan, and Yigit 2006; Dobrinsky 2007). In light of their prospective EU membership, the European transition countries in the last decade made noticeable

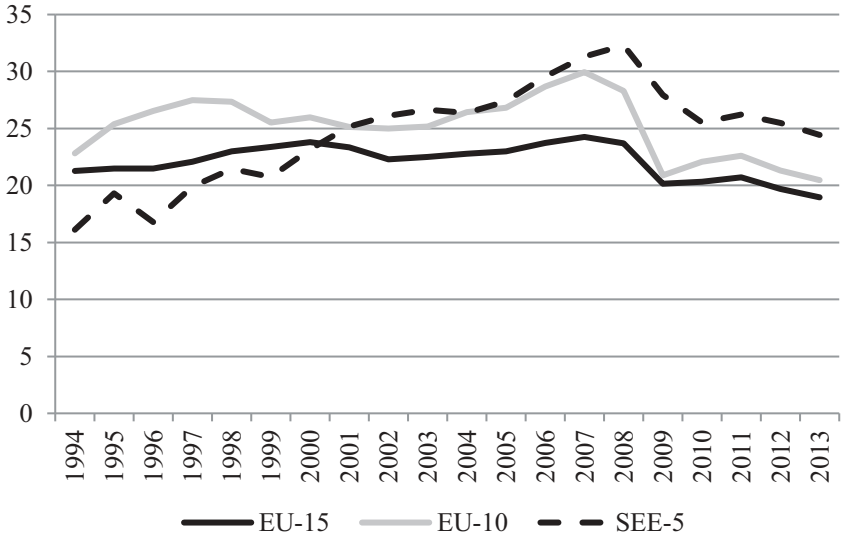

FIGURE 4 Gross domestic investment rates (in percent of GDP, 1994–2013).*Source*: Authors' calculations based on data from IMF World Economic Outlook database, October 2015.
Note: Non-weighted cross-country averages.

institutional progress and created a much more favorable investment climate, acknowledged by international organizations via improved international rankings. They also attracted foreign capital inflows with technology transfers and positive spillover effects on local suppliers. Although one is tempted to automatically attribute their significant current account deficits to greater investment demand, the issue merits thorough investigation in the following section.

Another important feature of the external accounts of the European transition countries is their counter-cyclical character. An acceleration of economic activity in the transition countries is associated with some deterioration of the external current accounts, and vice-versa, lower current account deficits are recorded during recessionary times (Figure 5, right panel). The negative association between both variables cannot reveal whether accelerated growth rates contribute to widening imports and subsequent external imbalances or whether the large inflows of foreign capital stimulate economic growth. Some studies even find bidirectional causality between external imbalances and economic growth (e.g., Abiad, Leigh and Mody 2009). A current account deficit caused by high economic growth is less problematic to the extent that external funds are used for investment, but again, the effect can only be isolated with a multivariate statistical analysis. In contrast, the external current accounts of the EU-15 economies tend to be slightly pro-cyclical (Figure 5, left panel).

A final remark about the European transition economies is their decision to liberalize their capital account transactions during the 2000s. Both *de facto* and *de jure* measures of international financial integration bring evidence that they noticeably increased their capital account openness, which enabled more international capital inflows to finance their external imbalances (see Figure 6).

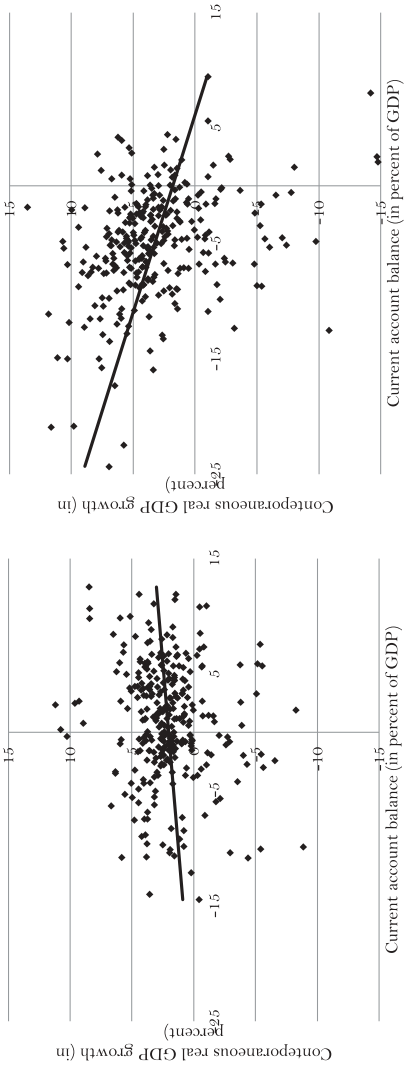

FIGURE 5 Contemporaneous Real GDP Growth Rate and Current Account Balances (in percent of GDP), 1994–2013.
Source: Authors' calculations based on data from IMF World Economic Outlook database, October 2015.
Note: Non-weighted cross-country averages.

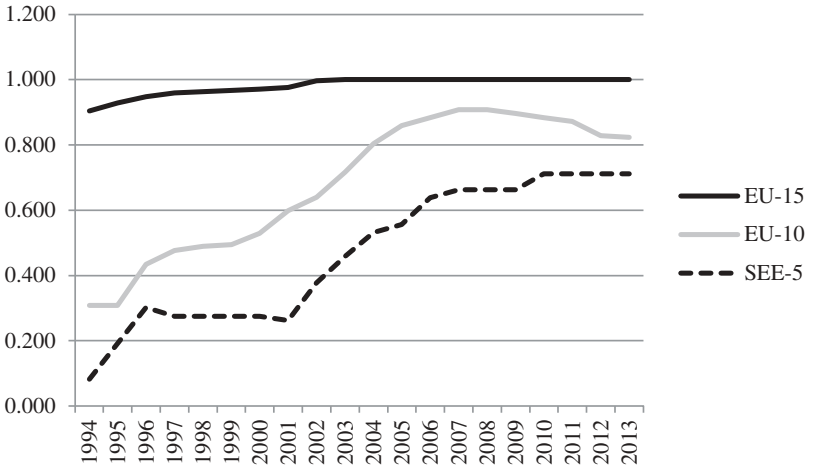

FIGURE 6 *De Jure* Indices of Capital Account Openness of Selected European Economies (1994–2013).

The latter stylized fact—increased capital mobility—is a crucial argument for justifying the intertemporal analysis of the current account determination. International capital mobility is one of the fundamental assumptions of the intertemporal model, as it allows intertemporal trade (consumption and investment smoothing across time). But first it is necessary to present a critical review of the theoretical and empirical literature.

LITERATURE REVIEW

From a geographical perspective, the academic literature on current account deficits has been primarily concerned with the sizable and persistent external imbalances of the United States (e.g., Chakraborty and Dekle 2009; Duncan 2015; Ivanova 2010; Kim and Roubini 2008; Mussa 2007; Sooreea and Wheeler 2010) and of the euro area (e.g., Blanchard and Giavazzi 2002; Brissimis et al. 2013; Campa and Gavilan 2011; Ca'Zorzi and Rubaszek 2012; Chen, Milesi-Ferretti, and Tressel 2013; Di Mauro and Pappada 2014; Hobza and Zeugner 2014; Körner and Zemanek 2013; Lane and Milesi-Ferretti 2007). Due to their minuscule geopolitical importance, very little academic attention has been devoted to the European transition countries (e.g., Aristovnik 2006, 2008; Bussière, Fratzscher, and Müller 2006). Yet these countries have been recording larger and much more volatile current account deficits as compared to the United States and the peripheral euro area countries. In that sense, this article brings evidence from the neglected debtor countries and complements the small body of empirical literature.

From an intertemporal perspective, early empirical work was built around standard intertemporal models that generally assumed flexible domestic prices, a high degree of capital mobility, and consumption-smoothing opportunities. The pioneering works of Sachs (1981), Obstfeld (1982), Svensson and Razin (1983), and Obstfeld and Rogoff (1994) served as important precursors for empirical studies in an intertemporal setting. The main competitive advantages of

the dynamic-optimizing analytical framework are the solid microeconomic foundations and the prominent role of agents' expectations. The early empirical work on dynamic-optimizing models relied on present value tests, an econometric approach initially suggested by Campbell (1987) and Campbell and Schiller (1987) based on the estimation of vector autoregressions. Present value tests follow the rationale of the intertemporal budget constraint, which is that present current account deficits must be equal to the discounted value of expected future increases in net output. In accordance with the intertemporal theory, the derived forecasts for net output should be equal to the current account in order to obey the long-run solvency constraint. Hence, the contemporaneous current account can be considered as a predictor of future increases in net output. The empirical difficulties began with the first studies that conducted present value tests (e.g. Milbourne and Otto 1992; Otto 1992; Sheffrin and Woo 1990) even for the most advanced economies, as the model predictions have been "routinely rejected by the data" (Nason and Rogers 2006, p. 106). From a technical point of view, most of the empirical studies have been confronted with a substantial discrepancy between the actual and predicted values of the current account position, the surprising non-stationarity of the current account time series, and a lack of evidence to justify some of the key assumptions. Therefore, research based on present value tests has not been able to identify the sources of weaknesses of the basic dynamic optimizing framework. Such findings have stimulated further theoretical refinements aiming to eliminate implausible assumptions and to improve the predictive power of empirical models. Extensions of the intertemporal framework have brought into play nominal rigidities, uncertainty, imperfect arbitrage on the international good markets, and pricing-to-market behavior. The relevance of intertemporal analysis has been widely tested for the advanced European countries and to a lesser extent for the European transition countries (e.g., Bussière, Fratzscher, and Müller 2006).

Predictions made by intertemporal theory can be in contradiction with influential Keynesian-type growth models and with models of international trade based on imperfect competition. For instance, Thirlwall's (1979) growth model favors an alternative demand-oriented approach to economic growth that accentuates the balance-of-payments constraint. To keep sustainable growth rates, it is expected that countries will experience a faster rise of their imports (preferably, imports of capital goods). In order to mitigate or avoid the balance-of-payments constraint, their exports must therefore grow faster than their output. Moreover, such an outcome is possible only if firms are able to reduce their unit-labor costs and increase their productivity above the common productivity growth in the trading partners, assuming other things being constant. The possibility of engaging in intertemporal trade (i.e., consumption and investment smoothing) can be severely limited when the current account is in permanent deficit. The external imbalances then act as impediments to economic growth (e.g., Soukiazis and Cerqueira 2012; Soukiazis, Cerqueira, and Antunes 2014).

MODEL

The intertemporal approach to current account determination will serve as the main framework. It relies on the assumption that private savings and investments result from forward-looking dynamic decisions (Obstfeld and Rogoff 1994; Razin 1995; Sachs 1981). In this context, liberalization of the capital account is a necessary condition for the validity of the intertemporal approach. There is an implicit sticky-price assumption in traditional non-optimizing models. In the intertemporal approach, this

assumption is relaxed, and domestic prices are assumed to be flexible. Indeed, greater exposure to globalization generates high competition on domestic goods markets.

The literature on open-economy macroeconomics has helped to formulate a simple intertemporal model of current account determination, originally designed by Obstfeld and Rogoff (1995) and augmented later by Bussière, Fratzscher, and Müller (2006). The model assumes a representative agent, though differentiating between liquidity-constrained (non-Ricardian) and liquidity-unconstrained (Ricardian) consumers. It also has a stochastic component to capture the uncertainty with respect to future income. The literature proposes a small open economy with a constant real interest rate (determined by the rest of the world), an exogenously determined output, investment, government consumption, and lump-sum taxes (all expressed in per capita terms).

According to the representative-agent framework, an individual residing in the small open economy maximizes his lifetime utility (U_l^i), which depends on the consumption levels in periods c_1^i and c_2^i:

$$U_l^i = u\left(c_1^i\right) + \beta u\left(c_2^i\right) \text{ with } 0 < \beta < 1 \tag{1}$$

where β is the subjective discount factor: the greater β, the more long-term the perspective. When β equals 1, the agent gives the same value to present and future consumptions. When β is close to 0, the individual then values the short term.

However, a significant share of the population cannot transfer their consumption across time, thus posing a challenge to the intertemporal model. This is why two types of consumers are introduced: non-Ricardian and Ricardian.

The non-Ricardian consumers spend all of their disposable income in each period:

$$DY_1^i = c_1^i \; ; \; DY_2^i = c_2^i \tag{2}$$

which equals the output (Y_t) minus investment (I_t) minus taxes (T_t). Therefore, the non-Ricardian consumers' consumption function is given by:

$$C_t^{NR} = Y_t - I_t = DY_t^{NR} \tag{3}$$

The Ricardian consumers can make intertemporal transfers and thus respect the propositions of the standard intertemporal model. The aggregate consumption ($\bar{C}_t$) is a weighted average of the consumption by non-Ricardian (C_t^{NR}) and Ricardian consumers (C_t^R):

$$\bar{C}_t = \lambda C_t^{NR} + (1 - \lambda) C_t^R \tag{4}$$

where λ and $(1 - \lambda)$ represent the shares for each type of consumers. The reason why both types of consumers are introduced is twofold: (1) it prevents us from relying on the assumption of homogeneity in consumption behavior and thus provides an analytical justification for the use of a dynamic specification, and (2) since the transition economies face more liquidity-constrained consumers, in comparison to the advanced European economies, such differentiation provides valuable real policy implications.

Abel (1990) explains that the present consumption decision depends on the individual's consumption in the last period (internal habits) and the consumption of an outside reference group in the last period (external habits). This assumption is included in the model so that the intra-temporal utility will depend not only on the actual consumption, but also on the degree by which it exceeds the aggregate consumption in the last period. In this model, aggregate

consumption captures the consumption of the outside reference group. The consumers' habits depend more on the history of aggregate consumption than on their own consumption in the previous period. Thus, the absolute level of the individual's consumption is an important factor, but so too is the change with respect to the previous aggregate consumption (Abel 1990; Campbell and Cochrane 1995).

Following the analytical derivation of the model, the final specification of Ricardian consumption takes the following form:

$$C_t^R = \frac{\gamma}{1+r}\bar{C}_{t-1} + \left(1 - \frac{\gamma(1-\lambda)}{1+r}\right) rB_t^p + \left(1 - \frac{\gamma}{1+r}\right)\frac{r}{1+r}E_t\sum_{s=t}^{\infty}\frac{Y_s - I_s - T_s}{(1+r)^{s-t}} \tag{5}$$

where C_t^R is the consumption of Ricardian agents. The fact that individual's consumption in each period exceeds past aggregate consumption is represented by γ, which is the fraction by which the individual's consumption exceeds past aggregate consumption. Then, r denotes the return on the net foreign assets (B_t^p) of the private sector, E_t is the expectations operator of the flow of future net output, and λ and $(1 - \lambda)$ represent the shares of non-Ricardian and Ricardian consumers, respectively.

The current account—or the national (dis)saving—is equal to the change in net foreign asset position:

$$CA_t = B_{t+1} - B_s = rB_t + Y_t - I_t - G_t - \bar{C}_t \tag{6}$$

In Equation (6), the current account is equal to the sum of the return on net foreign assets and net output minus the aggregate consumption. Eventually, the dynamic model of current account determination takes the following form:

$$\begin{aligned} CA_t = {} & (1-\lambda)\gamma CA_{t-1} + \lambda\left(T_t + rB_t^G - G_t\right) + \frac{\gamma(1-\lambda)}{1+r}\Delta NO_t \\ & + (1-\lambda)\left(1 - \frac{\gamma}{1+r}\right)\left(NO_t - E_t\overline{NO}_t\right) \end{aligned} \tag{7}$$

where the coefficient of the lagged term of the current account represents the share of Ricardian agents in the total population $(1 - \lambda)$ and the degree of habit persistence (γ), the term $\left(T_t + rB_t^G - G_t\right)$ represents the general government budget balance (taxes plus the return on government's net foreign assets minus government consumption). ΔNO_t stands for the change in net output (present output minus investment minus general government consumption), and the last term represents the core of the intertemporal approach: the deviation of the net output (NO_t) from its permanent value ($\overline{NO}_t$).

EMPIRICAL STRATEGY

Data

The empirical analysis is based on annual data covering the 1994–2013 period. The sample covers the period from 1994 onward, due to the questionable quality of the data for the transition countries in the early transition period. Data have been collected for three groups of countries:

TABLE 1
List of Variables Used

Symbol	*Description*
$ca_{i,t}$	Current account balance (expressed as % of GDP).
$fb_{i,t}$	Fiscal balance: general government budget balance (expressed as % of GDP).
$no_{i,t}$	Net output: GDP minus total investment minus general government consumption (expressed as % of GDP).
$relinc_{i,t}$	Relative income: natural logarithmic deviation of country's per capita income from permanent level of variable, defined as cross-country GDP-weighted average for EU-15 economies.
$relinv_{i,t}$	Relative investment: difference between country's gross domestic investment (as % of GDP) and time-varying cross-country GDP-weighted average of corresponding variable for EU-15 economies.
$relgc_{i,t}$	Relative government consumption: difference between country's general government consumption (as % of GDP) and time-varying cross-country GDP-weighted average of corresponding variable for EU-15 economies.

fifteen advanced European economies (EU-15), ten new EU member-states from Central and Eastern Europe, including Malta and Cyprus (EU-10), and five SEE transition countries (SEE-5). Hence, the sample consists of 598 observations (600 minus 2 missing observations). The main data source is the World Economic Outlook database of the International Monetary Fund (October 2015). A couple of data transformations have been computed to fit the research question (see Table 1).

Relative income is constructed as a log deviation of a country's gross domestic product per capita (in purchasing power parity terms and expressed in current international dollars) from the cross-national ($N - 1$) average. Relative investment is constructed as a log deviation of a country's investment ratio from the cross-national average in the corresponding year. Government consumption is used instead of public spending, which was the case in Bussière, Fratzscher, and Müller (2006). The latter study uses total public expenditures, which include government consumption (wages and goods and services), social transfers, interest payments, and government investments. It is argued that this is not an entirely consistent approach, as the government investment component is already factored into the analysis as a component of total investments. For this reason, we use the log deviation of a country's government consumption ratio from the cross-national average in the corresponding year.

As presented in Table 2, external imbalances have also been accompanied by large general government budget deficits in the European transition economies.

One of the assumptions of dynamic-optimizing analysis is that the degree of capital account openness of the European transition economies is sufficient for them to engage in intertemporal trade. In this context, the present study relies on the *de jure* index by Chinn and Ito (2008), updated until 2013.

Empirical Specification

In empirical terms, equation (7) is used to introduce the basic model:

$$CA_{i,t} = \alpha_1 + \alpha_2 CA_{i,t-1} + \beta_1 fb_{i,t} + \beta_2 \Delta no_{i,t} + \beta_3 relinc_{i,t} + \beta_4 relinv_{i,t} + \beta_4 relgc_{i,t} + u_{i,t} \quad (8)$$

TABLE 2
Descriptive Statistics for the Core Variables

	EU-15			*EU-10*			*SEE-5*		
Variable	*Avg*	*Min*	*Max*	*Avg*	*Min*	*Max*	*Avg*	*Min*	*Max*
Current account balance (in % of GDP)	0.9	−14.9	13.2	−5.0	−22.6	8.7	−5.9	−25.2	4.0
Fiscal balance (in % of GDP)	−2.5	−30.5	6.9	−3.4	−12.8	4.5	−3.3	−13.1	3.3
Change in net output (in percentage points)	0.1	−7.1	9.1	0.5	−14.5	21.6	−0.2	−12.6	16.1
GDP per capita (in constant 2005 US$)	35,463.5	14,269.0	88,398.0	11,121.6	3,275.7	24,159.3	4,388.4	1,247.0	11,569.1
Government consumption (in % of GDP)	21.4	15.4	34.5	20.4	15.5	33.1	17.9	8.1	25.5
Gross domestic investment (in % of GDP)	20.7	12.9	30.9	23.4	9.4	39.9	24.6	7.1	39.6

Note: The data refer to the period 1994–2013.

where $i = 1, 2, \ldots, 30$ (countries) and $t = 20$ years (1994, 1995, … 2013). The dependent variable is the current account (normalized by GDP). The independent variables are the fiscal balance relative to GDP ($FB_{i,t}$) and the change in net output ($\Delta NO_{i,t}$). The relative variables are relative income ($relinc_{i,t}$), relative investment ($relinv_{i,t}$), and relative government consumption ($relgc_{i,t}$).[3] Furthermore, α_1 is the intercept, and α_2 stands for the coefficient on the lagged dependent variable ($CA_{i,t-1}$). The last term in Equation (7) is reorganized in the following way:

$$NO_t - E_t NO_t = Y_t - I_t - G_t - (\bar{Y}_t - \bar{I}_t - \bar{G}_t) = (Y_t - \bar{Y}_t) - (I_t - \bar{I}_t) - (G_t - \bar{G}_t) \tag{9}$$

so that the expression $(Y_t - \bar{Y}_t)$ stands for the relative income, $(I_t - \bar{I}_t)$ for the relative investment, and $(G_t - \bar{G}_t)$ for the relative government consumption. These ratios are very relevant and capture the deviation of the actual data from the permanent level of the corresponding variables; $u_{i,t}$ stands for the disturbance term, which is assumed to be identically and independently distributed across time and countries.

The fiscal balance coefficient is expected to be zero or a positive number. Considering that the transition countries are populated by a larger share of liquidity-constrained consumers (e.g., Budina, Garretsen, and Eelke 2000), the magnitude of the coefficient is expected to be higher (Table 3). Due to the assumed consumption-smoothing effect, changes in net output are also expected to exhibit a positive correlation with the current account balance. It is expected that an increase in net output will not be entirely consumed. Part of it will be saved and reflected as an improvement of the current account position. Hence, changes in net output are also likely to be positively associated with the external balance.

Relative income is an important factor of current account behavior in both traditional and dynamic optimizing models. The intertemporal models suggest that global shocks leave the current account position unaltered. Hence, the relevant factor is the difference between the

[3] For further details, please see Appendix 3.

TABLE 3
Expected Signs and Magnitude of the Coefficients

Variable	Expected signs and magnitude of coefficients	
	EU-15 countries	*Fifteen transition countries*
Lagged current account balance	+	+
Fiscal balance (in % of GDP)	0/+	+
Changes in net output	+	+
Relative income	+	+
Relative investment	–	–
Relative government consumption	–	–

Note: 0 indicates no association; + indicates positive association; – indicates negative association with current account balance.

changes in per capita income and the average (global) changes. In empirical terms, the relative income is built as a natural logarithmic deviation of a country's per capita income from the permanent level of this variable. As mentioned above, it has been challenging to get an empirical mapping of this theoretical concept. Since the forward-looking characteristic of the permanent level of the variable is unobservable, empirical studies have often used other variables, such as the time-varying cross-country average for the sample (e.g., Glick and Rogoff 1995). If the country-specific income is above (below) the global average income, then the country is expected to run a current account surplus (deficit). Therefore, one would expect a positive sign on the coefficient of the relative income variable.

Relative government consumption and relative investments are constructed as a logarithmic difference between the permanent levels of these variables and actual country-year observations. Again, the permanent levels are defined as time-varying cross-country GDP-weighted averages. Any expenditure beyond the levels observed in the other countries is expected to worsen the current account position. As a conclusion, the expected signs on both variables are negative.

In relation to the previous literature, it is necessary to comment on two important departures:

(1) The permanent level assumption: Individual countries are assessed through the lens of their deviation from the permanent level. This permanent level is represented by the weighted average of either the entire sample of thirty countries or the EU-15 as a reference group. As in Bussière, Fratzscher, and Müller (2006), relative income, relative investment, and relative government consumption are interesting, since they use the sample average as a proxy for the permanent level of income, investments, and government consumption. For each period, then, the relative weight of each country in the overall average of the sample is measured. Nevertheless, if all the countries are deviating from the average, then the standard deviation actually has more information than the average. For instance, when one considers relative government consumption, one would assume it has a negative relationship with the current account. However, a stable country, in terms of government consumption, will see the relative government consumption measure increase if the rest of the sample decreases its government consumption. This means that the dispersion between the country's government consumption and the sample average is increasing. The fact that the sample average decreases means there is an expectation that the current account balance will improve (Bussière, Fratzscher, and Müller 2006). However, the fact that for some

countries the ratio is greater than one—because of the decrease of the denominator—implies that the current account should deteriorate. A lower denominator, however, implies that government consumption also went down, then improving the current account balance. Because of this limit, the percentage change in income, investment, and government consumption ratios is also considered in the robustness analysis.

(2) An important conceptual advance with respect to the previous literature is the introduction of GDP-weighted ($N - 1$) averages for the reference group. Considering the nature of the population, weighted averages are necessary to avoid biases created by the presence of large countries.

Selection of the Estimation Technique

The choice of the estimation technique is driven by the nature of the sample. Time-series cross-section (TSCS) analyses often do not work nicely with the ordinary least squares (OLS) assumptions. The common complications coming from TSCS are tackled by applying Bruno's (2005) bias-corrected least-square dummy variable estimator, developed for short dynamic panels with fixed effects, and extended to accommodate unbalanced data. Considering the nature of the dataset, this seems to be a solid choice.

The normality of the variables has been checked, and also the need for a potential polynomial transformation. As a result, a linear model is recommended here. Also, the panel is slightly unbalanced, and again considering the nature of the dataset, Bruno's (2005) estimation protocol is applied in three different contexts: (1) initialized with the Anderson-Hsiao's estimator (Anderson and Hsiao 1982), (2) estimated with a two-step difference GMM (Arellano and Bond 1991), and (3) estimated with the system GMM estimator (Blundell and Bond 1998).

First, as Bond (2002) points out, it is necessary to find the range of acceptable coefficients. Those bounds provide a useful check on results from theoretically superior estimators. To find the range of acceptable coefficients coming out of the three estimators, it is necessary to find the upper limit and the lower limit for the coefficients. This step serves to calibrate the model. To do so, it is necessary first to specify the model based on the right assumptions: For calibration purposes, is a fixed-effects model needed? What kind of fixed effects?[4]

The idea behind fixed-effects models is that each section has its own individual characteristics that may or may not influence the predictor variables. Fixed effects remove the effect of these time-invariant characteristics so that one can assess the net effect of the predictors on the outcome variable. After running a Hausman test, a fixed-effects model was selected to calibrate the model. Then the question was to know whether it was necessary to control for time-fixed effects. The test concluded in favor of time-fixed effects. Time-fixed effects will be used not only for calibration purposes but also for Bruno's (2005) estimator.

To determine the range of acceptable coefficients, the calibration is twofold: (1) a regular OLS, and then (2) an LSDV (Judson and Owen 1999; Kiviet 1995).

As aforementioned, time-fixed effects are included. One immediate problem in applying OLS to this empirical problem is that the lagged dependent variable is correlated with the fixed effects in the error term, which gives rise to "dynamic panel bias" (Nickell 1981). This positive correlation between a regressor and the error does not make OLS a consistent estimator.

[4] Please see Appendix 1 for their visualization.

There are three strategies to work around the endogeneity. The first strategy is to transform the data to remove the fixed effects; it is the essence of the so-called difference generalized-method-of-moments (GMM) estimator. The other is to instrument the lagged dependent variable and any other similarly endogenous variables with variables thought uncorrelated with the fixed effects. This is the essence of the so-called system GMM estimator. One of the important innovations brought by the system GMM is that it circumvents the main problem of difference GMM, which is associated with the weak assumption that past levels of the variable are good instruments for first differences. More precisely, for variables that may display a random walk, past changes may be more predictive of current levels than past levels are of current changes. The system GMM uses more moment conditions, because the explanatory variables expressed in first differences are instrumented with lags of their own levels, and the explanatory variables in levels are instrumented with lags of their own first differences. In panel datasets with short time dimensions and persistent time series, the Blundell and Bond (1998) version of the system GMM is found to bring dramatic efficiency gains in comparison with the basic first-difference GMM.

Another strategy to correct for the fixed effects is to draw them out of the error term by entering dummies for each individual—the so-called least-squares dummy variables (LSDV) estimator.

Since the seminal paper by Nickell (1981), where it is shown that the least-squares dummy variable (LSDV) estimator is not consistent for finite T in autoregressive panel-data models, a number of consistent instrumental variable (IV) and generalized method of moments (GMM) estimators have been proposed in the econometric literature as an alternative to LSDV. Anderson and Hsiao (1982) suggest two simple IV estimators that, upon transforming the model in first differences to eliminate unobserved individual heterogeneity, use the second lags of the dependent variable, either differenced or in levels, as an instrument for the differenced one-time lagged dependent variable.

However, Kiviet (1995) and Judson and Owen (1999) argue that the best way to handle dynamic panel bias is to perform LSDV, and then correct the results for the bias. However, this approach works only for balanced panels and does not address the potential endogeneity of other regressors. Here the panel is slightly unbalanced.

In this context, the more practical strategy is to use estimators that theoretically need no correction. What is needed to directly remove dynamic panel bias is a different transformation of the data, one that removes fixed effects (dynamic panel data estimators do not have fixed effects, by definition) while avoiding the propensity of the within-groups transformation to make every observation of the estimated value of the dependent variable endogenous to every other for a given individual. Under some conditions, a superior alternative is Bruno's (2005).

Arellano and Bond (1991) propose a GMM estimator for the first-differenced model, which, relying on a greater number of internal instruments, is more efficient than that of Anderson and Hsiao. Blundell and Bond (1998) observe that with highly persistent data, first-differenced IV or GMM estimators may suffer from a severe small-sample bias due to weak instruments. As a solution, they suggest a system GMM estimator with first-differenced instruments for the equation in levels and instrument in levels for the first-differenced equation (see also Roodman 2009).

A limitation of IV and GMM estimators is that their properties hold when N is large. Otherwise, they can be biased and imprecise in panel data with a small number of cross-sectional units. For a small N, earlier Monte Carlo studies (Arellano and Bond 1991; Judson and Owen 1999; Kiviet 1995) demonstrate that LSDV estimations have a relatively small variance as compared to IV and GMM estimators.

However, correcting the LSDV estimator is not feasible for unbalanced panels. The solution is partly found in Bruno (2005), where the bias approximations in Bun and Kiviet (2003) are extended to accommodate unbalanced panels with a strictly exogenous selection rule.

As a result, this article presents the LSDVC estimator building upon the theoretical estimation formulas in Bruno (2005) and estimates a bootstrap variance covariance matrix for the corrected estimator.

Estimation Results

The estimates from the three econometric techniques are remarkably consistent across different empirical specifications. Table 4 presents the estimation results for the basic model: columns [1]–[3] refer to the entire sample, columns [4]–[6] to the EU-15 countries only, and columns [7]–[9] to fifteen European transition countries only. Data are used for the entire sample and two disjoint samples: EU-15 countries and fifteen European transition countries.

The empirical results suggest that during the selected period, on average, the current accounts of the European economies were strongly driven by past developments. They produce evidence of the marked persistence of the current account balance, given that the lagged current account coefficient estimate is in the range between 0.67 and 0.94. The coefficient captures the partial adjustment of the current account and can be rationalized by habit formation in the behavior of consumers and investors.

The coefficient on the fiscal balance suggests a complete Ricardian equivalence. A widening of the budget deficit is expected to be offset by corresponding increases in private savings as a response to expectations about higher future taxes. This is entirely consistent with the propositions of the representative-agent framework

The coefficients for the change in net output also display the expected sign and are statistically significant at the 1 percent level. For instance, the preferred specification—the bias-corrected system GMM specification presented in column [3]—suggests that 67 percent of the increase in net output would be consumed, whereas 33 percent would be saved and translated into improvement of the current account. The coefficient for the European transition economies (column [9]) suggests that 71.6 percent of an increase in net output would be consumed, and 28.4 percent would be saved and reflected as an improvement of the current account position.

The relative terms are constructed using the time-varying GDP-weighted ($N - 1$) average as a reference series. The coefficient on relative income is insignificant in the entire-sample regressions. Yet, in contrast with theoretical propositions, it has a negative and statistically significant coefficient at the 10 percent level in a few regressions for the transition countries. The negative coefficient on relative income suggests that a per capita income above the sample average is likely to be associated with a deteriorated current account position. A per capita income of 10 percent above the sample average, which was US$ 32,862 (2005 constant prices) in 2013, would imply a higher current account deficit by approximately 0.68 percentage points of GDP (= {[ln(36,148.2) – ln(32,862.2)] × 1.059}).

As expected, the changes in a country's relative investments are negatively correlated with the current account positions. An increase of the investment ratio by 1 percentage point above the sample average (for instance, from 18.1% to 19.1% of GDP) is expected to deteriorate the current account-to-GDP ratio by 0.18 percentage points (={[ln(23.1) – ln(22.1)] × −4.090}) in EU-15 countries and by 0.05 percentage points in the European transition countries, *ceteris paribus*.

TABLE 4
Baseline Model: Estimation Results

Bias-corrected LSDV estimators									
Models	Full sample (N= 30)			EU-15 countries (N =15)			Transition countries (N= 15)		
Explanatory variables	*AH (1982)*	*AB (1991)*	*BB (1998)*	*AH (1982)*	*AB (1991)*	*BB (1998)*	*AH (1982)*	*AB (1991)*	*BB (1998)*
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Lagged current account balance	**0.808*****	**0.788*****	**0.813*****	**0.829*****	**0.907*****	**0.940*****	**0.680*****	**0.672*****	**0.687*****
	[0.04]	[0.04]	[0.04]	[0.06]	[0.05]	[0.04]	[0.05]	[0.05]	[0.05]
Fiscal balance	0.007	0.007	0.004	0.025	0.016	0.017	–0.062	–0.059	–0.067
	[0.04]	[0.04]	[0.04]	[0.18]	[0.04]	[0.04]	[0.09]	[0.08]	[0.08]
Change in net output	**0.327*****	**0.324*****	**0.333*****	0.231	**0.263*****	**0.274*****	**0.279*****	**0.280*****	**0.284*****
	[0.03]	[0.03]	[0.03]	[0.24]	[0.06]	[0.06]	[0.04]	[0.04]	[0.04]
Relative income	–2.110	**–2.943***	–2.906	–2.055	–1.305	–1.673	**–5.645***	**–6.861****	**–7.105****
	[1.91]	[1.72]	[1.78]	[11.98]	[2.45]	[2.47]	[3.05]	[2.70]	[2.84]
Relative investment	**–1.263****	**–1.188*****	**–0.974****	–4.988	**–4.390*****	**–4.090*****	**–1.315****	**–1.163***	–1.014
	[0.49]	[0.44]	[0.45]	[5.97]	[1.30]	[1.29]	[0.66]	[0.60]	[0.62]
Relative gov consumption	–3.378	**–3.713***	**–4.145****	–0.519	0.588	0.914	**–5.609***	**–5.863****	**–6.345****
	[2.18]	[2.02]	[2.08]	[11.40]	[2.51]	[2.51]	[2.98]	[2.68]	[2.80]
Number of observations	568	568	568	284	284	284	284	284	284
Number of countries	30	30	30	15	15	15	15	15	15

Sources: Authors' regressions use data from International Monetary Fund and United Nations national accounts database; Bruno (2005).
Notes: Dependent variable: Current account balance (in % of GDP), annual observations for 30 European countries, 1994–2013. Robust standard errors are reported in brackets. Asterisks indicate statistical significance at the ***1%, **5%, and *10%levels. GDP data are adjusted for international differences in purchasing power of dollar. AH (1982) stands for Anderson and Hsiao (1982) estimator; AB (1991) stands for Arellano and Bond (1991) or the difference GMM estimator; and BB (1998) stands for Blundell and Bond (1998) or the system GMM estimator.

The increase of government consumption is also a statistically significant determinant in the model. An increase of the government consumption ratio by 1 percentage point above the sample average is expected to deteriorate the current account-to-GDP ratio by 0.20 percentage points in the entire group and by 0.34 percentage points (= {[ln(19.8) – ln(18.8)] × −6.345}) in the European transition countries, *ceteris paribus*.

What are the noteworthy differences for the EU-15 vis-à-vis the fifteen European transition countries? First, the coefficient of the lagged dependent variable is larger for the EU-15 countries, suggesting higher persistence of the current account balance. These countries have a higher portion of liquidity-unconstrained economic agents. Second, relative income appears to be uncorrelated with the current account behavior in the EU-15 countries, but negatively correlated with external accounts of the European transition countries. Third, relative government consumption is a statistically significant determinant of current account behavior only among the European transition economies and the main driving force, given the magnitude of the coefficient.

The main corollary is that, during the observed period (1994–2013), the EU-15 countries were using intertemporal trade mainly for private consumption and investment smoothing, whereas the European transition countries used it primarily for government consumption smoothing and, to a lesser extent, for investment smoothing. The robustness of the estimations is investigated in the next section.

Robustness Analysis

To assess the consistency of the estimated coefficients, five robustness checks are reported associated with re-estimation of (1) the same model for different combinations of subperiods; (2) the model with the current account deviation ($ca_{i,t} - \overline{ca}_t$) as a dependent variable; (3) the model with decomposed net output; (4) the model with intra-European creditor-debtor division; and (5) a consistency check with the intertemporal theory.

Different Combinations of Subperiods

The time dimension was split into combinations of two subperiods. Starting with the 1994–2002 and 2003–2013 subperiods, the first subperiod is consecutively increased by an additional year, and the second subperiod is correspondingly reduced by a year. The goal is to investigate whether the estimates refer only to a certain subperiod. The estimates are fairly consistent across different empirical specifications, as most regression coefficients retain their sign, magnitude, and statistical significance. Due to space limitation, the regressions for all subperiods are reported in Appendix 2. Yet a graphical presentation is offered of the implied consumption percentages of net output increases in different subperiods (Figure 7). They are derived from the statistically significant coefficients at the 1 percent level for the changes in net output across time.

Before the outbreak of the global financial crisis in 2008, the European transition economies consumed a much higher portion of the net output increases. There are at least two explanations: (1) the liquidity constraints were binding during the 1990s, because of the underdeveloped financial institutions, and (2) prospective EU membership and permanent increases of future output had already been factored into the consumption decisions. In contrast, the subperiods between 2000 and 2013 were marked by lower percentages of consumption and a significant portion of precautionary saving, particularly during the global financial crisis. This is entirely consistent with recent econometric

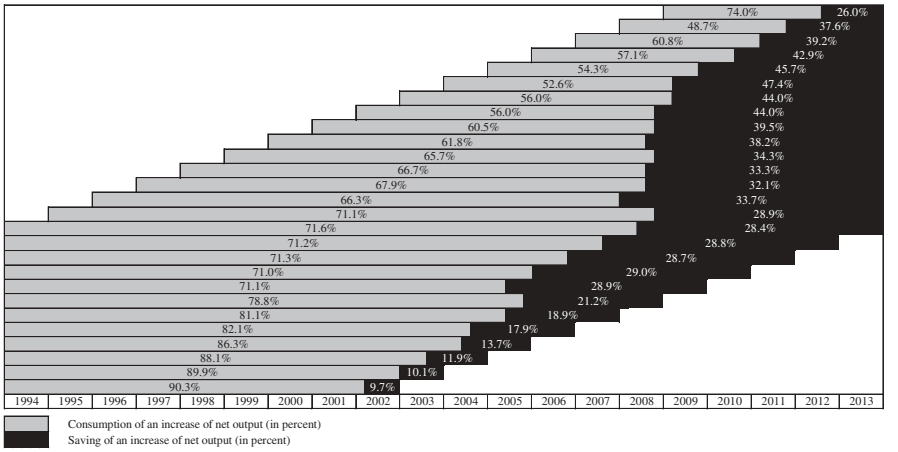

FIGURE 7 Consumption vs. Saving of an Increase of Net Output in European Transition Countries (in percent), Different Subperiods. *Source*: Authors' calculations based on data from IMF World Economic Outlook database, October 2015. *Note*: Non-weighted cross-country averages. *Source*: Authors' calculations based on data from IMF World Economic Outlook database, October 2015. *Note*: Non-weighted cross-country averages.

inquiries into the nexus between the Great Recession and precautionary savings (e.g., Ashoka, Ohnsorge, and Sandri 2012).

Current Account Deviation as a Dependent Variable

As another robustness check, we investigate whether the model estimated for relative variables, $(ca_{i,t} - \overline{ca}_t)$ instead of $ca_{i,t}$, and $(no_{i,t} - \overline{no}_t)$ instead of $no_{i,t}$, yields similar results. The intuition of the suggested inspection is as follows: It can be expected that faster growth of net output at home affects the current account balance as long as it is not accompanied by faster growth of net output abroad. As the ultimate result, what matters is the relative growth rate of net output. The results, which are presented in Table 5, are remarkably consistent with the estimation results from the baseline model. Since the dependent variable is now the deviation of the current account balance from the permanent level, the level of persistence is much lower: the coefficient on the lagged current account balance varies between 0.398 and 0.867. The impact of net output growth—beyond that in the other countries under investigation—is also statistically significant, with a stable coefficient in the range between 0.36 and 0.39.

Model with Decomposed Net Output

Departing from previous empirical works, the changes in net output are broken down into (1) the real GDP growth rate; (2) changes in the country's investment ratio, and (3) changes in the general government consumption ratio (see Appendix 3 for their construction). This provides a more

TABLE 5
Model with Current Account Deviation ($ca_{i,t} - \overline{ca}_t$) as a Dependent Variable

	Bias–corrected LSDV estimators								
Models	*Full sample (*N= *30)*			*EU-15 countries (*N =*15)*			*Transition countries (*N= *15)*		
Explanatory variables	*AH (1982)*	*AB (1991)*	*BB (1998)*	*AH (1982)*	*AB (1991)*	*BB (1998)*	*AH (1982)*	*AB (1991)*	*BB (1998)*
Lagged current account balance	**0.525*****	**0.526*****	**0.566*****	**0.826*****	**0.831*****	**0.867*****	**0.398*****	**0.399*****	**0.427*****
	[0.04]	[0.04]	[0.04]	[0.05]	[0.05]	[0.05]	[0.05]	[0.05]	[0.05]
Fiscal balance	–0.021	–0.018	–0.03	–0.01	–0.015	–0.018	**–0.162***	**–0.155***	**–0.162***
	[0.05]	[0.04]	[0.04]	[0.05]	[0.04]	[0.05]	[0.09]	[0.08]	[0.08]
Net output deviation (*no – ño*)	**0.374*****	**0.378*****	**0.388*****	0.174	0.151	0.154	**0.353*****	**0.357*****	**0.362*****
	[0.06]	[0.05]	[0.05]	[0.15]	[0.12]	[0.12]	[0.07]	[0.06]	[0.06]
Relative income	–1.301	–1.087	–0.838	–1.928	–0.76	–0.864	**–5.176***	**–5.141****	**–5.280***
	[1.81]	[1.72]	[1.83]	[3.10]	[2.44]	[2.63]	[2.86]	[2.62]	[2.75]
Relative investment	0.626	0.621	0.75	–2.873	–3.644	–3.719	0.737	0.74	0.833
	[0.86]	[0.85]	[0.84]	[3.45]	[2.53]	[2.69]	[0.82]	[0.76]	[0.76]
Relative government consumption	**–4.488****	**–4.170****	**–4.571****	3.618	2.313	2.598	**–7.622*****	**–7.448*****	**–7.775** ***
	[1.84]	[1.77]	[1.83]	[3.77]	[2.89]	[3.11]	[2.88]	[2.66]	[2.74]
Number of observations	569	569	569	284	284	284	285	285	285
Number of countries	30	30	30	15	15	15	15	15	15

Source: Authors' regressions using data from the International Monetary Fund and the United Nations national accounts database; Bruno (2005).
Notes: Dependent variable: Deviation of current account balance from its permanent level ($ca_{i,t} - \overline{ca}_t$), annual observations for 30 European countries, 1994–2013. Robust standard errors are reported in brackets. Asterisks indicate statistical significance at the ***1%, **5%, and *10% levels. GDP data are adjusted for international differences in purchasing power of dollar. AH (1982) stands for Anderson and Hsiao (1982) estimator; AB (1991) stands for Arellano and Bond (1991) or the difference GMM estimator, and BB (1998) stands for the Blundell and Bond (1998) or the system GMM estimator.

accurate inquiry into the important sideshow behind the net output story. The results are presented in Table 6. They bring ample evidence on the counter-cyclical character of the external accounts of the European transition economies—an acceleration of the real GDP growth rate by 1 percentage point is likely to be associated with a 0.2 percent of GDP deterioration of their current account balances. This appears to be another *differentia specifica* with regard to the EU-15 countries. The remaining coefficients are remarkably consistent across different empirical specifications.

Model with Intra-European Creditor-Debtor Division

As the Great Recession hit Europe in late 2009, another intra-European division started to gain ground: creditor vs. debtor countries. European creditor countries are defined as those having an average current account surplus (CA > 0) during the investigated period. Only nine of the thirty European countries fulfill this criterion: Austria, Belgium, Denmark, Finland, France, Germany, Luxembourg, Netherlands, and Sweden. The remaining countries, on average, recorded current account deficits (CA < 0) during the observed period, and are labeled as European debtor countries.

The empirical results from the basic model are presented in Table 7. The degree of habit persistence—captured by the lagged current account term—is smaller among the debtor countries (columns [4]–[5]). There is no substantial difference in terms of net output impact.

The main finding is that faster growth of government consumption (relative growth, or simply growth beyond the growth observed in their trading partners) significantly deteriorates the external accounts. This is not only *differentia specifica* for the European transition countries, but also for all European debtor countries. This unsurprising outcome calls for appropriate structural reforms in the European peripheral and transition countries—current and potential future members of the euro area—in order to result in more stable and longer-lasting foreign capital inflows. In contrast, relative government consumption does not play a role in explaining the current account balances of the nine European creditor countries.

Consistency Check with Intertemporal Theory

Lastly, there are a few stylized facts that shed more light on the validity of the intertemporal approach for the European transition economies. International capital mobility is one of the fundamental assumptions of the intertemporal model, as it allows for intertemporal trade and consumption smoothing. As already noted in the second section, most transition countries embarked on gradual capital account liberalization during the late 1990s and the 2000s. Hence, the periods of relatively higher capital account openness should be matched by the model's relatively lower standard error of predictions, implying a negative correlation. The standard error of predictions represents a measure of the average amount by which actual current account data deviate from the predicted values. The simple unconditional correlation between the standard errors of the predictions of the basic model (column 3 of Table 4) and the Chinn and Ito (2008) indices of capital account openness produces a coefficient of −0.20 for the entire sample. The test for the significance of the Pearson product-moment correlation coefficient suggests that it is statistically significant at any conventional level (p-value is close to 0). Hence, there is sufficient evidence that the intertemporal model fits better the periods with higher degrees of capital account openness.

TABLE 6
Model with Decomposed Net Output

	Bias-corrected LSDV estimators								
Models	Full sample (N= 30)			EU-15 countries (N =15)			Transition countries (N= 15)		
Explanatory variables	*AH (1982)* [1]	*AB (1991)* [2]	*BB (1998)* [3]	*AH (1982)* [4]	*AB (1991)* [5]	*BB (1998)* [6]	*AH (1982)* [7]	*AB (1991)* [8]	*BB (1998)* [9]
Lagged current account balance	**0.660*****	**0.652*****	**0.677*****	**0.808*****	**0.876*****	**0.913*****	**0.512*****	**0.506*****	**0.518*****
	[0.04]	[0.04]	[0.04]	[0.06]	[0.05]	[0.04]	[0.06]	[0.06]	[0.06]
Fiscal balance	0.015	0.022	0.016	0.026	0.017	0.018	–0.065	–0.054	–0.058
	[0.05]	[0.05]	[0.05]	[0.08]	[0.06]	[0.04]	[0.10]	[0.09]	[0.09]
Net output variables									
Real GDP growth	**–0.232*****	**–0.232*****	**–0.233*****	0.084	0.058	0.069	**–0.202****	**–0.196*****	**–0.194*****
	[0.05]	[0.05]	[0.05]	[0.21]	[0.07]	[0.07]	[0.08]	[0.07]	[0.07]
Change in country's investment ratio	–0.046	–0.044	–0.040	–0.163	**–0.172*****	**–0.180*****	–0.011	–0.004	–0.001
	[0.03]	[0.03]	[0.03]	[0.18]	[0.06]	[0.06]	[0.04]	[0.04]	[0.04]
Change in country's gov cons. ratio	**0.002***	**0.002****	**0.002****	–0.091	**–0.100*****	**–0.104*****	**0.003****	**0.003****	**0.003****
	[0.00]	[0.00]	[0.00]	[0.07]	[0.02]	[0.02]	[0.00]	[0.00]	[0.00]
Relative income	–0.887	–0.694	–0.715	–1.666	–1.345	–1.524	**–5.289***	**–5.537***	**–5.748***
	[2.03]	[1.87]	[1.98]	[8.01]	[2.45]	[2.50]	[3.21]	[2.98]	[3.15]
Relative investment	**–2.396*****	**–2.466*****	**–2.424*****	–5.067	**–4.507*****	**–4.288*****	**–2.164*****	**–2.241*****	**–2.211*****
	[0.49]	[0.47]	[0.47]	[4.35]	[1.40]	[1.41]	[0.70]	[0.65]	[0.67]
Relative government consumption	**–5.181****	**–4.929****	**–5.518****	0.741	1.236	2.188	**–7.653****	**–7.959****	**–8.308****
	[2.39]	[2.23]	[2.35]	[7.81]	[2.57]	[2.55]	[3.35]	[3.16]	[3.36]
Number of observations	568	568	568	284	284	284	284	284	284
Number of countries	30	30	30	15	15	15	15	15	15

Sources: Authors' regressions using data from the International Monetary Fund and the United Nations national accounts database; Bruno (2005).
Notes: Dependent variable: Current account balance (in % of GDP), annual observations for 30 European countries, 1994–2013. Robust standard errors are reported in brackets. Asterisks indicate statistical significance at the ***1%, **5%, and *10% levels. GDP data are adjusted for international differences in purchasing power of dollar. AH (1982) stands for Anderson and Hsiao (1982) estimator; AB (1991) stands for Arellano and Bond (1991) or the difference GMM estimator, and BB (1998) stands for the Blundell and Bond (1998) or the system GMM estimator.

TABLE 7
Baseline Model: Estimation Results for European Creditors vs. Debtor Countries

	Bias-corrected LSDV estimators					
Models	*European creditor countries (N=9)*			*European debtor countries (N =21)*		
Explanatory variables	AH (1982) [1]	AB (1991) [2]	BB (1998) [3]	AH (1982) [4]	AB (1991) [5]	BB (1998) [6]
Lagged current account balance	**0.833*****	**0.916*****	**0.940*****	**0.726*****	**0.717*****	**0.733*****
	[0.08]	[0.06]	[0.05]	[0.04]	[0.04]	[0.04]
Fiscal balance	0.050	0.017	0.008	0.005	0.004	0.003
	[0.13]	[0.08]	[0.08]	[0.05]	[0.05]	[0.05]
Change in net output	**0.203***	**0.250*****	**0.262*****	**0.296*****	**0.296*****	**0.301*****
	[0.12]	[0.08]	[0.08]	[0.03]	[0.03]	[0.03]
Relative income	0.816	–2.075	–1.937	–3.417	**–4.638****	**–4.910****
	[7.77]	[4.47]	[4.71]	[2.25]	[2.05]	[2.19]
Relative investment	–6.174	**–3.732***	–3.284	**–1.293****	**–1.148****	**–0.994***
	[3.86]	[2.24]	[2.29]	[0.57]	[0.52]	[0.54]
Relative government consumption	1.259	2.131	2.995	**–5.391****	**–5.813*****	**–6.268*****
	[6.15]	[3.36]	[3.64]	[2.24]	[2.03]	[2.12]
Number of observations	170	170	170	398	398	398
Number of countries	9	9	9	21	21	21

Sources: Authors' regressions using data from International Monetary Fund and United Nations national accounts database; Bruno (2005).
Notes: Dependent variable: Current account balance (in % of GDP), annual observations for 30 European countries, 1994–2013. Robust standard errors are reported in brackets. Asterisks indicate statistical significance at ***1%, **5%, and *10% levels. GDP data are adjusted for international differences in purchasing power of dollar. AH (1982) stands for Anderson and Hsiao (1982) estimator; AB (1991) stands for Arellano and Bond (1991) or the difference GMM estimator, and BB (1998) stands for the Blundell and Bond (1998) or the system GMM estimator

The underlying assumption of the dynamic-optimizing theory of a sufficiently high degree of capital mobility implies that it should be a more suitable analytical framework for the advanced EU-15 economies. If this is the case, the average standard error of predictions should be higher for the European transition economies. Indeed, the corresponding values for EU-15 and the fifteen European transition economies are 2.23 and 3.78, respectively. This comparison lends additional support to the argument that the intertemporal model works better for the developed economies. Still, the intertemporal approach to current account determination is also a useful analytical framework for the European transition countries, given the substantial liberalization of their capital accounts. Please see Appendix 4 for a comparison of the actual and predicted current account balances of the European transition countries.

CONCLUSION

The widening and persistent current account deficits of the European transition economies have been partly made possible by the trend of capital account liberalization in the past two decades. The European transition economies have recorded much higher and more volatile external

current account deficits than the EU-15 economies. Even so, there have been few academic inquiries into the determinants and implications of these external imbalances.

It is argued that the present degree of capital account openness justifies an intertemporal analysis of the current accounts of European transition economies. The determinants of the current account imbalances of the European transition economies are contrasted and compared with those of the EU-15 economies. The results are based on a solid empirical strategy based on Bruno 92005)'s protocol: the estimators proposed by Anderson and Hsiao (1982), Arellano and Bond (1991), and Blundell and Bond (1998), corrected by Bruno's (2005) a bias-corrected least-squares dummy variable estimator, developed for short dynamic panels with fixed effects, and extended to accommodate unbalanced data. The empirical results are fairly consistent across different empirical specifications, as most regression coefficients retain their sign, magnitude, and statistical significance.

The estimations reveal that during the 1994–2013 period, the EU-15 economies were using intertemporal trade mainly for private consumption and investment smoothing, whereas the fifteen European transition countries used it primarily for government consumption and, to a lesser extent, investment smoothing. It appears that relative government consumption is one of the main driving forces of current account behavior among the European transition economies, given the magnitude of the coefficient.

Before the outbreak of the global financial crisis, the European transition economies consumed a much higher portion of net output increases. There are at least two explanations: (1) liquidity constraints were binding during the 1990s, because of the underdeveloped financial institutions, and (2) the prospective EU membership and permanent increases in future output had already been factored into the consumption decisions. In contrast, the period between 2000 and 2012 was marked by significant increases in precautionary saving, particularly during the global financial crisis. Additionally, the growth of net output at home also positively affected current account balances, since it was accompanied by lower growth of net output abroad.

All empirical specifications bring ample evidence in favor of investment-induced current account deficits. The increase in investment demand—as transition economies speed up the European integration process—has further contributed to a deterioration of their current account positions. This is entirely consistent with the counter-cyclical character of their external accounts—an acceleration of the real GDP growth rate by 1 percentage point is likely to be associated with deterioration of their current account balances by 0.2 percent of GDP, even when controlling for potential endogeneity. The channel to high growth in these countries is, primarily, through making possible the pursuit of investment opportunities that would otherwise remain unfunded; in turn, this seems to be intimately linked to the opportunities created by EU membership. Yet European transition countries have faster growth of government consumption (as compared to their trading partners) that deteriorates their external accounts, and this is a general feature of the European debtor countries. This calls for appropriate structural reforms in the European peripheral and transition countries—current and potential future members of the euro area—in order to result in longer-lasting foreign capital inflows.

Despite these valuable and consistent findings, the theoretical coherence of the intertemporal model and its applicability for the transition economies remain insufficiently explored. The empirical results should now be cross-validated by a dynamic stochastic general equilibrium model in order to examine how shocks and policy responses impact on and propagate through the economy.

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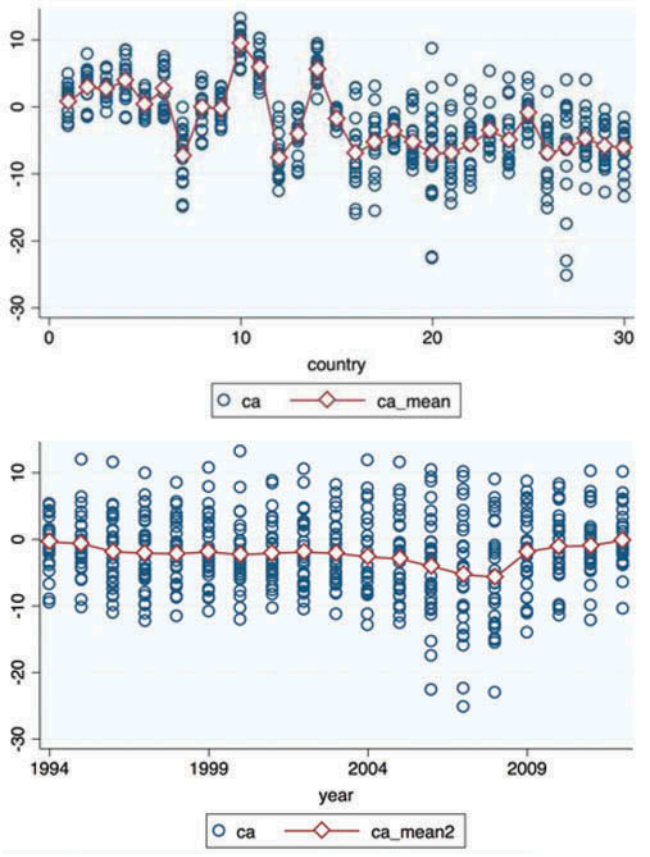
Appendix 1. Visualization of Fixed Effects



Appendix 2. Estimations for Different Subperiods for Entire Sample

Explanatory variables	*1994-2002*	*2003-2013*	*1994-2003*	*2004-2013*	*1994-2004*	*2005-2013*	*1994-2005*	*2006-2013*
Lagged current account	**0.394*****	**0.808*****	**0.388*****	**0.813*****	**0.394*****	**0.802*****	**0.435*****	**0.740*****
	[0.10]	[0.09]	[0.09]	[0.09]	[0.089	[0.081	[0.08]	[0.09]
Fiscal balance	-0.005	-0.057	-0.007	-0.028	0.005	-0.035	-0.051	-0.076
	[0.14]	[0.12]	[0.13]	[0.13]	[0.13]	[0.14]	[0.13]	[0.13]
Change in net output	**0.097***	**0.440*****	**0.101****	**0.474*****	**0.119*****	**0.457*****	**0137*****	**0.429*****
	[0.05]	[0.06]	[0.05]	[0.07]	[0.05]	[0.07]	[0.05]	[0.07]
Relative income	**-14.478*****	-4.490	**-14.316*****	-2.440	**-11.260****	-4.085	**-10.855****	-4.568
	[5.18]	[4.99]	[5.55]	[6.16]	[5.33]	[6.68]	[4.61]	[8.71]
Relative investment	-1.184	-1.964	-1.176	-2.482	-1.127	-2.980	-1.107	-3.946
	[0.92]	[2.58]	[0.90]	[3.05]	[0.76]	[3.08]	[0.78]	[3.60]
Relative gov consumption	**-12.265****	-6.795	**-11.415****	-5.970	**-9.237****	-8.558	**-9.703*****	-12.526
	[4.80]	[6.74]	[4.58]	[6.52]	[3.89]	[7.51]	[3.77]	[9.51]
Number of obervations	119	150	134	135	149	120	164	105
Number of countries	15	15	15	15	15	15	15	15

Appendix 3. Calculations Related to Explanatory Variables

Explanatory variables	*1994-2006*	*2007-2013*	*1994-2007*	*2008-2013*	*1994-2008*	*2009-2013*
Lagged current account	**0.559*** **	**0.665*** **	**0.627*** **	**0.601*** **	**0.651*** **	**0.370*** **
	[0.07]	[0.11]	[0.07]	[0.14]	[0.06]	[0.14]
Fiscal balance	-0.078	-0.068	-0.041	-0.036	-0074	-0.042
	[0.12]	[0.14]	[0.12]	[0.14]	[0.11]	[0.14]
Change in net output	**0.179*** **	**0.392*** **	**0.189*** **	**0.376*** **	**0.212*** **	**0.260*** **
	[0.04]	[0.07]	[0.04]	[0.08]	[0.04]	[0.07]
Relative income	**-11.861*** **	-2.615	**-9.524*** **	0.027	**-8.542** **	-2.099
	[4.11]	[8.77]	[4.39]	[10.13]	[4.04]	[11.77]
Relative investment	-0.98	[4.18]	**-1.359***	-4.872	**-1.258***	-4.457
	[0.70]	[3.63]	[0.76]	[3.65]	[0.71]	[4.48]
Relative gov consumption	**-9.061*** **	-7.898	**-7.267** **	1.577	**-6.747** **	11.399
	[3.23]	[11.0]	[3.47]	[13.40]	[3.17]	[13.59]
Number of obervations	179	90	194	75	209	60
Number of countries	15	15	15	15	15	15

Sources: Authors' regressions using data from International Monetary Fund and United Nations national accounts database.

Notes: Dependent Variable: Current account balance (in percent of GDP), annual observations for thirty European countries, 1994–2013. Robust standard errors are reported in brackets. Asterisks indicate statistical significance at the ***1%, **5%, and *10% levels. GDP data are adjusted for international differences in purchasing power of the dollar. The results are based on bias-correction of Blundell and Bond (1998) estimation.

Net output variables	
Change in net output:	$chno_{i,t} = no_{i,t}/no_{i,t-1}\,100 - 100$
Real GDP growth rate:	$gr_{i,t} = gdp_{i,t}/gdp_{i,t-1}\,100 - 100$
Changes in the total investment ratio:	$\Delta inv_t = \frac{i_t}{gdp_t} / \frac{i_{t-1}}{gdp_{t-1}}\,100 - 100$
Changes in the government consumption ratio:	$\Delta gc_t = \frac{gc_t}{gdp_t} / \frac{gc_{t-1}}{gdp_{t-1}}\,100 - 100$
Relative variables	
Relative income:	$relinc_{i,t} = 1n(gdppc_{i,t}) - 1n(gdppc_{sample\ average,t})$
Relative investment:	$relinv_{i,t} = 1n\,(inv_{i,t}) - 1n\,(inv_{sample\ average,t})$
Relative government consumption:	$relgc_{i,t} = 1n\,(gc_{i,t}) - 1n\,(gc_{sample\ average,t})$

APPENDIX 4. ACTUAL VS. PREDICTED CURRENT ACCOUNT BALANCES (IN PERCENT OF GDP), 1994–2013