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Determinants of current account developments in the central and east European EU member states – consequences for the enlargement of the euro area

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Abstract

The current accounts of most EU member states in central and eastern Europe have been showing growing deficits in recent years. According to panel estimates the deficits can be attributed primarily to factors characteristic for the stage of development, ie the relative income level and high capital building. The positive impact of a closing income gap, however, is largely compensated by real appreciation. The net effect of government budget deficits is rather small, since they are mostly financed by private saving. Further integration of the financial sector is likely to improve the current accounts. Although the current account positions do not require fundamental policy reversals, there are clear risks of exchange rate adjustments that should be reduced before entering the euro area.

JEL classification: F15; F32

Keywords: current account; new EU member countries; catching-up process

Non technical summary

This paper investigates the determinants of the current account deficits in central and eastern Europe. Taking the saving-investment decision as a starting point, a reduced form of the current account balances is estimated for a panel of eight countries. The focus is on the question of whether the empirical findings provide indications that the existing and, in some cases, high deficits will decline over time. In this context, particular attention is paid to the effect of development gaps in comparison with the reference country, Germany.

The estimations show that the relative per capita income has a significant effect on private saving and can therefore explain a large part of the past deficits. Seen in that light, it can be expected that a continuing catching-up process will lead to falling current account deficits. On the other hand, setbacks in this process would disrupt this development.

Besides relative per capita income, the impact of a number of other variables was examined. This included exchange rates, investment demand, fiscal deficits and the state of development of the financial systems in these countries. Our estimations suggest that the low valuation of their currencies has prevented the accession countries from having higher deficits; a future appreciation will, accordingly, counteract the positive effects of the catching-up process. The fact that the financial system is still underdeveloped is likely to have impeded the saving process in these countries. Progress in this respect might therefore have a positive impact on the current accounts. The results confirm the so called twin-deficit hypothesis, even if according to our calculations, the impact of the fiscal deficits proves to be slight. Higher private savings compensated the negative effect on the current account balance, thereby restraining, however, the potential of private investment.

Concluding, existing current account deficits do not require fundamental policy reversals according to our findings. However, they remain a source of risk. This applies in particular to those countries with deficits clearly exceeding the levels, which are assessed to be in line with their stage of development.

Nicht technische Zusammenfassung

Dieses Papier untersucht die Bestimmungsgründe der Leistungsbilanzdefizite in Mittel- und Osteuropa. Ausgehend von der Spar-Investitionsentscheidung wird für ein Panel aus 8 Ländern eine reduzierte Form der Leistungsbilanzsalden geschätzt. Im Zentrum steht dabei die Frage, ob es auf Basis der empirischen Ergebnisse Anhaltspunkte dafür gibt, dass die bestehenden - z. T. hohen - Defizite im weiteren Verlauf zurückgehen werden. Besondere Aufmerksamkeit wird dabei dem Einfluss der Entwicklungslücken gegenüber dem Referenzland Deutschland geschenkt.

Die Schätzungen zeigen, dass das relative Pro-Kopf-Einkommen die private Ersparnisbildung signifikant beeinflusst und damit einen wesentlichen Teil der vergangenen Defizite erklären kann. Von daher kann man die Erwartung hegen, dass ein fortschreitender Aufholprozess zu sinkenden Leistungsbilanzdefiziten führen wird. Rückschläge in diesem Prozess würden andererseits diese Entwicklung stören.

Neben den relativen Pro-Kopf-Einkommen wird der Einfluss einer Reihe weiterer Variablen untersucht. Dazu gehören die Wechselkurse, die Investitionsnachfrage, die öffentlichen Defizite und der Entwicklungsstand der Finanzsysteme in diesen Ländern. Unsere Schätzungen legen nahe, dass die niedrige Bewertung ihrer Währungen höhere Leistungsbilanzdefizite der Beitrittsländer verhindert haben, eine künftige Aufwertung wird dementsprechend den positiven Effekten des Aufholprozesses entgegenwirken. Das noch unterentwickelte Finanzsystem dürfte den Sparprozess in den Ländern behindert haben. Fortschritte könnten dementsprechend günstig auf die Leistungsbilanzen wirken. Die Ergebnisse bestätigen die so genannte „twin-deficit“ Hypothese, wenngleich der Einfluss der öffentlichen Defizite sich nach unseren Berechnungen als eher gering erweist. Höhere private Ersparnisse kompensierten die negativen Effekte auf die Leistungsbilanz, schränkten jedoch dadurch das Potential privater Investitionen ein.

Zusammenfassend ergibt sich, dass die bestehenden Leistungsbilanzdefizite gemäß unseren Ergebnissen keine fundamentalen Veränderungen in der Wirtschaftspolitik erforderlich machen. Dennoch stellen sie weiterhin ein Risiko dar. Dies gilt insbesondere für solche Länder, deren Defizite höher sind als es ihrem derzeitigen Entwicklungsstand entspricht.

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Determinants of current account developments in the central and east European EU member states – consequences for the enlargement of the euro area*)

I Introduction

The current accounts of most new EU member states in central and eastern Europe have been showing growing deficits in recent years; in four of these countries, the deficits amounted to over 8% of GDP in 2004. If they remain at this level or grow even further, they could present a serious obstacle to further monetary integration. Article 121 (1) of the EC Treaty explicitly instructs the European Commission and the ECB to take the pre-ins' current account developments into consideration when assessing their convergence.

This analysis is closely related to the question of sustainability. There is a wide range of literature on this issue. We do not deal with indicators of impending financial crises or the strand on global imbalances between advanced economies. Instead, we concentrate on the case of a small open economy in the catching-up process and the question whether existing deficits will disappear over time as the income gap to the reference country becomes smaller or whether additional adjustments of key economic indicators such as government expenditure, private consumption, investment, interest rates or exchange rates will be necessary.[1] This approach refers to the example of Greece and Portugal who at the beginning of the new millennium also had high current account deficits of 7.3% and 10.4% of GDP respectively. These deficits however were generally judged to be in line with their stage of development relative to other EU countries and have indeed been reduced in latest years without necessitating a substantial real depreciation.[2]

With regard to the external stability of the central and east European EU countries, as well as the enlarged currency area as a whole, it is therefore of interest to what extent the development of current accounts are related to the catching-up process and which are the risks for future development.

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*) For helpful comments we want to thank Balazs Égert, Ulrich Grosch, Heinz Herrmann, the participants of the research meeting of the Deutsche Bundesbank, the participants of the 2005 ZEW summer school in Mannheim and the participants of the 1st CEUS workshop in Koblenz. We are furthermore indebted to Jörg Breitung for his advice in econometric questions. Of course, all remaining errors are ours.

1 See Milesi-Ferretti/Razin (1996).

2 See Blanchard/Giavazzi (2002).

If the results show that inappropriate economic policies are responsible for the current account deficits, the relevant reforms should be introduced before a country becomes a member of the Exchange Rate Mechanism II (ERM II) or monetary union. The adjustment of non-sustainable current account deficits is usually triggered by a real depreciation of the national currency. This can be carried out only partly by productivity gains leading to falling prices. Nominal depreciations are also generally necessary, especially if social adjustment costs in terms of rising unemployment shall be minimised. Nominal devaluations, however, can result in conflicts with ERM II, ie major exchange rate disruptions or repeated adjustments of the central rate. Once the euro is introduced such exchange rate adjustments will, by definition, be impossible. Looking ahead to the future entry of these countries into the Eurosystem, it is therefore all the more necessary to avoid unsustainable current account deficits and any resultant major price adjustments.

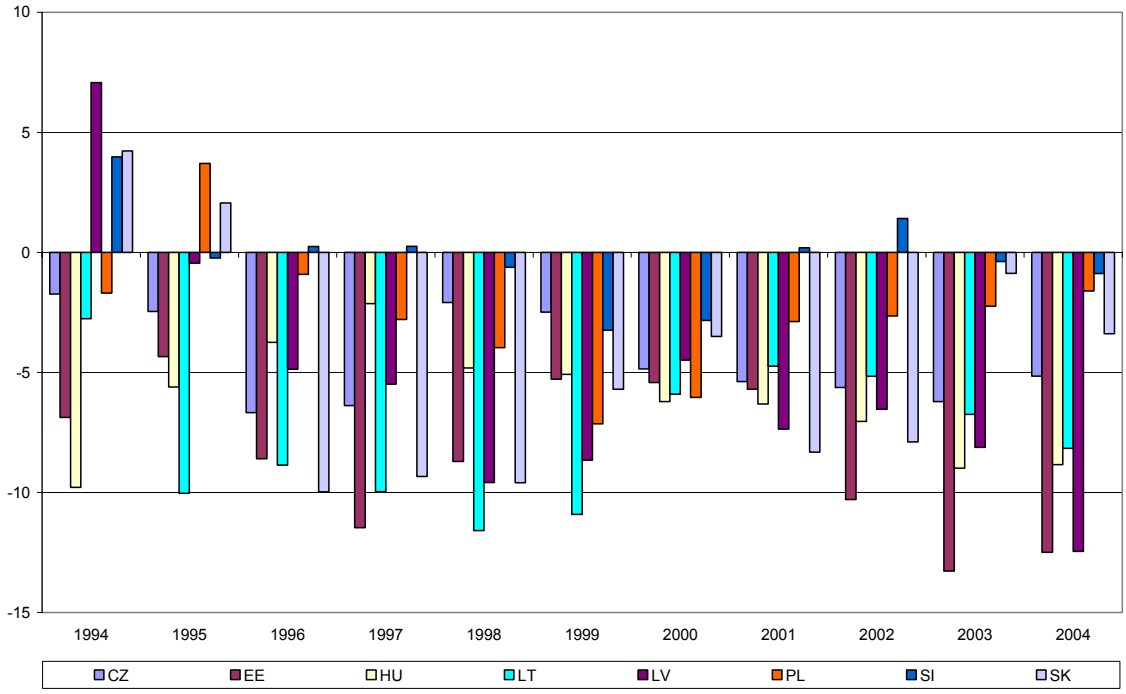
However, if the current account deficits in the new EU member states are to be attributed mainly to determinants that are typical of their stage of development, no immediate demands on economic policy will result. Nevertheless, even these factors may be associated with substantial risks, if the speed of catching-up falls behind expectations or creditors loose confidence into the economic competence of the government. These risks can also have implications for the real exchange rate and be opposed to an early accession to European Monetary Union.

This paper is organised as follows. *Chapter II* provides an overview of the creation, development and financing of the current accounts in the central and east European EU member states. The fundamental theoretical approaches to the current account and a brief review of the literature are presented in *Chapter III*. *Chapter IV* examines the macroeconomic determinants of the current accounts on the basis of a reduced form model and as part of a panel estimate and evaluates the contribution of these variables to the deficits of the eight central and east European EU member states in the period from 1994 to 2004. *Chapter V* summarises the main findings and draws conclusions for further monetary integration within an enlarged European monetary union.

II Current account developments in the central and east European EU member states

Between 1994 and 2004, the current accounts of the central and east European EU member states displayed fairly fluctuating trends (*Figure 1*).

Figure 1. Current account developments of the central and east European EU member states from 1994 to 2004 (as a percentage of GDP)



Source: Eurostat NewCronos; IMF International Financial Statistics; National Bank of Poland

At the beginning of the period under review – the transformation process that was just getting underway was accompanied by a steep drop in GDP and a redirection of foreign trade towards western Europe – there were predominantly moderate deficits or, in some cases, even surpluses. As economic activity picked up, significant deficits emerged in external transactions in the mid to late 1990s. The impact of the Russia crisis in 1998 and the general cyclical downturn led – with the exception of Poland and Hungary – to a transitory decline of the deficits at the end of the 1990s. They increased again at the beginning of the new millennium.

In the last two years, current account deficits in four countries exceeded 8% of GDP. The Baltic states recorded the largest deficits throughout the period under review. Whereas Lithuania managed to reduce its deficits to under 10% of GDP in the last few years, the

negative balance in Estonia and Latvia stood at about 13% at the end of 2004. Only in Slovenia, Poland and Slovakia the need for net external financing was below 4% of GDP.

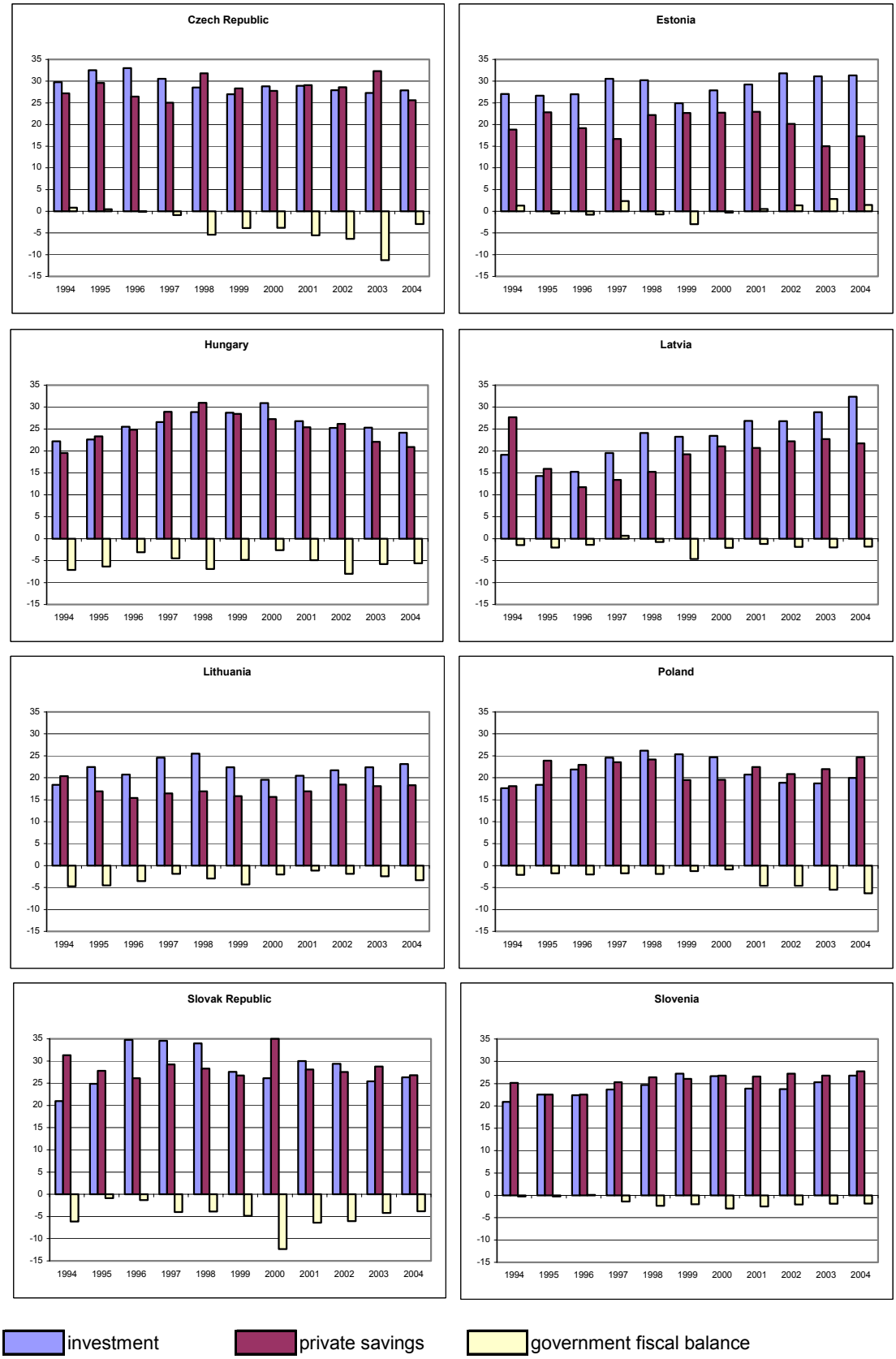
A look at the domestic counterpart of the current account deficits - the saving-investment decision - shows that, with average figures ranging from 22% in Latvia, Lithuania and Poland to 30% in the Czech Republic, there is a wide variation in the gross investment ratios of the central and east European economies (*Figure 2*). However, all the countries' ratios are higher than those in the euro area, where investment amounts to only around 20% of GDP on average. If developments are monitored over time, a fairly similar pattern emerges in most countries. An increase in the investment ratio in the second half of the 1990s contrasted with a slight fall at the start of the new millennium while, on the whole, a pronounced recovery of investment activity is beginning at the current end.

The figures for the private gross savings ratios were also spread widely. The Czech and the Slovak Republic lead the field whereas the figures of the Baltic economies were comparatively low. While a slight rise can again be observed in Lithuania and Latvia in recent years, in Estonia, the trend at the current end is negative. With the exception of Lithuania, where only around 17% of GDP is being saved, in all central and east European economies the proportion is higher than the euro area average (22%).

In Poland, the Slovak Republic and Slovenia, private savings were higher than investment in most years. In the Czech Republic, the share of private savings was only just below the investment ratio. However, it cannot be concluded from these ratios that the current account deficits are due to public budget deficits alone. The level of private savings may reflect government borrowing (Ricardian equivalence). There is a marked discrepancy between investment and private saving in the Baltic states which cannot be attributed to exceptionally strong investment activity but rather to a private saving ratio that is below the average of the countries studied.

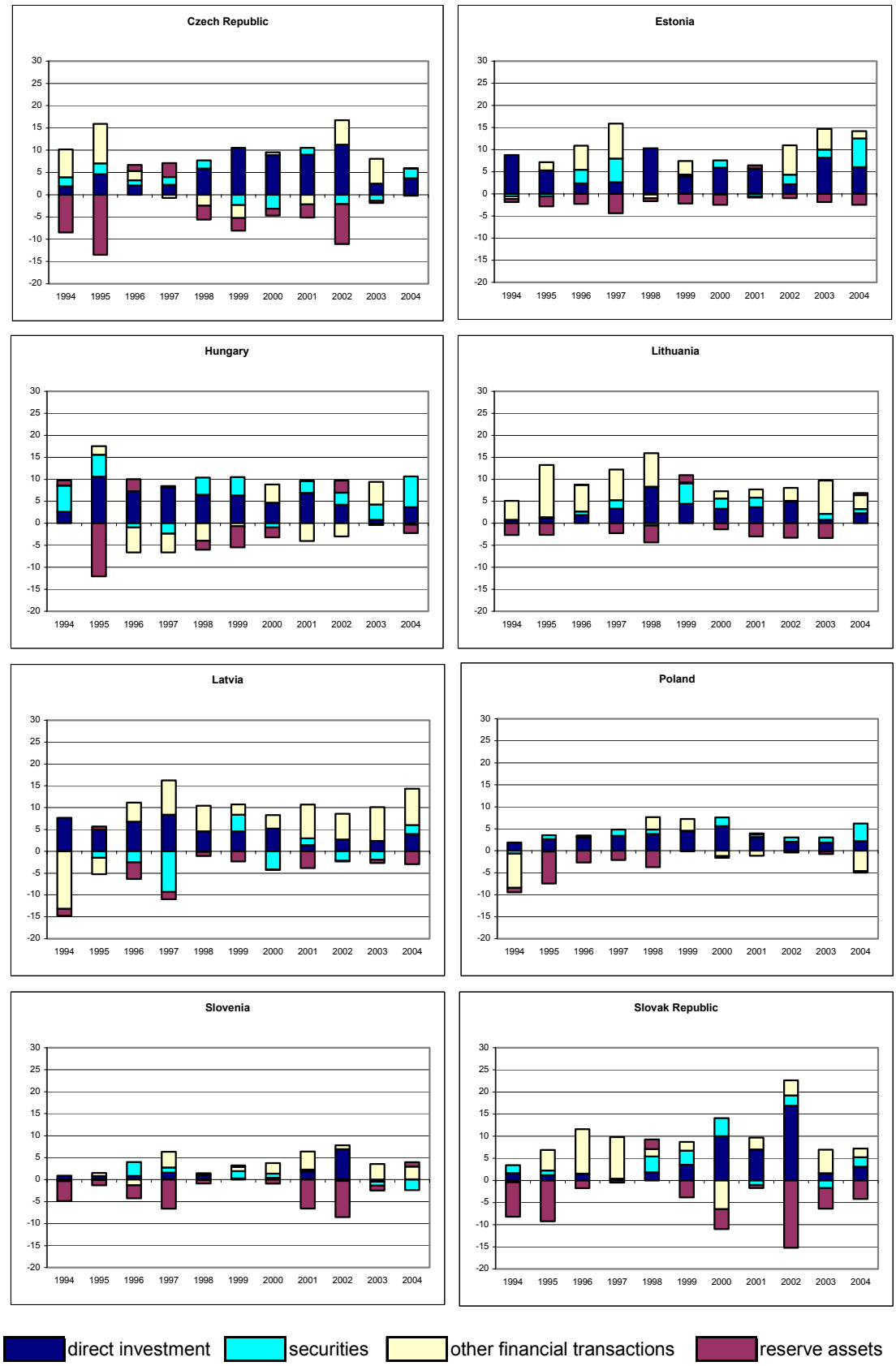
On the financing side of the current account (*Figure 3*), there was a marked rise in foreign direct investment in most of the countries in the mid-1990s, in part related to privatisation. This development is continuing in Poland. However, in most other countries, such as the Czech Republic, Lithuania, Latvia and Hungary, its importance has declined in recent years compared with other capital inflows. Movements of capital were subject to strong fluctuations in Slovenia and the Slovak Republic.

Figure 2. Investment, private and public savings from 1994 to 2004 (as a percentage of GDP)



Source: Eurostat, NewCronos; IMF, International Financial Statistics.

Figure 3. Composition of net capital flows from 1994 to 2004 (as a percentage of GDP)



Source: Eurostat, NewCronos; IMF, International Financial Statistics.

In all of the economies under review, portfolio investment makes up only a minor part of the financial account, except in specific years. Given the only rudimentarily developed stock markets, it is essentially debt securities that are involved. Loans are the most important items of other financial transactions. They played a vital role in covering capital requirements in the initial transformation period and regained significance at the current end, partly reflecting contrary developments in direct investment.

In most years of the period under review, private capital inflows were greater than the financing needs resulting from the current account. At the beginning of the study, the creation of reserve assets was particularly marked. Although the growth rates were reduced noticeably over time, they have increased again in the last years. This was also the case in the Baltic economies. Growing reserve assets in themselves are an argument against an acute need to adjust an existing current account deficit. Furthermore they increase the room for manoeuvre in ERM II when intervention is required to defend the fluctuation margin for depreciating currencies.

III Theoretical approaches to the current account and literature overview

There are several approaches to explain current account deficits which partially apply to a different economic environment and therefore can have varying implications for economic policy and exchange rate adjustments. The following analysis is based on the *intertemporal approach* which goes back to studies of Sachs (1981), Obstfeld (1982), Svensson/Razin (1983) and Frenkel/Razin (1987).[3] Private saving and investment decisions result from expectations of the future development of macroeconomic variables. The current account is a result of an intertemporal optimisation with the objective of optimally distributing consumption over time (*consumption smoothing*).

In line with works of Chinn/Prasad (2000) and Freund (2000) we link the intertemporal approach to the stages of development hypothesis.[4] Differences in per capita income between reforming countries and advanced economies are supposed to diminish over time as a result of an economic catching-up process. This so-called β convergence has its theoretical foundation in the neoclassical growth theory, but is only partially confirmed

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[3] Alternative approaches are the *absorption approach* (Alexander 1952) or the *Mundell-Fleming model* and its derivatives. See Fleming (1962), Mundell (1962), Knight/Masson (1986) or Frenkel/Mussa (1990).

[4] See Debelle/Faruqee (1996), Faruqee/Debelle (1998) and Chinn/Prasad (2000). A backward country has a larger deficit as the marked need for investment is accompanied by relatively low domestic savings. At an early stage of development, the external financing requirement initially rises with the increasing development of a country but then goes back down when a higher level of development has been reached.

empirically.[5] With regard to European Union recent studies come to the conclusion that income gaps between new and old member states are indeed closing and that convergence is fuelled by economic integration.[6] Nevertheless, consumption smoothing over a long time horizon entails substantial risks with regard to future repayments of accumulated debt. In the case of an unexpected slow-down of economic growth, current account deficits can become persistent and eventually turn out to be unsustainable. Likewise, government borrowing may be associated with economic development. Nevertheless, it should be assessed with caution, since public investment usually does not follow purely economic considerations and the distinction between public investment and consumption is often arbitrary.

Our approach is also related to the IMF's *macroeconomic balance approach*,[7] which aims to identify the equilibrium exchange rate that allows for the simultaneous compliance of an external and an internal equilibrium. The approach is based on studies by Laursen/Metzler (1950) and Mundell (1962) and became popular as a result of its implementation in MULTIMOD, the IMF's econometric model. Meredith (1998) made the approach more dynamic by modelling expectations, while further refinements were carried out by Borowski/Couharde (2003). In our own model we abstain from determining an equilibrium exchange rate, but we also compare actual levels of the current account with the fitted levels that are consistent with full employment and the stage of development. Doing so, it is possible to get some information on possible future adjustments of the real exchange rate.

Despite a wide range of empirical research on the topic of current account deficits, only a few studies have so far focused on the central and east European economies. Aristovnik/Zajc (2001) and Aristovnik (2002) estimate the determinants of current account deficits for twelve transition economies and test for the twin-deficit hypothesis. They find that Ricardian equivalence is not strictly valid. Further factors that significantly influence the current account positions are investment, the real exchange rate, the real interest rate, economic growth and money in relation to GDP. Doisy/Hervé (2003) estimate a benchmark for current account positions applying a solvency constraint and also identify determinants of the saving-investment balance. They include the fiscal balance, the share of the privat sector in value added, the per capita income, the ratio of capital income to wage income and the openness of an economy. Bussière/Fratzscher/Müller (2004) use a heterogeneous panel with the new EU member states as well as with 21 OECD countries. They compare

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5 For an excellent overview of the debate on convergence see Barro/Sala-i-Martin (2004).

6 See Kutan/Taner (2002), Chaney (2003) or Yigit/Kutan (2004).

7 See Masson (1998), Isard *et al* (2001), Faruqee *et al* (1999) and Isard/Mussa (1998).

the current accounts of the individual countries with the predicted values of the sample which are defined as the "structural" current account positions.

The paper at hand is different from the cited studies, in that it explicitly focuses on the new EU members in Central and Eastern Europe without putting them into a panel with other reforming countries or advanced economies. A further increase in homogeneity is reached by using an updated database which begins in 1994, when EU accession already had a concrete perspective and reaches until 2004, the first year of EU membership. Quarterly observations of all variables yield a sufficiently large database to use a dynamic estimator that – among the other studies – is only employed by Bussière/Fratzscher/Müller (2004) for the extended panel of 33 countries. Finally, we conduct a contribution analysis of individual factors which are found to be responsible of current account developments in central and eastern Europe. Doing so we can assess the quantitative relevance of individual variables for the current account positions in addition to the estimated elasticities.

IV Macroeconomic determinants of current account deficits in the central and east European EU member states

4.1. A simple model

The starting point of the estimation model is the identity of the current account (*CA*) with the difference of domestic saving (*S*) and investment (*I*), whereby total saving is divided into private saving (S_P) and the government fiscal balance (S_G):

(1) $$CA = S_P + S_G - I$$

For the purposes of comparability between various countries, the variables can be set in relation to GDP (*Y*) and thus normalised:

(2) $$\frac{CA}{Y} = \frac{S_P}{Y} + \frac{S_G}{Y} - \frac{I}{Y}$$

The private saving ratio as the relation of voluntary private savings (S_P^v) to GDP is a function of different variables:

(3) $$\frac{S_P^v}{Y} = f\left(\frac{Y}{N} \Big/ \frac{Y^*}{N^*}, REER, \frac{S_G}{Y}, \frac{I^f}{Y} \right)$$

The national real per capita income *(Y/N)* in relation to the real per capita income of the world or of a reference country *(Y*/N*)* represents an important factor in explaining the current account and characterises an economy's stage of development. Anticipating real convergence and expecting a higher income in the future, consumers in emerging economies take on debt in order to smooth their long-term consumption.[8] Besides the consumption smoothing the comparatively high capital productivity provides an important explanation for the fact that current account deficits are typical of catching-up countries. However, by considering fixed investment, this component will explicitly be taken into account below. Therefore the estimated influences of the relative per capita income exclusively reflect consumption effects.

In addition to real income developments, changes in the real effective exchange rate play an important role in the relative income and asset position of an economy. The real effective exchange rate (*REER*) generally tends to rise while the economic catching-up process is taking place.[9] This is due to productivity gains in manufacturing (Balassa-Samuelson effect) as well as demand-side influences such as the use of capital inflows and comparatively high government spending to build up infrastructure.[10] To the extent that the real appreciation is anticipated to be an element of the economic catching-up process, the effects on the savings ratio are equivalent to those of real income developments: the initial undervaluation of the currency induces, in expectation of later gains in purchasing power, higher household debt, which is later reduced.[11] Unforeseen (but permanent) appreciations affect the saving ratio in the opposite direction: as a result of the appreciation, the purchasing power of current and future income increases, as does that of monetary and property assets already accumulated. This positive wealth effect has a negative influence on the propensity to save.[12] Finally, a temporary real appreciation

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8 Rebelo (1992) deduces a positive link between the level of income and the savings ratio based on the Stone-Geary utility function, according to which utility is a function of that part of consumption above the subsistence level. Accordingly, countries that consume close to the subsistence level have a smaller elasticity of intertemporal substitution. Atkeson/Ogaki (1991) and Giovannini (1985) put forward similar arguments. In contrast to an often described u-form relationship between relative income and the current account, this approach assumes a linear relationship between the two variables. This is due to the fact that at the beginning of the period under review the central and east European economies already had the initial distortions of the transformation process behind them.

9 The indirect quotation is assumed, ie a rise in the exchange rate corresponds to an appreciation.

10 For a discussion of real appreciation in the new EU member states see for example Fischer (2002).

11 For example, see Razin (1984).

12 See Davey (2001), Maki/Palumbo (2001) and Strauss (2000). However, if the real appreciation leads to an improvement in the terms of trade (the elasticity of the supply of imported and exported goods is high), an unexpected rise in the real exchange rate can have a positive effect on the current account. A positive valuation effect emerges alongside the negative wealth effect, resulting in a fall in the import value when trading volumes are unchanged. The overall effect is dependent on supply and demand elasticities as well as

should result in an improvement of the current account according to the consumption smoothing hypothesis.[13] Overall, the link between the real exchange rate and the saving ratio can only be determined empirically.

The fiscal balance as a percentage of GDP (S_G/Y) affects private saving as today's government debt induces future taxes for debt servicing. In extreme cases, a rise in government debt is fully compensated by additional private saving (Ricardian equivalence). This is claimed by the standard intertemporal approach. However, there are also arguments for an incomplete absorption of government deficits by private savings (limited time horizon, heterogeneity of the population as well as liquidity constraints).[14]

When there is full employment, savings and investment that have actually been made are in line with the planned variables. Fixed investment (I^f) can be regarded as planned investment; the building-up/reduction of inventories, on the other hand, helps to absorb unforeseen sales and production developments. The investment ratio (I^f/Y) particularly correlates with private saving when access to the international capital markets is restricted (Feldstein/Horioka, 1980 and Razin, 1995). Further reasons for a close link between the two variables are discussed in the literature under the term "home bias".[15]

While there is assumed to be a direct linear connection between the private saving ratio and the government deficit and investment ratios, a semi-elastic relationship is assumed to exist between the private saving ratio and relative per capita income. If per capita economic growth in the catching-up economy stands 1% above the per capita economic growth of the reference country, the saving ratio goes up by a constant amount. *PCI* therefore stands for the natural logarithm of per capita income. The real effective exchange rate is also represented logarithmically. The regression equation of the private saving ratio is therefore:

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the time preference of economic agents. See Harberger (1950), Laursen/Metzler (1950), Svensson/Razin (1983), Backus/Kehoe/Kydland (1994) or Kent (1997).

13 See Obstfeld/Rogoff (1995).

14 In this way, Bachmann (1992), Rosenzweig/Tallman (1993), Debelle/Faruqee (1996), Selhattini (1997), Chinn/Prasad (2000), Aristovnik (2002), Bussière/Chortareas/Driver (2003) and Bussière/Fratzscher/Müller (2004) claim that budget deficits affect current account deficits. Enders/Lee (1990), Ventura (2001), Dewald/Ulan (1990), on the other hand, do not see any indications of this effect. Fidrmuc (2002) does not observe any significant link in the new EU member states in the 1990s either. In opposition to that, Darrat (1988) reports bilateral causality.

15 See Murphy (1984), Penati/Dooley (1984), Frankel (1985), Tesar (1991), Bodman (1994), Obstfeld (1994), Bayoumi/McDonald (1995), Schmidt-Hebbel/Servén/Solimano (1996), Sorensen/Yosha (1997) and Kraay *et al* (2000).

$$(4) \qquad \frac{S_P^v}{Y} = \alpha_0 + \alpha_1(PCI - PCI^*) + \alpha_2 REER + \alpha_3 \frac{S_G}{Y} + \alpha_4 \frac{I^f}{Y} + \varepsilon$$

Substituting into equation (2) yields the current account balance that is compatible with full employment on the domestic goods market ($\overline{CA}$):

$$(5) \qquad \frac{\overline{CA}}{Y} = \alpha_0 + \alpha_1(PCI - PCI^*) + \alpha_2 REER + (1 + \alpha_3)\frac{S_G}{Y} + (\alpha_4 - 1)\frac{I^f}{Y} + \varepsilon$$

If Ricardian equivalence holds (α_3 = -1), the public finances have no effect at all on the current account balance. In the case of full international capital immobility (α_4 = 1), domestic fixed investment is completely financed from domestic savings.

4.2. Empirical research

Empirical research is based on a panel of the eight central and east European countries that joined the European Union in May 2004. Quarterly data from 1994 Q1 to 2004 Q4 are used. Germany acts as a reference country for relative per capita income.[16]

The regression to be estimated relates to the model presented in equation (5), which, in different notation, is:

$$(6) \qquad CAGDP_{i,t} = \gamma_i + \gamma_1 RELGDP_{i,t} + \gamma_2 FINGDP_{i,t} + \gamma_3 INVGDP_{i,t} + \gamma_4 REER_{i,t} + \varepsilon_{i,t}$$

Where *CAGDP* is the current account in relation to GDP, *RELGDP* is relative per capita income of the former transition country compared with the reference country in logarithms, *FINGDP* is the fiscal balance in relation to GDP, *INVGDP* is the investment ratio and *REER* is the logarithm of the real effective exchange rate. According to the arguments above, positive signs are expected for γ_1 and γ_2, and a negative sign for γ_3. The sign of γ_4 is ambiguous a priori. The absolute values of γ_2 and γ_3 should be between nil and one since they are elements of the current account ratio, although their overall effect may be partly offset by private savings.

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16 The variables are not seasonally adjusted. If necessary, seasonal effects were taken into consideration by AR terms in the case of the static procedure and by an appropriate lag structure in the case of the dynamic procedure. Data sources are the Eurostat NewCronos database and the IMF International Financial Statistics database (see the annex for explanatory notes on the data). Reliable data are available only for the time after the end of the transformation shock, ie from around 1994 onwards. Germany is chosen as reference country, because data for the European Union as a whole are not completely available for the whole sample.

Panel unit root tests of the individual time series confirmed that all variables being stationary with *RELGDP* and *REER* being trend stationary.[17] As the endogenous variable *CAGDP* does not show any trend, the effects of the trends in *RELGDP* and *REER* on the current account ratio should cancel each other out. Otherwise, equation (6) does not capture all the relevant variables. The regression was therefore repeated, taking a possible trend into account. The relevant parameter of the trend was not significantly different from nil in all model variants, with the result that equation (6) could be estimated without further adjustments.[18]

In an initial step, a *Feasible Generalized Least Squares (FGLS)* estimation was conducted. Taking into account fixed country effects and panel-specific AR terms, the estimator accounts a heteroskedastic error structure as well as a correlation between countries.[19] In a second step, a dynamic procedure is used. This means that the effect of earlier periods on the latest current account position was not captured via an autocorrelation of the disturbance terms but, instead, explicitly by including delayed endogenous variables. Using an IV estimator according to Anderson/Hsiao (1981) also avoids the Nickell bias that appears in the panel estimators when calculating AR terms.[20] Furthermore, a suitable selection of instruments allows for possible repercussions of the current account on the exchange rate, which would otherwise result in a distortion of the estimated results.[21] A GMM estimator would not be consistent owing to the limited number of observations. The advantages of the IV estimator, which are that the dynamics of the process, as well as a possible endogeneity of the real exchange rate, can be explicitly modelled and that the Nickell bias can be avoided, might, however, be offset by a lower efficiency than with the static model.

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17 The panel unit root tests of Levin/Lin/Chu (2002), Breitung (2000), Im/Pesaran/Shin (2003) as well as an ADF test based on Maddala/Wu (1999) were applied. Whereas the first two procedures assume a common unit root process, the remaining tests alow that each country exhibits different coefficients of the AR terms.

18 If the trend had a significant effect, it would indicate a miss-specification. See Hassler (2003).

19 On the basis of F tests, jointly insignificant fixed effects were eliminated from the estimation but only when the likelihood ratio test did not reject the restricted model.

20 However, the Nickell bias should not represent all that great a problem in this FGLS estimation given the relatively large number of temporal observations.

21 The constant, the second lag of the endogenous variables, the exogenous variables and their lags as well as two lags of the previously-determined variable *REER* were used as instruments. Lane/Milesi-Ferretti (2002), for example, found indications of a possible endogeneity of the real exchange rate.

Both results are shown in *Table 1.*[22] All the parameters – with the exception of REER in the IV-estimator – are significant at the 5%-level. The Wald test confirms the significant effect of the variables in their entirety, and the adjusted R^2 amounts to 0.5.

Table 1. **Macroeconomic determinants of the current account - FGLS/IV estimations of the basic model**

	FGLS estimation	**IV estimation**
CAGDP (-1)	-	0.4827*** *(6.24)*
RELGDP	0.0312*** *(7.25)*	0.0240*** *(4.58)*
FINGDP	0.0810** *(2.13)*	0.0871** *(2.41)*
INVGDP	-0.2600*** *(-7.78)*	-0.2636*** *(-6.84)*
REER	-0.0608*** *(-3.48)*	-0.043 *(-1.38)*
Prob > Wald chi^2	0.0000	0.0000
Adj. R^2	-	0.48

*** (**) [*] denotes significance at the 1% (5%) [10%] level; t-values in parentheses.

The current account deficits in the period under review were largely brought about by the level of development of the economies, ie the lower per capita income compared with that of Germany lowers savings in the central and east European economies. If the economic development process continues, it should, *ceteris paribus*, have a positive effect on the private saving ratio of the new EU member states. So far the positive development trend has evidently been compensated by the accompanying real appreciation which per saldo has a negative impact on the current account. As a result a reduction in the current account deficits has not yet been observed during the observation period.

The considerable demand for investment and its significant effect on the current account is also closely related to an economy's level of development. The relatively low coefficient of investment implies a marked link between domestic fixed investment and domestic saving, even though there is no complete correlation. Nevertheless, if the income level of the catching-up economies moves closer to that of the EU, the need for investment in the

[22] The FGLS regression with panel-specific AR(1) terms was estimated with STATA 8.2, and the IV estimator with EViews 5.1.

catching-up economies is likely to diminish, which should have positive implications for the current accounts.[23]

Whereas the catching-up process can be influenced or accelerated only indirectly by the political decision-makers, the findings additionally provide indications that economic policy plays an active role in current account developments. The results confirm the so-called twin-deficit hypothesis, ie that during the period under review an increase in the general government fiscal deficit has contributed to the deterioration of the current accounts of the central and east European EU member states. However, the coefficient of *FINBIP* is very small, which implies that a change in the government deficit is compensated by private saving to a large extent and therefore affects the current account only moderately. Nevertheless, the rising fiscal deficits of some of the new EU member states, such as the Czech Republic, Poland, the Slovak Republic and Hungary, appear not suitable for reducing existing current account deficits.

Furthermore, the lagging endogenous variable in the dynamic IV estimator is significant at the 1% level. This shows a certain persistence of existing current account deficits without offering a clear explanation for it.

Supplementary to the basic model and based on Edwards (1995), additional financial market variables were used to explain the private saving ratio. The real interest rate should, *ceteris paribus*, have a positive effect on private savings, thereby tending to move the current account into surplus.[24] The development of the banking system – measured as the ratio of the monetary aggregate M2 to GDP – opens up more efficient investment opportunities and thereby increases the attractiveness of saving, which results in an expected positive sign for this parameter. On the other hand, existing credit restrictions are relaxed with the rising efficiency of financial intermediation, with the result that the opportunities for borrowing increase. The net effect can only be determined empirically. Besides the financial market variables, the current situation of the business cycle can also

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23 Ventura (2002) points out an interesting phenomenon. A "between" regression has found that the link is very slight, ie that countries which invest more do not, on average, have larger current account deficits. By contrast, a "within" regression suggests that, in years when there is greater investment, economies also tend to have higher current account deficits. These findings are also confirmed by Glick/Rogoff (1995) as well as by Penati/Dooley (1984).

24 A rise in the interest rate results in a reduction in current consumption, thereby tending to improve the current account. This occurs through both substitution effects, ie current consumption becomes relatively expensive, and an income effect. The last one puts economies with current account deficits at a disadvantage when interest rates are going up as they have to export more in the future to pay for current imports of goods. Another transmission channel is investment, which should fall as a result of the interest rate rise and, in this way, is also likely to contribute towards an improvement in the current account. However, investment has already been explicitly considered in the model.

be explicitly integrated into the estimation model. Actual economic growth is generally likely to be positively correlated with the degree of utilisation and therefore tends to be accompanied by a movement of the current account into deficit.[25] The results of the expanded model using a static FGLS estimator and a dynamic IV estimator are summarised in *Table 2*.

The real interest rate has the expected positive sign and the net effect of the money to GDP ratio is also positive, even if it is only significant in the IV estimation. The growth rate of GDP, however, does not help to explain the level of the current account ratio beyond the factors already taken into consideration.[26] As in the basic version, the static and dynamic models come to qualitatively comparable results, which indicates that the conclusions with respect to alternative estimation methods can, in turn, be regarded as robust. The adjusted R^2 increases only marginally over the basic model. To that extent, although the variables are significant, their joint contribution to providing an explanation is relatively small.

Table 2. **Macroeconomic determinants of the current account - FGLS/IV estimations of the enlarged model**

	FGLS estimation	**IV estimation**
CAGDP (-1)	-	0.4608*** *(2.75)*
RELGDP	0.02700*** *(5.40)*	0.0147*** *(2.75)*
FINGDP	0.0831** *(2.20)*	0.1420*** *(2.75)*
INVGDP	-0.2375*** *(-6.93)*	-0.2891*** *(-6.66)*
REER	-0.0381* *(-1.94)*	-0.0264 *(-1.15)*
RIR	0.0009** *(2.09)*	0.0014*** *(2.71)*
M2GDP	0.0062 *(-1.02)*	0.0138*** *(3.19)*
Prob > Wald chi^2	0.0000	
R^2		0.50

*** (**) [*] denotes significance on the 1% (5%) [10%] level; t values in parentheses.

[25] A number of studies address the link between cyclical factors and the current account. For example, Kandil/Greene (2002) found signs that an increase in real GDP growth has a negative effect on the current account. On the other hand, there is also empirical evidence of the opposite relationship, ie that rapidly expanding economies actually show current account surpluses.

[26] In *Table 2* the growth rate has been excluded as it was not significant in any of the estimators. Alternatively, domestic economic growth can be measured relative to growth of World output or of a reference country's GDP. This variant, however, did not improve the results of the regression.

Our results are widely consistent with the studies of Aristovnik/Zajc (2001), Aristovnik (2002), Doisy/Hervé (2003) and Bussière/Fratzscher/Müller (2004) cited in the literature overview. Especially relative GDP per capita has a positive impact on the current account in all studies. A high negative effect is generally confirmed for the investment ratio which, however, is ignored by Doisy/Hervé (2003). The effect of fiscal deficits in our findings is at the lower margin of the wide range of estimates which vary between 0.1 and 0.5. Financial market variables are ignored by Doisy/Hervé (2003) and Bussière/Fratzscher/Müller (2004). Aristovnik/Zajc (2001) confirm the positive impact of money but find a negative correlation between the real interest rate and the current account position which they interpret as an indicator of deteriorating competitiveness. The negative impact of a real exchange rate appreciation is confirmed by all studies that include this variable, namely Aristovnik/Zajc (2001), Aristovnik (2002) and Bussière/Fratzscher/Müller (2004).

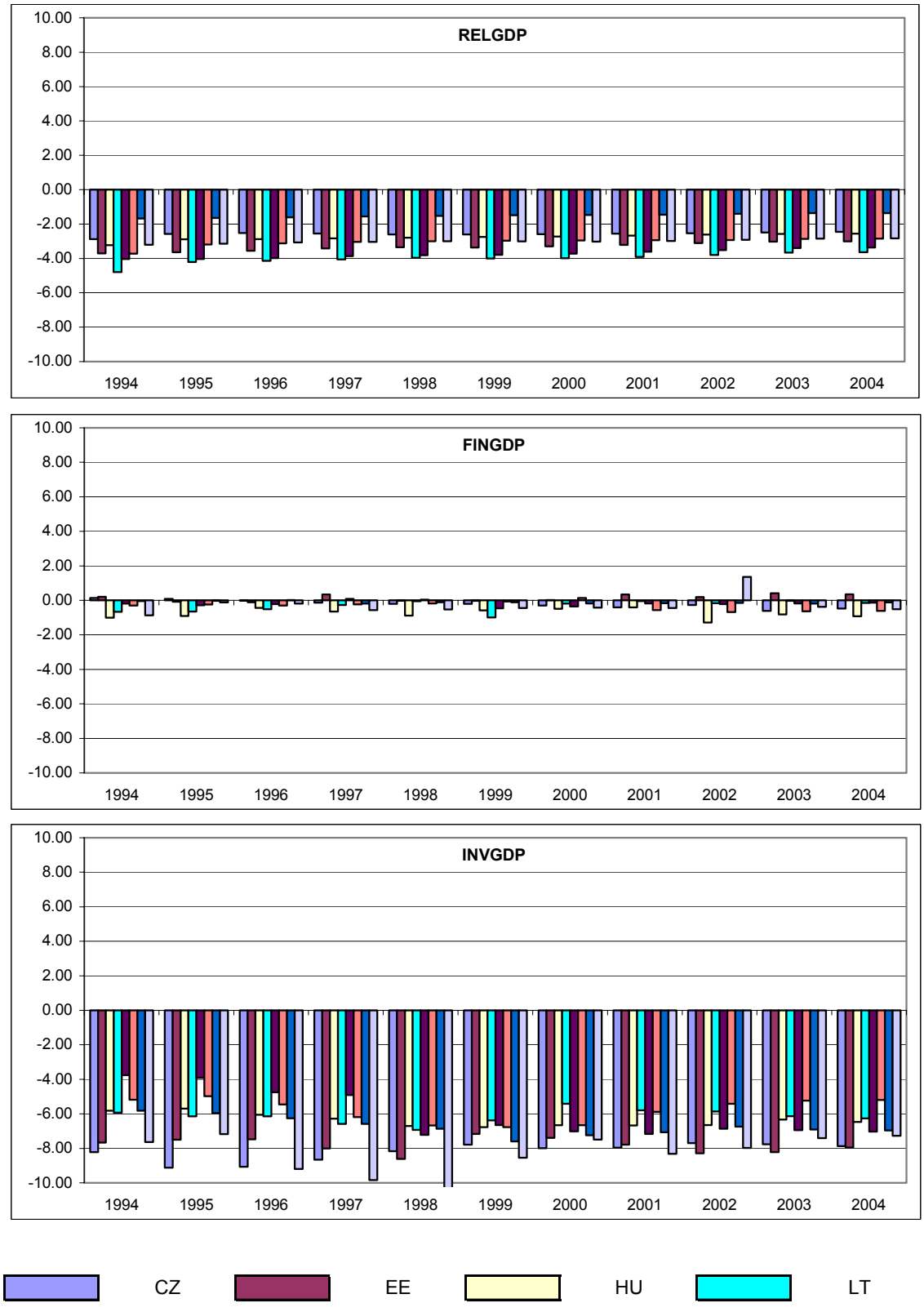
All in all, the results show that the catching-up process can help to reduce current account deficits by increasing the saving ratio and decreasing the need for investment. This similarly applies to a sound government fiscal policy structure. Balanced current accounts, in turn, help to avoid enforced adjustments of economic policy and significant distortions in the nominal and real exchange rate. To that extent, the Eurosystem´s requirement that a sufficient amount of real convergence, as well as consistent and sound economic policies, be ensured before a country can adopt the euro also appears justified in view of the current account developments.

4.3. Contribution analysis

The identification of significant determinants of the current account deficits of the new EU member states does not enable any conclusion to be drawn on sustainability or the emergence of possible risks. Instead, we need to know what contribution the individual factors have actually made to the level of the deficits. A contribution analysis provides this information (*Figure 4*).[27]

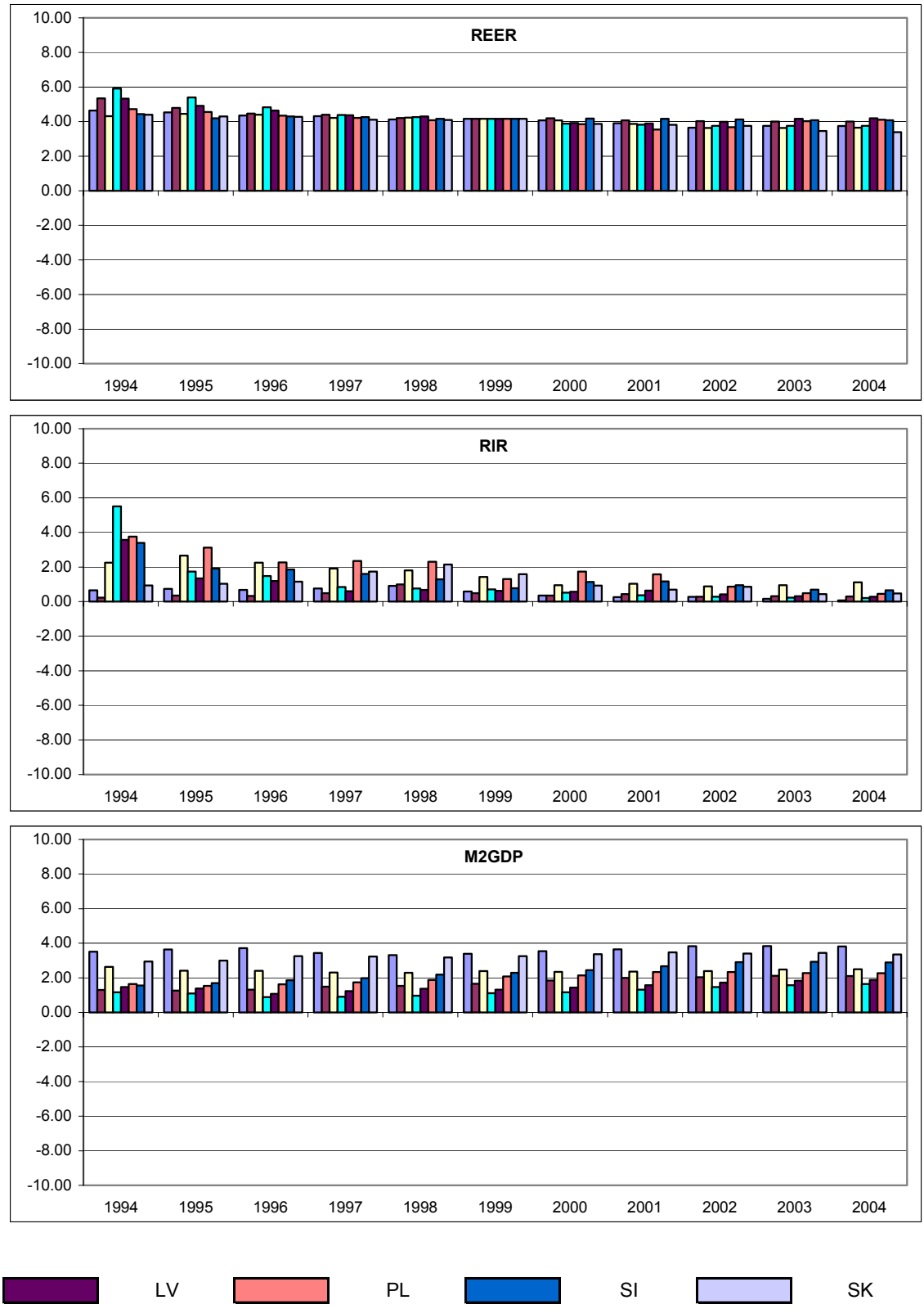
[27] The data result from multiplying the estimated parameters by the annual figures of each factor. The study is based on the estimation results of the IV estimator taking account of financial market variables but disregarding the insignificant growth rate of GDP. In the equation, the constant is added to the contribution of the real effective exchange rate. The "neutral" value of the real effective exchange rate is therefore defined as the value that would balance out the current account if additional variables were neglected.

Figure 4. Contribution analysis of the current account ratio (as a percentage)[28]



28 The contribution analysis refers to the IV estimation results of the enlarged model (see Table 2).

Figure 4. Contribution analysis of the current account ratio (as a percentage)



Around 3 percentage points of the current account deficits in relation to GDP are due to the differences in income compared with Germany. The effects of these differences have tended to decline slightly over the past ten years. This is especially true for the three Baltic states, whose economic backwardness was still particularly marked at the beginning of the 1990s. Nevertheless, Latvia and Lithuania still have by far the lowest per capita income levels of the European Union. The reduction of their current account deficits, which are well above the average of the eight countries under consideration, therefore heavily relies on their further progress in catching-up. The convergence process is mirrored in the trend of the real effective exchange rates. Their positive impact on the current account positions of the central and east European member countries has eased somewhat over time but is still sensible.

The parallel development of relative income and real exchange rate entails consequences for further monetary integration. Under ERM II, adjustments of the nominal exchange rates in line with progress in real convergence are still possible, but after the entry to the Eurosystem real appreciation can only be achieved by inflation differentials. Furthermore, it would be almost impossible to determine an adequate conversion rate, if accession comes too early. An overvaluation of the domestic currency could considerably burden the current accounts of the new member states. An undervaluation, in turn, would result in additional inflation pressure.

The current accounts in central and eastern Europe are primarily determined by domestic fixed investment. This investment accounts for deficits totalling 5 to 8 percentage points of GDP. The figures are above-average in the Czech Republic, Estonia and Slovakia. Although no significant influence of foreign direct investment can yet be concluded directly from this link, its relationship with domestic fixed investment deserves further consideration owing to its long-term effects on current accounts.[29]

The effect of the financial sector on the current account is fairly minor. The convergence of real interest rates to the west European level observed in the past has almost completely eroded the effect of this variable. Furthermore, any more appreciable contributions of the real interest rates should not be expected in the future either. By contrast, the relationship between the money stock and GDP is still very much lower in the transition countries compared with the established EU member states. Therefore, in the medium-term, it is likely that the variable will favour domestic saving more than in the past. For example, advancing integration of the financial sector combined with the growing confidence of

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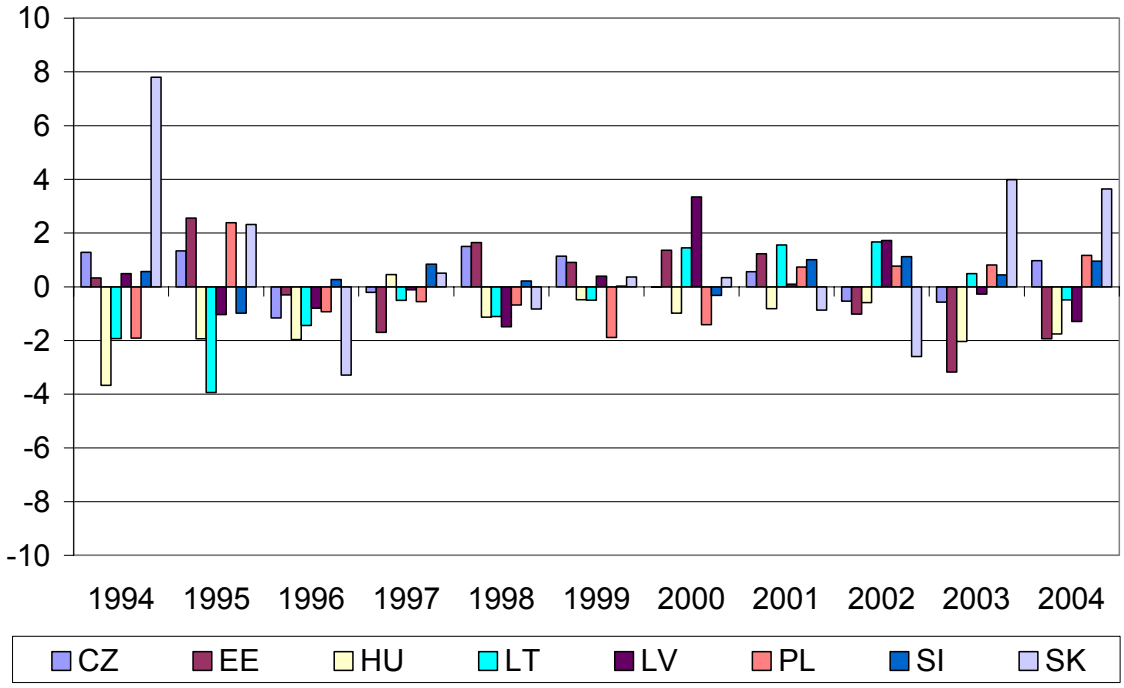
29 This question is addressed by Herrmann/Jochem (2005).

economic agents in financial intermediation suggest that positive effects for current account trends can be expected.

Interestingly, the role of government budget deficits is virtually negligible. Despite their statistical significance in the estimations, their importance is widely masked by other determinants. This is not due to their extent, which almost equals the level of the current account deficits in some countries, but more to the fact that they are predominantly offset by additional private savings. The strongest effects can be identified in Hungary. In some of the years under review approximately 1 percentage point of the deficit in the current account ratio was due to the government deficit; in 2002, the percentage was even somewhat higher.

The predicted values of the current account position serves as a benchmark for the average or normal level which is in line with the general economic situation in a given country.[30] Deviations of the actual values from this benchmark can be attributed to additional factors or exogenous shocks. *Figure 5* therefore shows the development of the residuals for all the countries under consideration during the observation period.

Figure 5. Contribution of residuals to the current account ratio (as a percentage)



[30] The contribution analysis has shown that current accounts are mainly influenced by variables linked to the catching-up process, whereas the impact of fiscal deficits is almost negligible. Therefore the predicted values can be interpreted as consistent with the stage of development.

Generally speaking, the impact of residuals seems to have diminished over time with the exception of the last two years when deviations of the actual current account from the predicted values increased somewhat for the Slovak Republic and Estonia. Compared to the benchmark, Hungary in most years has an excessive current account deficit, whereas Slovenia - with the exception of the year 2000 - shoes positive deviations from the predicted values. A positive trend in the residuals can be observed for Poland and Lithuania, but for Estonia the last three years exhibit negative deviations. A further deviation from levels which are consistent with the catching-up process might indicate necessary corrections of economic policy or give reason for reconsidering the strategy of monetary integration into the euro area.

In summary, it can be said that the current account deficits of the central and east European EU member states are essentially determined by domestic investment activity and the level of economic development. Further integration of the financial sector is also likely to encourage domestic saving and leads to an improvement of the current account.[31] The effects on the current account of rising per capita income and the accompanying real appreciation partly have compensated each other, with the result that if past developments will continue no significant impacts can be expected from this area. Nevertheless, the substantial income gaps of Latvia and Lithuania entail clear risks with respect to possible setbacks in the catching-up process. Increasing fiscal deficits are - technically speaking - to a large extent compensated by additional private saving and the impact of disturbances has generally diminished over time. Hungary and Estonia exhibit persistent negative deviations of actual to fitted current account positions and their current account deficits relative to GDP belong to the highest in central and eastern Europe. If the main determinants of the current account in these countries will not be corrected, external disequilibria will continue and endanger the sustainability of the external position.

V Conclusion

The current account deficits in the new EU member states can be attributed primarily to factors typical of the economic catching-up process, ie the relative income level and high capital building. The positive impact of a closing income gap, however, is largely compensated by real appreciation. The results confirm the so called twin-deficit hypothesis, even if the net effect of government budget deficits is rather small, since they

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[31] See Deutsche Bundesbank (2003) for more information on the integration of the central and east European financial markets.

are mostly financed by private saving. Further integration of the financial sector is likely to improve the current accounts.

Even if the current account positions do not require fundamental policy reversals, they are not free of risks. This is especially true with respect to the private propensity to borrow in expectation of future rises in income. In this respect the reduction of the current account deficits in Latvia and Lithuania is very sensible to their future course of economic convergence, and setbacks during the catching-up process cannot be ruled out. The situation in Estonia and Hungary also deserve special attention, since their current account deficits clearly exceed the levels, which are assessed to be in line with their stage of development.

In addition, an unfavourable development of the financing structure may increase the risk of sudden capital movements. The recent decline in the significance of direct investment for financing current account deficits in central and eastern Europe should be noted in this regard. It is offset positively by the ongoing build-up of reserve assets, which proves that inflows of private capital currently exceed the need for financing the current account deficits. Membership of the European Union is also likely to further stabilise inflows of capital into the new member states and tend to increase the readiness to make long-term commitments.

To conclude, our findings suggest that the ongoing catching-up process is continuously improving the current account situation of most central and east European EU member states. Despite these generally positive prospects, the still large current account deficits of some countries can present a serious obstacle to further monetary integration. As indicated, they increase the likelihood of future adjustments to the real exchange rate and make the determination of a sustainable conversion rate to the euro more difficult.

Annex: Data sources

Variable	Source	Unit/Calculation	Observations
Current account	IMF, International Financial Statistics	Quarterly data, converted into ECU at average quarterly exchange rates	Latvia, Poland (1994)
	National Bank of Poland	Annual data/4, converted into ECU/EUR at average quarterly exchange rates	Poland (1995-99)
	Eurostat, NewCronos	Quarterly data, in ECU/EUR	All remaining observations
GDP, current prices	IMF, International Financial Statistics	Annual data/4, converted into ECU at average quarterly exchange rates	Hungary, Poland, Slovenia (1994)
	Eurostat, NewCronos	Quarterly data, in ECU/EUR	All remaining observations
GDP, constant prices	IMF, International Financial Statistics	Annual data/4, converted into ECU at average quarterly exchange rates	Hungary, Poland (1994)
	IMF, International Financial Statistics	Quarterly data, converted into ECU at average quarterly exchange rates	Czech Republic, Lithuania (1994)
	Eurostat, NewCronos	Quarterly data, in ECU/EUR	All remaining observations
Population	Eurostat, NewCronos	Annual data	All observations
Fiscal balance (consolidated central government balance)	Eurostat, NewCronos	Annual data/4, in ECU	Latvia, Slovakia (1994-95)
	IMF, International Financial Statistics	Annual data/4, converted into ECU/EUR at average quarterly exchange rates	Estonia (1994-2003), Hungary (1994-96), Lithuania (1994-98), Poland (1994-95), Slovak Republic (1996-2000)
	IMF, International Financial Statistics	Quarterly data, converted into ECU/EUR at average quarterly exchange rates	All remaining observations
Fixed investment	IMF, International Financial Statistics	Annual data/4, converted into ECU/EUR at average quarterly exchange rates	Hungary, Poland (1994), Slovenia (1994-98)
	IMF, International Financial Statistics	Quarterly data, converted into ECU/EUR at average quarterly exchange rates	Lithuania (1994)
	Eurostat, NewCronos	Quarterly data, in ECU/EUR	All remaining observations
Real effective exchange rate (against 25 partner countries)	Eurostat, NewCronos	Quarterly data	All observations
Nominal interest rate	IMF, International Financial Statistics	Deposit rate, quarterly data	All observations
Inflation	IMF, International Financial Statistics	Consumer price index, quarterly data	All observations
Money stock	IMF, International Financial Statistics	M2, quarterly data	All observations

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