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**EUROPEAN UNIVERSITY INSTITUTE, FLORENCE**
**ROBERT SCHUMAN CENTRE FOR ADVANCED STUDIES**

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## Abstract

This paper explores the conflict of real and monetary convergence during the EMU run-up of the future Central and Eastern European (CEE) EU member states. Based on a Balassa-Samuelson model of productivity driven inflation, it compares the policy options which might make the compliance possible, i.e., fiscal tightening and nominal appreciation within the ERM2 band. Nominal appreciation within ERM2 seems the better option to achieve the compliance with the Maastricht criteria as no discretionary government intervention is necessary and losses in terms of real growth are less. Having once opted for nominal appreciation within ERM2 by fixing the ERM2 entry rate as the ERM2 central rate (Irish model), a high degree of flexibility is provided in coping with erratic short-term capital inflows. Setting the ERM2 entry rate below or above the ERM2 central rate (Greek model) implies a clear exchange rate path within ERM2 and thereby less exchange rate volatility. But the Greek model also requires accurate information about the future exchange rate path and strict fulfilment of the Maastricht criteria within the projected time frame. Despite the merits of nominal appreciation, countries committed to hard euro pegs might choose fiscal contraction as the second best solution.

## Keywords

EMU, EU eastern enlargement, Balassa-Samuelson effect, real appreciation, monetary union, Central and Eastern Europe.

## JEL

E52, F31

## 1. Introduction

In the new millennium the European integration process has gained momentum. By 2004 ten mostly Central and Eastern European (CEE) countries (the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Slovak Republic, Slovenia, as well as Cyprus and Malta) will join the European Union. Bulgaria and Romania are expected to follow by 2006.

The eastern enlargement of the European Union (EU) also heralds the enlargement of the European Monetary Union (EMU). Many of the CEE countries have expressed their strong intention to join the EMU as soon as possible. As enhanced macroeconomic stability and lower interest rates seem beneficial for long-term growth, early EMU accession is a rational choice.

But before the new EU members will be able to join the EMU, a sustained process of monetary and real convergence will be necessary. The Maastricht criteria for EMU membership require the EU and EMU accession candidates to adjust inflation, interest rates, public debt and nominal exchange rates to the EMU level.

The requirement of monetary convergence has triggered a broad discussion about the achievability of the Maastricht criteria for the new EMU accession candidates. Based on the finding of Balassa (1964) and Samuelson (1964) that countries in the economic catch-up face higher productivity growth in the traded goods sector and thereby higher inflation, the incompatibility of the Maastricht inflation and exchange rate criteria has been stressed (Halpern and Wyplosz, 2001; Buiter and Grafe, 2002; De Broeck and Sløk, 2002; Égert *et al*., 2002).

How should the new EU members cope with the convergence dilemma? As a renegotiation of the Maastricht criteria seems improbable the governments of the accession candidates might take economic policy action. Fiscal tightening dampens the Balassa-Samuelson effect. A reinterpretation of the ERM2 exchange rate mechanism provides room for productivity adjustment by nominal appreciation.

## 2. Is the Enlarged European Union an Optimum Currency Area?

The accession of the CEE countries to the European Monetary Union has been widely discussed under the framework of the theory of optimum currency area (OCA) as put forward by Mundell (1961) and McKinnon (1963). The main criteria applied are openness and asymmetric shocks.[1] Within the OCA framework countries considering joining a monetary union will weigh the potential benefits of exchange stability for international trade against the costs of giving up monetary policy independence.

Open economies with close trade linkages to the EU will benefit from irrevocably fixed exchange rates as the transaction costs for international trade decline. With the cost of (hedging) foreign exchange risk eliminated more division of labour within the enlarged Euro Area is expected to increase welfare. Frankel and Rose (2002) have suggested that the merits of monetary union membership are quite significant—trade with other currency union members is assumed to triple (!) thereby boosting real growth and welfare gains.[2]

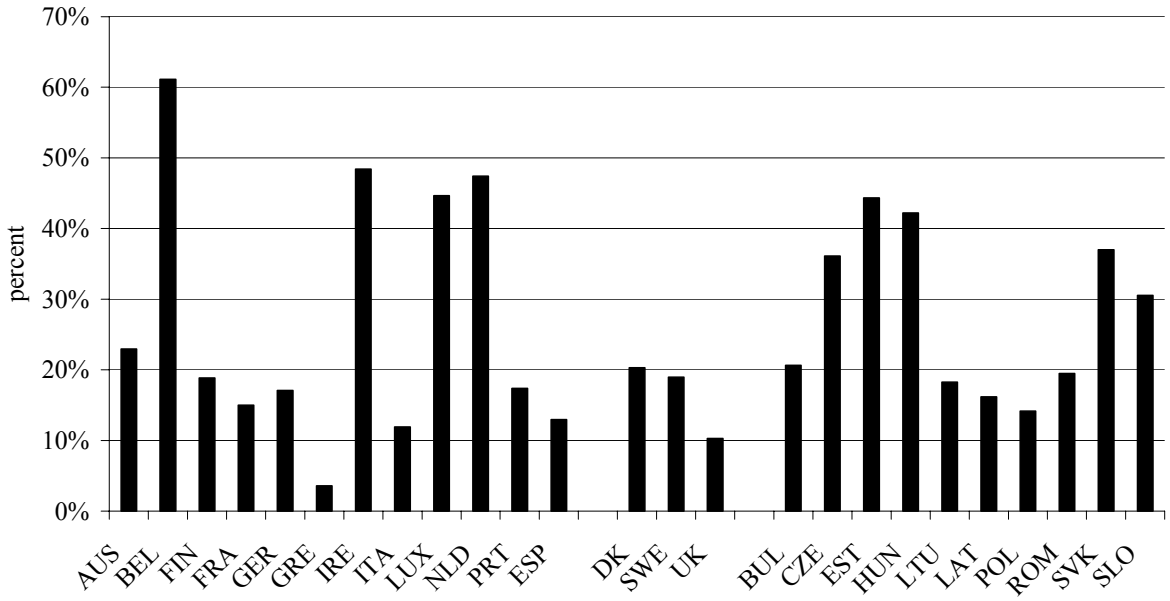
As shown in Figure 1 which takes exports to the EU15 as percentage of GDP to be an indicator for OCA openness, the CEE countries qualify without doubt for the EMU. Today trade to EU15 as percentage of GDP is about as high for the CEE accession candidates as for the present EMU

1 As asymmetric shocks can be absorbed more easily if labour markets are flexible, labour mobility and wage flexibility have been other criteria.

2 Because currency unions before EMU mainly linked small, low income countries the impact can be assumed less on more developed countries. A study of the British HM Treasury (2003) concludes that a reasonable range for the potential increase in UK trade with the Euro Area resulting from EMU membership would be in the range of 5% to 50%.

members after more than four years EMU membership.[3] Exports to the EU as percentage of GDP average 28.7% for the CEE countries in comparison to 26.8% for the EMU member states (2001). The economic integration with the EU is much stronger for the CEE countries than for the EMU 'outs' Denmark, Sweden and UK (16.5% in average).

**Figure 1: Exports to EU15 as percent of GDP (2001)**




Source: IMF: Direction of Trade Statistics.

Thus, according to the OCA openness criterion the euro seems the natural anchor for exchange rate stabilization in Central and Eastern Europe. Flexible exchange rates might be more beneficial, however, if asymmetric real shocks hit the CEE economies in which case adjustment via monetary policy and nominal exchange rates is easier than through wages and prices.[4]

To this end tracing asymmetric shocks in the CEE economies with respect to the Euro Area has gained wide attention. Buiter and Grafe (2002) analyse the heterogeneity of national incomes structures and co-movements of inventory cycles and conclude that CEE business cycles are by no means being synchronized with the EU. Fidrmuc and Korhonen (2002) use a correlation analysis of business cycles and a VAR methodology as proposed by Blanchard and Quah (1989) to measure the degree of demand and supply shocks within the enlarged European Union.[5] Based on the assumption that demand shocks are temporary and supply shocks are persistent with respect to output, Fidrmuc and Korhonen (2002) find that for the most accession countries the shocks are significantly more idiosyncratic with regard to the European Union than for the present EU members.

Given that the economic structures and business cycles in Central and Eastern Europe are quite different from the present European Union in combination with the assumption that labour mobility and wages flexibility are restricted, the CEE countries probably do not qualify for EMU accession—at least if the OCA criteria are applied (De Grauwe, 2002). Nevertheless, EMU accession seems to be tempting as most

3 Membership in a currency union is expected to increase trade integration among the members. Micco, Stein and Ordoñez (2003) argue that EMU membership has increased bilateral trade between the present members by 9% to 20% compared with trade among non-EMU countries.

4 As contributed by Kenen (1969) asymmetric shocks might be less likely when the structure of production and demand is diversified.

5 The study follows a similar exercise done for the present EMU members by Bayoumi and Eichengreen (1993).

CEE countries have expressed their strong intention to join the EMU as soon as possible.[6] The reasons lie beyond the OCA framework: Mundells (1961) Keynesian approach[7] does not account for the positive growth stimulus of macroeconomic stability, lower interest rates and the endogeneity of the OCA criteria.

First, during the 1990s the Central and Eastern European transition economies have struggled for macroeconomic stabilization like most developing countries and emerging markets—with mixed success. Even though inflation rates fell during most of the 1990s they still remained high. Only the start of the EU accession process triggered a fast convergence of inflation rates towards the Western European level (Figure A in the appendix). The process towards EMU membership, which implies the adoption of the Maastricht inflation and exchange rate criteria, will further enhance the need for price stability[8] and thus contribute to a stable (and thereby higher) long-term growth performance.

Second, based on macroeconomic and exchange rate stability, falling risk premiums on interest rates might add an additional growth impulse via capital markets.[9] While most emerging markets face high risk premiums on interest rates due to 'original sin'[10] (Eichengreen and Hausmann, 1999), the CEE economies have the unique opportunity to import—credibly and irrevocably—the reputation of the European Central Bank. Through the participation in the highly developed European capital markets, low nominal and real interest rates can be expected to spur the real economic catch-up.[11]

Third, Frankel and Rose (1998) have stressed the endogeneity of the optimum currency area criteria. If trade integration rises after EMU accession due to the elimination of foreign exchange risk, business cycles will probably correlate more. More synchronized business cycles will also spring from the common monetary policy. To this end—as it has already been proven by the EMU accession of the southern European countries—the optimum currency area criteria are more likely to be fulfilled after EMU entry thereby further stressing the long-term gains of joining the EMU.

## 3. The Institutional Framework for EMU Accession

Given the long-term merits of EMU membership it seems rational that most CEE economies want to join the EMU as soon as possible. Figure 2 shows the fastest time path for EMU membership. For these countries, which will join the EU in year 2004, the fastest EMU accession period can be sub-divided into three sub-periods:

- a pre-EU accession period ranging from 1998/99 up to 2004 (1),
- a post-EU pre-EMU accession period ranging from 2004 up to 2006 (2),
- a post-EMU accession period starting in 2006 (3).

6 Estonia planned to adopt the euro as official currency even before its EU accession in 2002. The Hungarian Central Bank states that the 'accession to the Economic and Monetary Union is one of the most important steps in Hungary's European integration, which will entail abandoning the national currency and adopting the euro as domestic legal tender.' (Csajbók and Csermely 2002: 1). The Bank of Slovenia has clearly defined the medium-term monetary goal 'to gain access to the EMU as soon as possible' (Bank of Slovenia, 2002: 8). The Lithuanian government decided to re-peg its currency from the dollar to the euro in order to join ERM2 and EMU as soon as possible after EU accession (Alonso-Gamo et. al., 2002: 4).

7 For a critical review of Mundell (1961) see McKinnon (2002). McKinnon (2002) also stresses Mundell's argument that within an environment of international capital mobility a monetary union might be beneficial to adjust more easily to asymmetric shocks.

8 For more detailed analysis of the interdependence of the EU, ERM2 and EMU accession process and macroeconomic stability see section 3.

9 Further, the Maastricht fiscal criteria might contribute to lower interest rates as public debt is constrained.

10 As development countries and emerging markets have a long tradition of inflation and depreciation, capital markets are strongly fragmented and risk premiums for default risk and exchange rate variability are usually high.

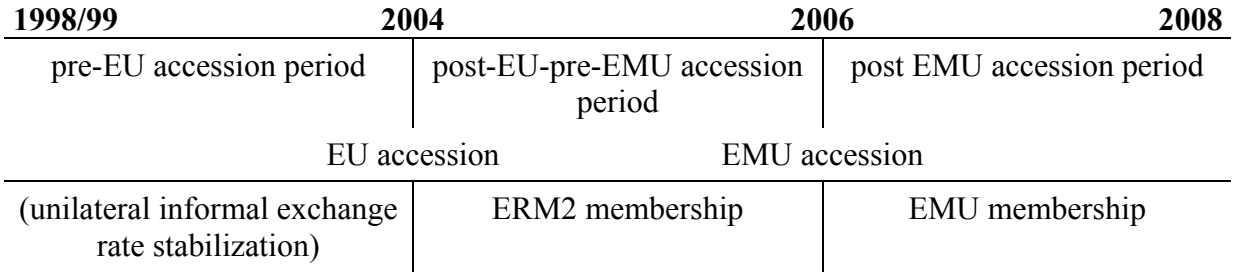
11 Indeed, with the EU (and possible EMU) accession approaching, short-term interest rates have converged towards the EMU level (Figure B in the appendix). Further, EMU membership would shield the CEE economies against speculative attacks.

The respective sub-periods on the way to full EMU membership have different implications for the monetary, fiscal and exchange rate policies of the accession countries:

(1) The pre-EU accession period is assumed to have started with the EU accession negotiations in 1998/99 and will end with the final accession in 2004 (possibly 2007 in the case of Bulgaria and Romania). Although the preparation for EU accession does not impose any concrete requirements on monetary and exchange rate policies in terms of specific criteria the adoption of the Maastricht Treaty as legal EU framework narrows the margin of macroeconomic discretion considerably.

In detail the EC Treaty, which is part of the *Acquis Communautaire*, states that the economic policies of the EU members are of common concern and shall be coordinated (art. 103, 1). The European Council monitors the economic developments in each member state to ensure convergence (art. 103, 3). Loans by the central bank to the government and related organizations are forbidden (art. 104). The countries have to avoid budget deficits and have to comply with the rules of the stability and growth pact (art. 104c).

**Figure 2: Fastest Time Path of EMU Accession for the CEE countries**




As the EC Treaty does not place any direct constraints on the exchange rate policies, up to the present the exchange rate regimes in Central and Eastern Europe have remained rather heterogeneous.[12] But with inflation declining the chronic depreciations of most CEE currencies have abated (Figure C in the appendix).

(2) The restrictions on macroeconomic policies will get tighter as the countries enter the EU in 2004. The targets of the convergence process during the post-EU pre-EMU accession period are specified by the Maastricht criteria for EMU membership (art. 109j EC treaty), which have to be fulfilled at the end (monetary and fiscal criteria) and during (exchange rate criterion) the EMU run-up. The fastest time period for the EMU run-up can be assumed to be from 2004 (start of EU membership) to 2006 (earliest year of EMU entry).

Although the new members '*will not be expected to transfer their monetary sovereignty to the EU'* (ECB 2000: 46), inflation rates are expected to converge further towards the EMU benchmark, as the new member states '*will consequently be integrated into the European System of Central Banks*' (ECB, 2000: 46).[13] To enter EMU, inflation in the accession countries must not exceed the average inflation of the three EU member states with the lowest inflation by more than 1.5% (art. 109j EC Treaty and the respective protocol).[14]

12 While one group of countries has moved towards tighter pegs to the euro, a second group has (officially) moved towards more exchange rate flexibility (Schnabl, 2003).

13 In accordance with article 122 EC Treaty the acceding countries will join immediately the monetary union albeit as member states with a derogation (ECB, 2000: 46).

14 As one or more of these countries might not belong to the euro zone, Gros et al. (2002: 83-84) recommend a revision of the Maastricht inflation criterion: Now that the euro area exists, the average euro-area wide inflation is the 'natural' benchmark. The same applies for the Maastricht interest rate criterion.

Although EU membership does not entail any direct provisions for exchange rate policy, the new EU member states will have to '*treat* […] *exchange rate policy as a matter of common interest*' (Art. 109m EC Treaty). Exchange rate policy has to support other economic policies to ensure nominal and real convergence (ECOFIN, 2000).[15] More precisely, EU membership—though not directly required by the EC Treaty—implies a tacit pressure to join ERM2—probably soon after having achieved EU membership (no opt out clause).[16] The new member states '*can be*' (ECOFIN, 1997) and '*will be*' (ECOFIN, 2000) expected to join ERM2 some time after accession.[17] '*In their progress towards adopting the euro* [the EMU accession candidates] *are expected to participate in the exchange rate mechanism (ERMII)*' (ECB, 2000: 46). Moreover, without any regard to the obligation to ERM2 membership, most CEE countries want to join ERM2 as soon as possible (section 2).

The ERM2 membership will put an additional restriction on the exchange rate policies as the new members have to agree with the EU on a central rate with a fluctuation band of ±15.0% (ECOFIN, 1997).[18] EMU membership will require the accession candidates to stay within the fluctuation band for at least two years without devaluing against the currency of any other member state (art. 109j and the respective protocol).[19]

(3) Joining the EMU is lastly dependent upon the European Commission and the ECB report to the European Council on the progress the accession candidates have made towards fulfilling the Maastricht criteria. On the basis of these reports, the Council, acting by a qualified majority on a recommendation from the Commission, decides on EMU membership (art 109j, 3).

In the post-EMU accession period, which starts in the earliest case in 2007, inflation and exchange rates are treated asymmetrically. After having joined the monetary union, there are no particular constraints on inflation. While monetary sovereignty is ceded to the ECB, inflation and long-term interest rates are allowed to differ among the EMU members.[20] In contrast, nominal exchange rates are '*irrevocably fixed*'[21] (art. 109l), as the new EMU members adopt the euro as legal tender.

## 4. The Balassa-Samuelson Model with Respect to EMU Accession

While the path to the EMU accession of the Central and Eastern European countries described above could be seen as an optimal way to join the EMU, the CEE countries have to pass the Maastricht bottleneck as a precondition for membership. As the Balassa-Samuelson effect for the transition economies is '*now well established and powerful*' (Begg *et. al*., 2001: ix), the impact of fast productivity catch-up on inflation could be a considerable impediment to EMU membership.

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15 'As the exchange rate vis-à-vis the euro generally plays a fundamental role for these countries, the faster the process of integration moves towards a single market and economic convergence with the EU/euro area, the stronger the case for the stability of the nominal exchange rates vis-à-vis the euro will become.' (ECB 2000, 44).

16 Deutsche Bundesbank (2003: 19) argues that due to the complex process of adjustment a high degree of exchange rate flexibility might be the better choice thereby suggesting a 'careful timing' of ERM2 accession.

17 'The single market must not be endangered by real exchange-rate misalignments, or by excessive nominal exchange rate fluctuations between the euro and other EU currencies' (ECOFIN, 1997).

18 ERM2 membership requires 'disciplined monetary policies directed towards price stability.' 'Sound fiscal and structural policies in all Member States are, at least, essential for sustainable exchange-rate stability.' (ECOFIN 1997).

19 The Deutsche Bundesbank (2003: 18-20) argues that ERM2 membership shall be without tension or devaluation. ERM2 membership should not be understood as 'waiting room' for EMU membership, but as distinct stage in monetary convergence ('internship'). The EMU candidate countries might want to stay as short as possible, as indicated for Poland by Borowski and Brzoza-Brzezina and Szpunar (2003). The European Commission (2002: 13) gives an overview about expected ERM2 participation of the accession candidates.

20 Government deficits remain under the control of the stability and growth pact.

21 No fixed exchange rate regime is absolutely and unconditionally credible. Even a full monetary union or common currency area can break up.

### 4.1 The Basic Balassa-Samuelson Model

In the 1960s, Balassa (1964) and Samuelson (1964) observed a similar situation in developing countries to that which we are observing today in Central and Eastern Europe. They found that developing countries in the economic catch-up process had higher productivity gains in the tradable sector than industrial countries. They also observed higher consumer price inflation which contributed to a secular 'catch-up' of prices.[22]

Our basic version of the Balassa-Samuelson model is a two-country model with a tradable goods (industry) and a non-tradable goods (services) sector as described by De Grauwe and Skudelny (2002). We assume perfect competition in the tradable goods markets and perfect mobility in the national labour markets—but no labour mobility between the two countries. There is no direct competition between the non-traded sectors of the two countries and no competition between the traded and non-traded goods sector within each country.

The production of traded and non-traded goods in each country is based on two Cobb-Douglas production functions for the traded goods sector T and the non-traded goods sector NT:[23]

$$Y^T = A^T (K^T)^{\gamma^T} (L^T)^{1-\gamma^T} \quad \text{with } 0 < \gamma < 1 \tag{1a}$$

$$Y^{NT} = A^{NT} (K^{NT})^{\gamma^{NT}} (L^{NT})^{1-\gamma^{NT}} \quad \text{with } 0 < \gamma < 1 \tag{1b}$$

In equations (1a) and (1b) $Y^i$ is the (real) industrial output, $A^i$ is technology, $K^i$ is (fixed) capital, and $L^i$ is the employed labour force in sector i (i=T, NT).[24] In both sectors output is generated by combining technology, capital and labour. Assuming competitive markets and profit maximization the marginal productivity of labour ($(1-\gamma^i)\frac{Y^i}{L^i}$)[25] must correspond to the real wage in the respective sector. The real wages in the two sectors are defined as nominal wage divided by the price level of the respective goods:

$$(1-\gamma^T)\frac{Y^T}{L^T} = \frac{W^T}{P^T} \tag{2a}$$

$$(1-\gamma^{NT})\frac{Y^{NT}}{L^{NT}} = \frac{W^{NT}}{P^{NT}} \tag{2b}$$

Nominal wages in the traded and non-traded sectors are assumed to be equal as perfect labour mobility between the traded and non-traded sector is assumed:

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22 Indeed, Figure F in the appendix shows that productivity in the traded goods sector—measured as industrial (manufacturing) output per worker—grows much faster in most CEE accession countries than in the EMU members Spain and Germany. Further, Figure D in the appendix—which plots wholesale prices in relation to consumer prices—indicates that consumer inflation relative to wholesale price inflation is much higher in most CEE countries.

23 There is a discussion about the classification of the traded and the non-traded goods sector. Most studies define the industrial or the manufacturing sector as traded goods sector and services or the remaining sectors as the non-traded goods sector. Some studies include agriculture, mining, transports and tourism into the traded goods sector. Others see evidence that agricultures belong to the non-traded sector because of high trade barriers. For an overview see Égert et. al. (2002).

24 The overall labor force of the economy $\overline{L}$ is assumed constant: $\overline{L} = L^T + L^{NT}$

25 $\frac{\partial Y^i}{\partial L^i} = (1-\gamma^i)A^i(K^i)^{\gamma^i}(L^i)^{-\gamma^i} = (1-\gamma^i)\frac{A^i(K^i)^{\gamma^i}}{(L^i)^{\gamma^i}}$. Given $A^i(K^i)^{\gamma^i} = \frac{Y^i}{(L^i)^{(1-\gamma^i)}}$ this yields $\frac{\partial Y^i}{\partial L^i} = (1-\gamma^i)\frac{Y^i}{L^i}$.

$$W^T = W^{NT} = W \tag{3}$$

Using (3), dividing (2a) by (2b) and multiplying by (-1) yields:

$$-c\frac{Q^T}{Q^{NT}} = -\frac{P^{NT}}{P^T} \tag{4}$$

where $Q^i$ are the labour productivities in the respective sectors ($\frac{Y^i}{L^i}$) and c is a positive[26] constant depending on the respective weights of the tradable and non-tradable goods ($\frac{1-\gamma^T}{1-\gamma^{NT}}$).

According to equation (4) if productivity in the non-traded goods sector is—by and large—constant[27], an increase in traded goods productivity would push the relative price of non-traded to traded goods upward. As the overall consumer price level is a composite of traded and non-traded goods, inflation will rise.

The Balassa-Samuelson effect is modelled graphically in Figure 3. The transformation curve AA' is derived from the two production functions for traded and non-traded goods (1a/1b). Given a constant input of labour L, capital K and technology A, the accession country can produce the combinations of traded goods $Y^T$ and non-traded goods $Y^{NT}$ represented by the production possibility frontier AA'. The slope of the production possibility frontier AA' corresponds to the ratio of the marginal productivities ($-c\frac{Q^T}{Q^{NT}}$).

The optimal combination of traded and non-traded goods output is determined by the relative price line BB'($-\frac{P^{NT}}{P^T}$), which can be derived from both equation (4) and a budget constraint for overall demand.[28] In Figure 3 the equilibrium is described by point E where the relative price line is tangent to the transformation curve AA' and where equation (4) applies. Point E is also on the consumption line DD' which assumes for simplicity that at all income levels the consumers prefer the same consumption structure of traded and non-traded goods.[29] In the equilibrium E overall production and consumption consist of $Y^{T*}$ plus $Y^{NT*}$.

Simulating the productivity increase in the traded goods sectors of the accession countries—we assume a onetime productivity shift in the traded goods sector. In terms of equation (1a) this corresponds to an exogenous increase of the productivity factor $A^T$. The productivity shock shifts the transformation curve upward along the y-axis to form the new transformation curve A''A' in Figure 3. With the same labour and capital input the accession country can now produce more traded goods. As productivity is assumed to be constant in the non-traded goods sector, the intersection on the x-axis remains the same.

The asymmetric productivity shock in favour of the traded goods sector triggers an adjustment of relative prices. As described by equation (4) the rise of marginal productivity in the traded goods

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26 As $\gamma^T$ and $\gamma^{NT}$ are larger than 0 and smaller than unity.

27 The assumption of constant productivity in the non-traded goods sector springs from the fact that productivity increases in the service sector are slow.

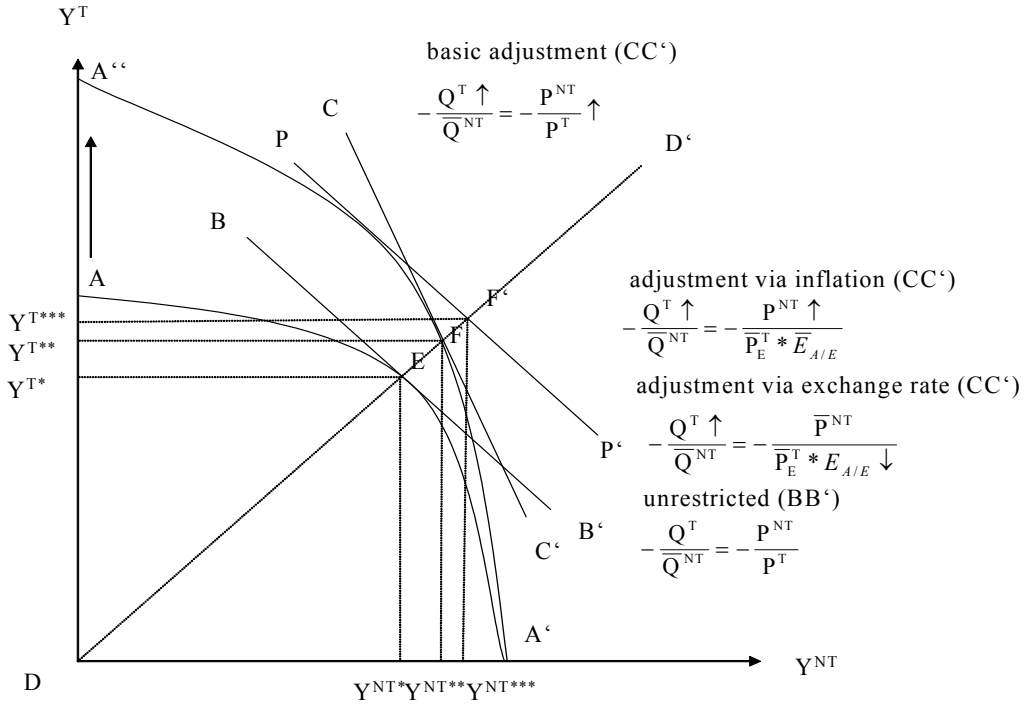
28 $Y = P^{NT} * Y^{NT} + P^T * Y^T$.

29 We assume for the sake of brevity that the consumption pattern is not sensitive to relative price changes which corresponds to a Leontief-type utility function. In the case of convex utility functions changes in relative prices would trigger substitution effects between traded and non-traded causing a shift of the consumption line inwards. The main findings would be unchanged, however.

sector implies—given that productivity in the non-traded goods sector is constant ($\overline{Q}^{NT}$)—an upward shift of non-traded goods prices in comparison to traded goods prices.

Due to the productivity increase in the traded goods sector the relative price line CC' is steeper. The equilibrium shifts to point F where the shares for traded and non-traded goods remain unchanged.[30] The markets of both traded and non-traded goods are in equilibrium, as in both cases supply meets demand. Because non-traded goods prices make up a significant part of overall consumer prices, inflation in the accession country rises.

**Figure 3: The Balassa-Samuelson-Effect–Fixed Exchange Rate or Fixed Inflation**




Note: c is assumed to be equal to 1. $P_E$ corresponds to the price level of the Euro Area.

## 4.2. Restrictions on the Adjustment Mechanism

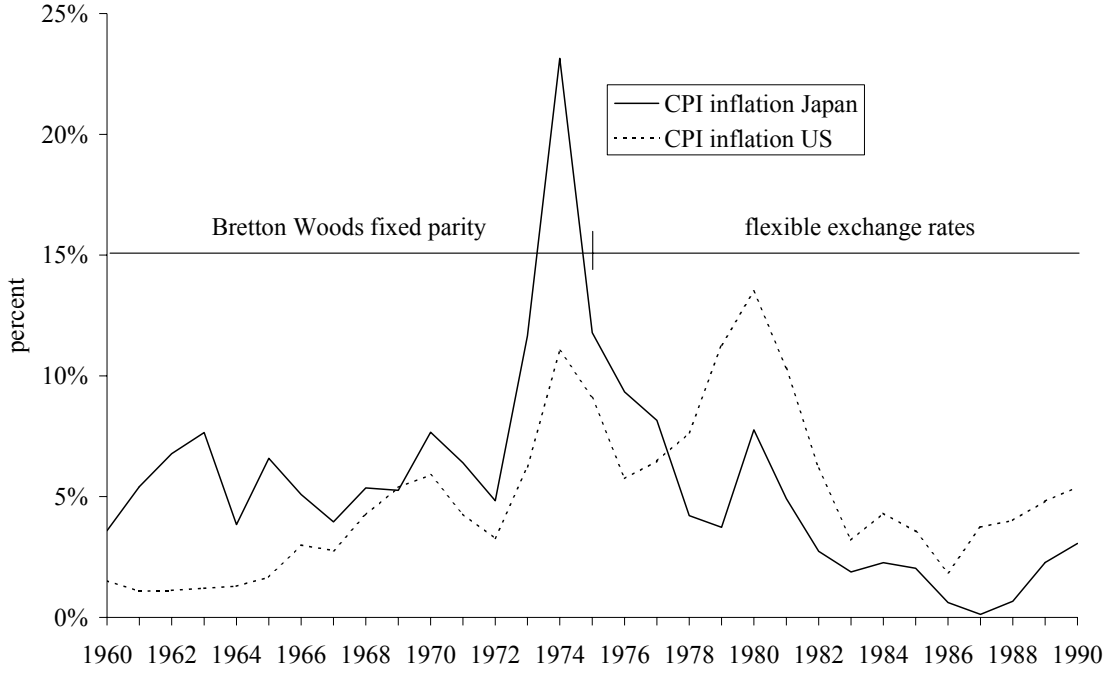
We learn from Figure 3 that non-traded goods prices and subsequently inflation provide an adjustment mechanism for relative productivity increases in the traded goods sector. To model the impact of the Maastricht criteria on the adjustment mechanism as described in section 4.1. Balassa's (1964) and Samuelson's (1964) approach is extended to a two country setting with both a fixed and a flexible exchange rate regime.

As observed during the economic catch-up process of Japan the impact of productivity growth in the traded goods sector on consumer price inflation depends on the exchange rate arrangement. Similar to the CEE countries today, Japan experienced higher productivity growth than other industrialized countries (US) during the 1960s up to the late 1980s. A regime shift in the exchange arrangement has taken place during this period—from the Bretton Woods fixed exchange rate regime (360 yen/dollar) to flexible rates since 1973.

30 $\frac{Y^{T*}}{Y^{NT*}} = \frac{Y^{T**}}{Y^{NT**}}$

As shown in Figure 4 this regime shift can be associated with a structural break in the ratio of Japan's consumer price inflation relative to US consumer price inflation. Under the fixed exchange rate regime Japan's higher inflation provided adjustment for higher productivity growth in the Japanese export sector as outlined in section 4.1. When the nominal exchange rate became flexible and the central bank started targeting inflation, however, (after a transition period) the relative productivity gains in the traded goods sectors showed up in nominal appreciation while inflation was lower than in the US.

**Figure 4: Exchange Rate Regime and Inflation in Japan and US (1960 –1980)**




Source: IMF: IFS.

Thus, while the impact of relative productivity gains in the traded goods sector on the real exchange rate against the dollar is the same under both exchange regimes (real appreciation) the exchange rate regime matters for the adjustment channel.

### *4.2.1. Pegging the Nominal Exchange Rate*

In the CEE countries we are currently able to observe both corner solutions of exchange rate arrangements—hard pegs to the euro (Bulgaria, Estonia, Lithuania) and fully flexible exchange rates (Poland).[31] First we scrutinize the impact of fixed exchange rates on the adjustment mechanism that applies for the group with hard pegs exchange rate arrangements.

This case widely resembles the basic model of section 4.2. We assume that Euro Area tradable prices are exogenous for the accession country and for simplicity constant ($\overline{P}_E^T$). Further, we assume that purchasing power parity holds for the traded goods sector.[32] As the exchange rate of the accession country currency is assumed constant against the euro ($\overline{E}_{A/E}$), traded goods prices in the accession

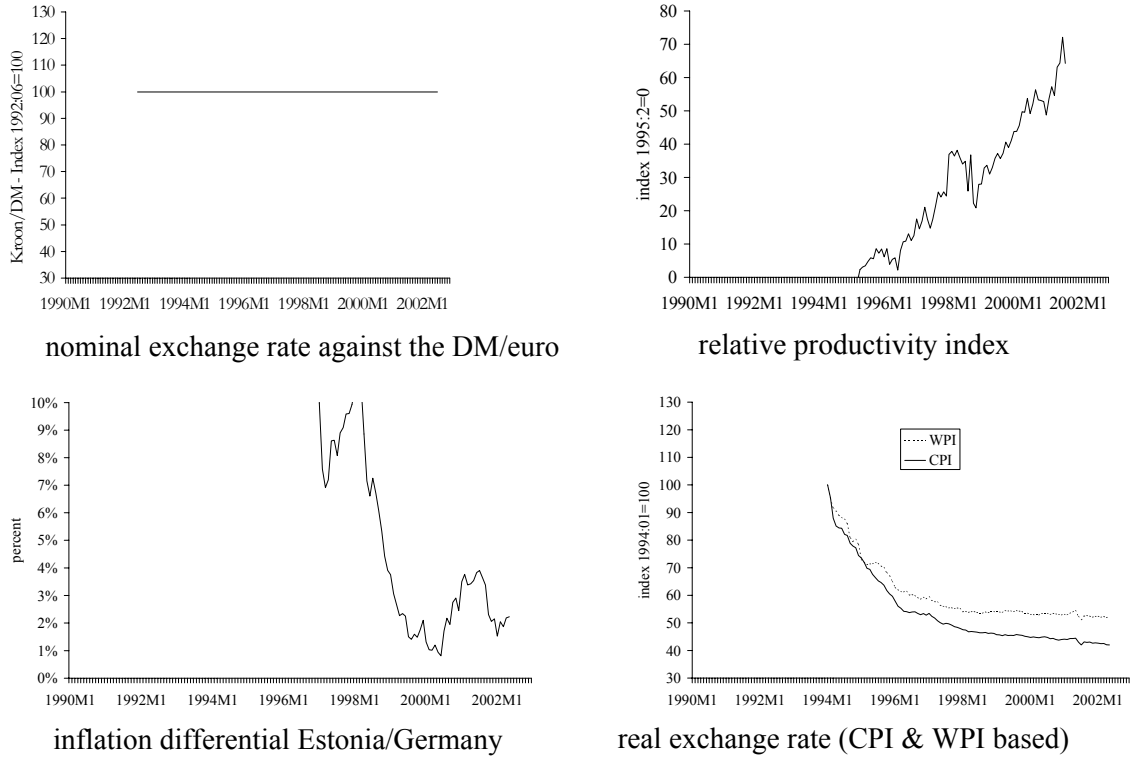
31 All other countries pursue de facto intermediate exchange rate regimes, as managed floats or downward crawling pegs (Schnabl 2003).

32 $P^T = P_E^T * E_{A/E}$.

country are constant ( $\overline{P}^T$ ) as well. In Figure 3, with fixed nominal exchange rate and fixed traded goods prices, higher productivity growth in the traded goods sector pushes non-traded goods prices and thereby inflation upwards leading to the equilibrium in point F. Given fixed nominal exchange rates, higher consumer price inflation than in the euro zone results in a real appreciation of currency A.

As shown in Figure 5 this phenomenon can be observed in Estonia which has pegged the kroon tightly to the DM (later the euro) since 1992 as plotted in the upper left panel of Figure 5. At the same time the productivity in the industrial sector has grown much faster than in Germany (upper right panel of Figure 5). As plotted in the lower left panel of Figure 5 despite the tight exchange rate stabilization against DM and euro the inflation differential between Estonia and Germany/Euro Area has not disappeared, supporting the argument of productivity-driven inflation. The combination of a stable nominal exchange rate against the euro and higher inflation leads to a gradual real appreciation of the kroon as predicted by the Balassa-Samuelson effect (lower right panel of Figure 5).

**Figure 5: Balassa-Samuelson-Effect under Fixed Exchange Rates (Estonia)**




nominal exchange rate against the DM/euro

relative productivity index

inflation differential Estonia/Germany

real exchange rate (CPI & WPI based)

Sources: OECD and IMF. Relative productivity index calculated as industrial output/industrial employment (Estonia) minus industrial output/employment (Germany) both normalized to 1995:02=100. Germany represents the euro area since 1999.

### *4.2.2. Pegging Inflation*

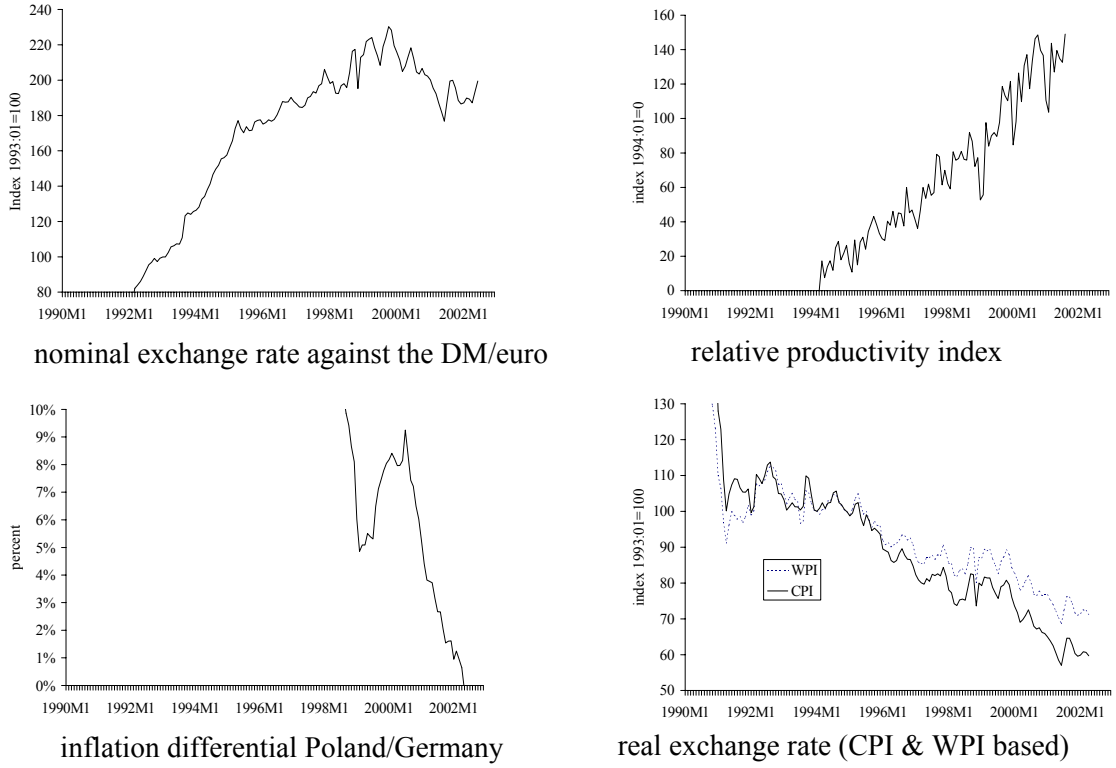
We assume that a country chooses to 'peg' inflation, i.e., to adjust consumer price inflation (close to) the EMU level while floating the exchange rate freely. While all CEE countries made monetary policy with respect to exchange rate targets throughout most of the 1990s, some CEE countries—in particular Poland and to a certain extent the Czech and Slovak Republics—have moved recently towards inflation targets leaving the exchange rate to float (more) freely.

The Maastricht inflation criterion requires the accession countries to bring inflation (close) to the Euro Area level, which means that relative productivity cannot adjust via non-traded goods prices as assumed in

section4.2.1. Instead, as observed in Japan during the post Bretton-Woods period, the nominal exchange rate will change. This case also corresponds to Figure 3. But now, with prices of foreign traded goods assumed exogenous and constant ( $\overline{P}_E^T$ ) and (non-traded goods) inflation fixed to the EMU level ( $\overline{P}_E^{NT}$ ), nominal exchange rate appreciation shifts the equilibrium to point F. Because inflation is fixed to the Euro Area level, nominal appreciation against the euro is equal to real appreciation.[33]

Figure 6 shows this finding for Poland. The observation period starts in the year 2000 when Poland abandoned its currency basket arrangement and decided to float its currency. As shown in the lower left panel of Figure 6 Poland reduced consumer price inflation starting in the year 2000, and the inflation differential to Germany gradually declined vanishing by mid 2002. As the productivity increases in the traded goods sector continued (upper right panel of Figure 6) this implied both a nominal and a real appreciation of the Polish zloty as shown in the upper left and the lower right panel of Figure 6.

**Figure 6: Balassa-Samuelson-Effect under Flexible Exchange Rate (Poland since 2000)**




nominal exchange rate against the DM/euro

relative productivity index

inflation differential Poland/Germany

real exchange rate (CPI & WPI based)

Sources: OECD and IMF. Relative productivity index calculated as manufacturing output/manufacturing employment (Poland) industrial output/employment (Germany) both normalized to 1995:02=100. Germany represents the euro area since 1999.

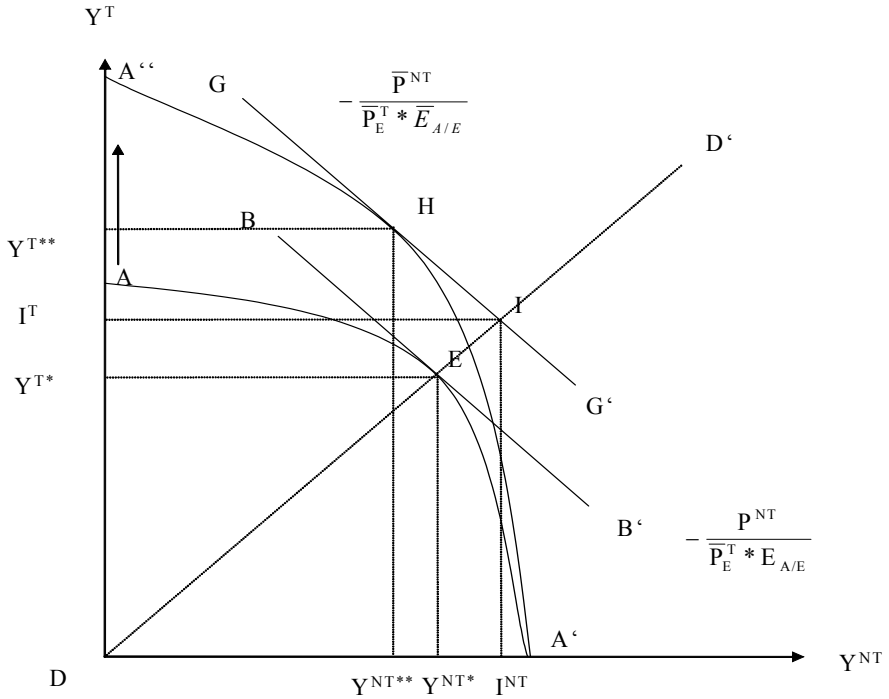
### *4.2.3. Pegging Exchange Rate and Inflation*

From sections 4.2.1 and 4.2.2 we observe that imposing restrictions on either the nominal exchange rate or inflation does not constitute any major problem for the adjustment process. Both higher consumer price inflation (given fixed exchange rates) and nominal appreciation (given fixed inflation) allow for the real appreciation necessary to equilibrate relative productivity gains.

33 Real appreciation will also induce an adjustment of the current account to net capital inflows. As additional net capital inflows will be spent on both traded and non-traded goods, the current account deficit would be ceteris paribus smaller than net capital inflows. The higher relative prices on non-traded goods will shift the demand to traded goods to ensure that the current account is matched by the capital account.

But combining both restrictions as required by the Maastricht criteria constitutes the problem modelled in Figure 7. With the nominal exchange rate, traded goods prices and (non-traded goods) inflation fixed, the slope of the new price line GG' remains unchanged shifting the new equilibrium to H. Due to higher productivity at constant relative prices and given fixed capital stock the preferred relative production pattern changes. More traded goods ($Y^{T**} > Y^{T*}$) and less non-traded goods ($Y^{NT**} < Y^{NT*}$) are produced.

**Figure 7: The Balassa-Samuelson-Effect – Fixed Exchange Rate and Fixed Inflation**




Note: c is assumed to be equal to 1. PE corresponds to the price level of the Euro Area.

At constant relative prices the preferred consumption point remains at point I, putting both markets for traded and non-traded goods into disequilibrium. In the traded goods market the production of traded goods $Y^{T**}$ is larger than the preferred consumption of traded goods $I^T$ leading to a trade surplus ($Y^{T**} - I^T > 0$).[34] In the non-traded goods market—with traded goods prices lower than in the equilibrium—the production of non-traded goods $Y^{NT**}$ is smaller than the private demand for non-traded goods $I^{NT}$. Since services are by definition not traded there is an upward pressure on non-traded goods prices.

## 5. How to Cope with the Dilemma

In the most positive scenario for the post EU-accession developments, the new member states have to stay in the ERM2 for at least two years before they can enter the EMU. Due to the Balassa-Samuelson effect and other factors[35] which enforce the price gap between traded and non-traded goods a tight peg to the euro might produce an inflation rate above the Maastricht ceiling as is presently being experienced in pre-entry Estonia or post-entry Ireland. Adjusting inflation to the EMU level might—as currently in Poland—cause appreciation pressure to place exchange rate stability against the euro at risk.

Under these circumstances, it would be the easiest solution to renegotiate either the Maastricht inflation criterion or the Maastricht exchange rate criterion. As the original Maastricht criteria have been

34 For countries that run a current account deficit the deficit would be less and net capital imports would decline.

35 As indicated in footnote 47.

designed for countries that were by and large at the same stage of economic development, it seems appropriate to design new Maastricht criteria for the faster growing CEE countries (Szapáry, 2000).

Providing a possible framework for such a modification, McKinnon (1984) proposed an international monetary standard based on fixed exchange rates and the stabilization of traded goods (wholesale) prices among the US, Japan and Germany in the 1980s. McKinnon (1984) argued that stable traded goods prices would be consistent with long-run exchange rate stability because they would allow high growth economies (Japan) higher productivity growth in the traded goods sector. Higher consumer price inflation could be tolerated without endangering the goal of nominal exchange rate stability.

Similarly, Buiter and Grafe (2002: 41) propose to maintain the fixed exchange rate requirement while applying the inflation criterion to traded goods only as an '*elegant solution*' to the convergence dilemma. If the measurement for inflation were restricted to traded goods, the Balassa-Samuelson effect would not matter for the EMU entry. Productivity-driven 'good' inflation would only show up in the non-traded goods sector and would thus be ex ante excluded from the EMU qualification process. At the same time monetary policy in the accession countries would be 'under control' as exchange rates remain fixed to the euro.

According to Buiter and Grafe (2002: 41-42) an alternative option could be '*a waiver*' or '*derogation*' to the inflation criterion for countries with a strong Balassa-Samuelson effect. But both the renegotiation and the complete derogation of (one of) the Maastricht criteria seem impracticable, as they would violate the '*prerequisite of equal treatment*'. The ECB (2000) and the ECOFIN Council (2000) are signalling that the new EU Member States have to fulfil the same criteria as the present members: *'The assessment of the fulfilment of the Maastricht convergence criteria and the procedures to be followed for the introduction of the euro will ensure equal treatment between future Member States and the current participants in the euro area.*' (ECOFIN, 2000)[36]

### 5.1. Fiscal Tightening

Given that the renegotiation of the Maastricht criteria is quite unrealistic, the governments of the CEE countries have to consider restrictive macroeconomic policies in order to cope with the Balassa-Samuelson effect and other 'non-monetary' inflation pressure. Buiter and Grafe (2002: 41) suggest that the candidate EMU members need a transitional recession for at least one year to depress the inflation rate to the level required by the Maastricht treaty. Natalucci and Ravenna (2002) as well as Gros *et al*. (2002:) argue that a restrictive macroeconomic policy would dampen the price gap between traded and non-traded goods and thereby the upward-drift of consumer price inflation.[37] As—by definition—monetary policy in ERM2 will be primarily committed to exchange rate stability, fiscal policy will be the main macroeconomic tool to adjust inflation.

To this end Halpern and Wyplosz (2002) suggest that prices in the non-traded sector are not solely determined by supply factors (as productivity) but also by demand factors. They argue that rising productivity in the traded goods sector not only pushes consumer prices upward, but also increases income, wealth—and thereby consumption. Relative traded and non-traded goods prices can be effected in different ways depending on the private consumption pattern: (1) If the demand for both traded and non-traded goods grows at the same rate, the demand effect is neutral and the price gap is solely driven by the supply effects. (2) If the growth of private aggregate demand is biased towards the traded goods sector the supply side effect is (partly) offset by the income effects. (3) If consumer demand is biased towards non-traded goods the Balassa-Samuelson effect is enforced.

36 This assessment also explains why ECOFIN and ECB are objected to early euroization as proposed by Nuti (2001). A similar argument is made by Deutsche Bundesbank (2003: 19).

37 The year 1999 might be provide a blueprint when—for instance in Estonia—a restrictive monetary policy triggered a strong recession which was accompanied by a sharp decline of inflation.

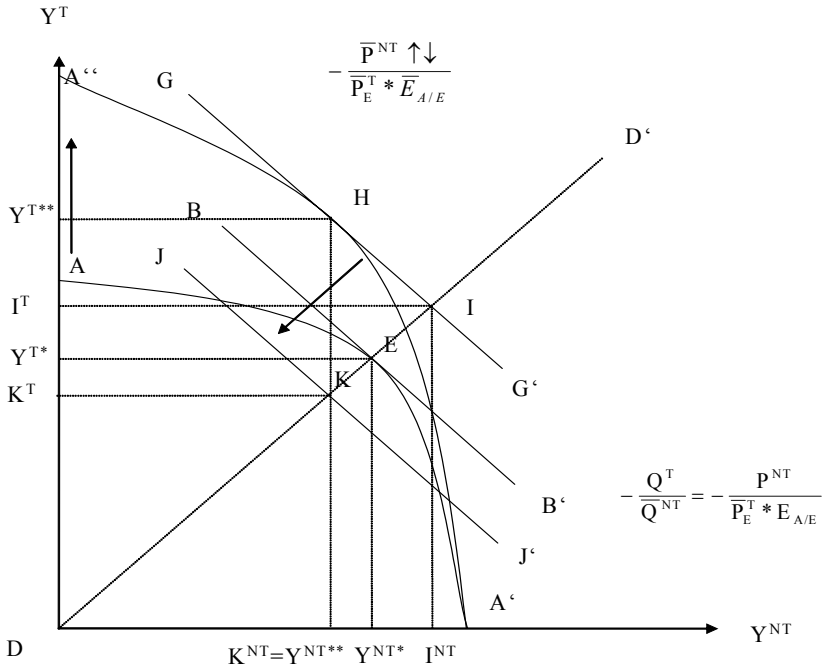
Comparing the three effects Halpern and Wyplosz (2002) argue that higher income usually induces a higher private demand for services—and hence conclude that the demand side effect would reinforce the Balassa-Samuelson effect. Thus, if private demand is assumed to be biased towards non-traded goods, higher income taxes would crowd out private consumption thus alleviating the upward pressure on inflation.

A similar argument can be made with respect to exogenous changes of government demand on non-traded goods prices. As government demand is assumed to be dominated by services, a restrictive fiscal policy could dampen the productivity-driven upward pressure on non-tradable goods prices. The impact of fiscal tightening on non-traded goods prices is even more clear-cut as government consumption is exogenous. The government can choose both the level and (to some extend) the structure of its consumption pattern, thus neutralizing price pressure on non-traded goods prices and shifting the aggregate budget line in the desired direction.

Starting from the disequilibrium as shown in Figure 7 the impact of higher taxes and/or lower government consumption on non-traded goods prices is shown in Figure 8. A decline in government expenditure (or higher income tax) has two effects: first, it dampens the upward drift in non-traded goods prices. The productivity-driven (upward) supply-side effect is compensated by the (downward) demand side effect. The slope of the budget constraint BB' remains unchanged, implying an equilibrium in H on the GG' line. Second, as the disposable income declines and aggregate demand falls the budget line shifts downward to—say—JJ'.

The new equilibrium will be in point K, which satisfies both the Maastricht exchange rate and inflation criteria. K lies on the consumption path meaning that the equilibrium is sustainable, and the supply of non-traded goods ($Y^{NT**}$) is equal to the demand for non-traded goods ($K^{NT}$). In the traded goods market with the production point remaining at H the trade surplus—defined as the production of traded goods minus the consumption of traded goods will increase from $Y^{T**} - I^{T}$ to $Y^{T**} - K^{T}$.[38] The new equilibrium will be at the expense of an economic slowdown as the budget line GG' shifts downward to JJ'. The loss of aggregate demand corresponds to $I^{NT}$—$K^{NT}$.

**Figure 8: The Balassa-Samuelson-Effect – Fiscal Tightening**



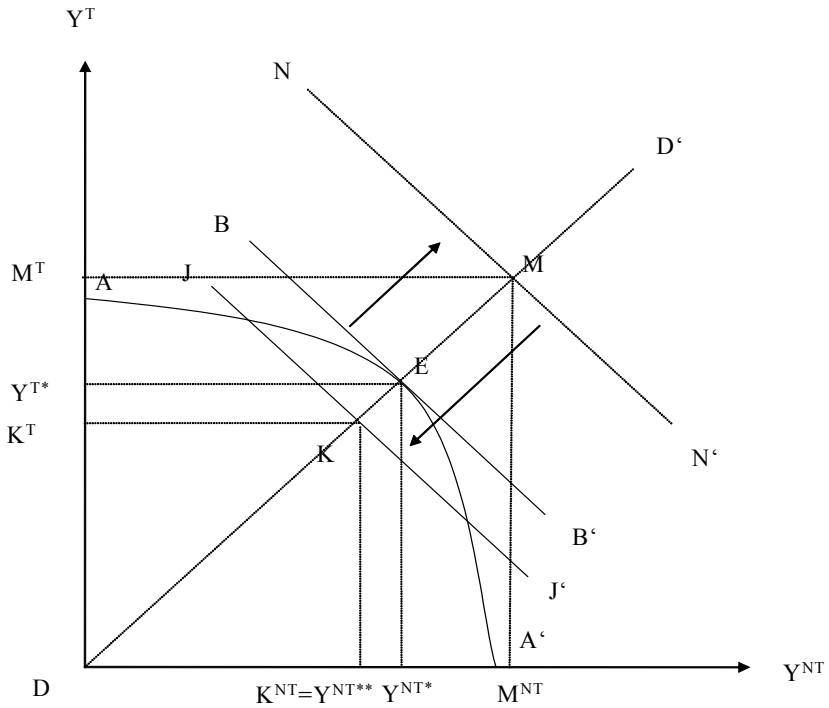

Note: c is assumed to be equal to 1. $P_E$ corresponds to the price level of the Euro Area.

38 For countries running a trade deficit it will decline.

Thus, while fiscal contraction would help fulfil the Maastricht criteria it would be at the cost of less aggregate demand. Whether or not this is harmful for the accession economies remains unclear. Begg *et. al* (2001: 40-41)—who scrutinize the impact of international capital inflows to the present southern EMU member states during their EMU run up—argue that tighter fiscal policies were helpful in controlling speculative capital inflows and overheating.[39]

The impact of restrictive fiscal policies in the case of overheating is modelled in Figure 9. For simplicity we assume the basic case without exogenous productivity shifts. Buoyant demand stimulated by hot capital inflows shifts the budget line to the right as the disposable income rises (NN' line). This leads to the new consumption point M where the preferred amount of traded goods $M^T$ is larger than the production of traded goods $Y^{T*}$. A current account deficit emerges ($M^T > Y^{T*}$).[40] On the market for non-traded goods demand is larger than supply ($M^{NT} > Y^{NT**}$) which implies a strong upward pressure on non-traded goods prices and thereby inflation.

**Figure 9: The Balassa-Samuelson-Effect – Overheating and Fiscal Tightening**




A restrictive fiscal policy is able to cope with both the distortions caused by the Balassa-Samuelson effect and the overheating caused by capital inflows. The fiscal contraction leads to a lower consumption of traded and non-traded goods, while at the same time relative prices remain unchanged. If the restrictive effect is large enough the budget line shifts back to the JJ' line. The new equilibrium is at point K. Since the current account deficit—which corresponds to an inflow of (hot) short-term capital—is thereby reduced or transformed into a current account surplus, the danger of short-term capital flows is counteracted. The stabilization occurs once again at the cost of lower aggregate demand, but has the merit of avoiding overheating and contributing to a lower budget deficit and thereby lower interest rates.

39 'When any inflows occurred, any expansionary consequences were generally countered by tighter fiscal policy. Thus the fiscal elements of the Maastricht criteria may have cushioned a loss of competitiveness by preventing domestic overheating. Fiscal policy will remain a crucial component of the smooth accession of accession candidates.' (Begg et. al. 2001: viii)

40 A current account deficit gets larger.

To this end, while a restrictive fiscal policy helps to simultaneously achieve the Maastricht monetary and exchange rate criteria, it also contributes to fiscal stability as budget deficits are constrained and the stock of public debt are reduced. This could be crucial for these countries whose budgets deficits have increased considerably recently as shown in Table 1. The Czech Republic, Hungary, Poland and the Slovak Republic might need a fiscal contraction to comply with the Maastricht fiscal criteria.

**Table 1: Budget Deficit as Percent of GDP**

| | 1999 | 2000 | 2001 | 2002 | 2003* |
|---|---|---|---|---|---|
| **Bulgaria** | 0.4 | -0.5 | 0.2 | -0.6 | -0.7 |
| **Czech Republic** | -3.7 | -4.0 | -5.5 | -3.9 | -5.8 |
| **Estonia** | -4.0 | -0.4 | 0.2 | 1.3 | -0.3 |
| **Hungary** | -5.6 | -3.0 | -4.7 | -9.2 | -4.5 |
| **Latvia** | -5.3 | -2.7 | -1.6 | -3.0 | -3.1 |
| **Lithuania** | -5.7 | -2.6 | -2.2 | -2.0 | -2.1 |
| **Poland** | -1.5 | -1.8 | -3.0 | -4.1 | -4.0 |
| **Romania** | -4.5 | -4.6 | -3.3 | -2.2 | -2.5 |
| **Slovak Republic** | -6.4 | -10.4 | -7.3 | -7.2 | -4.9 |
| **Slovenia** | -2.2 | -3.3 | -2.8 | -2.6 | -1.4 |

Source: European Commission: Enlargement Paper No. 17 – September 2003. * planned.

Note however that the overall effect on the fiscal criteria remains unclear, since recession will cause the revenue-side tax income to decline. Further, the sudden turn-around in fiscal policy could be destabilizing for two reasons. First, timing and scope of fiscal policy measures might fail. Second, as attributed by Szapáry (2000), the stop and go in fiscal policy might bring about cyclical fluctuations similar to those experienced prior to the monetary union. The fiscal contraction will induce a stronger recession before EMU entry, after the EMU accession the fiscal expansion will enforce an economic upswing.

### 5.2. Nominal Appreciation within ERM2

Thus, while fiscal tightening could contribute to the fulfilment of the Maastricht criteria, it constitutes discretionary government intervention incorporating considerable losses to aggregate demand and the danger of possible failure in timing or dosage. In contrast, nominal appreciation within ERM2 could provide a 'natural' adjustment mechanism for productivity differentials, and no discretionary government intervention would be necessary.

Losses to aggregate demand would be less. Figure 3 and Figure 8 show the different impact of fiscal tightening and nominal appreciation on aggregate demand. In the case of fiscal tightening adjustment is solely achieved by the contraction of aggregate demand without changing relative prices between traded and non-traded goods. In Figure 8 fiscal tightening shifts the consumption point inward from I (GG' line) to K (JJ' line) while the production point remains at H. The loss in aggregate demand corresponds to $I^{NT}$—$K^{NT}$ (non-traded goods).

Nominal appreciation adjustment is achieved through changes in relative prices and thereby expenditure switching. As shown in Figure 3, a nominal appreciation shifts the equilibrium to point F (CC' line). Without relative price changes, the equilibrium would correspond to point F' on the PP' line with output and consumption at $Y^{T***}$ and $Y^{NT***}$. The loss in aggregate demand—corresponding to $Y^{NT***}$—$Y^{NT**}$—is less than in the case of fiscal contraction ($I^{NT}$—$K^{NT}$).

This finding suggests a reinterpretation of the Maastricht exchange rate criterion without renegotiation. Instead of fiscal tightening the CEE accessions countries could allow a gradual appreciation of their currencies within ERM2. A downward moving exchange rate would provide a 'safety valve' for appreciation pressure caused by relative productivity gains.

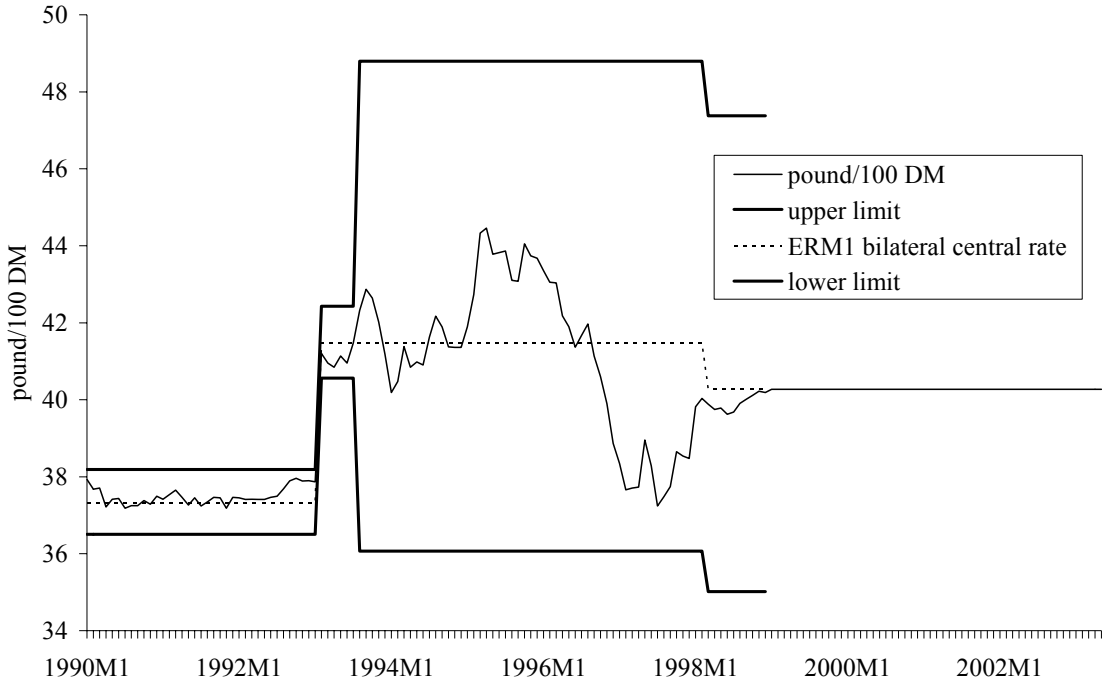
Indeed the European Council has signalled that the ERM2 band is wide enough '*to accommodate the varying degrees, paces and strategies of economic convergence of Member States outside the euro area joining the mechanism*' (ECOFIN, 1997: 1.7, 1.8). Alike the ECB (2000: 46) states that the ERM2 mechanism '*should allow sufficient flexibility for accession countries to reconcile price and exchange rate stability with the structural evolution of their economies, thereby accommodating their different needs.*'[41]

How could the exchange rate movements within ERM2 work? Pre-EMU entry Ireland and pre-EMU entry Greece provide the possible blueprints.

### *5.2.1. The 'Flexible' Irish Model*

The Irish pound has participated in the ERM1 since 1978. In the early 1990s, the bilateral central rate against the DM was at 0.37 pound per DM with a fluctuation band of ±2.25%. During the 1993 EMS crisis the bilateral central rate against the DM was devalued by about 11% to 0.42 pound per DM in February 2002. In the August 1993 the bandwidth was extended to ±15%. Under the new band the Irish pound experienced wide fluctuations around the central rate but within the limits. The pound depreciated considerably against the DM until late 1995 and thereafter appreciated strongly, which was in line with the significant productivity growth relative to the EU core countries (Figure 10).

**Figure 10: ERM1 and EMU Membership of Ireland**




Source: IMF: IFS

In contrast to the other later future EMU founding members who kept the bilateral exchange rates of their currencies close to the bilateral central rates during the two-year 'EMU probationary period',

41 A similar argument is made by Deutsche Bundesbank (2003: 20).

the nominal appreciation of the Irish pound set the stage for the 'end game' in the Irish currency policy. The Irish government could choose a high or a low EMU entry rate (Honohan 1997).

In December 1997—one year before the planned EMU entry—the Irish currency was quoted at around 8% below the bilateral DM central rate. Because the central rate could be expected to correspond to the final conversion rate (fixed rate rule), this implied—given no further policy measures—an 8% depreciation of the Irish pound over the next twelve months (Figure 10). Such a sharp depreciation could be, but not necessarily needed to be, counteracted by a revaluation of the bilateral central rates.

Given the prior appreciation of the pound, the Irish government had two options of setting the final entry rate. Leaving the bilateral central rates unchanged would have meant —given the fixed rate rule—that the prevalent bilateral central rates would have corresponded to the final bilateral EMU entry rates. As exchange rates were likely to be more responsive to changes in market expectations than short-term interest rates, without revaluation the final announcement of the conversion rates could be expected to trigger a jump of the exchange rate towards the conversion rate.[42] Such sharp depreciation would have stimulated growth, but would also have caused additional inflationary pressure to the (post-) EMU entry Irish economy—possibly putting the Maastricht inflation criterion at risk and contributing to overheating. From a long-term perspective, entering the EMU at a considerably lower rate than the then market rate would have ensured sustained wage and price competitiveness within the monetary union.

The alternative was to revalue the bilateral central rates to avoid such sharp depreciations. If, for instance, the bilateral central rate had been revalued by 8% no upward pressure on prices and wages would have emerged, but at the cost of less growth stimulus From a long-term perspective, Ireland would have missed the chance to enter the EMU undervalued.[43]

The Irish government opted for a 3% revaluation of the bilateral central rates in March 1998 which corresponded to a compromise between depreciation and 'complete' revaluation. The market exchange rates of the Irish pound jumped against the new bilateral parities. In June 1998 the prevalent bilateral central rates were fixed as irrevocable EMU entry rates.

Applying the Irish model to the CEE currencies would provide flexibility to exchange rate movements prior to the final conversion rates. Several authors such as Corker et al. (2000) have suggested that quick reversals of short term capital flows (convergence plays) might (more) easily be accommodated under a (more) flexible exchange rate arrangement than under fixed rate regimes during the EMU accession period. Given an exchange rate corridor of ±15%, defining the ERM2 entry rate as ERM2 central rate would allow considerable exchange rate fluctuations prior to the final fixing of the conversion rate.[44]

If erratic exchange rate fluctuations are allowed—depending on short-term capital flows—both depreciation and appreciation are possible. But given the relative productivity growth in the CEE economies (more erratic rather than gradual) appreciation is the more probable case. Just as occurred in Ireland nominal appreciation will create a strategic position for the final fixing of the EMU conversion rate. When deciding about revaluations prior to EMU entry, the governments in the accession countries can weigh the negative effects of additional inflationary pressure against the merits of higher (short-term) competitiveness. The possible scope of sustained 'beggar-thy-EMU-

42 Depreciation was also suggested by interest rate differentials. Despite the appreciation of the Irish pound Irish short-term and long-term interest rates had remained higher than in Germany.

43 Note, that in the discussion about the Irish final entry rate relative productivity growth did not play an important role. This could be due to the fact that prior to EMU entry exchange rate expectations were dominated by the fixing of the final conversion rate instead of productivity.

44 After and even some time prior to the final fixing of the EMU conversion rates exchange rate fluctuations against the euro will abate as shown by De Grauwe, Dewachter and Veestraeten (1999).

neighbour'[45] depreciation will depend on the degree of prior nominal appreciation. The larger the prior appreciation the stronger the competitiveness effect when the central rate remains unchanged.

Given that the ERM2 entry rate corresponds to the ERM2 central rate—will the lower 15% ERM2 corridor suffice to equilibrate the Balassa-Samuelson effect? As stated by Begg *et al*. (2001: 47) in Central and Eastern Europe '*the scope for* […] *real appreciation will remain considerably larger than that experienced in previous accessions*'. If the monetary authorities allow erratic fluctuations of exchange rates within the ERM2 limits it is uncertain whether exchange rates will be driven by relative productivity gains or short-term capital flows during the EMU probationary period. Assuming that relative productivity gains will be roughly reflected by nominal exchange rate movements, the degree of real appreciation pressure matters.

The estimations of real appreciation in the CEE countries such as those made by Halpern and Wylposz (2002: 19-20) find that the Balassa-Samuelson effect will cause a yearly (real and nominal) appreciation of around 3.5%. A panel estimation of De Broeck and Sløk (2001) quantifies the productivity-driven real appreciation in the accession countries to about 1.5% per annum. The estimations of Kovács (2003) for five CEE economies find that the Balassa-Samuelson effect vis-á-vis Germany has not exceeded 2% per annum, a value that he considers similar to Spain before its EMU entry.[46] Borowski, Brzozina and Szpunar (2003) estimate the Balassa-Samuelson effect for Poland to be at 1.2 to 1.7% per year.

Buiter and Grafe (2002: 40) summarize the literature on the quantification of real appreciation and conclude that despite a caveat on the estimation methodologies, the real appreciation of the CEE currencies against the euro due to the Balassa-Samuelson effect appear to be in the range of 1.5% to 2.5% per annum. Indicating other forces[47] capable of reinforcing the appreciation trend they estimate an annual equilibrium real appreciation not higher than 3.5% to 4.0%.

For additional evidence on the scope of real appreciation in Central and Eastern Europe Table 2 shows yearly CPI-based real appreciation since the start of EMU in January 1999. We assume that inflation rates are equal to the Euro Area and thereby real appreciation corresponds to nominal appreciation. Table 2 reveals that the all-year all-country average of -3.08% roughly corresponds to the results reported above. This suggests that on average the 15% lower part of the corridor will easily accommodate relative productivity gains. Country-by-country real appreciation differs significantly ranging from -0.29% in Slovenia up to -6.50% in the Slovak Republic. Extrapolating the Slovak trend in real appreciation would suggest that even the country with the highest real appreciation would not exceed the lower 15% ERM2 limit within two years. Yet the longer ERM2 membership continues the higher is the probability of revaluations.

As the wide ERM2 band would be enough to accommodate the Balassa-Samuelson driven real nominal appreciation, the role of revaluations will be mainly restricted to balancing the pros and cons of depreciation shocks prior to the EMU entry. This picture changes if the April 2003 proposition of EU Commissioner of Monetary Affairs Pedro Solbes to narrow the ERM2 band for the new EU members to ±2.25% is taken into account.

Ignoring the delicate issue of fairness (wider margins were allowed to the present members than would be allowed to the new ones) the narrow bandwidth proposed by Solbes will affect both exchange rate variability and the decisions about the final conversion rates. A bandwidth of 2.25%

45 Competitive depreciations may also incorporate depreciation against the currencies of other EMU accession members with respect to competitiveness in the (third) EMU market.

46 But as shown in Figure D and Figure F in the appendix, relative productivity gains in most CEE countries are much larger than in pre-EMU entry Spain.

47 Lower costs for capital would increase the capital-labor ratios in the tradable sector and thus would contribute to higher wages in the tradable sector. Changes in sectoral wages, sectoral pricing and intermediate product prices can cause appreciation. Yet the Balassa-Samuelson effect decreases in magnitude as catching up proceeds Kovács (2003).

would by-and-large correspond to a fixed exchange rate regime. Nominal appreciation could hardly control short-term capital inflows and productivity-driven appreciation.

**Table 2: Yearly CPI-Based Real Appreciation in CEE Economies**

| | 1999 | 2000 | 2001 | 2002 | mean |
|---|---|---|---|---|---|
| **Bulgaria** | -5.25 | -6.45 | -3.44 | 2.27 | **-3.22** |
| **Czech Republic** | 8.00 | -4.14 | -8.92 | 0.18 | **-1.22** |
| **Estonia** | -1.87 | -3.32 | -0.89 | -0.79 | **-1.72** |
| **Hungary** | -6.41 | -3.41 | -11.70 | -3.34 | **-6.22** |
| **Latvia** | -12.14 | -0.68 | -2.35 | -10.92 | **-1.06** |
| **Lithuania** | -12.17 | -5.03 | -5.74 | 1.61 | **-5.33** |
| **Poland** | -6.79 | -11.82 | -7.28 | 15.00 | **-2.72** |
| **Romania** | -8.69 | -3.24 | -7.63 | 9.42 | **-2.54** |
| **Slovak Republic** | -11.78 | -1.91 | -5.40 | -6.91 | **-6.50** |
| **Slovenia** | -1.38 | 1.11 | -0.18 | -0.70 | **-0.29** |
| **mean** | **-5.85** | **-3.89** | **-5.35** | **0.58** | **-3.08** |

Source: IMF: IFS. Negative signs correspond to real appreciation.

Only revaluations of the ERM2 central rate could help to control both nominal appreciation caused by the Balassa-Samuelson effect and short-term hot capital flows, but with less flexibility. The margin for nominal appreciation to cope with the Balassa-Samuelson effect would be 2.25% under the Solbes proposal. Based on the results reported in Table 2 and assuming that exchange rates appreciate gradually we can extrapolate the past real appreciation of the CEE EU accession countries. Six out of ten CEE countries would reach the lower limit ERM2 limit within one year, eight out of ten countries within two years.

In practice, however, erratic exchange rate fluctuations might be difficult to distinguish from productivity-driven appreciation pressure contributing more to uncertainty about revaluations (and possibly crisis) than to exchange rate stability.

### *5.2.2. The 'Rigid' Greek Model*

While the Irish model has the merit of flexibility, it suffers from sharp exchange rate movements prior to the final fixing of the entry rate. The Greek model might provide an alternative, as it rules out sharp exchange rate fluctuations from the very beginning of ERM2 entry.

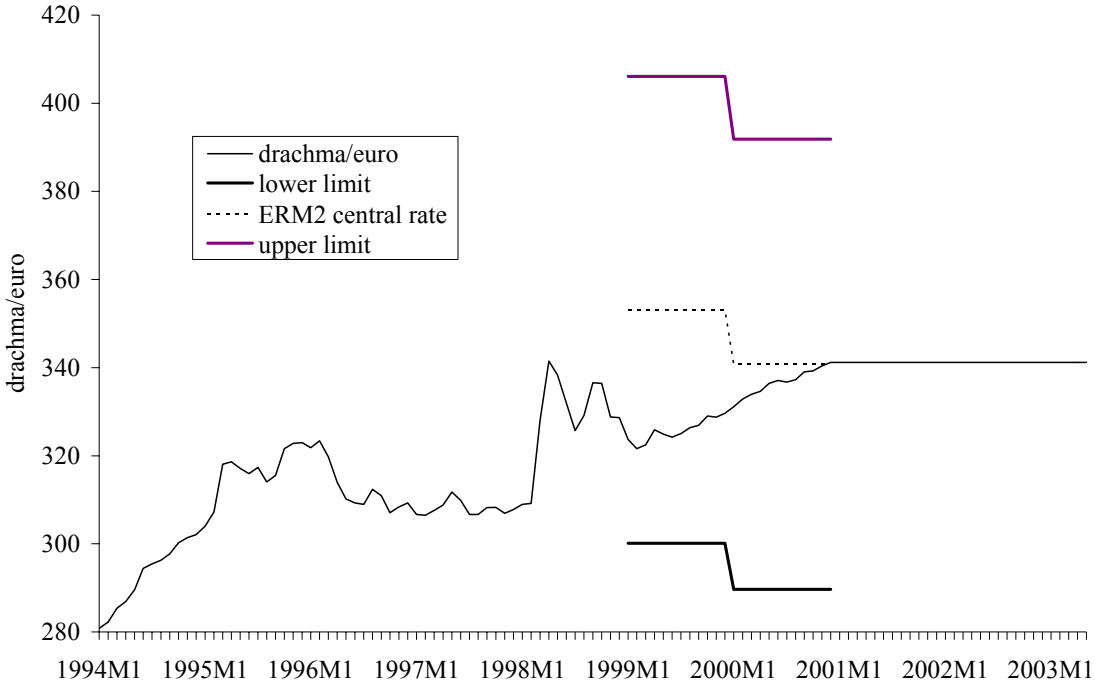
The Greek EMU entry process is shown in Figure 11. Before entering ERM2 the Greek drachma had continuously depreciated against the other European currencies.[48] On March 16th 1998 the Greek drachma entered the ERM1 at a central rate that corresponded to a 12.3 devaluation of the drachma (Kontolemis, 2003: 33).[49] In the September 1998, the Greek government announced to participate in ERM2 with a bandwidth of ±15.0%. In January 1999 Greece entered ERM2. The ERM2 central rate

48 In contrast to the CEE countries Greece did not exhibit a (strong) productivity increase relative to the Euro Area.

49 The devaluation was considered important with respect to EMU membership in order to correct for an overvaluation of the drachma which would have led to a further deterioration of the current account and weaker growth prospects.

was set at 353.109 drachmas per euro—about 7.5% above the then market rate of around 329 drachmas per euro on December 31 1998 (Garganas, 2003).

**Figure 11: Pre-ERM2, ERM2 and EMU Membership of Greece**




Source: IMF: IFS. Before January 1999 the DM represents the euro.

Because the ERM2 central rate against the euro was expected to correspond to the final conversion rate (fixed rate rule), this implied a nominal depreciation of the drachma within the ERM2 band. The central rate provided the upper limit for the depreciation because any rise beyond the central rate would have caused doubts about Greece's ability to enter EMU. To prevent destabilizing speculation the Greek central bank would have been obliged to intervene against any depreciation beyond the central rate. Thus in effect, the ERM2 bandwidth was reduced to 15% with the exchange rate moving upward (depreciation) within a 7% to 8% corridor towards the central rate.

## 6. Conclusion

The accession of the Central and Eastern European economies to the European Union is approaching fast. This poses the question about the EMU membership of the young members. As the CEE countries have explicitly indicated their strong intention to join the EMU as soon as possible they face the Maastricht dilemma of real and monetary convergence. Although the Maastricht criteria have been designed for countries with similar levels of development there is no indication that they will be redesigned for the new accession candidates.

This paper discussed fiscal contraction and nominal appreciation as the two main options to achieve the EMU membership. Fiscal contraction will be at the expense of a temporary recession. As Begg *et al*. (2001) put it, '*the fixed exchange rate route is likely to be the most painful*' as losses to aggregate demand are considerable. The cost of a recession is less if the economy suffers from overheating or if fiscal contraction is needed to achieve fiscal convergence.

Gradual appreciation within ERM2 seems the better choice for two reasons. First, it does not necessitate any discretionary government action, thereby avoiding a possible policy failure (in timing

and dosage). Second, the dampening effects on output will be less than under fiscal tightening as expenditure switching accounts for adjustment.

Having once opted for gradual appreciation the Irish case could be the blueprint for ERM2 membership. Defining the ERM2 entry rate as the ERM2 central rate provides a high degree of flexibility during the probationary period, but it also opens the door to strategic behaviour with respect to the EMU entry rate. Before the final fixing of the EMU entry rate the EMU accession countries have to ponder positive competitiveness effects of depreciation against the danger of additional inflationary pressure in the post-EMU entry period.

The Greek model might be the right choice for these countries which want to minimize exchange rate fluctuations and determine a clear path towards EMU membership. This strategy requires a strict time schedule for EMU membership and the strict fulfilment of all Maastricht criteria after the two years 'waiting room' is indispensable.

Although nominal appreciation within the ERM2 corridor seems the optimal choice to reconcile nominal and real convergence, these countries that decided to adopt hard pegs to the euro (Bulgaria, Estonia, Lithuania and potentially Latvia) will have to rely on fiscal contraction and will have to accept significant losses in economic activity.

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## References

ALONSO-GAMO, Patricia, Stefania Fabrizio, Vitali Kramarenko and Quing Wang 2002. *Lithuania: History and Future of the Currency Board Arrangement*. IMF Working Paper WP/02/127.

BALASSA, Bela 1964. 'The Purchasing-Power Parity Doctrine: A Reappraisal', *Journal of Political Economy*, 6, pp. 584-566.

BANK OF SLOVENIA 2002. Short-Term Implementation of Medium-Term Monetary Policy Framework of the Bank of Slovenia, May 2002.

BAYOUMI, Tamin and Barry Eichengreen 1993. 'Shocking Aspects of European Monetary Integration', in: Francisco Torres and Francesco Giavazzi (eds.), *Adjustment and Growth in the European Monetary Union*. Cambridge and New York: Cambridge University Press, pp. 193-229.

BEGG, David and Barry Eichengreen, Lázló Halpern, Jürgen von Hagen and Charles Wyplosz 2001. *Sustainable Regimes of Capital Movements in Accession Countries*. CEPR Policy Paper No. 10.

BLANCHARD, Olivier and Danny Quah 1989. 'The Dynamic Effects of Aggregate Demand and Supply Disturbances', *American Economic Review*, 79, pp. 655-673.

BOROWSKI, Jakub, Michal Brzoza-Brzezina and Piotr Szpunar 2003. *Exchange Rate Regimes and Poland's Participation in ERMII*. Mimeo.

BUITER, Willem and Clemens Grafe 2002. *Anchor, Float or Abandon Ship: Exchange Rate Regimes for Accession Countries*. CEPR Discussion Paper No. 3184.

CORKER, Robert, Craig Beaumont, Rachel van Elkan, and Dora Iakova 2000. *Exchange Rate Regimes in Selected Advanced Transition Economies—Coping with Transition, Capital Inflows, and EU Accession*. IMF Policy Discussion Paper 00/03.

CSAJBÓK, Attila and Agnes Csermely 2002. *Adopting the Euro in Hungary. Expected Costs, Benefits and Timing*. National Bank of Hungary Occasional Paper 2002/24.

DE BROECK, Mark and Torsten Sløk 2001. *Interpreting Real Exchange Rate Movements in Transition Countries*. IMF Working Paper WP/01/56.

DE GRAUWE, Paul 2002. *The Euro at Stake? The Monetary Union in an Enlarged Europe*. Mimeo.

DE GRAUWE, Paul and Hans Dewachter and Dirk Veestraeten 1999. 'Explaining Recent European Exchange Rate Stability', *International Finance*, 2, pp. 1-31.

DE GRAUWE, Paul and Frauke Skudelny 2002. 'Inflation and Productivity Differentials in EMU', in: Jean-Oliver Hairault and Hubert Kempf (eds.) *Market Imperfections and Macroeconomic Dynamics*. Boston: Kluwer Academic Publishers, pp. 77-104.

DEUTSCHE BUNDESBANK 2003. *Monthly Report*, July.

ECOFIN 1997. Resolution of the European Council on the Establishment of an Exchange Rate Mechanism in the Third Stage of Economic and Monetary Union, Amsterdam 16 June 1997 (97/C 236/03).

ECOFIN 2000. Exchange Rate Strategies for Accession Countries—Council Conclusions, Brussels.

EICHENGREEN, Barry and Ricardo Hausmann 1999. *Exchange Rates and Financial Fragility*. NBER Working Paper, 7418.

EUROPEAN CENTRAL BANK 2000. 'The Eurosystem and the EU Enlargement Process', *ECB Monthly Bulletin*, February, pp. 39-51.

EUROPEAN COMMISSION 2002. *Evaluation of the 2002 Pre-Accession Economic Programs of Candidate Countries*. European Economy Enlargement Papers, No. 14–November 2002.

ÉGERT, Balász, Drine Imed, Kirsten Lommatzsch and Christophe Rault 2002. *The Balassa-Samuelson Effect in Central and Eastern Europe: Myth or Reality?* William Davidson Working Paper, Number 483.

FIDRMUC, Jarko and Iikka Korhonen 2002. *Similarity of Supply and Demand Shocks between the Euro Area and the CEECs*. Mimeo.

FRANKEL, Jeffrey and Andrew Rose 1998. 'The Endogeneity of the Optimum Currency Area Criteria', *Economic Journal*, 108, pp. 1009-1025.

FRANKEL, Jeffrey and Andrew Rose 2002. 'An Estimate of the Effect of Common Currencies on Trade and Income', *Quarterly Journal of Economics*, 117, pp. 437-466.

GARGANAS, Nicholas 2003. *Exchange-Rate Regimes on the Road to EMU: Lessons form Greece's Experience*. Mimeo.

GROS, Daniel *et al*. 2002. *The Euro at 25: Special Report of the CEPS Macroeconomic Policy Group*. Brussels: Centre for European Policy Studies.

HALPERN, Lászlo and Charles Wyplosz 1997. *Equilibrium Exchange Rates in Transition Economies*. IMF Staff Papers 44, 430-461.

HALPERN, Lászlo and Charles Wyplosz 2001. *Economic Transformation and Real Exchange Rate in the 2000s: the Balassa-Samuelson Connection*. Mimeo.

HM TREASURY 2003. EMU and Trade.

HONOHAN, Patrick 1997. *The Tortuous Path to EMU Entry: Irish Policy Issues for Interest Rates and Exchange Rates*. Mimeo.

KENEN, Peter 1969. 'The Theory of Optimum Currency Areas: an eclectic view', in: Robert Mundell and Alexander Swoboda (eds.), *Monetary Problems of the International Economy*. Chicago: University of Chicago Press, pp. 41-60.

KONTOLEMIS, Zenon 2003. *Exchange Rates Are a Matter of Common Concern: Policies in the Run-up to the Euro?* European Commission Economic Papers No. 191.

KOVÁCS, Mihály 2003. *How Real is the Fear? Investigating the Balassa-Samuelson Effect in CEC5 Countries in the Prospect of EMU Enlargement*. Mimeo.

MCKINNON, Ronald 1963. 'Optimum Currency Areas', *American Economic Review*, 53, pp. 207-222.

MCKINNON, Ronald 1984. *An International Standard for Monetary Stabilization*, Washington DC: Institute for International Economics.

MCKINNON, Ronald 2002. 'Optimum Currency Areas and the European Experience', *Economics of Transition*, 10, pp. 343-364.

MICCO, Alejandro, Ernesto Stein and Guillermo Ordoñez 2003. 'The Currency Union Effect on Trade: Early Evidence from EMU', *Economic Policy*, 37, pp. 315-356.

MUNDELL, Robert 1961. 'A Theory of Optimal Currency Areas', *American Economic Review*, 51, pp. 657-665.

NATALUCCI, Fabio and Federico Ravenna 2002. *The Road to Adopting the Euro: Monetary Policy and Exchange Rate Regimes in EU Candidate Countries*. Board of Governors of the Federal Reserve System International Finance Discussion Paper No. 741.

NUTI, Mario 2002. 'Costs and Benefits of Early Euroization in Central Eastern Europe', *Economics of Transition*, 10, pp. 419-444.

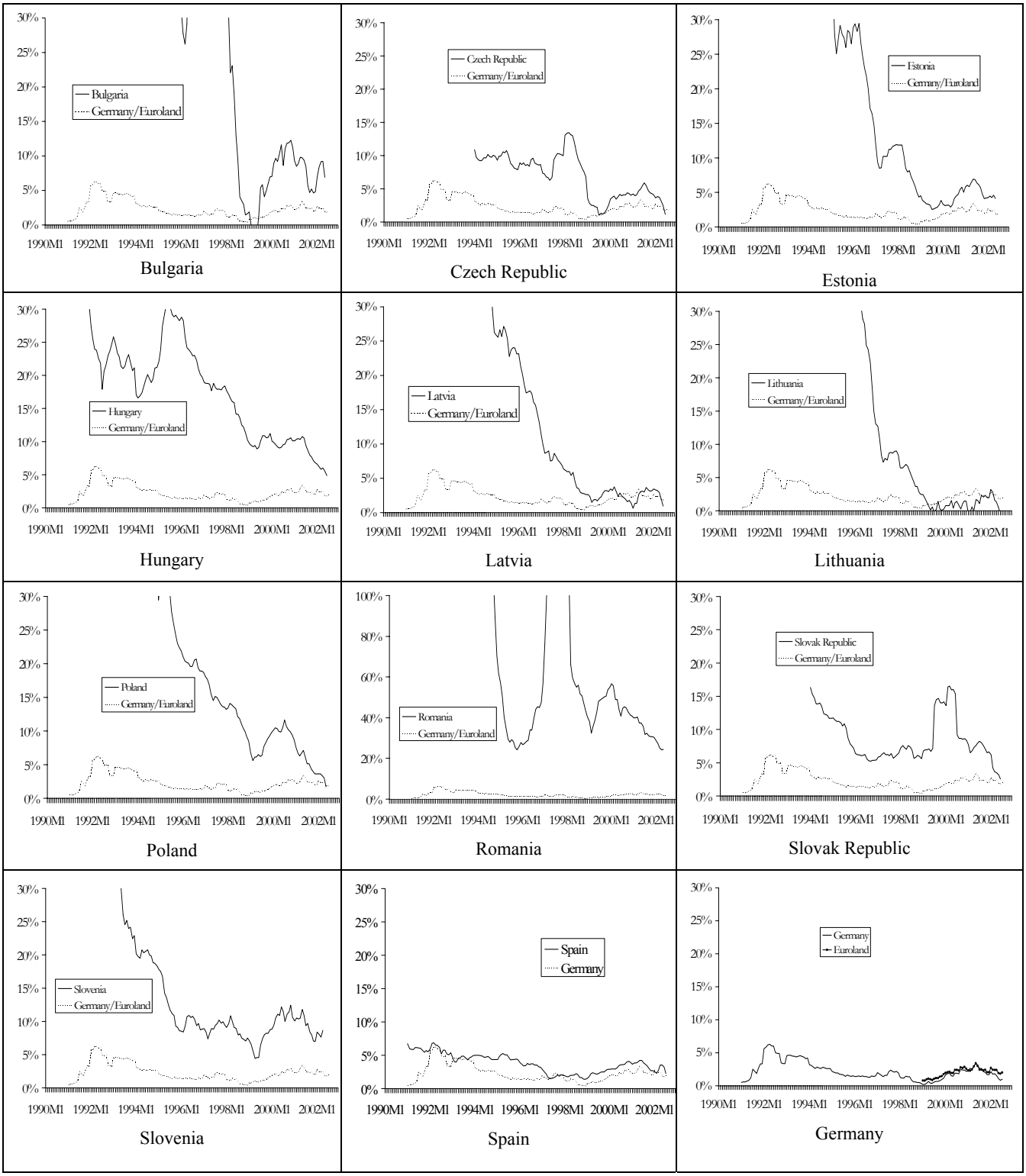
SAMUELSON, Paul 1964. 'Theoretical Notes on Trade Problems', *Review of Economics and Statistics*, 64, pp. 145-154.

SCHNABL, Gunther 2003. *The Emergence of a Euro Zone. An Informal Euro Standard as a First Step for EMU Membership of the Central and Eastern European Countries*. International Center for Economic Growth, European Center Working Paper, Nr. 19, February 2003.

SZAPÁRY, György 2000. *Maastricht and the Choice of Exchange Rate Regime in Transition During the Run-Up to EMU*. National Bank of Hungary Working Paper 2000/7.

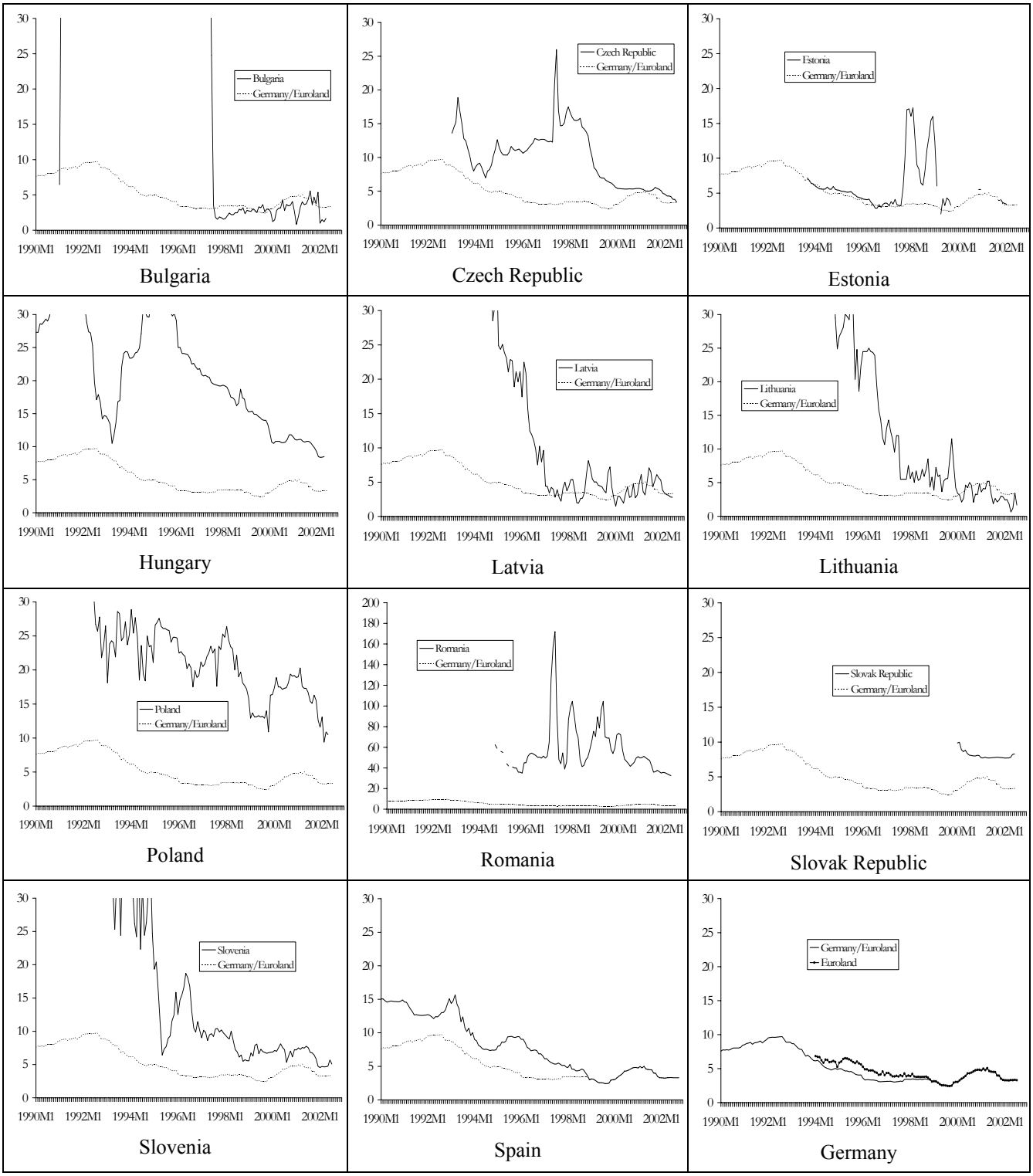
# Appendix

## Figure A: Monetary Convergence I: Consumer Price Inflation (percent)



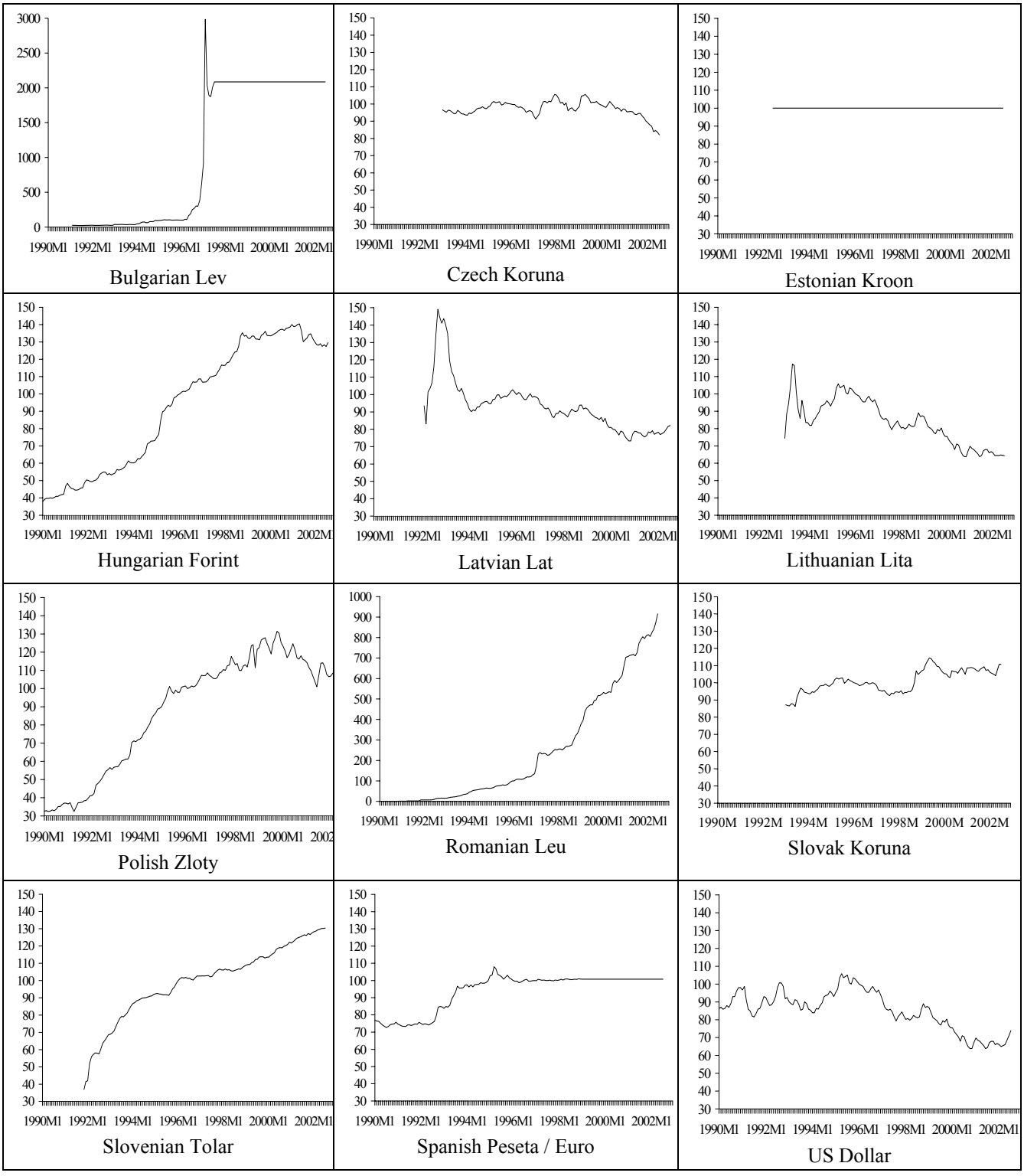

Source: IMF: IFS. Note Different Scale for Romania

**Figure B: Monetary Convergence II: Short-term Interest Rates (percent)**



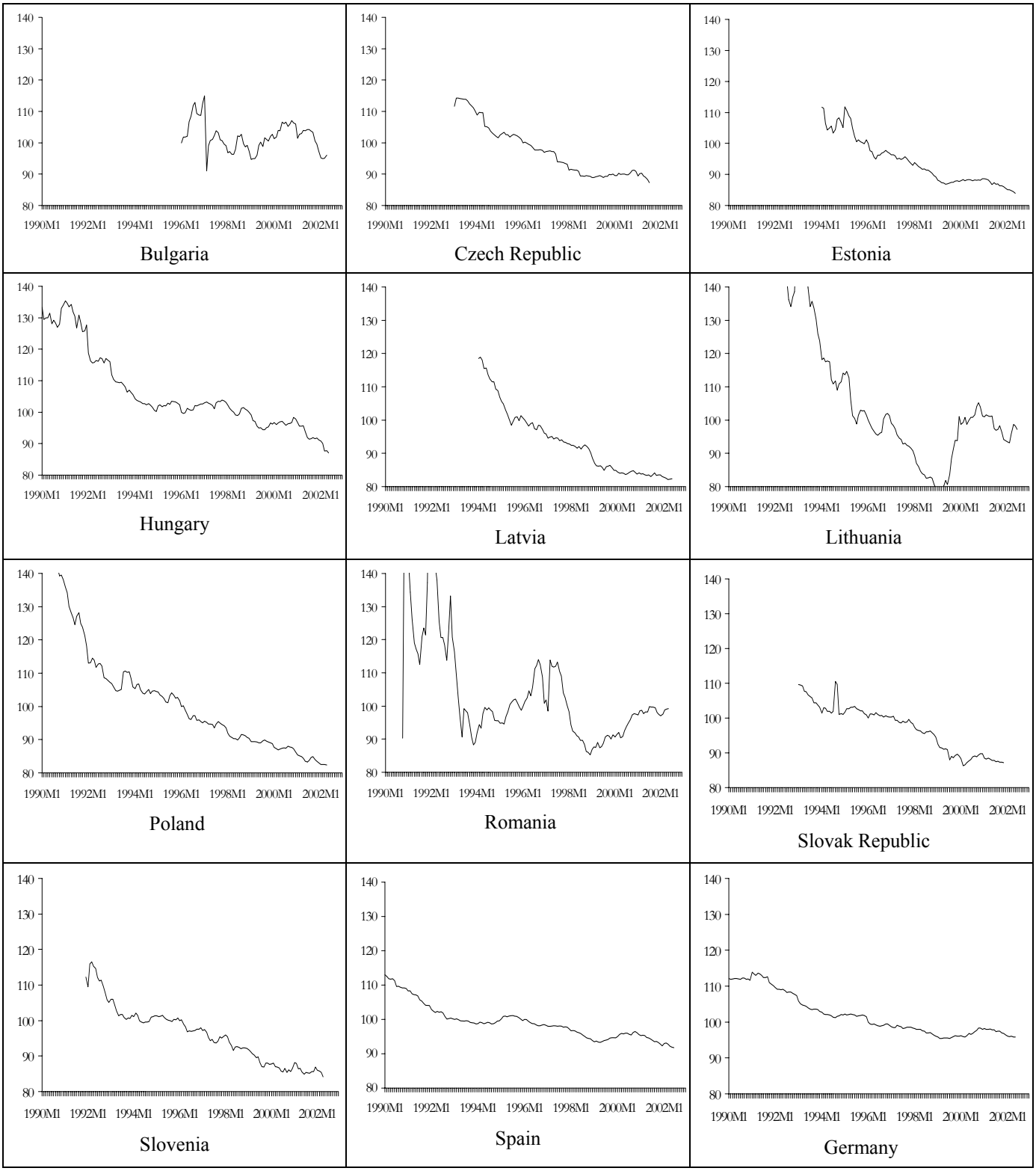

Source: IMF: IFS. Note different scale for Romania.

**Figure C: Monetary Convergence III: Nominal Exchange Rates against DM/Euro**



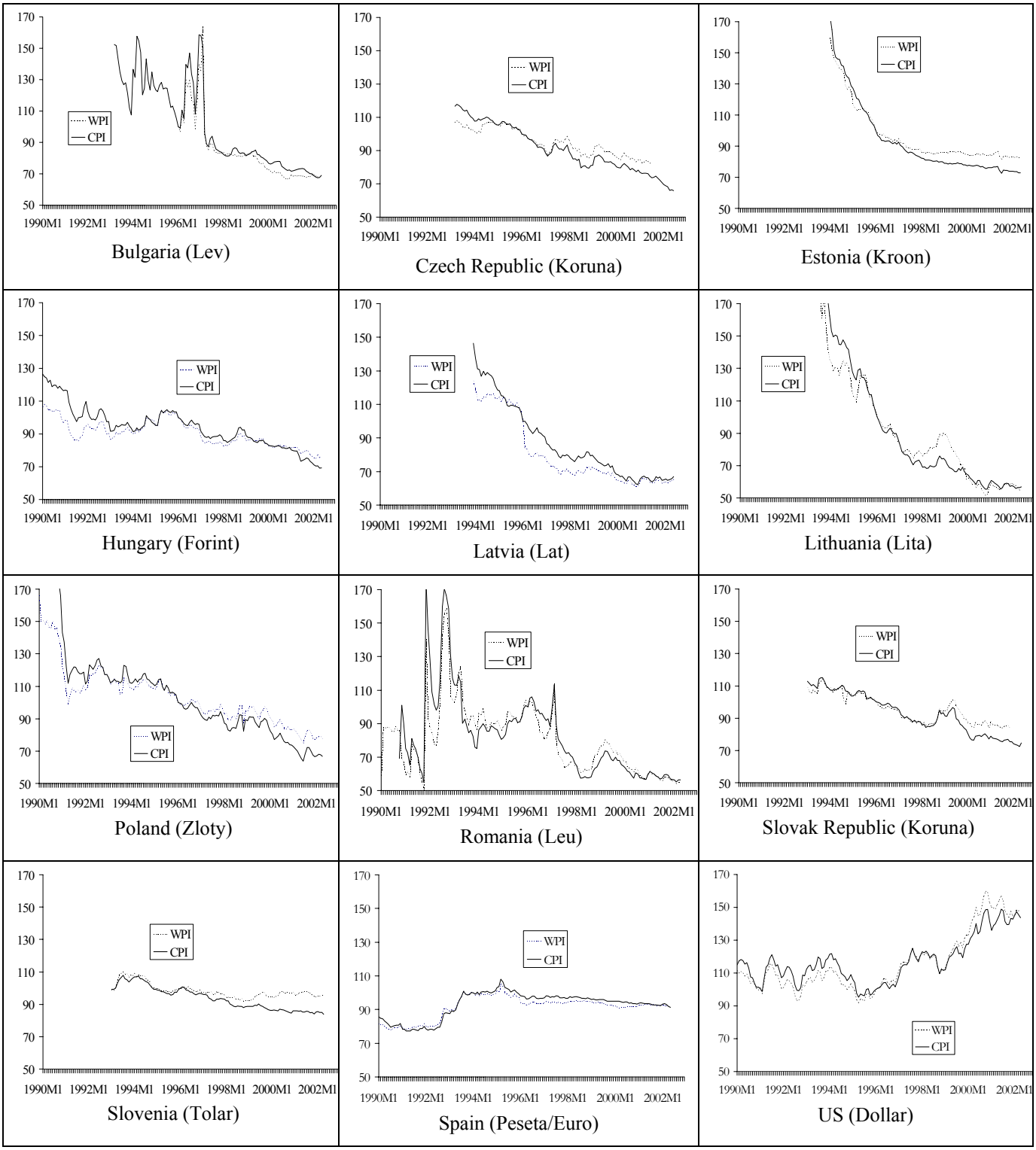

Source: IMF: IFS. Index 1996: 01=100. Note different scales for Bulgaria and Romania.

**Figure D: Productivity Measure I: Relative Producer and Consumer Prices**



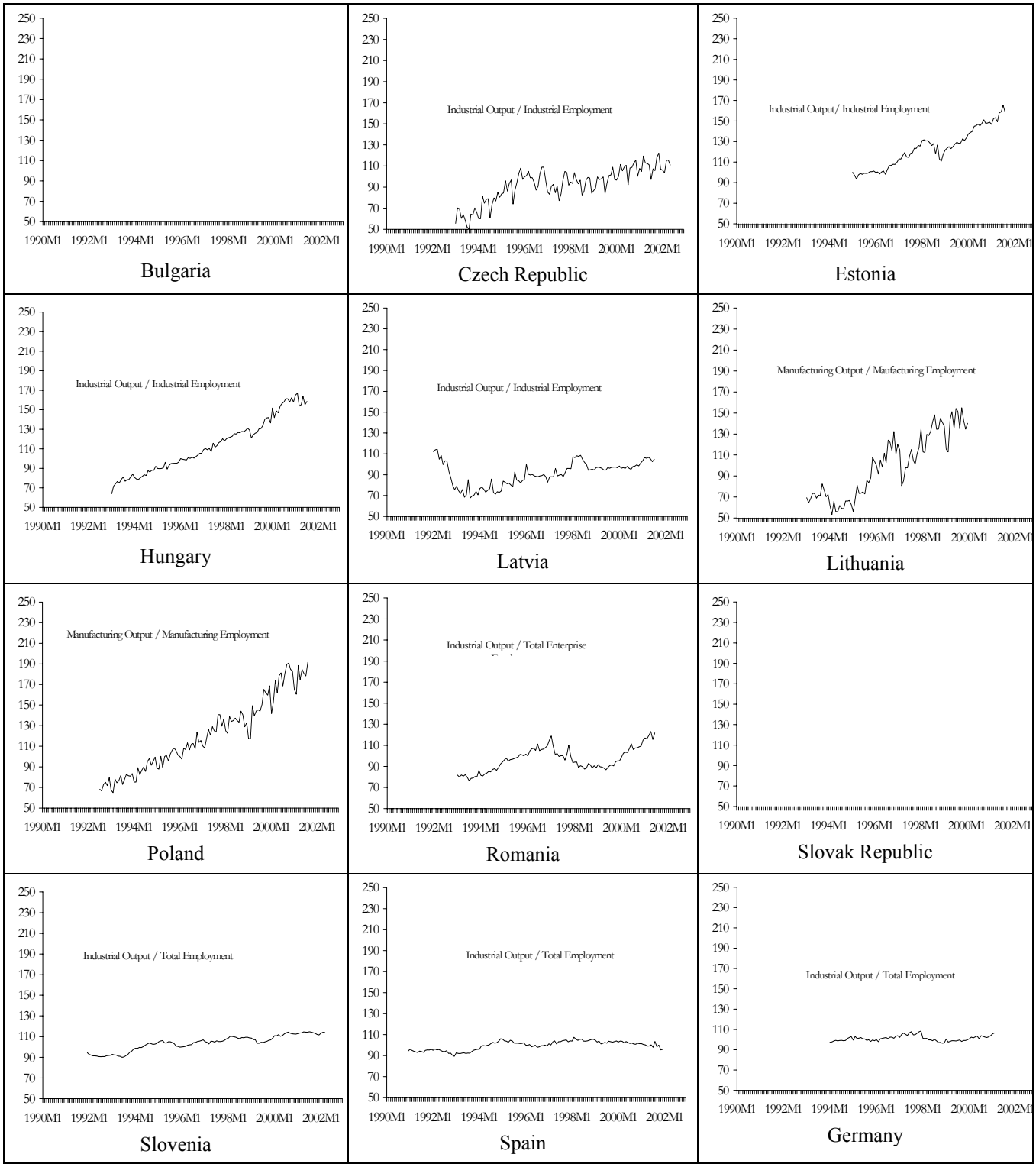

Source: IMF: IFS. Index 1996: 01=100.

**Figure E: Productivity Measure II: Real Exchange Rates of CEE countries (against DM/Euro)**




Source: IMF: IFS. Index 1996:01=100.

## Figure F: Productivity Measure III: Industrial/Manufacturing Output per Employee




Source: IMF: IFS. Index 1996:01=100.