

**TWIN DEFICITS HYPOTHESIS AND HORIOKA-FELDSTEIN PUZZLE  
IN TRANSITION ECONOMIES**

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## ***Abstract***

*The article's main objective is to investigate the empirical link between the fiscal balance and the current account (i.e. the twin deficits phenomenon). The article focuses on transition economies which are according to their different characteristics divided into three major groups, i.e. Central and Eastern Europe (CEE), Southern and Eastern Europe (SEE) and the Commonwealth of Independent States (CIS). In fact, the inconsistency between public sector instability and currency overvaluations which led to current account balance deterioration was denoted as one of the key determinants of the balance of payments (currency) crisis seen in transition economies like Czech Republic (1997) and Russia (1998). Moreover, the importance of the so-called Horioka-Feldstein puzzle in transition economies is examined in order to draw some conclusions about the regions' integration with international capital markets. For this purpose, pooled cross-sectional and time-series techniques are used to characterize the properties of current account variations across selected groups of transition economies in the 1990-2003 period. The empirical results suggest that high budget deficits in transition countries have signaled relatively low level of substitutability between private and public savings, implying a relatively high correlation between fiscal and external imbalances. Accordingly, special emphasis should be paid to the fiscal policy shift in these economies. Indeed, the main element of the economic policy reversal in transition countries should involve a substantial reduction of fiscal deficits in the future in order to reduce the probability of a balance of payments (currency) crisis. Finally, the article provides some evidence of the existence of the Horioka-Feldstein puzzle in transition economies.*

**Key words:** *current account deficit, fiscal policy, investment, Horioka-Feldstein puzzle, panel data, transition economies*

**JEL classification:** C33, F32

## **1. Introduction**

In the last decade, many financial crises have emerged and induced substantial welfare losses for economies such as the Mexican (1994), Asian (1997), Brazilian (1999) and Argentinean crises (2001). Moreover, even transition economies have not been immune to some form of a 'balance of payment crisis' (or currency crisis). In fact, along with a number of capital account liberalizations the enhanced macroeconomic stability combined with decisively pro-Western and pro-market-oriented economic policy and rhetoric made many transition economies the darlings of international investors. Nevertheless, these trends made these economies increasingly more vulnerable and in some cases ended in a currency crisis, as in Czech Republic (1997) and Russia (1998) where a worsening of certain macroeconomic fundamentals and political instability were identified. In fact, in line with the first-generation models (Krugman, 1979) the inconsistency between public sector instability and currency overvaluations which led to a current account balance deterioration was denoted as one of the major determinants of the currency crisis in these economies. Eventually, the main internal factor contributing to the Russian crisis was the persistent failure to bring fiscal problems under control. The lack of commitment to fiscal reform at the highest political levels, political opposition to such reform, the lack of co-operation by regional governments, the lax control over spending (particularly in the military area), and the emergence of influential oligarchs unwilling to share the tax burden all helped stifle the pace of fiscal reform (McGettigan, 2000).

The extent to which variations in the stance of fiscal policy can lead to predictable developments in an open country's performance in the current account of the balance of payments remains a controversial issue. Generally, two competing views exist to explain variations in the current account as a consequence of public sector (in)stability. The traditional view argues that general government budget deficits cause current account deficits. In fact, public sector activity can have both direct and indirect effects on the current account balance. Construction projects by the public sector may require imports of investment goods, thereby exerting a direct influence on the external balance. Simultaneously, public sector activities affect total demand in the economy and an increase in them can also have some psychological effect. In addition, financing budget deficits by issuing bonds leads to higher consumption expenditure due to wealth effects and they raise interest rates. *Ceteris paribus*, these higher interest rates appreciate the currency and, because of the resulting loss in competitiveness, worsen the current account balance. The traditional view is challenged by adherents to the Ricardian equivalence hypothesis (Barro, 1989) which states that an increase in a budget deficit (through reduced taxes) will be offset by increases in private savings, insofar as the private sector fully discounts the future tax liabilities associated with financing the fiscal deficit.

It is not only developed economies like the US that seem to suffer from a twin deficit problem since several developing economies, including transition economies, are also experiencing deficits in both the government budget and current account balance. So far, empirical studies have mainly concentrated on the US and other developed economies. Therefore, empirical work to analyze data from different developing economies is needed, in particular for the so far mainly neglected transition economies, i.e. the 27 economies of Central and Eastern Europe (CEE), Southern and Eastern Europe (SEE) and the Commonwealth of Independent States (CIS). In line with this, the article builds on the work of Fidermuc (2003) who investigated evidence of the twin deficits phenomenon and the so-called Horioka-Feldstein puzzle in a wide range of economies, including three transition economies, by modifying his analysis to transition economies only and applying different econometric approaches.

Accordingly, the article's primary aim is to provide an empirical characterization of the twin deficit problem and to consider some policy implications of a possible twin deficit as well as any evidence of the Horioka-Feldstein puzzle in the different blocks of transition economies (CEE, SEE and CIS). In fact, almost all transition economies have experienced large deficits in both balances since the start of the transition process. On one hand transition economies collapsed, prompting the government to adopt an expansionary fiscal policy in the form of increased expenditures (to build up social and physical infrastructure) and extended tax incentives to encourage investment. Moreover, fiscal deficits expanded as governments tried to absorb the revenue and expenditure pressure associated with the sharp falls in GDP and fiscal restructuring. On the other hand, current account deficits jumped to record high levels in some economies mainly due to the low level of exports, consisting predominately of low valued agricultural and primary goods as well as uncompetitive manufacturing goods. In addition, due to the regional pickup in growth and investment and other factors (e.g. real exchange rate appreciation), substantial external deficits also reflect high levels of imported consumer and capital goods, whereby the latter were needed to introduce new technology and make industry more efficient.

To summarize, a brief descriptive analysis supports the hypothesis of the high probability of the existence of the twin deficit phenomenon in transition economies. Nevertheless, a robust,

positive and statistically significant medium-term relationship between the government budget balance and the current account balance should be tested to confirm or reject this hypothesis. Moreover, the relationship between the current account and investment should provide some evidence of the degree of transition economies' integration with international capital markets.

The article is organized as follows. The next chapter of the article contains a discussion of some theoretical issues, in particular the twin deficits hypothesis, germane to the empirical modeling of the current account. Chapter 2 summarizes trends and developments in current account and fiscal imbalances in transition economies. The empirical framework and results from the pooled cross-sectional and time-series data estimations with a variety of robustness tests are presented in Chapter 3. The final section provides concluding remarks and some policy implications.

## 2. Theoretical Background

Simple national accounting identities help shed light on the macroeconomic determinants of current account fluctuations. According to the absorption theory of the balance of payments (Alexander, 1952), the current account is the excess of gross national product ( $GNP_t$ ) over absorption ( $A_t$ ):

$$CA_t = GNP_t - (C_t + G_t + I_t) = GNP_t - A_t \quad (1)$$

where  $C_t$ ,  $G_t$ , and  $I_t$  stand for private consumption, government purchases and investment. In addition, note that the difference between a country's national product and private and government consumption is national savings that are the sum of private and government savings. As a result, the current account is also equal to the difference between national savings,  $S_t$ , and investment:

$$CA_t = S_t - I_t = S_t^p - I_t^p + (T_t - G_t) \quad (2)$$

where a current account surplus must be matched by a private sector surplus ( $S_t^p > I_t^p$ ) and/or public-sector surplus ( $T_t > G_t$ ). By analogy, a current account deficit must be matched by a private sector deficit and/or public sector deficit (i.e. the 'twin deficit' problem). When an economy starts to run a current account deficit, policymakers will want to see whether there has been a decrease in (private) savings, increase in investment, and/or increase in the budget deficit. However, there is a sound reason to worry about a country's long-term prospects if the onset of the current account deficit reflects lower (private) savings or a larger budget deficit.<sup>1</sup> In both cases, the country is borrowing abroad or running down its foreign assets to sustain or raise consumption, whether by the private sector or the public sector. Yet there is less cause to worry when the onset of a current account deficit reflects an increase in investment. Namely, the country is then raising its capital stock more quickly and therefore raising its future output faster.

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<sup>1</sup> Proponents of the so-called Lawson doctrine emphasized that an increase in a current account deficit that results from a shift in private sector behavior should not be a matter of concern at all. On the other hand, the public budget balance is a matter of public policy concern and the focus should be on this (Corden, 1994). Nevertheless, several financial crises, like Mexico (1994), occurred despite the absence of large fiscal imbalances.

Suppose that current taxes are held constant and  $(S_t^p - I_t^p)$  remains the same and stable, an increase in temporary purchases will raise the government budget deficit  $(G_t - T_t)$  which in turn affects the current account. In this way, a government budget deficit resulting from increased purchases reduces the nation's current account surplus or widens a nation's current account deficit (Abel and Bernanke, 2001). Another aspect of the twin deficits phenomenon could be the positive effect of budget deficits on interest rates. In fact, in a small open economy an increase in the budget deficit leads to an increase in interest rates. The increase in interest rates induces capital inflows leading to an appreciation of domestic currency. A twin deficits situation arises as the appreciation deteriorates net exports and, in turn, worsens the current account (Kearney and Monadjemi, 1990).<sup>2</sup>

On the other hand, many economists support the alternative view (intertemporal approach) exemplified by the Ricardian theory (see Barro, 1989) and suggest that the decline in public saving is offset by an equal increase in private saving, and that national saving remains unaffected. In other words, the proponents of Ricardian equivalence stress that, in order to analyze macroeconomic phenomena, it is necessary to take into account the intertemporal saving and investment decisions of the private sector. In these models, the current account is viewed as the solution to a dynamic optimization problem where the objective is to allocate consumption optimally over time. The current account balance is seen as the change in net assets of an economy. In addition, the government budget deficit is the result of a cut in current taxes, with current and planned future government purchases unchanged. With government purchases,  $G_t$ , unchanged and with output,  $Y_t$ , held constant at its full-employment level, the tax cut will cause national saving to fall only if it causes private consumption,  $C_t$ , to rise.

In fact, the proponents of Ricardian equivalence argue that lump-sum tax changes (with current and future government purchases held constant) will not affect consumption or national savings. These economists argue that a cut in taxes today forces the government to borrow more to pay for its current purchases; when this extra borrowing plus interest is repaid in the future then future taxes will have to rise. Thus, although a tax cut raises consumers' current after-tax incomes the tax cut creates the need for higher future taxes and lowers the after-tax incomes that consumers can expect to receive in future. If the Ricardian equivalence proposition is true, a budget deficit resulting from a tax cut will have no effect on the current account because it does not affect national savings.<sup>3</sup>

In recent years many theoretical and empirical researches into the external balance have concentrated on the intertemporal approach to the current account, where levels of investment and saving need not to be correlated (Obstfeld and Rogoff, 1996). According to this intertemporal approach, the economy can finance large investment or government budgetary needs or equalize positive productivity shocks by external (negative) imbalances which fit the situation in transition economies. Therefore, for the transition economies a relatively high correlation between current account and investment is expected, implying some evidence of gradual integration into international financial markets.<sup>4</sup> Moreover, Miller (2002) argues that

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<sup>2</sup> Several studies supported the twin deficits hypothesis, such as Darrat (1988) and Bachman (1992) for the USA, Vamvoukas (1997) for Greece, Kulkarni et al. (2001) for Mexico, India and Pakistan, Islam (1998) for Brazil, Akbostanci et al. (2001) for Turkey, and Fidermuc (2003) for Hungary and Poland.

<sup>3</sup> The empirical evidence of Ricardian equivalence was found in Great Britain by Ahmed (1987) and in the USA by Miller and Russek (1989).

<sup>4</sup> Feldstein and Horioka's (1980) findings suggest that saving and investment are highly correlated (with a correlation coefficient of 0.89) for 16 OECD economies over the 1960-1974 period. The results imply that even

the relatively high positive correlation between investment and savings reflects the idea of endogenous fiscal policy. In fact, in several transition economies the current account deteriorated via an increase in investment. Generally, the home government responded to these current account deficits with a decrease in government expenditure and/or an increase in taxes; i.e. higher government saving. Consequently, the endogenous fiscal policy probably creates a strong positive relationship between saving and investment in transition economies.

### 3. Current Account and Fiscal Imbalances in Transition Economies

#### 3.1. Current account imbalances in transition economies

**Table 1: Saving/Investment Imbalances in Transition Economies**  
(in percentage of GDP; unweighted average)

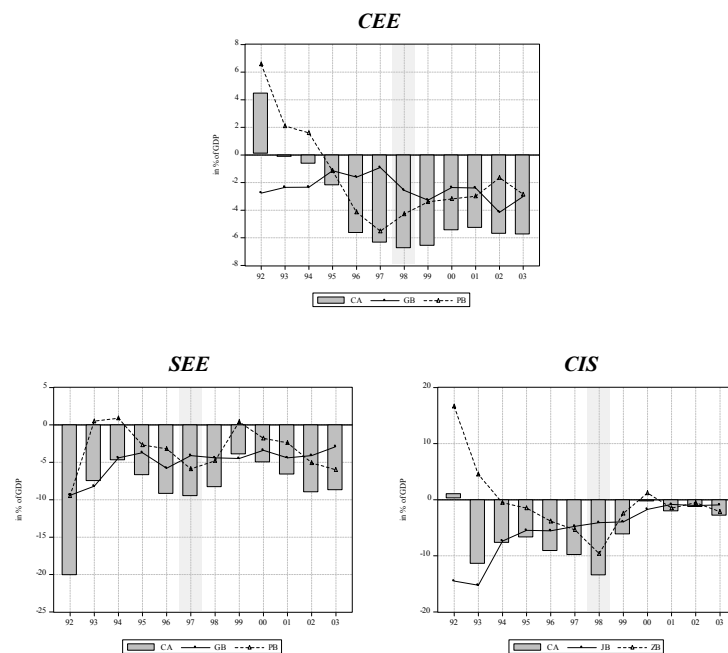
	Private sector balances			Government balances			Current account balance		
	1992-1997 average	1998-2003 average	1992-2003 average	1992-1997 average	1998-2003 average	1992-2003 average	1992-1997 average	1998-2003 average	1992-2003 average
Czech R.	-3.9	-1.4	-2.7	0.5	-3.4	-1.5	-3.4	-4.8	-4.2
Estonia	-4.3	-7.8	-6.1	-0.1	-0.4	-0.2	-4.4	-8.2	-6.3
Hungary	-1.8	-2.3	-2	-3.5	-5.4	-4.5	-5.3	-7.7	-6.5
Latvia	5.5	-6.8	-0.7	-1.0	-2.2	-1.6	4.5	-9.0	-2.3
Lithuania	-2.7	-3.9	-3.4	-4.1	-3.6	-3.8	-6.8	-7.5	-7.2
Poland	0.5	-0.8	-0.2	-2.9	-3.4	-3.1	-2.4	-4.2	-3.3
Slovakia	0.6	-2	-0.8	-4.1	-4.0	-4.0	-3.5	-6.0	-4.8
Slovenia	2.0	0.6	1.3	0.2	-1.4	-0.6	2.2	-0.8	0.7
<b>CEE</b>	<b>0.0</b>	<b>-3.0</b>	<b>-1.5</b>	<b>-1.8</b>	<b>-3.0</b>	<b>-2.4</b>	<b>-1.8</b>	<b>-6.0</b>	<b>-3.9</b>
Albania	-9.2	2.8	-3.2	-14.4	-8.9	-11.6	-23.6	-6.1	-14.8
Bosnia and Herzegovina	-19	-11	-14	-1.7	-4.1	-3.3	-20.7	-15.1	-17.3
Bulgaria	6.2	-4.9	0.6	-6.9	-0.4	-3.6	-0.7	-5.3	-3.0
Croatia	-2.4	-0.8	-1.7	-1.6	-5.2	-3.4	-4.0	-6.0	-5.1
Macedonia	0.8	-3	-1.1	-4.8	-2.4	-3.6	-4.0	-5.4	-4.7
Romania	-2.0	-1.3	-1.6	-3.4	-3.5	-3.5	-5.4	-4.8	-5.1
Serbia and Montenegro	n. a.	-4.4	-4.8	n. a.	-2.6	-2.6	-8.0	-7.0	-7.4
<b>SEE</b>	<b>-3.9</b>	<b>-3.2</b>	<b>-3.6</b>	<b>-5.9</b>	<b>-3.9</b>	<b>-4.9</b>	<b>-9.8</b>	<b>-7.1</b>	<b>-8.5</b>
Armenia	1.4	-8.9	-3.6	-18.1	-4.0	-11.0	-16.7	-12.9	-14.6
Azerbaijan	-13.8	-12.9	-12.9	-6.0	-1.9	-3.9	-19.8	-14.8	-16.8
Belarus	-3.8	-2.1	-2.8	-3.2	-1.4	-2.3	-7.0	-3.5	-5.1
Georgia	-7.4	-3.6	-5.6	-13.1	-3.8	-8.4	-20.5	-7.4	-14.0
Kazakhstan	-4.3	-0.2	-2.2	-4.9	-1.6	-3.3	-9.2	-1.8	-5.5
Kyrgyz	-4.3	-0.2	-1.7	-9.3	-8.0	-8.7	-13.6	-8.2	-10.4
Moldavia	1.0	-8.2	-3.7	-10.2	-1.1	-5.6	-9.2	-9.3	-9.3
Russia	10.2	9.1	9.7	-7.4	0.6	-3.4	2.8	9.7	6.3
Tajikistan	-3.5	-4.1	-3.3	-11.8	-1.1	-6.5	-15.3	-5.2	-9.8
Turkmenistan	13.5	-6	3.8	-3.1	-0.9	-2.0	10.4	-6.9	1.8
Ukraine	8.3	4.5	7	-11.2	-0.5	-5.8	-2.9	4.0	1.2
Uzbekistan	4.0	2.3	3.3	-7.6	-1.4	-4.5	-3.6	0.9	-1.2
<b>CIS</b>	<b>1.3</b>	<b>-2.5</b>	<b>-0.6</b>	<b>-8.8</b>	<b>-2.1</b>	<b>-5.5</b>	<b>-7.5</b>	<b>-4.6</b>	<b>-6.1</b>
<b>ALL TRANSITION</b>	<b>-0.9</b>	<b>-2.9</b>	<b>-1.9</b>	<b>-5.5</b>	<b>-3.0</b>	<b>-4.3</b>	<b>-6.4</b>	<b>-5.9</b>	<b>-6.2</b>

among industrial economies capital mobility is substantially limited. Nevertheless, many economists (e.g. Obstfeld and Rogoff, 1996, Miller, 2002, and Levy, 2003) disagree with this interpretation. In fact, many studies (e.g. Hutchison and Singh, 1993, Popper, 1990) showed that capital mobility among developed economies is very high. Hence, a strong relationship between saving and investment cannot be useful for measuring the extent of international capital mobility. Accordingly, Levy (2003) points out that it is merely just a test of a country's economic solvency.

Sources: WDI (2004), EIU (2004), EBRD (2004), own calculations.

The overview of the current account balance in transition economies shows that, with the exception of Russia – a major commodity exporter, the opening up to external trade has been accompanied by significant current account deficits (see Table 1). In CEE the current account balances were not problematic with even a moderate positive balance as a share of GDP up until 1994 (averaging around 1 percent of GDP), reflecting contractions in domestic demand, real exchange rate undervaluations and external financing constraints. Afterwards, significant current account deficit deterioration was noticed in the region, peaking at almost 7 percent of GDP in 1998 on average (e.g. Lithuania (11.7), Latvia (10.7) and Slovakia (9.6)), mostly as a result of growing imports of both consumption and investment goods. Moreover, the gradual growth of the current account deficit in the CEE region reflects a combination of long-term growth and structural factors, external shocks and domestic policies. More precisely, the deterioration of current accounts in the region was the result of the growth of merchandise trade deficits, downward trends in the service balance, rising indebtedness and profit repatriation as well as the consequence of the continuous real appreciation of domestic currency in most of the examined cases.<sup>5</sup>

**Figure 1: Average current account balance (CA), fiscal balance (GB) and private balance (PB) in transition economies (in percentage of GDP; unweighted average)**



<sup>5</sup> In transition economies a large part of real appreciation accounts for the real appreciation that reflects productivity gains in the tradable sector (due to the Balassa-Samuelson (B-S) effect). This trend is commonly the case in fast growing economies, like transition economies, where the catch-up process is driven mainly by increasingly productive tradable sector. For example, Coricelli and Jazbec (2001) estimated that B-S effects in (19 selected) transition economies were between 0.7-1.2 percent, p.a., over the 1990-1998 period. Moreover, the dynamics of the real exchange rate in several CEE and SEE economies in the process of accession to the European Union can now be assimilated to those of previously acceding countries such as Spain, Portugal and Greece, with the B-S effect playing a dominant role in the later stages of their transition.

Sources: WDI (2004), EIU (2004), EBRD (2004), own calculations.

Similar but even more intensive current account deficit dynamics were seen in the CIS region by achieving the top average current account deficit at a significantly higher level (13.7 percent of GDP) than the CEE region in 1998. The major contributors to such a huge deterioration in the current account balance were some economies in the region with current account deficits above 20 percent of GDP (e.g. Turkmenistan (37.4), Azerbaijan (30.7) etc.). Several factors contributed to this development. First, many countries in the region experienced large losses in their terms of trade as prices for energy imports from the former Council for Mutual Economic Assistance (CMEA) trading partners moved to market-determined levels. Second, these countries ran high negative fiscal imbalances as authorities tried to absorb the revenue and expenditure pressure associated with sharp falls in national income and fiscal restructuring (see Table 1). Third, as a result of slow progress in building a competitive and diversified export sector trade liberalization mainly stimulated imports of consumer goods and services. As a response to the Russian crisis the average current account deficits narrowed in the group. However, in many cases the deficits remained high – around or even above 10 percent of GDP (Azerbaijan (15.9), Armenia (8.1) etc.) on average in the recent 2001-2003 period. On the other hand, the SEE region achieved the highest average current account deficit with around 20 percent of GDP in 1992 due to the enormous deficit in Albania (68.5 percent). Later these huge external imbalances improved significantly. However, at the beginning of the second half of the 1990s and in the first years of the 21st century they again deteriorated. Eventually, the average current account deficit was at 8.2 percent of GDP in the 2001-2003 period in comparison to the previous three years when it averaged out at 5.9 percent of GDP (see Figure 1).

### **3.1.1. Development in investment and saving rates in transition economies**

At the start of transition more than a decade ago the investment-to-GDP ratio in all transition economies practically bottomed out in line with the drop in output (see Figure 2). Moreover, much of the capital stock at that time became obsolete overnight. Afterwards, investment rebounded particularly in the CEE region (an average of some 28 percent of GDP in 1998) when economies intensively struggled to transform their economies into market-oriented ones. Nevertheless, the rise in total investment in most transition economies during the 1990s was largely concentrated in the business sector. In fact, in most transition economies average government capital expenditure was less than 5 percent of GDP in the period. However, as part of the process of real convergence, the investment ratio, also including public investment, may have to rise further to maintain strong economic growth.

The various structural reforms being undertaken in transition economies should lead to an increase in the marginal productivity of domestic investment. Consequently, the further reform of financial markets, particularly in the SEE and CIS regions with respective investment rates of only around 13 and 18 percent of GDP in the 2001-2003 period are needed to ensure efficient and productive capital allocation. Moreover, in order to spur growth potential and boost the capacity to service future debt repayments in transition economies, external borrowing for investment purposes is preferred to borrowing for consumption purposes. In this respect, capital inflows, in particular FDI, have been crucial in supporting these economies' stronger investment needs. In fact, for transition economies it may be optimal to attract foreign savings and direct them to productive investment. Data suggest that CEE has been the most successful region with net FDI averaging out at almost 5 percent of GDP, whereas the CIS region attracted a net FDI of just above 4 percent of GDP

on average in the 1992-2003 period.<sup>6</sup> These figures are much higher than in developed economies, especially in the EU-15, which averaged less than 3 percent of GDP in the same period.

In most transition economies, during the pre-transition era domestic saving rates were exceptionally high. At the end of the 1980s the average saving rates of CEE, SEE and CIS were 32.9, 30.7 and 28.8 percent of GDP, respectively. These numbers are relatively high, especially given the EU-15 member states' average saving rate of only some 20 percent of GDP in the same period.<sup>7</sup> However, saving rates within the transition economies differed widely, with Poland on top (42.7 percent) in 1989 and Tajikistan (12.5) and Kyrgyz Republic (13.1) at the bottom. Denizler and Wolf (2000) revealed three main factors which effected savings in the pre-transition era: first there was 'planned' savings for funding 'centrally planned' investment. Second, the lack of consumer goods exposed limits on consumption below the desired levels and consequently induced so-called 'involuntary savings'. Third, savings that were voluntary but driven by expectations of a systemic change, e.g. reflecting expectations of the greater availability of goods.

With the start of the transition process, the drop in domestic saving rates was enormous. Schrooten and Stephan (2003) pointed out at least three important factors which should be taken into account: consumption constraint, the savings overhang inherited from the past and the massive uncertainty at the beginning of the transition process (high inflation, high unemployment, GDP decline etc.). However, a relatively slow recovery has been noticed despite huge differences both between and within the group of transition economies. For example, saving rates in CEE have stabilized at around 20 percent of GDP (the highest in Czech Republic with around 26 percent, the lowest in Poland with around 15 percent) on average in recent years. On the other hand, in spite of significant saving rates improvements in CIS since 1998 they have recently remained quite low, at around 17 percent of GDP (the highest in Russia with around 32 percent, the lowest in Moldova with even a negative savings rate of around 12 percent).<sup>8</sup>

A decomposition of the external imbalance between savings and investment shows that the main determinant of growing current account deficits has been, in general, a remarkable increase in the average investment rate in CEE and a significant decline in the average saving rate in SEE and CIS in the 1992-2003 period. In fact, international comparisons (see Milesi-Ferretti and Razin, 1996) suggest that low and falling saving rates make current account deficits less sustainable and potentially make the economy fragile. Moreover, the trends presented above mainly suggests an intertemporal approach to the current account, where saving is primarily determined by intertemporal consumption smoothing which would predict a lower saving rate as private agents increase consumption today based on expectations of a higher income in the future. In the case of transition economies, in particular in the latter stages of the transition process, the recent liberalization of financial markets and steadily

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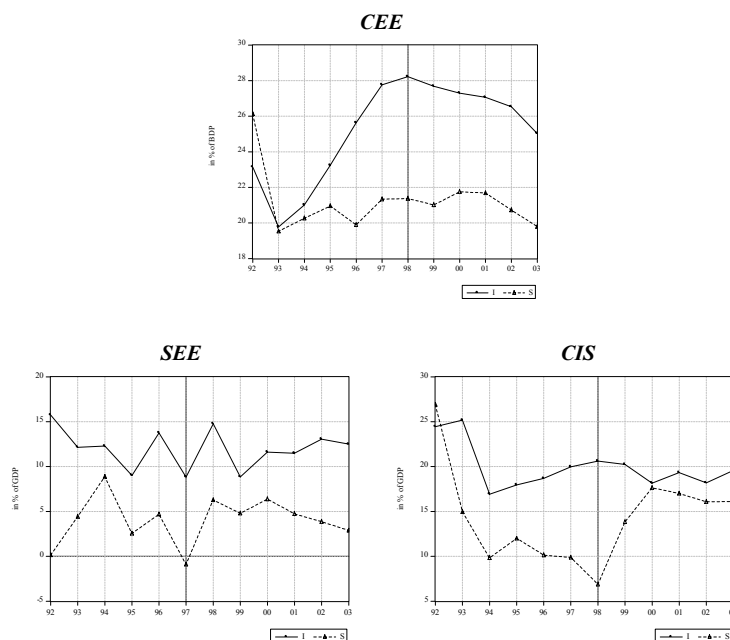
<sup>6</sup> In the 2000-2003 period the most attractive economies for FDI in the CEE region were Slovakia and Czech Republic with an average net FDI of 8.8 and 8.5 percent of GDP, respectively. In the CIS region, the main attractions are Azerbaijan and Kazakhstan with an average of 13.6 and 9.1 percent of GDP, respectively, in the same period.

<sup>7</sup> The EU-15 average savings rate has remained stabilized at around 20 percent of GDP since then.

<sup>8</sup> Due to data deficiencies, it is hard to estimate a reliable level of the saving rate for the SEE region. Nevertheless, according to the available data almost all economies in the region have relatively low or even negative saving rates.

improving access to credit by the domestic private sector might be confronted with a declining saving rate as uncertainty becomes reduced and liquidity constraints are eased.<sup>9</sup>

**Figure 2: Average domestic savings and investment in transition economies, 1992-2003 (in percentage of GDP; unweighted average)**



Sources: WDI (2004), EIU (2004), EBRD (2004), own calculations.

### 3.2. Fiscal imbalances in transition economies

At the beginning of the transformation process fiscal policy had an important role in replacing the decline in private consumption which had appeared as a consequence of the collapse of output. Government expenditure in most transition economies in 1992 was significantly higher than in market economies with comparable levels of per capita GDP (in purchasing power parity terms), sometimes more than ten percentage points of GDP higher. Consequently, most transition economies implemented major fiscal reforms, some more successfully than others. In the early stage of the transition the need for major fiscal reforms was generally underestimated. The emphasis was more on the need for rapid privatization and ‘getting the state out of the economy’; the need to reform state structures and the public administration in order to perform their very different but crucial roles in a market economy received less attention until a number of fiscal crises emerged (UN Economic Commission For Europe, 2000). Nevertheless, more recently practically all transition economies have admitted the need for totally new systems requiring not only new tax laws but also new fiscal institutions, new skills, technical knowledge, and political capital.

Within the transition process economic reforms have taken place with damaging impacts on existing public finances. First, by the destruction of central plans and the elimination of information on quantities of goods produced and their prices. Consequently, the government had to rely on other sources, including taxpayers’ declarations that increased tax evasion.

<sup>9</sup> Rodrik (2000) estimated that a 1 percentage point increase in the ratio of private credit to income lowers the long-term private saving rate by 0.74 of a percentage point in five CEE economies.

Second, the reforms dramatically increased the number of producers and thus of potential taxpayers. In fact, the large state enterprises which once provided the bulk of tax revenue have been replaced by new, small and difficult-to tax private producers. Since a tax culture never developed in the centrally planned economies, people reacted with hostility to the introduction of an explicit tax system. Finally, the economic reforms removed the restrictions on payment methods that had existed under central planning when all payments were channeled through the central bank. Accordingly, tax arrears and payments in the form of barter have grown, creating major difficulties for the new system (Tanzi, 1999).

The patterns in public revenues and expenditure reflect local factors as well as the mixed advice transition economies received from Western economies and institutions such as the IMF and the WB. An analysis of the fiscal data of transition economies yields several stylized facts. Most importantly, almost all transition economies went through a dramatic fiscal adjustment. In fact, the turnaround in fiscal imbalances has been especially remarkable for CIS economies which reduced their average deficits from an average of 8.8 percent of GDP in the 1992-1997 period to a moderate fiscal deficit of 2.1 percent of GDP in the 1998-2003 period (see Table 1). The extent of this fiscal adjustment in CIS is more than twice as much as that of SEE economies whose average deficit was reduced from 5.9 percent of GDP to 3.9 percent of GDP in the same period. These fiscal imbalance trends were the outcome of a major revenue shock at the start of transition. For many CIS economies, independence from the Soviet Union also meant the loss of large fiscal transfers from Moscow which further compounded declines in government revenues from the recession and the flawed tax system with its weak administration.<sup>10</sup> Consequently, the CIS' average budget revenues declined from 29.3 percent of GDP in 1992 to 24.1 percent of GDP in 2003.

The sudden loss of control over state resources in CIS economies forced governments to sharply cut expenditures. In fact, the average expenditure for CIS economies fell from about 43.8 percent of GDP in 1992 to 25.0 percent of GDP in 2003. In some cases, the expenditure cuts were dramatic, as in Tajikistan and Armenia where general government expenditure declined from the CIS' highest levels of 65.7 percent and 46.7 percent of GDP in 1992 to the CIS' lowest levels of 15.6 percent and 18.9 percent of GDP, respectively. Accordingly, as the transition process progressed, especially after the Russian (financial) crisis of 1998, the fiscal balances of CIS economies improved in large part due to the boom in energy prices which positively effect CIS energy exporting economies as well as due to revenue collection improvements, expenditure restraints and the more prudent management of external debt reflecting the 'lesson of the Russian crisis'.

Contrary to the CIS and SEE fiscal imbalance trends, CEE economies started with much lower average fiscal deficits, averaging out at 1.8 percent of GDP in 1992-1997 and even deteriorating to an average 3 percent of GDP in 1998-2003, generally as a result of maintaining relatively high government expenditure shares (an average of 38.3 percent of GDP in the 1998-2003 period) and a moderate decline of government revenues in the period (e.g. in Czech Republic and Poland by more than ten structural points in the 1992-2003 period) (see Table 1). An important measure to deal with the revenue shortfall was the adoption of value-added tax (VAT). The rate initially adopted has generally been reduced, and in most CEE states VAT now provides about the same proportion of total fiscal revenue as in most Western European states (i.e. 15 to 25 percent). Moreover, a number of CEE and SEE

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<sup>10</sup> For example, in 1992 both Uzbekistan and the Kyrgyz Republic lost transfers from Moscow which were equivalent to about 18 percent of GDP in 1991 (see Alam and Sundberg, 2002).

economies have introduced, or are in the process of introducing, uniform personal income taxes.

As mentioned above, the recent worsening budgetary performance in CEE economies marks a departure from the pattern of most CIS and SEE economies. However, in some CEE economies (e.g. Estonia – increasing government revenues, and Lithuania – declining government expenditures) a relatively significant improvement in the fiscal balance has been seen in recent years. While most CEE economies are clustered in a narrow band there are extremes, for example Czech Republic's overall budget in 2003 posted the highest deficit among all transition economies of 6.6 percent of GDP while Estonia posted a surplus of 1.7 percent of GDP. Nevertheless, when one looks at the change in primary balances CEE economies generally maintained the average balance of their primary budget, while CIS economies drastically reduced their large deficits in the 1992-2003 period since interest expenditure were growing in the same period. However, despite the declining share of expenditure in GDP, real public expenditure has been rising in many transition economies due to the relatively high GDP growth. Therefore, the fiscal reform process in the region consists more of ensuring that the budget process continues to require the necessary instruments for increasing efficiency, in the course of which further control over expenditure is likely to provide savings. In addition, less government interventions in the market, further reductions of budget deficits and structural reform of public finance remain important targets of economic policy in most transition economies.

Overall, in view of the uncertainties regarding saving and investment behavior (see subchapter 2.1.1.), the role of fiscal policy needs to have a built-in degree of flexibility to counterbalance potential saving-investment imbalances and the vulnerability implied by large external current account deficits. However, for the CEE economies the European Union has placed an emphasis on low budget deficits but at the same time it requires the adoption of a number of relatively costly social program and structural measures, which places upward pressure on government expenditure. Moreover, in light of the forthcoming adoption of the euro in many CEE economies the Maastricht fiscal deficit criteria should be reconsidered as these economies might risk hampering the development of badly needed infrastructure and achieving the so-called 'Golden Rule capital-labor ratio'.<sup>11</sup> Nevertheless, the sustainability of an economy's fiscal balance has important implications for the sustainability of its external position. In transition economies, sizable fiscal deficits have generally not been offset by higher private saving and have consequently been reflected in large current account deficits (see Figure 2). In fact, for many economies in transition government budget deficits have been financed in large measure through external borrowing in a foreign currency, with most of the outstanding stock of external debt in each country being owed by the government. In reality, sizable external borrowing to finance productive investment may be appropriate when large potential returns from investment are expected and confronted with the relatively high cost of domestic finance. However, some governments in transition economies like Kyrgyz Republic and Serbia and Montenegro with an external debt of around 100 percent of GDP have recently largely turned to external borrowing to finance their current expenditures, such

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<sup>11</sup> The 'golden rule' is the level of capital-labor ratio that maximizes consumption per worker in the steady state. Kandogan (2004) set out that capital-labor ratios in transition economies significantly lag behind those of the EU-15 economies. For example, Germany has a capital-labor ratio that is more than 2.5 times higher than Slovenia, 5 times higher than Slovakia and around 12 times higher than Bulgaria and Latvia.

as paying off wage and pension arrears and to retire domestic debt, while using non-recurrent revenues such as those arising from privatization to reduce government budget imbalances.<sup>12</sup>

## 4. The Empirical Framework

### 4.1. Empirical methodology

The aim of the empirical research is to identify the medium-term impact of two important determinants of current account deficits in transition economies in the 1990-2003 period. Following equation (2) and previous theoretical and empirical studies of Chinn and Prasad (2000), Calderon et al. (2002), Fidermuc (2003) and Bussière and Müller (2004), we estimate a model which may be expressed in the following general form:

$$CA_{it} = \alpha_i + \gamma_t + \beta'x_{it} + \varepsilon_{it} , \quad (3)$$

where the dependent variable is the current account balance (CA) (negative values indicate a deficit) for the  $i$ -th unit at time  $t$  and the vector of independent variables,  $(x_i)$  includes the general government budget balance (GB) and investment rate (I).  $\alpha_i$  represent individual effects which are specific to individual economies, the vector  $\beta'$  is a vector of regression coefficients,  $\gamma_t$  denotes time-specific effects which are peculiar to a particular period but constant for all economies and the error term  $\varepsilon_{it}$  represents the effects of the omitted variables that are peculiar to both the individual units and time periods.

According to the previous theoretical and empirical considerations, we expect a positive relationship between the current account balance and the fiscal balance. On the other hand, a negative effect is expected in the case of the investment rate. Moreover, statistically significant results would lead to some further conclusions. If there is a statistically significant positive relationship between CA and GB, this should provide some support for the 'twin deficits phenomenon' in the region. Besides, a statistically significant and low negative relationship CA with I would provide some evidence of the so-called Feldstein-Horioka puzzle. According to the empirical results, appropriate economic policy implications for the transition economies under consideration may be identified.

### 4.2. Data

We estimate model (3) on the basis of pooled cross-sectional and time-series (panel) data for transition economies in the 1990-2003 period, where time series for particular transition country begins in the year when the most serious stabilization attempt was performed ( $t=1$ ). The data set comes from the EBRD Transition Reports, the Economist Intelligence Unit (EIU) and IMF International Financial Statistics (IFS) and covers the 27 transition economies, i.e. eight CEE, seven SEE and twelve CIS economies. Our estimates are based on unbalanced panel data while for some economies included in the sample data were unavailable for the whole period. The dependent variable is a current account balance (CA), expressed as a ratio

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<sup>12</sup> One of the most important problematic aspects of public finance in many transition economies is the increasing strain exerted by the pension system, based on a pay-as-you-go system. Due to its unsustainability, several CEE economies have already moved to raise the retirement age and to supplement the public retirement system with a multi-pillar system. On the other hand, the majority of CIS economies face less of a public sector burden with regard to retirement costs because the level of government-promised retirement benefits is lower (Svejnar, 2001).

to GDP (negative values indicate a deficit). Independent variables are the general government budget balance (GB) as measured by the general government budget balance and investment (I) by gross capital formation, both expressed as a percentage of GDP. Since the economies considered here are different sizes and differ in other characteristics, we perform three tests that specify the properties of the data set (see Table 2). The empirical results are summarized in the next section where we estimate model (3). The partial correlations coefficient and empirical results of the model (3) are presented in Tables 4 and 5, respectively.

### 4.3. Empirical results

#### 4.3.1. Testing for panel heteroscedasticity, correlations across economies and serial correlation of the model specification

As heterogeneity is the main characteristic of the economies under consideration, other specifications might be preferred to a simple OLS specification in our analysis. In fact, in the case of the transition economies this argument is plausible once the differences like macroeconomic conditions and structural reforms are taken into account. The Breusch-Pagan LM test confirms the appropriateness of the model based on panel data in all cases (except for SEE). Therefore, we extended the benchmark OLS model, adding both country effects and time effects. Moreover, Hausman's test indicates that for all samples of transition countries the random-effect model (REM) provides a better specification.<sup>13</sup>

**Table 2: Data set properties**

<b>Dependent variable (CA)</b>	<b>CEE</b>	<b>SEE</b>	<b>CIS</b>	<b>ALL TRANSITION COUNTRIES</b>
Panel heteroscedasticity ( $\chi^2$ ) ( $H_0$ : homoscedasticity)	526.9 (0.00)	1.209.8 (0.00)	1,798.6 (0.00)	4,989.3 (0.00)
Cross-sectional correlation ( $\chi^2$ ) ( $H_0$ : no cross-sectional correlation)	30.1 (0.00)	0.12 (0.73)	103.2 (0.00)	81.0 (0.00)
Serial correlation (LM) ( $H_0$ : no serial correlation)	16.7 (0.00)	297.7 (0.00)	13.3 (0.00)	44.7 (0.00)

Note: the probability of rejecting  $H_0$  is presented below the corresponding coefficient.

Source: author's calculations.

To be exact, Green (1997) pointed out that panel data typically exhibit a serial correlation, cross-sectional correlation, and group-wise heteroscedasticity. In order to confirm these facts, we first applied a modified Wald test for group-wise heteroscedasticity to check for common variance in the panels. Critical values of Chi-squared with 7, 6, 11 and 26 degrees of freedom at a 1-percent significance level are 18.48, 16.81, 24.73 and 45.64 which are considerably lower than the test values obtained. Hence, we can reject the null hypothesis of homoscedasticity across the panels due to the different characteristics of the countries under consideration. Second, the contemporaneous or cross-sectional correlation is tested with a Breusch-Pagan LM test. As already presented above, according to the critical values of Chi-squared only in the case of the SEE countries is a rejection of the null hypothesis of no cross-sectional correlation impossible. Third, all estimations reject the null hypothesis of no serial

<sup>13</sup> Green (1997) stressed that REM is the appropriate one if we believe that sampled cross-sectional units are drawn from a large population.

correlation. In fact, critical values of Chi-squared with 1 degree of freedom at a 0.5-percent significance level are equal to 7.88.

To sum up, the results of the tests presented above reveal there is panel heteroscedasticity, cross-sectional correlation (except in the SEE region) and serial correlation of the error terms in each transition group. Therefore, REM and pooled OLS specifications are preferred in CEE and SEE, respectively. Moreover, in the case of more countries than annual observations per country, as in the group of CIS countries and all transition countries as a whole, Beck and Katz (1996) propose the use of ordinary least squares with panel corrected standard errors (OLS-PCSE).<sup>14</sup>

#### 4.3.2. Results of the model

**Table 3: Partial correlation coefficients for CEE, SEE and CIS countries, 1990-2003**

	Correlation coefficient (CA-I)	Correlation coefficient (CA-GB)		Correlation coefficient (CA-I)	Correlation coefficient (CA-GB)
<i>CEE</i>	<b>-0.52**</b>	<b>0.39**</b>	<i>CIS</i>	<b>-0.22**</b>	<b>0.46**</b>
Czech R.	-0.73**	0.42	Armenia	0.53	0.39
Estonia	-0.37	-0.20	Azerbaijan	-0.72**	0.73*
Hungary	-0.67**	0.61**	Belarus	-0.88**	0.08
Latvia	-0.46	0.39	Georgia	0.72**	-0.04
Lithuania	-0.95**	0.76**	Kazakhstan	-0.47	0.75**
Poland	-0.64**	0.70**	Kyrgyz	-0.18	0.63*
Slovakia	-0.96**	0.79**	Moldavia	-0.21	0.13
Slovenia	-0.89**	-0.39	Russia	-0.50	0.79**
			Tajikistan	-0.63**	-0.28**
			Turkmenistan	-0.83**	0.62
<i>SEE</i>	<b>0.08</b>	<b>0.56**</b>	Ukraine	-0.09	0.71**
Albania	0.71**	0.83**	Uzbekistan	-0.58*	0.58*
Bosnia in Herzegovina	-0.97**	-0.70			
Bulgaria	-0.92**	0.55*			
Croatia	-0.74**	-0.09			
Macedonia	-0.52	0.72**			
Romania	-0.43	0.63*			
Serbia in Montenegro	-0.78	0.86	<b>All transition countries</b>	<b>-0.14**</b>	<b>0.50**</b>

Note: \*\*, \* denotes significance at the levels of 5 percent and 10 percent, respectively.

Source: author's calculations.

As already shown in the previous chapters, the descriptive statistics show a negative external and fiscal balance for the majority of analyzed transition countries in the 1990-2003 period.

<sup>14</sup> A potential concern in our model (3) specification is the endogeneity of some explanatory variables, reflected in correlation between these variables and error term causing biased and inconsistent estimates. In fact, budget deficits could be influenced by investments. According to Green (1997), as lagged values of budget deficits are relatively highly correlated to their contemporaneous values and relatively independent of current account deficits, one-year-lagged values of budget deficit is used as instrument. Nevertheless, the results are principally supportive of the conclusions based on panel data estimates from Table 4.

However, there is mixed evidence on the relationship between the fiscal and external balance in particular groups of transition countries as well as within groups. In line with the theoretical expectations, the partial correlation coefficient shows a positive and moderate correlation with the government budget balance for all transition countries in the sample (0.50). To be exact, the (statistically significant) relations between the current account and the fiscal balance for CEE, SEE and CIS are 0.39, 0.56 and 0.46, respectively. Nevertheless, the partial correlation coefficients vary considerably within each group. Namely, within CEE countries the partial coefficient ranges from -0.39 in Slovenia to 0.79 in Slovakia, within SEE from -0.70 in Bosnia and Herzegovina to 0.86 in Serbia and Montenegro, and within the CIS from -0.28 in Tajikistan to 0.79 in Russia.<sup>15</sup> These results further confirm the suggestion on the deployment of models which account for parametric heterogeneity.

Greater consistency is seen when considering the partial correlation between current account and investment rates, where the theoretically expected coefficient (negative and statistically significant) signs are found in CEE (-0.52) and the CIS (-0.22), but a positive (and statistically insignificant) sign is found in SEE. In the great majority of transition countries the partial coefficient signs are negative and statistically significant. Not surprisingly, the highest negative correlation is found within CEE countries where more than half of the group (Czech R., Hungary, Lithuania, Slovakia and Slovenia) achieved a correlation coefficient of around 0.70 or more, implying extremely high degree of integration of their domestic economy to the international capital markets. A similar but slightly weaker negative correlation is found in CIS countries where half of the group countries attained a correlation coefficient of around 0.60 or more. On the other hand, within SEE only Bosnia and Herzegovina (-0.97), Bulgaria (-0.92) and Croatia (-0.74) have substantially high and statistically significant partial correlation coefficients.

Further, in Table 4 estimates of the OLS, FEM, REM and OLS-PCSE model specifications of the model (3) are presented. First, we investigated whether the impact of fiscal policy on the current account differs across transition regions. The results suggest that a 1 percentage point increase in the government budget deficit is associated on average with a 0.87 of a percentage point increase in the current account deficits-to-GDP ratio, with everything else being equal. These empirical results are significantly higher in comparisons to the results of Fidermuc (2003), Zanghieri (2004), and Chinn and Prasad (2003) for a sample of developing economies. The coefficient estimate suggests that in transition countries private savings provide extremely low Ricardian offset to changes in public saving. In fact, increases in private saving, as a ratio to GDP, by about 0.1 of a percentage point is expected when the ratio of government saving to GDP decreases by 1 percentage point.<sup>16</sup>

When investigating each particular group of transition countries we found that the effect of fiscal policy on the current account was significantly higher in SEE and CIS countries. The estimated coefficients on the budget balance vary between 0.92-1.12 in SEE and between 0.89-1.27 in CIS, depending on the model specifications. On the other hand, in CEE countries there is lower, but still moderate and statistically significant relationship between the budget deficit and the current account deficit (between 0.44-0.76). These results suggest that the SEE

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<sup>15</sup> The theoretically unexpected negative correlation coefficients are statistically insignificant at 10 percent and are the result of different factors such as political and economic instability (e.g. Bosnia and Herzegovina and Moldavia), as well as of data deficiencies (e.g. short time-series) and other statistical issues (like Slovenia synchronizing the fiscal year with the calendar year in 2002).

<sup>16</sup> This finding contradicts to Edwards' (1995) result for developing economies and to Jiang's (2000) results for selected CEE economies.

and CIS countries are generally confronted with underdeveloped and/or highly regulated financial markets (see Milesi-Ferretti and Razin, 1996). Overall, relatively strong evidence for the twin deficits is found in CEE (particularly in Slovakia, Lithuania and Czech R.) and SEE (e.g. Albania and Romania). On the other hand, less liquidity constraints that are likely to be prevalent in CEE countries due to their generally more developed financial systems imply some evidence of Ricardian offset in the region as a whole, albeit with some exceptions (in particular Slovakia, Lithuania and Poland). Nevertheless, when interpreting the empirical results data deficiencies and other caveats concerning transition countries should be taken into account.

**Table 4: Model (3) Estimations for Transition Countries, 1990-2003  
(Dependent Variable: CA)**

Explanatory Variable	pooled OLS	FEM (two-way)	REM (two-way)	OLS - PCSE
<b>CEE</b>				
$I_{it}$	-0.46*** (0.08)	-0.53*** (0.10)	-0.32*** (0.08)	-0.53*** (0.07)
$GB_{it}$	0.76*** (0.18)	0.56*** (0.19)	0.65*** (0.18)	0.44*** (0.15)
Adj. R <sup>2</sup>	0.35	0.69	0.67	0.59
No. of countries	8	8	8	8
No. of obs.	99	99	99	99
LM test			30.06***	
Hausman's test ( $\chi^2$ )			0.72	
<b>SEE</b>				
$I_{it}$	0.07 (0.11)	-0.10 (0.20)	0.07 (0.13)	0.08 (0.19)
$GB_{it}$	1.00*** (0.19)	1.12*** (0.33)	1.01*** (0.20)	0.92* (0.54)
Adj. R <sup>2</sup>	0.33	0.30	0.27	0.29
No. of countries	7	7	7	7
No. of obs.	67	67	67	67
LM test			0.12	
Hausman's test ( $\chi^2$ )			1.72	
<b>CIS</b>				
$I_{it}$	-0.15** (0.07)	-0.29*** (0.06)	-0.27*** (0.06)	-0.26*** (0.09)
$GB_{it}$	1.27*** (0.23)	0.45 (0.33)	0.61** (0.31)	0.89*** (0.33)
Adj. R <sup>2</sup>	0.22	0.41	0.40	0.28
No. of countries	12	12	12	12
No. of obs.	116	116	116	116
LM test			103.3***	
Hausman's test ( $\chi^2$ )			2.27	
<b>ALL TRANSITION COUNTRIES</b>				
$I_{it}$	-0.10** (0.04)	-0.29*** (0.05)	-0.24*** (0.05)	-0.16*** (0.06)
$GB_{it}$	1.12*** (0.12)	0.92*** (0.14)	1.00*** (0.13)	0.87*** (0.12)
Adj. R <sup>2</sup>	0.25	0.31	0.31	0.23
No. of countries	27	27	27	27
No. of obs.	282	282	282	282
LM test			81.0***	
Hausman's test ( $\chi^2$ )			13.8	

Notes: \*\*\*, \*\*, \* denotes significance at the levels of 1%, 5% and 10%, respectively.  
Standard errors are presented below the corresponding coefficient.

Source: author's calculations.

Finally, our model (3) also includes the relationship between investment and the current account balance. The reported coefficient for the transition region is relatively low (-0.16) and implies that around one-sixth of the increased investment rate is financed from international sources. This feature confirms the partial evidence of the so-called Feldstein-Horioka puzzle in the region.<sup>17</sup> Moreover, this result contradicts the findings for selected European countries included in the analysis by Blanchard and Giavazzi (2003), where the majority of investment is financed from international sources. Actually, the CEE and CIS regions show moderate and statistically significant coefficients with -0.32 and -0.26, respectively, which are similar to the results for OECD countries and ten new EU member states (see of Bussière et al (2004)). Indeed, the results confirm gradual capital market liberalization, the avoidance of restrictions on currency payments, the avoidance of discriminatory currency practices and convertibility of foreign-held balances in the region (particularly in the CEE) in the last decade. In addition, SEE as a whole has a relatively low, (theoretically unexpected) positive and statistically insignificant coefficient, which prevent us to reject the possible existence of the Horioka-Feldstein puzzle in the region.

## 5. Conclusions

Fiscal deficits have frequently induced current account unsustainability and consequently helped a balance of payments (currency) crisis to emerge worldwide. Therefore, the article considers the fiscal balance and its influence on the current account, as well as the role of investment, in the medium term for transition countries. Generally, the empirical results suggest that a decrease in public savings of 1 percentage point lowers overall savings and contributes to the deterioration of external imbalances by about 0.9 and 1.0 of a percentage point in CIS and SEE, respectively. In these countries as a whole the substitutability between private and public savings is extremely low. Therefore, one of the most important elements of any policy reversal to raise external sustainability in these countries should include a substantial reduction of the fiscal deficit, particularly in terms of current government expenditure. Similarly, but less intensive twin deficit phenomenon is found in CEE countries, where the presence of relatively higher substitutability between private and public sectors is identified. Hence, for all transition countries as a whole the increase in public savings will probably raise the overall savings rate and contribute to a reduction of external imbalances. In general terms, in these economies fiscal policy measures will be effective in terms of securing external sustainability.

Moreover the empirical results also suggest that, as originally claimed by Feldstein and Horioka in their seminal paper, the intertemporal theory of the current account partly failed to explain the relationship between domestic saving and investment in transition countries. In particular, this holds for the CEE and CIS sub-samples where, on average, an increase in the investment rate by 1 percentage point increases the current account deficit by about 0.3 of a percentage point. On the other hand, the empirical results prevent us to reject the validity of the Horioka-Feldstein puzzle in the SEE region as a whole. Nevertheless, given the partial

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<sup>17</sup> Indeed, within the result of the regression coefficient of the model,  $(I/Y)_{it} = \alpha_i + \beta' (S/Y)_{it} + \varepsilon_i$ , shows a positive and statistically significant result at 0.54 for the whole transition region in the 1990-2003 period.

equilibrium nature of this theory isolating the idiosyncratic sources of fluctuations by taking the heterogeneous responses to investment to global shocks into account should be considered in future research. Further, due to the relatively high heterogeneity within the transition regions certain other econometric techniques, like time-series analysis, could be applied in future empirical investigations, including more reliable data, in order to provide more accurate results for individual transition countries.

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