

East Germany, Central Europe, and the Risk of Real Convergence Overshooting

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1. Introduction

Economic and monetary integration with the EU enjoys a broadly based political support across the Central European accession countries. This is due not least to widespread hope that replicating the structures of the current union and gaining broad access to its goods and capital markets will foster a rapid and sustained improvement in living standards. Indeed, the past enduring economic outperformance of these countries, their improving credit ratings, and the steady sizeable flow of foreign direct investment all bear witness of the benefits, which the integration strategy has provided so far.

However, economic and monetary integration has not always been an unambiguous success in the Europe's recent history. In particular, the "front runner" among the transition economies in matters of integration and convergence with the West, East Germany has broadly fallen short of expectations. While unification with Western Germany (and thus EU accession) had proceeded swiftly, and real income and investment soared in the early 1990s thanks to generous public transfers, the East German economy has been anaemic since the middle of the 1990s. The consequences have been soft capital spending, high unemployment, a persistent need for large public transfers and widespread public discontent.

The East Germany's case was an extreme one with respect to the speed of integration and income convergence. The Central and Eastern European accession countries have followed that path in a very gradual fashion. However, it would be careless to dismiss the East Germany's experience as irrelevant. In particular, as EU accession is approaching and shall be concluded soon, easier access to foreign capital and an increasing EU budget support give the accession countries new opportunities to finance domestic spending.

As a consequence, there may be a temptation, similar to East Germany,

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to boost investment and income in the accession countries in order to “front-load” real spending convergence. Importantly, it can be shown in an intertemporal equilibrium model that if EU accession leads to a sizeable demand shock, the real external value of the accession countries’ currencies may overshoot its long-run equilibrium level. If the accession countries have successfully reduced inflation by that time, also the *nominal* external value of the currency will overshoot. Furthermore, if such overshooting coincides with rapid monetary integration and wage or price rigidities, it may take a long time for the real external value of currencies to adjust back downward to its equilibrium, leading to output losses and rising unemployment in the meantime. Thus, under a set of fairly plausible assumptions the Central European accession countries may on a smaller scale repeat some of the East Germany’s experience. The upshot for policymakers is to avert excessive temporary spending, including notably maintenance of fiscal discipline, remain focused on competitiveness and encourage wage and price flexibility in the economy.

The paper is structured as follows. *Section 2* will highlight the major macroeconomic developments in East Germany after unification, with a particular emphasis on the impact of rapid “front-loaded” income convergence with the West. *Section 3* shall point out that the convergence path of the four large Central European economies has been very different, but that in the run-up of EU accession the real appreciation and nominal GDP growth have accelerated. The intertemporal equilibrium model presented in *Section 4* shall demonstrate how various shocks affect the real and nominal exchange rate of small open economies. In particular, it shall illustrate formally how EU accession could trigger a temporary overshooting of the real external value in Central European countries. *Section 5* offers some conclusions, particularly for budget and wage policy in the wake of accession.

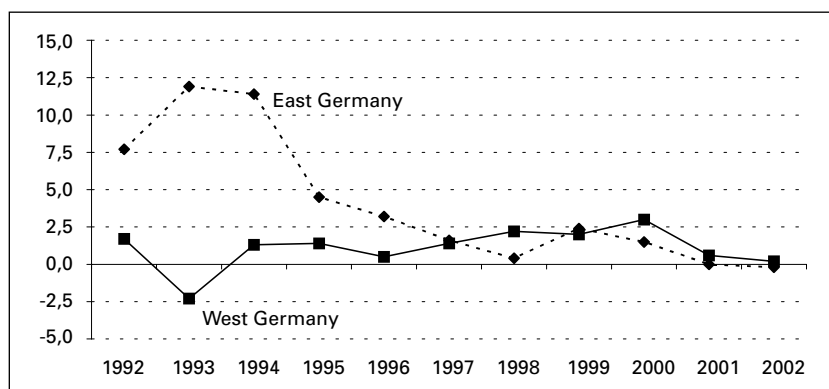
2. Developments in East Germany after Unification

2.1 Rapid Income Convergence Early in the Transition Phase

The overriding priority of the economic policy after unification was to create comparable living conditions across the enlarged country within a short period of time. While this approach was criticised by many economists, there was a compelling political case for front loading real convergence. Winning over the new voters in the new states required offering them something to look forward to after much of what they had achieved during their lifetime had been devalued in the process of unification. In addition, the perspective of rapidly improving economic conditions seemed to be critical for preventing mass migration from the East to the West, an outlook that had raised deep concern across the political spectrum.

With this objective in mind, the East German currency was converted at a rate of 1:1, into the DM, immediately lifting the East Germans’ purchasing power. Moreover, wage settlements agreed at the start of the transition period foresaw East German wages to reach western levels within

FIGURE 1 Real GDP
(% y/y)



Source: Arbeitskreis Volkswirtschaftliche Gesamtrechnung

a couple of years. Next, high levels of public spending on goods and services, in particular in public investment, generated income and improved living conditions. Generous public transfers also raised income for the non-working population, including pensioners whose average pensions have exceeded those in the West. Finally, considerable tax incentives for private investment attracted private capital flows from West Germany and abroad.

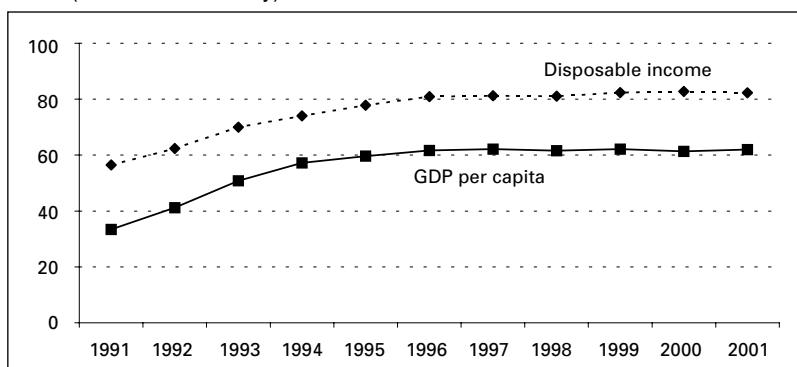
In economic terms, the shocks affecting the East German economy can be classified along the following lines: East German households experienced a rapid increase in wealth owing to the currency conversion rate, the strong wage increases and the onset of transfer payments from the public budget. Investors benefited from substantially improved after tax financing conditions reflecting generous tax subsidies. Finally, public finances benefited from transfers from the West while at the same time gained access to borrowing in financial markets, which was implicitly guaranteed by the West German economy.

As a consequence of these shocks output and income posted impressive advances during the first half of the nineties. In fact, during the boom phase between 1991 and 1995, real output soared by a cumulative 40 %.

As a result, East German per capita output almost doubled from around 30 % of the West German level in 1991 to 60 % in 1995. Reflecting the generous transfer payments, per capita disposable income in nominal terms climbed even higher and reached a level close to 80 % of those in the West in 1995. The lower price level for important expenditure categories, such as housing, suggests that the income convergence was even more impressive when adjusted for purchasing power parity.

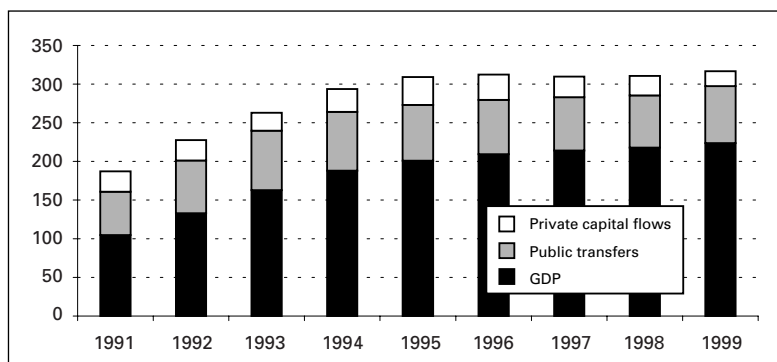
The post-unification boom was led by rapidly expanding aggregate demand. Between 1991 and 1995, private consumption rose by a cumulative 10 % in real terms in the East (excl. Berlin), while public consumption grew by 25 %. Strong demand and favourable financing conditions drove investment (gross fixed capital formation) up by a cumulative 96 % in the same period.

FIGURE 2 Disposable Income, GDP per capita
(% of West Germany)



Source: Arbeitskreis Volkswirtschaftliche Gesamtrechnung; own calculations

FIGURE 3 Output, Capital Inflows
(euro bn)



Source: Arbeitskreis Volkswirtschaftliche Gesamtrechnung; European Commission; own calculations

However, aggregate demand outstripped domestic output, resulting in a huge current account deficit. As shown below, about one third of domestic demand had to be financed from outside East Germany. The largest source of finance was public transfers. The latter amounted to more than DM 100 bn in 1991 and rose to more than DM 150 bn in 1994. The transfers were complemented by capital imports of DM 50–60 bn. These private imports include investment flows, attracted in part by the generous tax provisions, but they also comprise the financing of the rapidly rising public debt in the East, as per capita public debt levels converged to the levels observed in the western states.

2.2 Stagnation after 1995

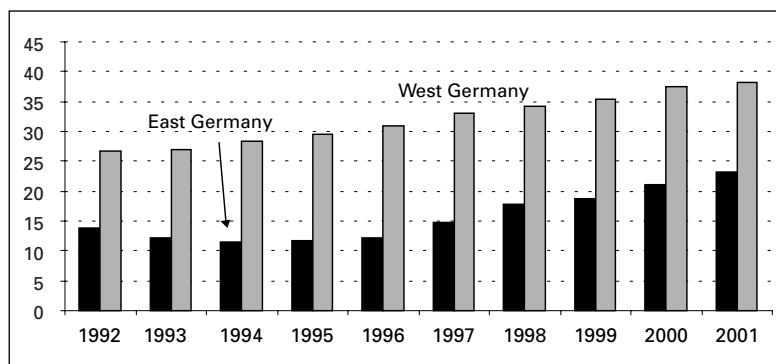
The boom ended abruptly in 1995. After the initial period of very rapid growth, the East German economy slowed to a crawl, a downshift which

FIGURE 4 Unit Labour Costs, Wages, Productivity
(% of West Germany)



Source: Arbeitskreis Volkswirtschaftliche Gesamtrechnung; own calculations

FIGURE 5 Export Share in Manufacturing
(% of output)



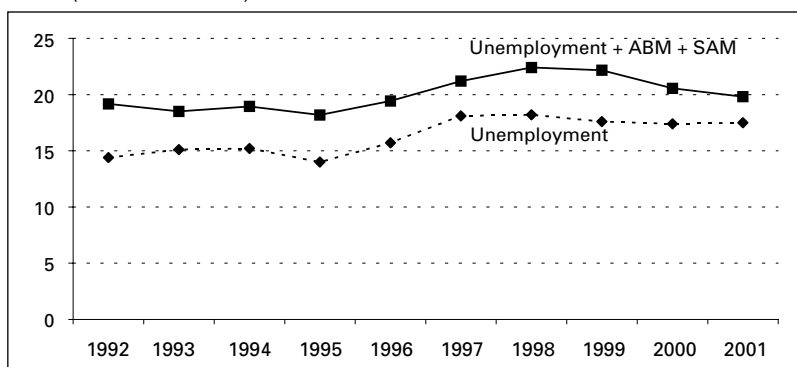
Source: Bundesministerium für Wirtschaft und Technologie

has persisted until the current day. In its wake, real economic convergence has ground to a halt and East German per capita disposable incomes have remained stuck at around 80 % of the western level.

Several factors have been advanced to explain the sudden reversal of economic fortunes. The most prominent version is that the currency conversion rate and the early wage agreements elevated the real exchange rate and labour costs to levels that were way out of line with the East Germany's competitiveness. As productivity failed to catch up with wages and prices, unit labour costs in East Germany rose strongly. In the early years of the transition process they exceeded the West German level by as much as 40 %.

Although the excess was reduced somewhat over the following years, unit labour costs in the East stayed consistently above those in the West over the entire transition period. This eroded the competitiveness of the region that would have needed low unit labour costs to encourage the reconstruction of its capital stock, particularly in industry. In fact, the export share of

FIGURE 6 Unemployment rates
(% of labour force)



Source: Bundesministerium für Wirtschaft und Technologie

the East German manufacturing sector has persistently remained far below that in the West and there is no evident trend of catching up.

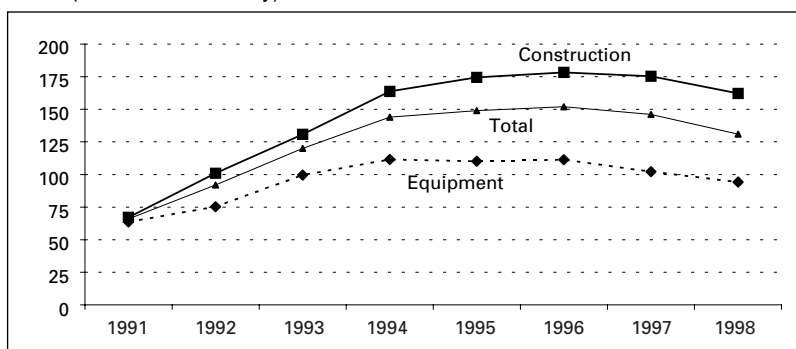
While some wage overshooting following a demand shock may not be expected to pose a major obstacle to long-term growth, the German institutional arrangements turned it into a persistent burden. Wages and unit labour costs did not decline any further in the second half of the nineties. The termination of the decline in unit labour costs coincided with a rise in unemployment levels to new highs during the second half of the decade. The high number of unemployed was provided (and placated) with generous unemployment and other social benefits. Liberal provisions regarding the duration of such benefits resulted in a cementation of the labour market problems.

Falling investment demand was a major characteristic of the slowdown in growth. Initially, per capita investment had climbed from below 70 % of the West German level in 1991 to some 150 % of that level in 1995 and 1996. Since then it has fallen considerably. The increase in the first half of the nineties was driven by construction investment, while equipment investment grew at a more moderate pace. The construction boom peaked in 1995 and since then investment has been falling steadily while growth in equipment investment slowed down but remained positive.

In addition to excessive wages, inefficient investment in the early transition phase may have contributed to the slowdown in investment. While some of the rapid demand increase in the early phase of the transition reflected much-needed infrastructure improvements, there was also a boom in private residential construction, which was likely driven by tax considerations rather than realistic yield expectations. This led to over-investment as evidenced by a large overhang in residential property that still needs to be corrected.

But also in the manufacturing sector, there are signs of mis-allocation. Empirical evidence suggests that labour productivity in manufacturing relative to West Germany has remained below the levels that would be explained by the differences in the capital stock. In fact, sectors with high ca-

FIGURE 7 Investment
(% of West Germany)



Source: (Klodt, 1999); Arbeitskreis Volkswirtschaftliche Gesamtrechnung

pital stock relative to West Germany have tended to exhibit relatively low labour productivity – see (Klodt, 1999), (Sinn, 2000), (OECD, 2001).

Overall, a strong aggregate demand shock and favourable external financing conditions appear to have induced a considerable boom in the East German economy immediately after unification. When the boom ended, downward rigid wages and the inability to adjust the nominal exchange rate implied that the East German economy had to go through a painful contraction period to re-gain competitiveness. This process seems to be still far from complete.

3. Central Europe's Real Economic Convergence

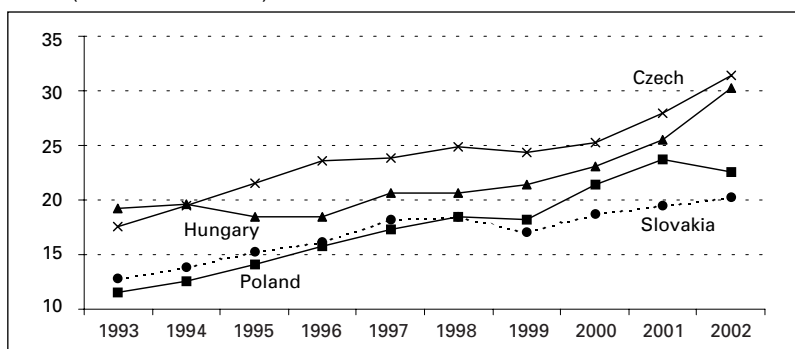
3.1 Reasons and Evidence for Gradual Real Convergence

As in East Germany, policymakers in Central Europe¹ have always considered the improvement in living standards a key policy objective. Indeed, many hopes for a pickup in investment, production and income have been pinned on integration with the West.

However, in contrast to Germany, rapid elevation of income close to levels in the West was neither a realistic nor a desirable *near-term* prospect. On the one hand, income convergence was less pressing, since migration between the Eastern and Western Europe was hampered by legal barriers and remained modest. On the other hand, Central Europe's policymakers had little other choice than building economic strength by using their own resources and efficiency, forcing them to prioritise stabilisation, economic reforms and competitiveness. Specifically, since there was little fiscal aid from the West and only limited access to foreign capital, competitiveness was critical for a sustained economic expansion. This necessitated short-term sacrifices for household income, low real exchange rates and fiscal austerity.

¹ In the following we focus our analysis on the four large Central European economies, namely Poland, Hungary, the Czech Republic and Slovakia.

FIGURE 8 GDP per capita
(% of the Euro area)



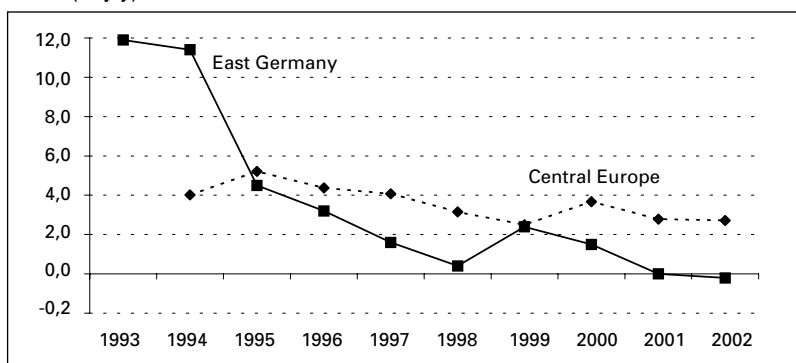
Source: Eurostat

It is therefore no surprise that real economic convergence has displayed a very different pattern in the Central European countries than in East Germany. In particular, real convergence has been smoother and less erosive for competitiveness:

- Income and GDP per capita remained compressed after the system transformation shock in the early 1990s and have stayed well below the East German average up to this day. In 1993 output per capita amounted on average in the four Central European countries to just 15 % of the Euro area level, compared with 69 % in East Germany. By 2002, the former ratio reached 23 % in the Central Europe, but was still very far from the 75 % ratio achieved by Germany's new Länder.²
- The real economic output growth has persistently outpaced the Euro (and even more East Germany) area since the mid-1990s. In fact, despite the Russian, Czech and Slovak crises, GDP growth in Poland, Hungary, the Czech Republic and Slovakia averaged 3.6 % from 1995 to 2002, more than twice the rate of East Germany (1.7 %). The Central Europe's expansion over the past seven years represented a noticeable improvement compared to the dismal performance of the early 1990s. This shift was diametrically opposite to East Germany, whose sluggish pace marked a drastic deceleration from the 10.3 % average pace in 1992–1994.
- Productivity in Central Europe (measured as real GDP per employee) has mostly outpaced real labour costs after the system transformation shock. Indeed, from 1993 to 2002 real unit labour costs declined by 16.4 % in Po-

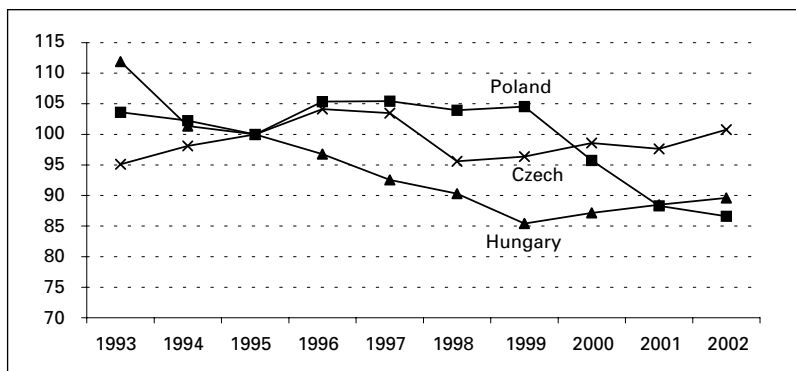
² Many economists have pointed out that the comparison of GDP per capita computed at current exchange rates may understate the real income situation in the Central Europe, in particular relative to the Euro area and East Germany. Indeed, judging from Eurostat data average GDP per capita in PPP (purchasing power parity) terms amounted to 51.6 % of the Euro area in 2002, almost double the ratio for nominal GDP. However this is still well below East Germany. Moreover, the PPP measure presumes that nontradables' prices, e. g. rents, refer to comparable items as in the West, while in reality there can be considerable differences in quality. Finally, the pace of convergence of PPP-adjusted GDP per capita relative to its Euro area equivalent has been very slow amounting to only 0.5 %-points p. a. over the past five years.

FIGURE 9 Real GDP
(% y/y)



Source: OECD and German Federal Statistics Office

FIGURE 10 Real Unit Labour Cost Index
(index, 1995 = 100)

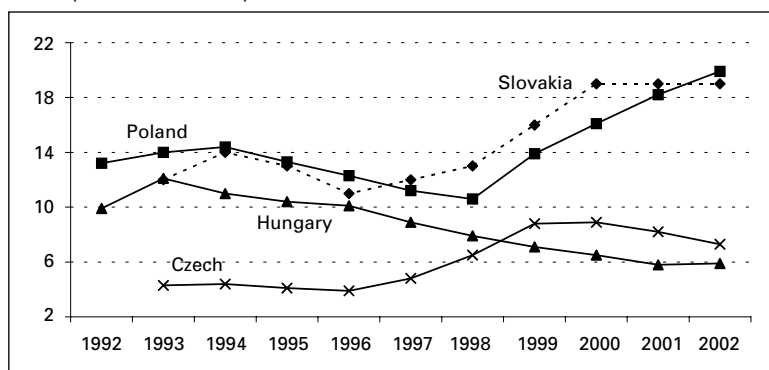


Source: OECD

land and 19.9 % in Hungary. In the Czech Republic real unit labour costs increased, but only by a modest 6 % over the time span of 10 years.

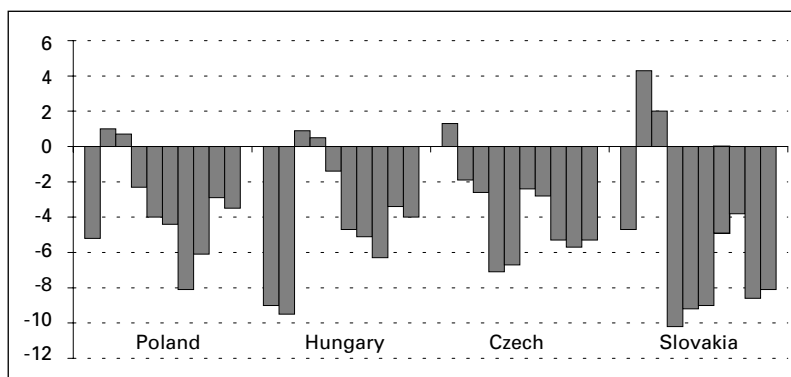
- Economic restructuring has naturally taken its toll on the labour markets of all transition countries. However, thanks to a stronger growth and subdued unit labour costs, the employment dynamics looked a little less dismal in Central Europe than in East Germany. On average the unemployment rate increased in the four Central European countries from 10.6 % in 1993 to 13 % in 2002. In East Germany it rose from 15.1 % to 17.5 %, or 19.8 % if one includes those on special make work programs.
- Central Europe received comparably little public transfers from abroad in the early 1990s. Also, the (initially) low external credit ratings, the poorly developed local financial markets and the small amounts of domestic savings restrained local governments' own funding. Therefore, public spending and investment subsidies remained modest, when compared to

FIGURE 11 Unemployment Rates
(% of labour force)



Source: OECD

FIGURE 12 Current Account Balances
(% of GDP, bars refer to years 1993–2002)



Source: OECD

Germany. The general government deficit in the four Central European economies from 1993 to 2000 averaged around 3.8 %.

- In the absence of large-scale transfers and subsidised investment, Central Europe's current account deficits and capital were modest most of the time. On average, the current account deficit amounted to 3.9 % of the GDP for the four large regional economies from 1993 to 2000, which was minuscule compared to the East Germany's 30 % gap between output and absorption.

The bottom line is that the Central Europe's real economic convergence has been more in line with the countries' competitiveness and economic strength. Incomes have remained low by western standards, but have been gradually expanding and are only moderately dependent on capital imports. Equalisation of wages and living standards has been largely driven by productivity growth.

3.2 Real Convergence in the Run-up to EU Accession

However, integration with the EU, which shall be crowned by full Union membership in May 2004 and adoption of the euro sometime thereafter, has broadened the policy options of the Central European governments. In particular, access to foreign financial markets, direct investment and even public funds from abroad have been improving. This offers an opportunity to accelerate real economic convergence, albeit at the expense of increasing dependence on capital imports and quite possibly a loss of competitiveness due to faster real appreciation.

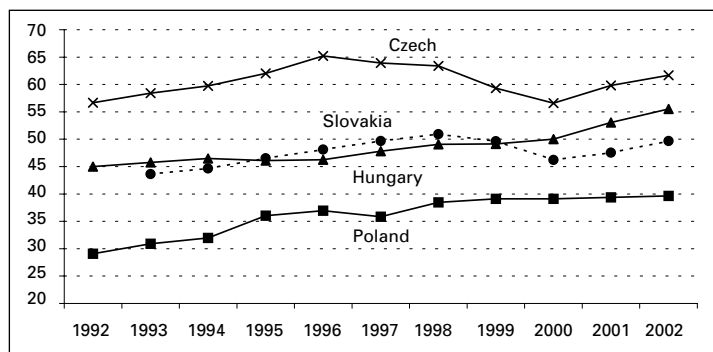
Improved access to funding may be accompanied by a rising political desire to speed up convergence in the wake of EU accession. Participation of Central Europe in the single labour market means that migration will become easier and the fight for talent and valuable human resources more intense. And once the Central European countries adopt the single currency the (currently vast) differences in compensation will become very transparent, raising additional issues of fairness and cohesion.

Indeed, there are first tentative signs that acceleration in real spending convergence has already begun and that it may be partly nurtured by rising capital imports and government deficits.

- The catch-up process of per-capita output and income has picked up since 2000 (Figure 8). On average GDP per capita as percent of the Euro area has increased by 2%-points per year from 1999 to 2002, more than double the pace from 1993 to 1999. Also, GDP-per capita adjusted for purchasing power parity has appeared to have picked up lately, albeit more modestly.
- Real appreciation has gone hand in hand with faster real convergence. The average annualised rate of appreciation of the real trade-weighted exchange rate in the four Central European countries was 4.7 % from 1999 to 2002, compared to just 1.8 % from 1993 to 1999. Currency strength was particularly pronounced in the countries with the most flexible regimes, Poland and the Czech Republic.
- Public budget deficits have widened. The average general government balance in Central Europe deteriorated to a negative 6.1 % of GDP last year, from 5.1 % in 2001, 4.8 % in 2000 and 4.0 % on average in the previous seven years since 1993.³ By the same token the current account deficits have widened and capital imports increased. The average current account deficit 2000–2002 was 5.3 % of GDP, up from 3.7 % in 1993–1999.
- Already in the 1990s, there were episodes of expansionary fiscal policy, rapid real appreciation and deteriorating current accounts. Hungary was at such a point in 1994, the Czech Republic in 1997, Slovakia in 1998 and Poland in 1999. However, in all these past cases either market-driven depreciation or policy tightening or both ultimately reversed the rise in cur-

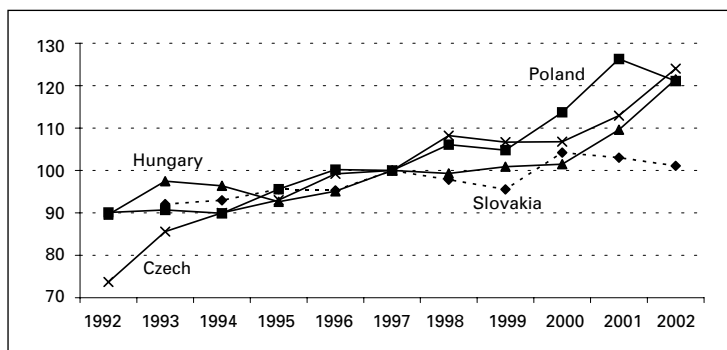
³ The fiscal data 1997–2002 are ESA95 definition. Previous data have been taken from the OECD data base.

FIGURE 13 GDP per capita, PPP-adjusted
(% of the Euro area)



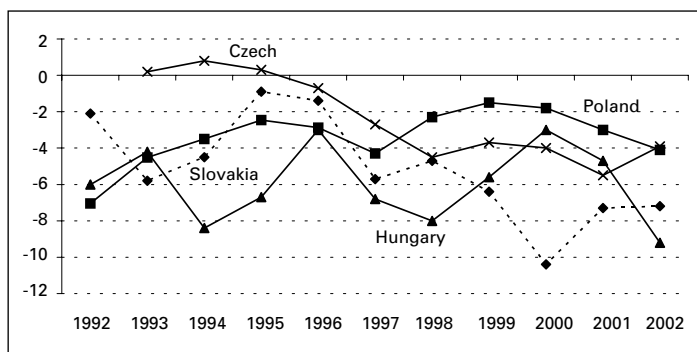
Source: Eurostat

FIGURE 14 Real Effective External Values of Central European Currencies
(index, 1997 = 100)



Source: Eurostat

FIGURE 15 General Government Budget Balances
(% of GDP)



Source: OECD and Eurostat

rent account deficits. Importantly, these adjustment mechanisms could be sluggish after Central Europe's accession to the EU. On the one hand, investors may become less wary of risks, since Union membership seems to provide some protection against serious stability crises. On the other hand, EU accession will at some point involve participation in ERM II. A multilateral exchange rate peg would not only hamper exchange rate fluctuations directly, but may also discourage drastic fiscal and monetary tightening, since both could lead to an exchange rate pressure.

4. A Theoretical Framework of Real Convergence Overshooting

The model used for the present analysis is an open-economy version of the standard linear new neoclassical synthesis framework (NNS) for monetary policy analyses. It draws on Svensson (2000) and Detken and Gaspar (2003), which expand the standard large-economy NNS model as described in (Clarida – Gali – Gertler, 1999) by small open economy features along the lines of Ball (1999 and 2000).

The loss function of the policymaker is of a standard quadratic type, discounting utility at the rate β , and applying a coefficient α to weigh the disutility of the log output gap (x_t) relative to inflation (π_t):

$$L = -\frac{1}{2} \cdot E_t \left[\sum_{j=0}^{\infty} \beta^j \cdot (\pi_{t+j}^2 + \alpha \cdot x_{t+j}^2) \right] \quad (1)$$

for $0 < \beta < 1$

Note that the log output gap x_t is defined as actual log output minus potential (inflation-free) log output.

The trade-off between the log output gap and inflation is determined by a linear expectations-augmented Phillips curve, which is subject to persistent cost-push shocks (u_t):

$$\pi_t = \lambda \cdot x_t + \beta \cdot E_t [\pi_{t+1}] + u_t \quad (2)$$

for $u_t = \rho_u \cdot u_{t-1} + \varepsilon_t^u$ with $0 < \rho_u < 1$ and $\varepsilon_t^u \sim iid(0, \sigma_u^2)$
and $\lambda > 0$

Note that the policymaker's loss function features neither the interest rate nor the exchange rate. By implication, the optimal target variables (inflation and the output gap) can be determined without information on a) the relation between the policy instrument (interest rate) and the economy and b) the feedback of the exchange rate on the economy. The necessary first-order conditions for optimality are:

$$\ell_{\pi} = -\pi_t + \mu = 0 \quad (3)$$

$$\ell_{xt} = -\alpha \cdot x_t - \mu \cdot \lambda = 0 \quad (4)$$

$$\ell_{\mu} = \pi_t - \lambda \cdot x_t - f_t = 0 \quad (5)$$

Combining (3) and (4) gives the optimal trade-off between the output gap and inflation:

$$x_t = -\frac{\lambda}{\alpha} \cdot \pi_t \quad (6)$$

The single relevant state is the cost-push shock. In order to express current optimal inflation and output gap as a function of the state one can employ the method of undetermined coefficients:

$$\pi_t = c_\pi \cdot u_t \quad (7)$$

$$x_t = c_x \cdot u_t \quad (8)$$

$$\text{for } c_\pi \equiv \frac{\alpha}{(\alpha(1 - \beta \cdot \rho_u) + \lambda^2)} > 0 \text{ and } c_x \equiv \frac{-\lambda}{(\alpha(1 - \beta \cdot \rho_u) + \lambda^2)} < 0$$

For the given optimal inflation and output gap the optimal interest rate is set under consideration of the IS function. Since, we refer to a small open economy we assume that the level of the exchange rate (e_t , denoting units of domestic currency per unit of foreign currency) has an impact on the output gap.⁴ Specifically, if the log *real* exchange rate (r_t) is below a neutral level \bar{r} it is assumed to reduce output and vice versa.⁵ Furthermore, the IS function is assumed to be subject to a demand shock d_t with persistence in form of an AR(1) process:

$$x_t = -\varphi \cdot (i_t - E_t[\pi_{t+1}]) + E_t[x_{t+1}] + \theta \cdot (r_t - \bar{r}) + d_t \quad (9)$$

for $r_t = e_t - p_t + p_t^*$, $\varphi > 0$, $\theta > 0$

and $d_t = \rho_d \cdot d_{t-1} + \varepsilon_t^d$ with $0 < \rho_d < 1$ and $\varepsilon_t^d \sim iid(0, \sigma_d^2)$

where p_t^* , p_t are the log price levels in the (large) foreign country and the (small) home country. The optimal interest rate is a function of the states and the log nominal exchange rate. The latter is linked to the interest rate by a foreign exchange market arbitrage condition, as below.

$$i_t = i_t^* - e_t - E[e_{t+1}] + f_t \quad (10)$$

for $f_t = \rho_f \cdot f_{t-1} + \varepsilon_t^f$ with $0 < \rho_f < 1$ and $\varepsilon_t^f \sim iid(0, \sigma_f^2)$

The large foreign country is assumed to be structurally identical to the home country, except that the exchange rate has no significant impact on demand. This implies that the foreign exchange rate is:

⁴ This implies that an overshooting of the real exchange rate r_t represents an undershooting of the accession country's real external currency value and – all other variables equal – an undershooting of nominal output and income.

⁵ This means that the real exchange rate r_t is defined as deviation from its neutral level and determined by the past price level in the home country relative to the shock, the present nominal exchange rate and the present domestic and foreign cost push shocks: $r_t = e_t - p_{t-1} - c_\pi \cdot (u_t - u_t^*)$.

$$i_t^* = \frac{1}{\varphi} \cdot \left(\frac{\lambda}{\alpha} \right) \cdot (1 - \rho_u) + \varphi \cdot \rho_u \cdot c_\pi \cdot u_t^* + \frac{1}{\varphi} \cdot d_t^* = c_{i,u}^* \cdot u_t^* + c_{i,d}^* \cdot d_t^* \quad (11)$$

$$\text{for } c_{i,u}^* \equiv \left(\rho_u + \frac{\lambda \cdot (1 - \rho_u)}{\alpha \cdot \varphi} \right) > 0, \quad c_{i,d}^* \equiv \frac{1}{\varphi} > c_{i,d}$$

$$\text{and } u_t^* = \rho_u \cdot u_t^* + \varepsilon_t^{u,*} \quad \text{with } \varepsilon_t^{u,*} \sim iid(0, \sigma_u^2)$$

$$\text{and } d_t^* = \rho_d \cdot d_{t-1}^* + \varepsilon_t^{d,*} \quad \text{with } \varepsilon_t^{d,*} \sim iid(0, \sigma_d^2)$$

Combining (9)–(11), norming the log of the neutral real exchange rate and the past foreign price level to zero, and using the method of undetermined coefficients yields the exchange and interest rate of the small country as function of the stochastic states and the foreign interest rate and price level.

$$e_t = p_{t-1} - c_1 \cdot (u_t - u_t^*) - c_2 \cdot (d_t - d_t^* - f_t) - c_3 \cdot u_t \quad (12)$$

$$\text{for } c_1 \equiv \left(\frac{\alpha \cdot (\theta - \varphi \cdot \rho_u) - \lambda \cdot (1 - \rho_u)}{\alpha (\theta + \varphi \cdot (1 - \rho_u))} \right) \cdot c_\pi$$

$$c_2 \equiv \frac{1}{\theta + \varphi \cdot (1 - \rho_d)} > 0$$

$$c_3 \equiv \left(\frac{\alpha \cdot \varphi}{\alpha (\theta + \varphi \cdot (1 - \rho_u))} \right) \cdot c_\pi > 0$$

One can use the above equilibrium solutions to analyse the impact of a specific set of idiosyncratic shocks on a small open economy. The shock profile determines an instantaneous over- or undershooting of the exchange rate relative to its long-term steady state. Although overshooting in this model is not due to monetary shocks, as originally posited by Dornbusch (1976), it is very similar in spirit to his approach.⁶ The Dornbusch's overshooting showed that for rigid goods prices and rational expectations, the exchange rate not only adjusts for the permanent impact on the long-run equilibrium, but also for the temporary change in equilibrium interest rates, which in turn requires a change in appreciation or depreciation expectations. In the present model, goods price stickiness is introduced through the implicit Calvo-pricing that provides the microeconomic foundation of the *IS*-curve. Also, all shocks can necessitate an interest rate differential, or a non-zero risk premium, both of which require the spot exchange rate to differ from its future expected value according to the equation (10).

⁶ The essence of overshooting and its relevance has been nicely summarised by Rogoff (2002).

For the case of central European countries, the analysis of shocks can help understanding the real exchange rate dynamics and, thereby, fluctuations on the path to real economic convergence. For example, in the initial phase of system transformation most countries were characterised by large idiosyncratic cost-push shocks (due to price liberalisation), a sizeable negative demand shock (due to the breakdown of trade relations in the COMECON) and large risk premia (due to economic and political uncertainty). From (12) it follows that the directional impact of cost-push shocks depends on the exact coefficient quantities. More specifically, if the weight of the output gap in the loss function (α) is low relative to the output gap and the elasticity of inflation with respect to the output gap (λ) large, the sum of the coefficients c_π , c_1 and c_3 would be negative. Indeed, in particular the first proposition is likely a good proxy for reality, since post-transformation policy in Central Europe strongly prioritised stabilisation, while output gaps were virtually impossible to measure. In this case and in combination with a sizeable risk premium, the real exchange rate would have overshoot its equilibrium level (which means that the real external value has undershot):

$$r_t = -(c_\pi + c_1 + c_3) \cdot u_t^{tr} + c_2 \cdot (f_t^{tr} - d_t^{tr}) > E_t \left[\lim_{T \rightarrow \infty} [r_{t+T}] = 0 \right] \quad (13)$$

where the set $\{u_t^{tr}, -d_t^{tr}, f_t^{tr}\} > \{0, 0, 0\}$ characterises the system transformation shocks.

Interestingly, equation (13) provides some warning against the assumption that all of the persistent real appreciation, which has been a salient feature since system transformation, reflected productivity and terms-of-trade effects. Partly, it may simply have been a correction for an initial real exchange rate undershooting.

EU accession is also likely to trigger shocks that affect the real exchange rate dynamics. First, risk premia on local investment in accession countries are likely to shrink, as economic and political integration will deepen and local authorities will emulate the legal and institutional conditions of the EU. Indeed, if integration and convergence are successful, risk premia are to vanish completely. Secondly, the financing conditions for accession countries' firms, households and public entities will probably improve, and so will their spending power. Moreover, EU accession should also have a more direct impact on aggregate spending through the government sector, since it requires and supports additional public spending for infrastructure and implementation of the *acquis communautaire*.

Quantification of these effects is difficult. However, a focus on EU transfers in the framework of structural funds and on necessary public investment may give a rough idea of the quantities involved.⁷ EU transfers under the structural funds and the related co-payments will have the most direct impact on aggregate demand. Such transfers are paid under the EU rules to the poorer regions of the Union to improve living conditions and generate solidarity. The funds are subject to the principle of additionality. That means they can only be used to finance projects that would not have been financed from public sources otherwise. Thus, by their very nature

they augment regular government spending. Regarding the size of the effect, the EU has limited transfers to 4 % of GDP of the receiving country per year. Thus, including domestic co-financing, the total effect could easily exceed 5 % of GDP per year, which would mark the most powerful fiscal stimulus by all standards.

Public investment projects are expected to become another area of additional demand in the coming years. Estimates of their size vary widely. The European Bank for Reconstruction and Development put the necessary additional public investment arising from EU accession to some 3 % of GDP per year over 10–15 years for the countries in its study (EBRD Transition Report 2000, 2002). Investment needs arise in particular in the area of environmental protection and the transport sector. An assessment of the net effect on aggregate demand needs to take into account that some of the public expenditures for investment could need to be diverted from other areas in view of tightening budget constraints. But still a substantial demand effect is likely in this area.

In addition, adoption of the *acquis* involves a number of tax policy changes that will also probably affect aggregate demand. However, an assessment of the net impact is difficult. For example, removal of remaining customs tariffs in some countries may lead to a reduction of the fiscal burden of the domestic economy. By contrast, harmonisation of VAT rules, excises and widening of social security contributor bases may induce a net increase in the fiscal burden.

Altogether, accession will thus likely compress risk premia and, by itself add sizeably to aggregate demand. In the context of the present model this leads unambiguously to an undershooting of the real exchange rate (and thus an overshooting of the real external currency value):

$$r_t = -c_2 \cdot d_t^{ac} < E_t \left[\lim_{T \rightarrow \infty} [r_{t+T}] = 0 \right] \quad (14)$$

where EU accession impact is in a stylised fashion characterised by a demand shock $d_t^{ac} > 0$ and a risk premia shock $\varepsilon_t^{ac,t} = \rho_f \cdot f_{t-1} > 0$, which fully eliminates the country risk. For simplicity, the cost-push shock and other demand shocks are assumed to be zero at that stage. Since the demand shock not only pushes up the real external currency value, but also output, nominal output and income in foreign currency terms must overshoot as well.

The economic rationale behind the shock impact can be summarised as follows. As transition countries join the EU, their trade and financial integration with the West deepens, while their stabilisation and credit ratings improve. Broadening access to foreign financing and public funding will un-

⁷ Note that this leaves out the important area of the transfers under the Common Agricultural Policy which could involve important financial flows, in particular for Poland. The reasons for excluding the CAP lie in the difficulties to assess the demand impact of the policy measures. In particular, first, while some progress has been achieved in the negotiations, there remains still some uncertainty regarding the final implementation of the new CAP arrangements, which is compounded by the difficulty of quantifying the possible demand effect of rising agricultural goods prices. Second, transfers under the CAP will in part replace domestic transfers so that their impact on total demand may be limited.

leash pent-up demand that will last until the debt levels and EU budget support have reached their limits. The demand shock requires accession countries to lift their interest rates above the Euro area level, in order to preserve price stability as stipulated by the Maastricht Treaty. However, at the same time the risk premium on their currencies has vanished. A higher interest rate relative to the Euro area would create a risk-free arbitrage opportunity. If financial markets are efficient, the equilibrium requires that the accession country's currency appreciates in nominal and real terms sufficiently to create depreciation expectations for the future.

Note that the *actual exchange rate dynamics* which ensues from the EU accession shock may be more sizeable than the mere overshooting. Specifically, as the economy has previously been in a state with positive risk premia, the real appreciation is characterised by the combined impact of the risk premium and demand shock:

$$r_t - r_{t-1} = c_2 \cdot (d_t^{ac} + \varepsilon_t^{f,ac}) < r_t < 0 \quad (15)$$

This suggests that it may be very difficult to distinguish the temporary impact of the demand shock from the persistent impact of the elimination of the risk premium when evaluating real exchange rate time series. If one further believes that previous real appreciation has ensued from the transition undershooting (as explained above) it becomes obvious that politicians might easily mistake the accession overshooting of real convergence as part of a sustained trend. However, interest rate differentials, the fiscal stance and the balance of payments might be used as indicators of the relative demand shock and future expected depreciation.

5. Policy Conclusions

EU accession poses a new challenge for Central European countries, namely to maintain competitiveness in view of rising pressures to achieve fast income convergence. Improved access to foreign financial markets, direct investment and public transfers from abroad provide new opportunities to raise spending and living conditions. At the same time, the political desire to speed up convergence may rise in view of increasing labour mobility. However, pursuing such policies carries the risk of overshooting in the real external value of currencies and a loss of competitiveness. Correcting that overshooting may be painful, as exchange rate pegs and relatively rigid wages are likely to reduce economic flexibility.

In view of the risk of such overshooting, policy-makers need to be particularly prudent. In the field of fiscal policies, care must be taken not to fuel or accommodate demand pressures on the economy. Thus, with already high overall tax burdens, necessary public investment expenditure will need to be financed by expenditure restraints in other areas. Large public transfers and entitlement programs make it particularly challenging to create room for fiscal flexibility.

Another important area is wage policies. With close integration into the EU, wage pressures in the Central European countries are likely to in-

crease. While in the past wage developments were broadly in line with changes in productivity, there is a risk that this benign behaviour could be reversed when major demand shocks kick in. Persistently high unemployment in some countries indicates that adjustment on the labour market occurs to a large extent through quantities rather than through prices. Thus, any necessary correction of real wages to regain competitiveness could induce long and painful adjustments with large imbalances on the labour markets and resulting in additional burdens on public finances.

In this environment, the room for manoeuvre of monetary policies would be severely restricted. Achieving low inflation rates while maintaining relatively fixed exchange rates in ERM II may be a daunting challenge. Indeed, such a peg remains risky as long as economic dynamics are still heavily subject to swings in fiscal policy and external financing conditions. This probably holds true, even if the peg itself would help to reduce financing costs of governments and private agents in Central Europe. The East German convergence path over the past decade may serve as an example for the pitfalls of overly ambitious convergence objectives.

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SUMMARY

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East Germany, Central Europe, and the Risk of Real Convergence Overshooting

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In East Germany, political considerations and ample funding precipitated a fast income convergence with the West in the early 1990s. However, the ensuing deterioration of competitiveness has led to a standstill in real convergence since the middle of the past decade. By contrast, Central Europe suffered a deep recession during the initial years of system transformation and real convergence has progressed gradually from low levels ever since.

EU accession raises the risks that Central Europe could, on a smaller scale, repeat some of the East German experience. Accession will provide the region with more ample funding, as it facilitates access to global financial markets and unlocks sizeable public transfers. Acceleration of convergence in real spending becomes increasingly feasible and attractive. Using an intertemporal equilibrium model, we show that this undue acceleration would occur partly through an overshooting of the real external value of Central European currencies and may entail a prolonged period of poor economic performance. Averting this pitfall requires fiscal discipline, price and wage flexibility and a continuous focus of macroeconomic policy on competitiveness.