Nominal versus Real Convergence with Respect to EMU Accession
- EMU Entry Scenarios for the New Member States

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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 above the ERM2 central rate (Greek model) implies a clear exchange rate path within ERM2 and thereby less exchange rate volatility. Despite the merits of nominal appreciation, countries committed to hard euro pegs or with high budget deficits might choose fiscal contraction as a solution.

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

JEL: E52, F31

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1. Introduction

In the new millennium the European integration process has gained momentum. In May 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) have joined the European Union. Bulgaria and Romania are expected to follow by 2007.

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. The new EU members will have to satisfy the Maastricht convergence criteria before entering the euro zone. This has led to a discussion about the achievability of the Maastricht criteria for the new EMU accession candidates. Based on the assumption that a Balassa-Samuelson-effect will be a natural outcome of the catch-up process, 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).

This paper starts from the assumption that the Balassa-Samuelson effect is "*now well established and powerful*" in Central and Eastern Europe (Begg et. al., 2001: ix) and is even necessary to reduce the real convergence between Western and Eastern Europe. It then explores the options to meet the Maastricht criteria despite the natural upward drift on inflation in Eastern Europe.

2. The Balassa-Samuelson Model with Respect to EMU Accession

After the CEE countries have entered the EU they "*can be*" (ECOFIN, 1997) and "*will be*" (ECOFIN, 2000) expected to join ERM2 some time after accession.[1] EMU membership will require the accession candidates to stay within the fluctuation band for at least two years without devaluation. At the end of this period inflation has to be adjusted close to the EMU level. The fixed exchange rate combined with the Balassa-Samuelson effect creates an upward pressure on inflation. This puts the stage for the Balassa-Samuelson dilemma with respect to EMU accession.

2.1. The Basic Balassa-Samuelson Model

In the 1960s, Balassa (1964) and Samuelson (1964) observed that developing countries experienced 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.

[1] For more information on the institutional background on the CEE EMU accession see De Grauwe and Schnabl (2003).

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:

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

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

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).[2] In both sectors output is generated by combining technology, capital and labour. Assuming competitive markets and profit maximization the marginal productivity of labour ($(1-\gamma^i)\frac{Y^i}{L^i}$) 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:

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

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

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:

$$W^T = W^{NT} = W \quad (3)$$

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

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

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

where Q^i are the labour productivities in the respective sectors ($\frac{Y^i}{L^i}$) and c is a positive[3] constant depending on the respective weights of the tradable and non-tradable goods ($\frac{1-\gamma^T}{1-\gamma^{NT}}$).

If one assumes that productivity in the non-traded goods sector is constant[4], then according to equation (4), an increase in traded goods productivity increases the relative price of non-traded goods. As the overall consumer price level is a composite of traded and non-traded goods, the general price level will rise.

The Balassa-Samuelson effect is modelled graphically in Figure 1. 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.[5] In Figure 1 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.[6] In the equilibrium E overall production and consumption consist of Y^{T*} plus Y^{NT*}.

[Figure 1 about here]

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3 As γ^T and γ^{NT} are larger than 0 and smaller than unity.

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

5 $Y = P^{NT} * Y^{NT} + P^T * Y^T$.

6 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.

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 1. 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 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.[7] 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, the consumption price index in the accession country rises.

2.2. Restrictions on the Adjustment Mechanism

We learn from Figure 1 that changes of relative prices between traded and non-traded goods provide an adjustment mechanism for relative productivity increases in the traded goods sector. As shown by De Grauwe and Schnabl (2003) a country can choose whether this adjustment is achieved by higher inflation—given fixed exchange rates—or by nominal appreciation—given that monetary policy targets domestic inflation. To model the impact of the Maastricht criteria on the adjustment mechanism the Balassa-Samuelson approach is extended to a two country setting with both a fixed and a flexible exchange rate regime.

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

[7] $\frac{Y^{T*}}{Y^{NT*}} = \frac{Y^{T**}}{Y^{NT**}}$

(Poland). First we study the impact of fixed exchange rates on the adjustment mechanism that applies for the group with tightly fixed exchange rate arrangements.

This case resembles the basic model of section 1.2. 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.[8] 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 country are constant ($\overline{P}^T$) as well. In Figure 1, with fixed nominal exchange rate and exogenous traded goods prices, higher productivity growth in the traded goods sector pushes non-traded goods prices upwards leading to the equilibrium in point F. Given fixed nominal exchange rates, the consumer price index increases resulting in a real appreciation of currency A—thus accommodating relative productivity gains.

Pegging Inflation

An alternative adjustment mechanism is provided when a country chooses to "peg" inflation, i.e., to adjust consumer price inflation (close to) the EMU level while allowing the exchange rate to float. While all CEE countries used exchange rate targeting 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 free to float. (Schnabl 2004).

The Maastricht inflation criterion requires the accession countries to bring inflation (close) to the Euro Area level. Then relative productivity cannot adjust via non-traded goods prices as assumed above. Instead, the nominal exchange rate will change. This case also corresponds to Figure 1. 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, the nominal appreciation against the euro is equal to the real appreciation.[9]

Pegging Exchange Rate and Inflation

As shown above 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

[8] $P_A^T = E_{A/E} * P_E^T$

[9] 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 pari-

(given fixed exchange rates) and nominal appreciation (given fixed inflation) allow for the real appreciation necessary to equilibrate relative productivity gains.

But combining both restrictions as required by the Maastricht criteria constitutes a problem which we model in Figure 2. 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 a 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.

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 ($Y^{T**} - I^T > 0$).[10] 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}.

3. Ways out of the Dilemma

How to get out of the dilemma described in the previous section? One possibility would be to renegotiate either the Maastricht inflation criterion or the Maastricht exchange rate criterion. As the original Maastricht criteria have been designed for countries that were by and large at the same stage of economic development, it might seem appropriate—as proposed by Szapáry (2000)—to design new Maastricht criteria for the faster growing CEE countries.

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. He 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

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bus 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.

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) have signalled that the new EU Member States have to fulfil the same criteria as the present members.

3.1. 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. 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.

In this connection 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 affected 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.

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 to-

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

wards non-traded goods, higher income taxes would crowd out private consumption 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.

We illustrate in Figure 3 how fiscal policy can solve the dilemma introduced by the Maastricht convergence criteria. Starting from the disequilibrium as shown in Figure 2 the impact of lower government consumption and/or higher taxes on non-traded goods prices is shown in Figure 3. 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, 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 $Y^{T**} - K^T$.[11] 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 3 about here]

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.[12] Fiscal contraction might also contribute to fiscal stability as budget deficits are constrained and the stocks of public debt are reduced. This could be crucial for these countries whose budgets deficits have increased considerably recently.

The shortcomings of fiscal contraction are a possible failure in timing and dosage. Further, the stop and go in fiscal policy might bring about cyclical fluctuations similar to those experienced

[11] For countries running a trade deficit it will decline.

prior to the monetary union, when the fiscal expansion after the EMU entry enforces an economic expansion.

3.2. Nominal Appreciation within ERM2

In contrast to fiscal contraction, nominal appreciation within ERM2 could provide a "natural" adjustment mechanism for productivity differentials, as no discretionary government intervention is necessary. Losses to aggregate demand would be less pronounced. Figure 1 and Figure 3 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 3 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).

In contrast, in the case nominal appreciation adjustment is achieved through changes in relative prices and thereby expenditure switching. As shown in Figure 1, 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 suggests that the CEE accessions countries could allow a gradual nominal appreciation of their currencies within ERM2. A downward moving exchange rate would provide a "safety valve" for appreciation pressure caused by relative productivity gains.[13] Pre-EMU entry Ireland and pre-EMU entry Greece provide the possible blueprints.

The "Flexible" Irish Model

As shown in Figure 4, before its EMU entry the Irish pound experienced wide fluctuations around the central rate but within the ±15% limits. In December 1997—one year before the planned EMU entry—the Irish currency was quoted at around 8% below the bilateral DM central rate, which was in line with the significant productivity growth relative to the EU core countries and inflation converging towards the EMU entry benchmark. Because the central rate could be expected to corre-

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[12] De Grauwe and Schnabl (2003: 16-19) explore the effects of fiscal policy in the case of overheating.

[13] Indeed the European Council has signaled 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.*" A similar argument is made by Deutsche Bundesbank (2003: 20).

spond 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 4).

[Figure 4 about here]

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 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 of the central rate the final announcement of the conversion rate could be expected to trigger a move of the exchange rate towards the conversion rate.[14] 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.

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. 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 (Honohan 1997).

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. Although the exchange rate of the Greek drachma did not appreciate in the wake of the EMU entry, the Greek model might provide useful insights for the new member states, because it ruled out sharp exchange rate fluctuations by setting the ERM2 entry rate different from the ERM2 central rate.

The Greek EMU entry process is shown in Figure 5. On March 16 1998 the Greek drachma entered the ERM1 and in the September 1998, the Greek government announced to participate in ERM2 with a bandwidth of ±15.0%. In January 1999 Greece entered ERM2 with a central rate of 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).

[14] 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.

[Figure 5 about here]

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. 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.

When the depreciation proceeded slowly during the first year of ERM2 membership, the revaluation of the central rate to 340.75 drachma per euro in January 2000 helped in reaching the final conversion target more smoothly. Finally, on June 19 2000 the ECOFIN Council announced the Greek EMU membership starting from January 2001 together with the final conversion rate which corresponded to the prevailing ERM2 central rate of 340.75 drachmas per euro.

4. Possible Entry Scenarios

The discussion of sections 2 and 3 allows us to sketch three EMU entry scenarios for the new EU member states.

4.1. Exchange Rate Rigidity and Fiscal Flexibility

Some countries such as the Baltic States will probably pursue a tight exchange rate peg with the euro. When entering the ERM2 the Baltic countries are likely to maintain their currency boards and commit to a narrow bandwidth close to ±0%. The strong exchange rate rigidity will require high fiscal flexibility to meet the Maastricht inflation criterion. Fiscal contraction to curb inflation may be supported by a "non-inflationary wage policy" as suggested by the National Bank of Slovakia (2003) and structural reforms to ensure fiscal flexibility (Figure 6).

[Figure 6 about here]

4.2. Exchange Rate Flexibility within the ±15% band

Another group of countries may allow for more exchange rate flexibility within ERM2. Corker et al. (2000) have suggested that quick reversals of short-term capital flows (convergence plays) might more easily be accommodated under a flexible exchange rate arrangement than under fixed rate

regimes during the EMU accession period. Applying the Irish model to the CEE currencies would provide flexibility to exchange rate movements prior to the final fixing. An exchange rate corridor of ±15% would allow for considerable exchange rate fluctuations, as deviations of the exchange rate above and below the central rate remain possible.

As observed in Ireland a nominal appreciation below the central rate is more probable when inflation rates converge towards the EMU level. Speculative capital inflows which anticipate EMU membership may enforce the Balassa-Samuelson effect and thereby boost appreciation. Once the conversion rate is announced, exchange rates will depreciate towards the central rate as shown by De Grauwe, Dewachter and Veestraeten (1999). The resulting inflationary pressure can be cushioned by a revaluation of the central rate.

The Irish entry scenario is simulated in Figure 7 under the restrictive assumption that exchange rates adjust gradually to the Balassa-Samuelson effect via nominal appreciation taking into account that inflation is (close to or) equal to the EMU level.[15] The estimations of real appreciation in the CEE countries such as those made by Halpern and Wylposz (2002: 19-20), De Broeck and Sløk (2001), Kovács (2003), Borowski, Brzozina and Szpunar (2003) suggest that the real appreciation of the CEE currencies against the euro due to the Balassa-Samuelson effect appear to be in the range of 1.0% to 2.5% per annum. There are other factors capable of reinforcing the trends toward real appreciation.[16] Taking these into account Buiter and Grafe (2002: 40) estimate the annual equilibrium real appreciations not exceed 3.5% to 4.0%. We simulate yearly nominal (and real) appreciations of 1% up to 5%.

[Figure 7 about here]

As shown in Figure 7, in most cases, nominal appreciation would exceed the lower 2.25% band before the end of the two-year probationary period, but the 15% lower band would be sufficient to accommodate the equilibrium appreciation pressure. (Intra-marginal) central bank intervention would remain necessary to control for sharp short-term exchange rate fluctuations which might surpass the ±15% limits.

Further, we assume that the assessment of compliance with the Maastricht criteria takes place after 24 months ERM2 membership (waiting room approach) and that at the same time the

[15] In practice the nominal exchange rates can be assumed to be more volatile, in particular as capital controls are removed.

[16] 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).

final EMU conversion rate[17] after—say—six months after assessment is announced. At this time the CEE currencies have probably appreciated considerably as shown in Figure 7. If the prevalent central rate would be announced to be the conversion rate, the respective currencies would gradually depreciate towards the conversion rate starting—or even prior—from the day of the announcement.

To dampen the resulting inflationary pressure the revaluation of the central rate has to be considered. Six months prior to EMU entry, the final conversion rate is easier to determine than at ERM2 entry. The degree of revaluation will be subject to negotiations between the EMU and the accession country. In Figure 7 we assume that a further appreciation is projected and the Balassa-Samuleson effect is fully incorporated in the determination of the final conversion rate. Nevertheless, a mixed strategy as pursued in Ireland which allows for some depreciation prior to the EMU entry is possible.

4.3. Exchange Rate Flexibility within the upper 15% band

In contrast to the Irish model the Greek model suggests to set the ERM2 entry rate different from the ERM2 central rate to reduce exchange rate volatility. In Greece exchange rate volatility during ERM2 membership was much smaller than in Ireland because the entry rate and the central rate projected a clear exchange rate path towards EMU membership.

In contrast to Greece, which allowed for a gradual depreciation within ERM2, the entry rate of the CEE countries would be above the central rate because an appreciation due to the Balassa-Samuelson effect is expected. Figure 8 simulates the EMU entry based on the Greek model (in reverse). Like in the Irish model we assume a probationary period of 24 months in ERM2 (waiting room approach) and an additional six month membership after successful compliance. We assume that different countries have different degrees of the Balassa-Samuelson effect. With inflation rates assumed to be (close or) equal to the EMU we simulate nominal appreciations of 1% up to 5%.

In order to project the adequate ERM2 entry rate exact information is needed concerning the degree of expected appreciation and the duration of ERM2 membership. Here we assume appreciations from 1% up to 5% and a minimal stay in ERM2 of 30 months—two years probationary period before assessment and six months preparation for EMU accession. Based on these assumptions the ERM2 entry rates can be calculated recursively. As shown in Figure 8 a high expected nominal appreciation will project a higher ERM2 entry, while a low expected real appreciation will lead to an

[17] This corresponds to the central rate due to the fixed rate rule.

ERM2 entry closely above the central rate. As for Greece the de facto bandwidth will be considerably smaller than 30% depending on the ERM2 entry rate.

[Figure 8 about here]

Setting the ERM2 central rate above the entry rate is based on the idea that the currencies will appreciate toward the projected EMU entry rate. This scenario implies a clear commitment in favour of the pre-announced EMU entry rate. If this commitment is credible, exchange rate volatility will be low to provide a safe EMU entry.

4.4. Heterogeneous EMU Entry Strategies and the Maastricht Criteria

As both hard pegs to the euro and gradual appreciation within ERMII constitute possible EMU entry strategies the new member states are likely to choose different entry options. This may—given that the Maastricht criteria for EMU entry remain unchanged—make the EMU entry for the group of countries with hard pegs more difficult.

According to the Maastricht Treaty and the respective protocols inflation should "*not exceed by more than one percentage points that of, at most, the three best performing Member States in terms of price stability.*" As the best performing members in terms of inflation will be chosen among all EU25 member states, these new member states which allow for gradual appreciation of their currencies are more likely to be the best performing members in terms of inflation.

For instance in 2003, Poland (0.7%) and the Czech Republic (-0.1%) which had previously allowed considerable appreciations of their currencies were among the three best performing members. Together with Lithuania (-1.1%) the average inflation was -0.16% which is significantly below the 2.1% HCPI inflation of the Euro Area as a whole—and also significantly below the 1.2% average of the three best performing EU15 members Germany (1.0%), Austria (1.3%), and Finland (1.3%).

This implies that heterogeneous entry strategies might constitute an additional entry barrier for countries pursuing hard pegs as entry strategy as simulated in Figure 6.

5. Conclusion

Eight Central and Eastern European economies have joined the European Union. This poses the question about the EMU membership of the new members. As the CEE countries have explicitly indicated their strong intention to join the EMU as soon as possible they face the Maastricht di-

lemma of real versus nominal 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 a smooth EMU membership. A number of countries will need to follow a policy of fiscal consolidation. In other countries, contractionary budgetary policies are not necessary. Whatever the budgetary policies these countries follow, it appears that the best they can to do take care of Balassa Samuleson effects consists in allowing for a gradual appreciation of their currencies.

Having once opted for gradual appreciation the Irish or the reversed Greek models 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 allows for sharp exchange rate fluctuations and opens the door to strategic behaviour with respect to the EMU entry rate. Choosing the ERM2 entry rate above the ERM2 central rat helps to reduce exchange rate volatility and thereby to achieve a safe EMU entry. Yet it necessitates clear information about expected appreciation and the duration of ERM2 membership.

Although nominal appreciation within the ERM2 corridor seems the better choice to reconcile nominal and real convergence, there are countries that have decided to adopt hard pegs to the euro (Estonia, Lithuania and potentially Latvia). Given the considerable investment these countries have made in the credibility of these arrangements, it does not seem desirable to change these arrangements.

There are countries which will have to go through a process of fiscal consolidation prior to their entry into the euro zone. Our main conclusion also holds for these countries. A gradual appreciation of the currencies of these countries is desirable. In the absence of such appreciation, these countries will have to follow policies of fiscal restriction that are tighter than is necessary to satisfy the Maastricht fiscal criteria.

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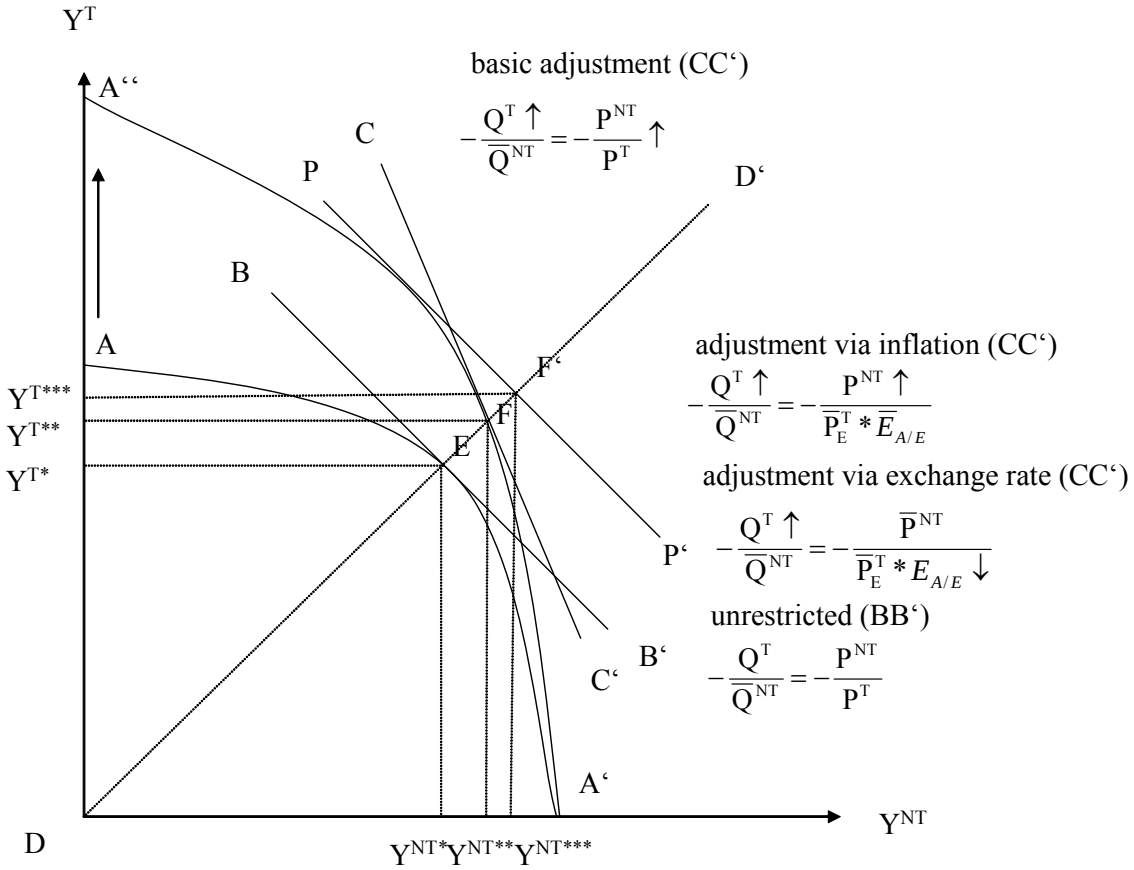
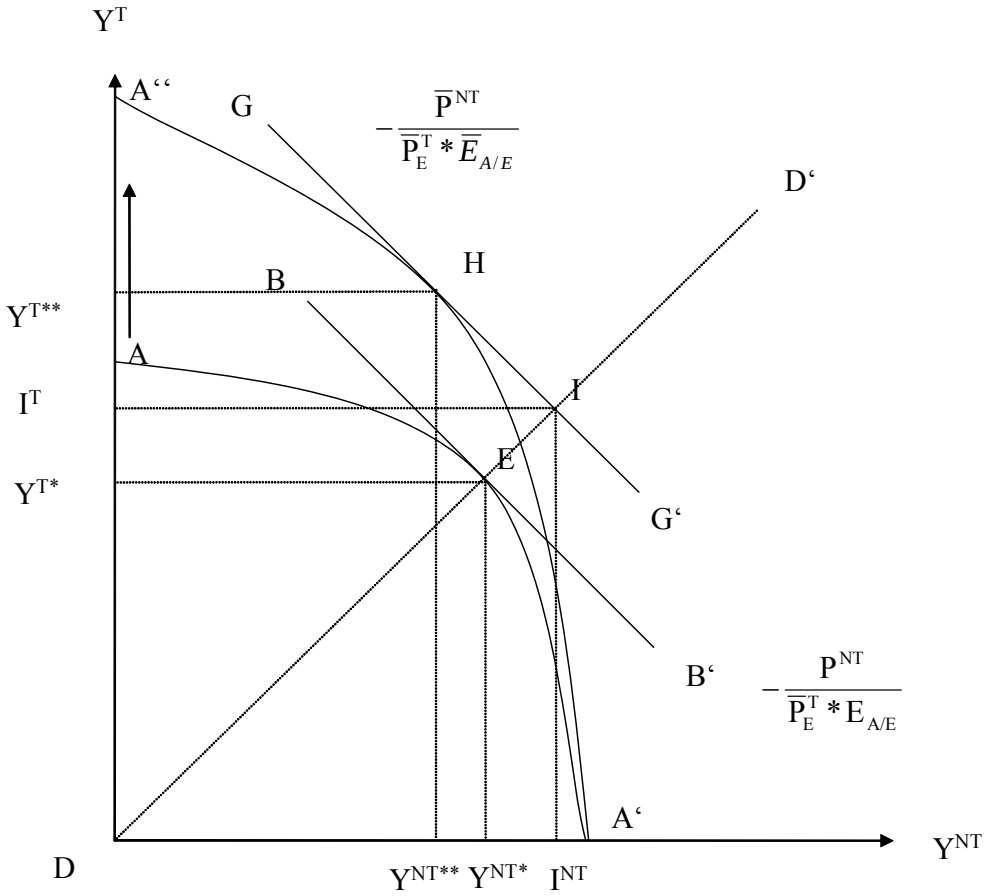
Figure 1: The Balassa-Samuelson-Effect – Fixed Exchange Rate or Fixed Inflation



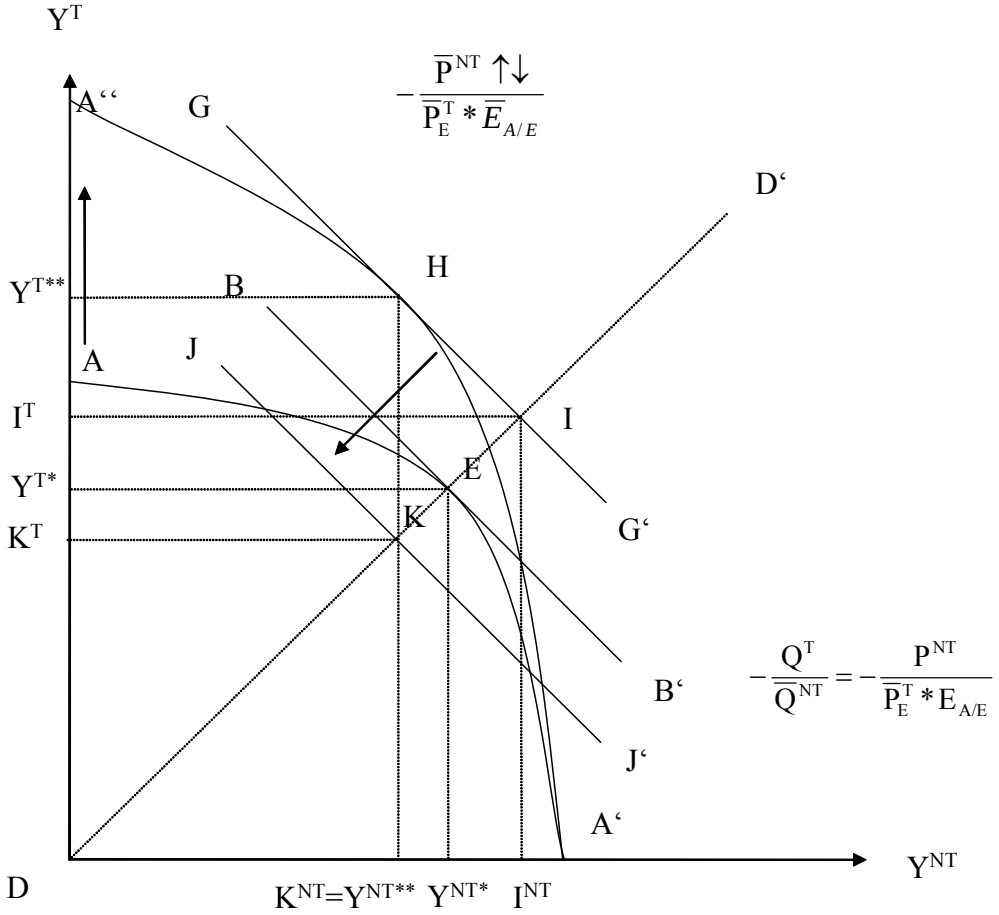
c is assumed to be equal to 1. P_E corresponds to the price level of the Euro Area.

Figure 2: The Balassa-Samuelson-Effect – Fixed Exchange Rate and Fixed Inflation



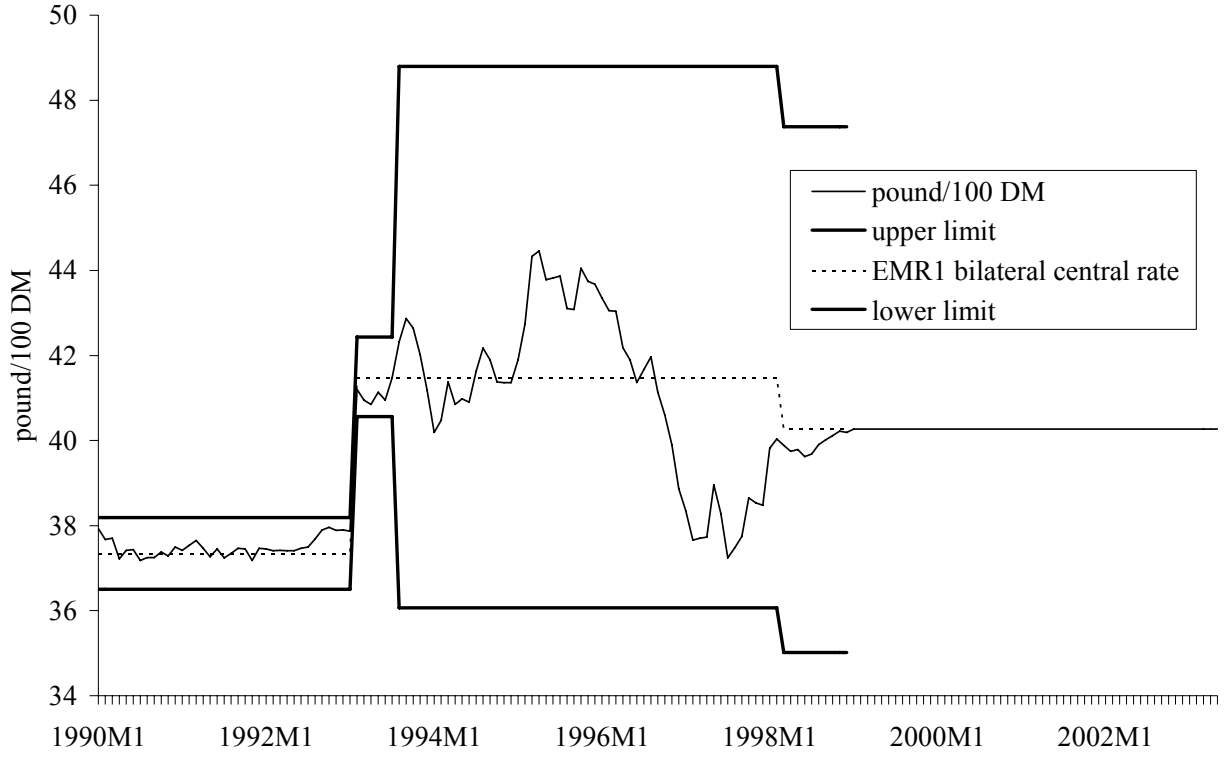
c is assumed to be equal to 1. P_E corresponds to the price level of the Euro Area.

Figure 3: The Balassa-Samuelson-Effect – Fiscal Tightening



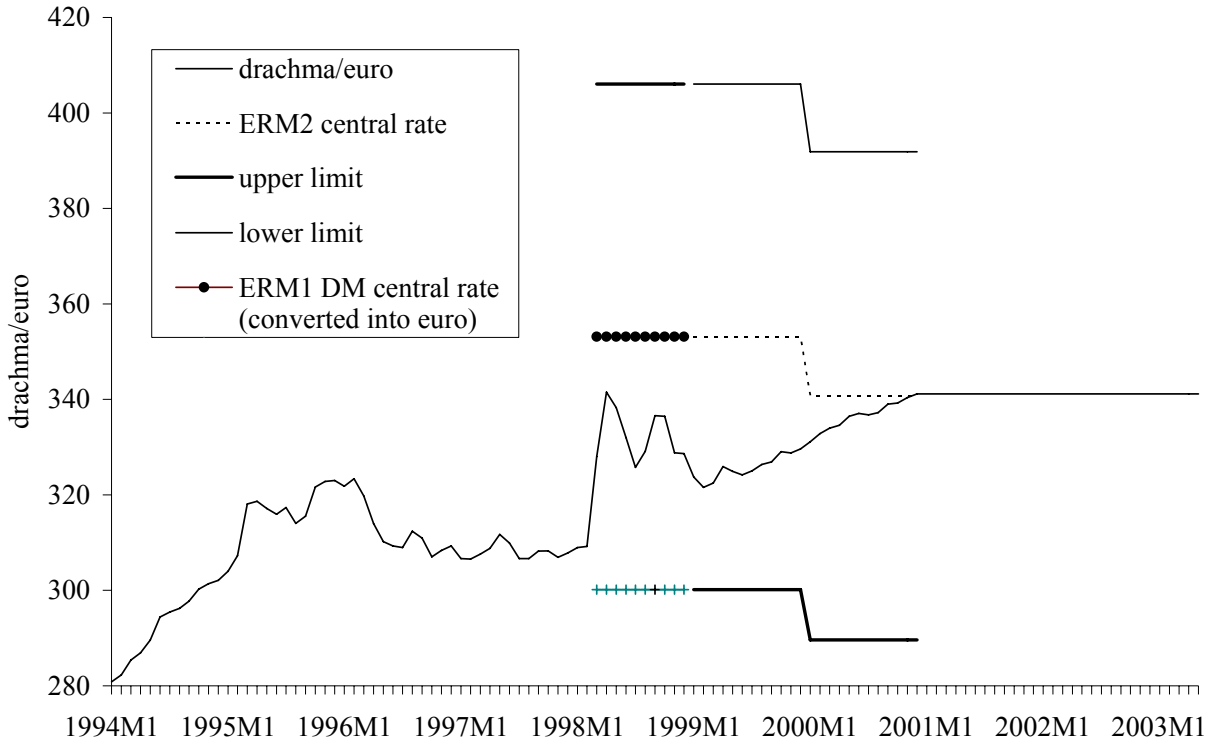
c is assumed to be equal to 1. P_E corresponds to the price level of the Euro Area.

Figure 4: ERM1 and EMU Membership of Ireland



Source: IMF: IFS.

Figure 5: Pre-ERM2, ERM2 and EMU Membership of Greece



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

Figure 6: Simulation of EMU Entry Based on Hard Pegs to the Euro

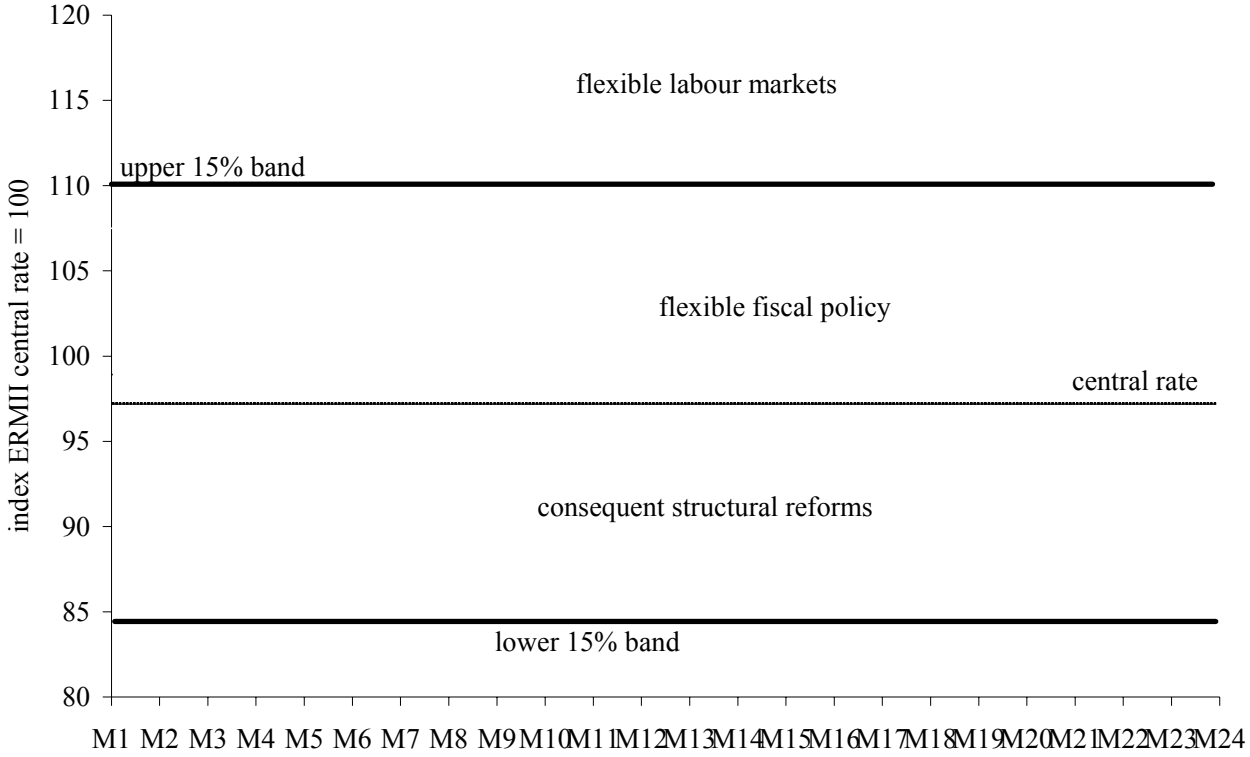


Figure 7: Simulation of EMU Entry Based on the Irish Model

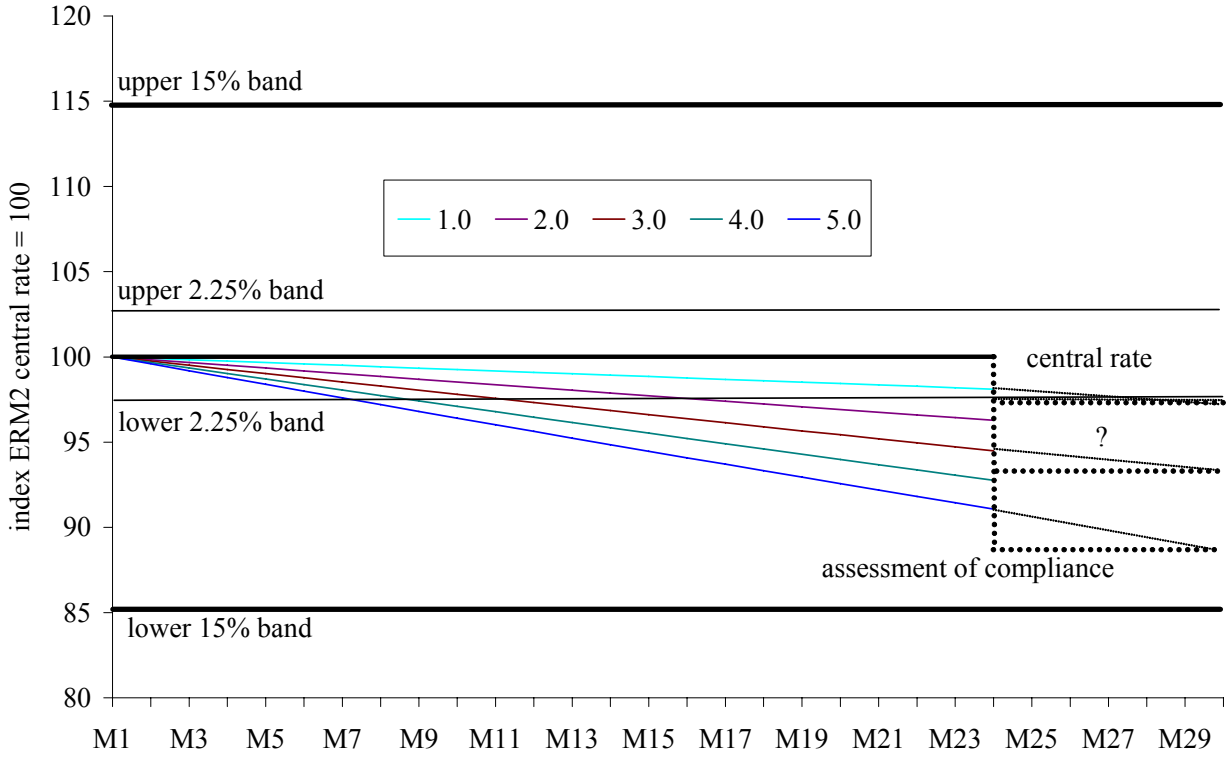


Figure 8: Simulation of EMU Entry Based on the Greek Model