



# Inflation convergence in the euro area: just another gimmick?

Inflation  
convergence in  
the euro area

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355

## Abstract

**Purpose** – The Maastricht inflation criterion has influenced the choice of disinflation strategies of prospective euro area member countries. Some historically high-inflation countries chose the fiat disinflation strategy of “low inflation now, reforms later,” bringing inflation down quickly. Their inflation rates increased immediately after their euro applications were assessed positively and stayed significantly higher than inflation in France and Germany, two historically low-inflation countries. The inflation differentials reflect both structural rigidities inherited from the past and higher inflation expectations stemming from the chosen disinflation strategy. This paper seeks to address these issues.

**Design/methodology/approach** – The paper highlights the inflation consequences of the choice of compliance policies with the Maastricht inflation criterion. To this end, the paper estimates costs of future disinflations in six high-inflation countries for which well-established stylized facts are held.

**Findings** – The Maastricht inflation criterion has been an influential nominal rule. While it swayed the public stance toward low inflation, it biased the choice of the disinflation strategy toward fiat measures. Inflation in these countries declined only temporarily, giving these countries a pronounced V-shaped pattern of inflation. These countries tended to opt for “low inflation now, reforms later” approach, which yielded low inflation quickly at the cost of postponing long-term structural reforms. While the ERM II process can be made relatively painless by fiat measures, such a strategy results in inefficient transmission mechanisms and costly disinflations.

**Originality/value** – The paper highlights the long-run inflation consequences of the choice of compliance policies with the Maastricht inflation criterion. While inflation was low prior to the euro and stayed low afterward in inflation-averse countries, a V-shaped inflation path in high-inflation countries is seen. The countries that expect to benefit the most from a fast adoption of the euro are likely to opt for fiat-driven compliance. The choice of compliance policies has consequences for future disinflations – monetary transmission distortions and inefficiencies of fiat policies increase the cost of future disinflations and will complicate ECB policymaking for years to come.

**Keywords** Inflation, Economic convergence, Euro, European Union

**Paper type** Research paper

## I. Introduction

The Maastricht inflation criterion—inflation of no more than one-and-a-half percent above the average inflation rate of the three European Union (EU) member states with the most stable prices—affects the choice of policy strategies to meet the criterion. Countries that

**JEL classification** – E31, E32, E42, F33

The authors are thankful for comments from A. Carare, L. Christiano, M. Čihák, E. Detragiache, M. Hampl, V. Koen, L. Lipschitz, M. Mandel, O. Schneider, and R. Vaubel, M. Tierney, and an anonymous referee; they also benefited from discussion at the Conference on Political Economy of International Organizations at Monte Verità and at seminars at the Czech National Bank and the International Monetary Fund. Batoul Rida provided research assistance.



expect to benefit the most from a fast adoption of the euro are likely to opt for fiat-driven compliance. Moreover, a tight inflation criterion motivates the authorities to pursue policies of short-term demand stabilization or price and indirect tax interventions at the expense of long-term structural reforms that would create a low-inflation environment. Examples of the former are a wage freeze or a temporary cut in indirect taxes, while examples of the latter are labor- and product-market liberalization. The choice of compliance policies has consequences for future disinflations – monetary transmission distortions and inefficiencies of fiat policies increase the cost of future disinflations and will complicate European Central Bank (ECB) policymaking for years to come.

While inflation was low prior to the euro and stayed low afterward in traditionally inflation-averse countries such as Germany, France, or The Netherlands, we see a V-shaped inflation path in traditionally high-inflation countries, such as Ireland, Italy, Portugal, Spain, Greece, Slovenia, Cyprus, Malta, and Slovakia. The V-shaped path – with the trough around the time when the European Commission was to decide on the country's euro application – appears similar in all sample countries despite the fact that they adopted the euro at different points of time (1999, 2001, 2007, 2008, and 2009).

The paper highlights the inflation consequences of the choice of compliance policies with the Maastricht inflation criterion. To this end, we estimate costs of future disinflations in six high-inflation countries for which we have well-established stylized facts. The results suggest that the countries that choose the fiat disinflation strategy of “low inflation now, reforms later” have had modest short-term costs of disinflation, mostly attributable to “borrowed credibility” from the ECB, however, their long-term costs have been high, reflecting structural rigidities inherited from the past. In contrast, reformist countries benefit from flexible markets and forward-looking agents, both of which push long-run disinflation costs down. While product and labor market reforms would not by itself secure lower national inflation rates, they would make fiat pre-euro disinflations less attractive. We also argue that future euro area applicants would benefit from a criterion that makes the choice of a fiat disinflation strategy less likely, either by calculating the criterion over the business cycle or by lengthening the evaluation period to better assess inflation sustainability.

This paper is organized as follows. First, we outline the pattern of inflation in selected euro area countries around the adoption of the euro and the choice of disinflation policies. Second, we compute hypothetical output losses from disinflation policies. Finally, we discuss the policy implications of the Maastricht criterion for the conduct of monetary policy in the member states and by the ECB.

## II. Disinflation and the Maastricht inflation criterion

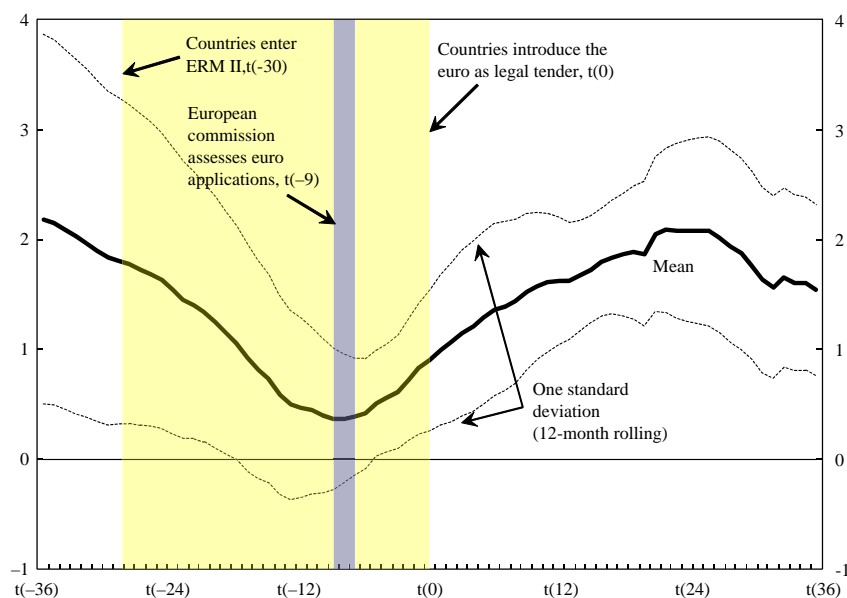
The concept of the new European monetary order was simple. Once exchange rates were stabilized and inflation rates converged, the former would be irrevocably fixed and the latter would be controlled by pan-European monetary policy of the ECB (Wyplosz, 1997). The plan was to motivate national central banks to bring inflation in line with low-inflation countries and it was to be supported on the institutional side by the European Monetary Union framework, including the finance ministers working group. Prior developments showed that time-inconsistent policies fueled by distorted labor markets, tax systems prone to inflation bias, and other structural impediments make it difficult to ensure a low-inflation environment in Europe. This failure can be seen also as the result of non-cooperation between the monetary and fiscal authorities.

Thus, to encourage the individual countries to undertake fundamental economic reforms prior to joining the adoption of the euro, the EU imposed various entry conditions jointly known as the Maastricht convergence criteria, see Article 109(j) of the Maastricht Treaty (EU, 1992). The inflation criterion reads:

[...] the achievement of a high degree of price stability; this will be apparent from a rate of inflation which is close to that of, at most, the three best performing Member States in terms of price stability.

### A. Inflation developments around the adoption of the euro

All historically high-inflation countries were able to lower the national rate of inflation to or below the Maastricht criterion rate at the time of the euro application, but a number of them did not sustain such rates much beyond the month when the euro application was accepted. This result was predicted by Buitert (2004), who argued that the Maastricht criterion would serve as a “purgatory” with no impact on long-term inflation development. While inflation in Germany, France, The Netherlands and a few other low-inflation countries was low prior to the euro and stayed low afterward, we see the V-shaped inflation path in the traditionally high-inflation countries, such as Ireland, Italy, Portugal, Spain, Greece, Slovenia, Cyprus, Malta, and Slovakia, (see Figure 1)[1]. Inflation rates of the nine high-inflation countries – expressed here as



**Notes:** Sample average of national inflation differentials *vis-à-vis* France and Germany; all national series are centered on the month of the adoption of the euro,  $t(0)$ , that is, January 1999 for Italy, Ireland, Portugal, and Spain; January 2001 for Greece; January 2007 for Slovenia; January 2008 for Cyprus and Malta; and January 2009 for Slovakia. The post-adoption average is therefore unbalanced: we have only 33, 21, and 9 post-adoption observations for Slovenia, Cyprus and Malta, and Slovakia, respectively

**Source:** Eurostat; authors' calculations

**Figure 1.**  
Average inflation differential in nine high-inflation countries

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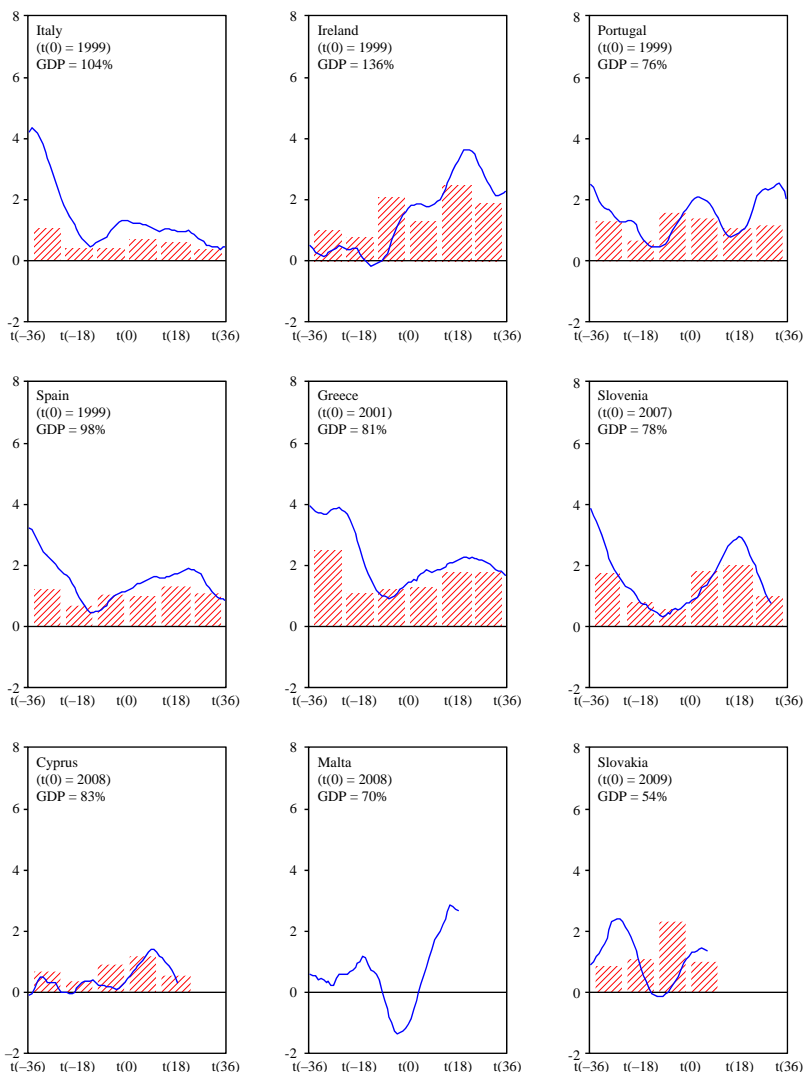
a differential *vis-à-vis* inflation in Germany and France to take out the global price shocks – were fairly similar in all countries despite the fact that they adopted the euro at different points of time and at different phases of the global business cycle (Figure 2).

The general pattern is as follows: three years before the eventual date of the euro introduction and before the countries in question entered the ERM II regime (the lightly shaded area in Figure 1) the national average annual rates of inflation were some 2-4 percentage points above the relevant Maastricht criterion rate. Upon entering the ERM II, the average national rates of inflation declined quickly to the Maastricht criterion rate, bottoming out at about nine months prior to the euro introduction,  $t(-9)$ , or precisely at the time the European Commission was to decide on whether the country's euro application was to be accepted or rejected. Interestingly, 1-year – ahead inflation expectations were higher than those of France and Germany by some 1-2 percentage points (bars in Figure 2)[2]. Clearly, the market analysts surveyed by consensus forecast did not believe that inflation will stay at the level of the two largest euro area countries thereafter.

After the application to join the euro area was accepted in mid-year, inflation accelerated sharply in all countries. On average, by January of the next year and at the time of the formal introduction the euro notes, inflation in the sample countries was higher by about 1 percentage point than inflation in France and Germany. The differential increased to 1.6 and 2.0 percentage points in 12 and 24 months after the introduction, respectively.

The temporary, fiat downward pressures on inflation were relaxed immediately after the successful euro application and the inflation rates in the sample countries started to diverge (Buliř and Hurnik, 2008) and their persistence increased (Stavrev, 2007). Needless to say, we fail to observe the V-shaped pattern of inflation either in EU countries that have yet to apply for the euro (Denmark, Sweden, and the UK) or the remaining, low-inflation euro area countries. In other words, the impetus of the Maastricht inflation criterion seemed to be binding only in the run-up to the euro, but not thereafter. Why is inflation low in some countries and high in other, despite the pan-European monetary stance of the ECB? Inflation differs across countries for four main reasons and only some of these factors can be affected by monetary policy actions (Angeloni and Ehrmann, 2004; Mody and Ohnsorge, 2007; and Buliř and Hurnik, 2008). First, the ECB's control over the aggregate demand fluctuations explains a substantial part of inflation fluctuations as economies with output above its potential experience price pressures. Of course, economic overheating and high inflation in any given euro area country matter for ECB's decision making only to the extent of the country's weight in the euro area harmonized index of consumer prices (HICP). Most sample countries are too small to make a sizable impact: while the cumulative weight of the nine countries is exactly 40 percent, after excluding Italy and Spain, the weight of the remaining seven countries is less than 9 percent[3].

The following factors are not under the control of the ECB. Second, the average price level and the level of economic development have been closely correlated. When the exchange rate is fixed and as the relatively poorer countries' incomes converge toward those of relatively richer countries, the price levels will be brought in line predominantly through faster inflation in the poorer countries (the so-called "convergence" inflation) and to a lesser degree through faster productivity in the nontradable sector that would limit the impact on the price level (the Balassa-Samuelson effect). This component of inflation divergence is unavoidable and may explain a big part of inflation developments



**Notes:** National inflation rate minus the mean of average inflation rates in France and Germany; inflation is measured monthly year-on-year. Inflation expectations are one-year-ahead for end-period annual inflation; for example, December 1998 vintage of consensus forecast for end-1999 inflation. All series are centered on the month of the adoption of the euro,  $t(0)$ , that is, January 1999 for Italy, Ireland, Portugal, and Spain; January 2001 for Greece; January 2007 for Slovenia; January 2008 for Cyprus and Malta; and January 2009 for Slovakia. consensus forecast data are not collected for Malta. GDP is measured as 2001-2007 average GDP per capita in percent of the EU-25 average

**Source:** Eurostat(actual inflation) and consensus forecast(expected inflation)

**Figure 2.** Inflation and inflation expectations around the adoption of the euro

in the fast-growing countries like Greece or Ireland that have had correspondingly high, fundamentals-driven appreciation of the real exchange rate. The contribution of this factor does not explain faster inflation in all countries, however, as purchasing parity gross domestic product (GDP) per capita of Italy and Spain has been above or equal to the EU average during 2001-2007 (Figure 2). Third, the EU countries with more protected and regulated product or labor markets have had higher average inflation rates than those with less protected markets. Higher markups in the protected markets in Greece or Italy increased these countries' unit labor cost, appreciating real exchange rates above and beyond the fundamentals-driven real exchange rates, and damaging competitiveness on their economies. Fourth, the domestic authorities have exercised control over administered prices and indirect taxes, thus affecting consumer price inflation. It appears that it is the last reason that explains a big part of inflation developments in high-inflation countries.

On balance, it would be naïve to believe that any amount of market liberalization could offset fully the economic boom that resulted from the euro-related convergence process (lower risk premia, gains from trade, and so on), but such liberalization would have limited the damage.

#### *B. Taking stock of the authorities' disinflation choice*

The ERM II countries – in particular those heavily managing their currencies – cannot control the “convergence” inflation and may be unwilling to proceed with structural reforms, but they may impose temporary tight macroeconomic policies to widen the output gap, limit the growth of administered prices, or forego an increase in indirect taxes. The Maastricht criterion increased aversion to inflation (Cecchetti and Ehrmann, 1999; Goldberg and Klein, 2005), however, it failed to stimulate the euro area countries' structural reforms as these remained slow and insufficient (Ahearne and Pisani-Ferry, 2006). The Lisbon strategy, the development plan for the EU, set out by the European Council in Lisbon in March 2000, and the prominent role played by structural reforms within this framework, failed to complement the thrust of the macroeconomic Maastricht criteria (Pisani-Ferry and Sapir, 2006).

It has been long argued that a part of pre-euro inflation stabilization in high-inflation countries was a window dressing exercise to cover the structural sources of inflation through fiat measures such as monetary tightening and administrative gimmicks. The national authorities have been aware that they can disinflate permanently through credible monetary policy and market-oriented reforms, both of which would lower inflation expectations; temporarily through short-term, fiat measures; or through a combination of both. With regard to permanently reducing inflationary pressures, the authorities would have to establish a low-inflation, competitive environment and embed low-inflation expectations. As for reducing inflation by fiat, the authorities would have to bring about *ad hoc* changes in regulated prices and indirect taxes, forge a temporary consensus of price and wage moderation, or engineer a sharp demand contraction to bring inflation down along a short-run Phillips curve. Domestic political economy in either reform-averse countries or countries with a backlog of structural reforms obviously favored fiat measures, which affect inflation with a shorter lag than reforms and entail smaller output losses. Virtually all euro area members engaged in some sort of fiscal or accounting gimmickry in their rush to the euro (Koen and van den Noord, 2005; Balassone *et al.*, 2007).

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Inflation gimmicks have been less publicized than fiscal gimmicks, but they were no less frequent. For example, the Irish Government was advised to “reduce the headline rate of inflation by reducing indirect taxes” (Beggs, 2000) and trade unions recommended “a moratorium on administrative prices” to keep inflation below 2 percent (European Trade Union Confederation, 2006). Indirect tax cuts in Greece lowered inflation by up to 1 percentage point in the reference period, assuming a full pass-through to consumer prices (ECB, 2000). In Latvia, the International Monetary Fund (IMF, 2005) criticized the authorities for “freezing administered prices.” In Slovakia, the IMF reported that 2007 inflation decelerated owing to “decreases in regulated prices [. . .] under pressure from the government” (IMF, 2007; Fitch, 2007).

Inflation was brought down also by the “brute force” of demand compression. The pre-euro output gap in our sample countries was highly negative, averaging almost – 2 percent of GDP in the three years prior to the euro application (calculation using the AMECO database of production function-based potential GDP). The output cost of pre-euro demand contractions was justified by their temporary nature as compared to the permanent benefits of the euro area membership. At least one central bank signaled well in advance its willingness to keep output below its potential in the run-up to and during ERM II (Slovak National Bank, 2005).

The optimal choice of disinflation tools – reforms or fiat – depends on the relative cost of reforms and benefits of euro area membership, conditional on meeting the inflation target. If the country puts enough weight on the near-term benefits of membership, the authorities are likely to choose the fiat measures in order to enter as quickly as possible, while garnering maximum political support (Ozkan *et al.*, 2004). Under such conditions long-term structural reforms are much less attractive, because they are likely to push the euro area membership far off into the future. If, however, the country assigns less weight to the immediate benefits of the euro, then the authorities are likely to deliver low inflation by running independent monetary policy, additional structural reform measures, and fewer fiat measures. The country would then enter the euro area at a later date, but with a healthier economy and low, sustainable inflation.

The main benefits of immediate euro area membership are mostly external, providing:

- access to the euro area’s highest rating, which seems to virtually eliminate transfer and convertibility risk and the risk of balance of payments crises;
- a shelter from external monetary shocks and currency crises;
- reduction of foreign currency related credit risks in banking systems; and
- faster GDP growth owing to lower transaction costs, increased investment, trade and capital flows, and lower capital costs.

The potential costs of euro adoption are also concentrated on the external and fiscal side:

- the loss of monetary and exchange rate policy flexibility to deal with asymmetric shocks;
- higher inflation related to loss of nominal exchange rate flexibility during a period of income convergence;
- risks to macroeconomic imbalances from excessive capital inflows; and
- a loss of the ability to inflate away the domestic-currency debt.

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It has been observed that the countries to gain the most from a fast euro adoption are those with weak external positions and comparatively strong fiscal positions, such as the Baltic States, Bulgaria, and Romania (Fitch, 2007).

The choice of disinflation strategy also depends on whether the inflation criterion is “tight” or “soft.” A tight criterion will at the margin push the authorities toward either fiat measures (or gimmicks), as the chance of meeting such a target would be limited without aggressive steps. In contrast, a soft inflation criterion should, other things being equal, push the authorities toward adopting reform measures as the chance of meeting such a target would be sufficiently high even without fiat actions. Thus, it does not seem surprising that when the Maastricht reference inflation rate was very low, as in the last ten years, countries resorted to fiat measures and gimmicks. This discussion would be of interest to economic historians only but for the fact that these strategies predetermine inflation performance in the euro area.

### III. How costly can disinflation be and why?

The initial choice of the reform- or-fiat disinflation mix has long-term consequences and in this section, we will attempt to quantify these costs. Structural rigidities, solidified by the use of the fiat measures, translate into a flatter Phillips curve, making the monetary policy transmission mechanism less efficient and future disinflations more costly. While the fiat-measure strategy may appear optimal in the short-term, the longer-term failure to create a low-inflation environment is likely to push the rate of inflation up over time. One possible method way of assessing the cost of future disinflation is by calibrating a new – Keynesian monetary model to fit the stylized facts of the economy in question and shocking the model economy with a change in the inflation objective. From these simulations, we obtain an estimate of the output gap resulting from tightening of the monetary policy stance toward the new inflation objective – that would have been consistent with 1 percentage point disinflation.

While the exact numerical results of our simulations need not be taken literally, they enable us to evaluate the long-term costs of disinflation across individual countries and link these costs to past policy choices. On one hand, our estimates are conditional on the past structure of the economy and historically observed agents’ response to shocks. Of course, there is no a priori reason why the sample economies and agents’ responses should not change following either the ERM II transition or euro adoption (Ciccarelli and Rebucci, 2006). On the other hand, the past-structure scenario is attractive providing the natural benchmark against which scenarios of changing policy environment would compare. Thus, we probably overestimate the output losses in countries that have reformed or in which the public has become more forward-looking.

#### *A. The model*

We capture the link between structural reforms and the monetary transmission mechanism in a simple model based on Walsh (2003). This framework has been employed widely in the past 20 years despite some limitations, such as the use of relationships that are difficult to test empirically (for example, the uncovered interest parity). The model consists of five equations that represent aggregate demand, aggregate supply, the uncovered interest rate parity condition, term structure, and the policy-reaction function (see the Appendix and, for further detail, Bulíř and Hurník, 2006). The aggregate spending relationship links the deviations of log output, the



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long-term real interest rate, and the real exchange rate from their steady-state levels. The aggregate supply equation, or the Phillips curve, captures the relationship between inflation, inflation expectations, import price inflation, and the output gap. Agents base their inflation expectations on a weighted average of forward-looking and past rates of inflation. The medium-term real exchange rate path is calibrated and the short-term relationship with the world is captured through the uncovered interest rate parity condition that relates the behavior of domestic and foreign interest rates and the nominal exchange rate, while allowing for persistence. The model is closed by a policy reaction function, whereby the monetary authority responds to the level of expected inflation, the deviations of expected inflation from a target, and the output gap, while taking into account the previous-period policy stance.

Other things being equal, disinflation requires output below potential and the inflation sensitivity to the output gap is determined by the slope of the Phillips curve. However, disinflation is less painful if the agents are forward-looking, thus incorporating the credible disinflation announcement into their expectations or if the exchange rate is less persistent.

### *B. Calibration*

The choice of countries is based on their inflation history. We simulate disinflations in a number of euro area countries with historically high-inflation rates: Greece, Ireland, Italy, Spain, Slovakia, and Slovenia (for data problems, we omit the other three countries in our sample). The country-specific models are calibrated following the methodology outlined in Berg *et al.* (2006), basing the parameters on:

- economic principles;
- available econometric and anecdotal evidence; and
- the sensible behavior of the whole model.

To ensure comparability of individual countries, we assume that the weights of inflation and output stabilization in the policy rule are the same for all countries and equal to 1/2 (as in Taylor, 1993), while the policy persistence parameter is country specific. In other words, we try to strike a balance between comparability of treatment and capturing country-specific characteristics.

First, we replicate the structural model Phillips curve estimates summarized in Rumler (2007) and other recent national central bank, ECB, and IMF publications (for complete calibration references and country-specific coefficients see Bulíř and Hurník, 2006). Second, we set the remaining parameters to mimic the well-known features of the individual economies, drawing either on the impulse response functions from the published central banks models or structural VARs. The estimates of impulse response functions are useful for designing the dynamic properties of individual calibrations. They help us to replicate, for example, the strong exchange rate channel in Hungary, stability of the real exchange rate in Slovenia, or a “two-peak” response of inflation to an interest rate shock reported in Poland. The stress is on replicating the selected qualitative characteristics of the economies in question rather than on statistical tests of historic goodness of fit. The resulting parameterization of the basic model exemplifies the impact of past policy choices. Reform laggards, such as Italy, tend to have a flatter Phillips curve; more reform-oriented countries seem to benefit from the forward-looking behavior of economic agents (Ireland); and so on.

*C. Simulations*

In our simulations a new and credible inflation objective – that is lower by 1 percentage point than the prevailing rate is announced, while letting the authorities choose a disinflation path consistent with the lowest possible output costs, given its reaction function. The authorities care about inflation only, ignoring fiscal developments or other macroeconomic and social indicators not encompassed in the policy rule. Following Cecchetti and Ehrmann (1999), we cumulate the associated output gap both over the three-year horizon and full, ten-year simulation horizon (Table I).

Estimated output losses differ substantially both across countries and across simulation horizons, reflecting the country-specific transmission mechanisms. In some countries disinflation costs are mostly one-off, in others disinflation appears to have longer-term growth consequences. First, in the three-year horizon, disinflation does not seem very costly in Greece and Ireland, whereas the costs appear much higher in Italy and Slovakia. Second, in the long run, output losses seem relatively low in Greece, Ireland, and Slovakia, whereas they appear much higher in Italy, Spain, and Slovenia. In other words, Italy and Spain require tighter monetary policy than Ireland or Slovakia to bring about the output gap required for the given decline in inflation.

The magnitude of output losses reflects mostly the structural characteristics of the individual euro area states as these differ substantially in the observed persistence of their economies and in expectations formation. Greece’s IS and Phillips curves are not persistent, however, the financial markets seem mostly backward looking. Ireland’s inflation reacts quickly and forcefully, mostly through the exchange rate channel. Although output is not much affected by interest rates, the gap-to-inflation nexus is comparatively strong. Italy appears to have a highly persistent economy with a flat Phillips curve. Spain seems to be a highly persistent economy, but the estimates of the Phillips curve are steeper than that of Italy. Both Slovenia and Slovakia exhibit mostly backward-looking behavior in the financial markets and such persistency is only partially compensated by the Phillips curve, the steepness of which is below the sample average. Slovenia’s Phillips curve is somewhat steeper than that of Slovakia, diminishing the short-run cost of disinflation.

Our results for the euro area countries, notably Italy, Spain, and Slovenia, seem consistent with the choice of “low inflation now, reforms later.” On one hand, their short-term costs of disinflation are relatively modest, mainly because of “borrowed credibility” from the ECB. On the other hand, their long-term costs are high, reflecting structural rigidities inherited from the past. In their rush to the euro, these countries set aside reforms that would ultimately have left their economies more flexible and better prepared for future disinflations. In contrast, the economies of Greece, Ireland,

| Cumulative output gap | Greece | Ireland | Italy   | Spain   | Slovakia | Slovenia |
|-----------------------|--------|---------|---------|---------|----------|----------|
| 12-quarter            | - 1/10 | - 1/10  | - 1/2   | - 1/4   | - 3/4    | - 1/3    |
| Full-horizon          | - 3/4  | - 1/2   | - 3 1/2 | - 1 3/4 | - 3/4    | - 1 1/3  |

**Table I.**  
Output losses following  
a 100-basis point  
disinflation

**Note:** In percent of GDP  
**Source:** Authors’ simulations

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and Slovakia seem more flexible – presumably as a result of past reforms and disinflations ought to be relatively painless.

#### **IV. Policy implications of the Maastricht criterion**

EU member countries have been aware that long-run reforms are politically costly, especially if they require consent of political groups, while fiat measures are virtually costless in terms of foregone output or domestic political capital. The choice between reform and fiat disinflation strategies is affected also by the definition of the criterion. A tight definition of the criterion – the three best performers, who are often economies with negative output gaps tilts the euro-applying countries toward the fiat-measure strategy as the chance of meeting a tight target may seem limited without aggressive administrative measures. The fiat strategy has been particularly attractive to countries that are to benefit immediately from the euro, either through lower borrowing costs (Greece and Italy), reduced current account vulnerability (the Baltic States), or from the ECB's low-inflation credibility (Italy and Hungary).

The choice of whether to reform or not affects both future inflation and the cost of future disinflations. Regulated markets with high markups and unit labor costs generate substantial inflationary impulses (Papademos, 2007) and economies with such nominal rigidities tend to have less efficient monetary transmission mechanisms requiring larger and longer-lasting output gaps to extinguish inflation. In contrast, liberalization of labor and product markets would spur productivity growth in the nontradable sector and thus arrest the nontradable and overall inflation. While nonreformers may succeed in lowering inflation temporarily, by failing to address the underlying cost-push impulses they will make future disinflations more costly. Still, from the domestic perspective, it may be better to opt for the fiat measures if the domestic political stalemate precludes the reforms – at least the ECB credibility will make agents more forward-looking and monetary policy transmission more efficient. Greece provides a good example of a much improved transmission mechanism despite only modest reforms and mostly fiat-driven disinflation (Chionis and Leon, 2006).

Looking ahead, a further fiat-driven rush toward low inflation in order to satisfy the Maastricht inflation criterion is likely to be costly both for the new member states and the ECB. The long-term risks for the new member states are identical to those faced by the high-inflation old member states – stalled reforms, inflexible economies, and loss of competitiveness as inflation accelerates following the adoption of the euro and the real exchange rate appreciates above and beyond the fundamentals-driven trend appreciation (Blanchard, 2007). The long-term impact on the ECB is costly as well. The more, the euro area applicants choose the fiat measures, postponing structural reforms and varying the euro area transmission mechanism, the more adverse impact this will have on ECB decision making. Using the above results, to keep inflation low Italy would require much tighter monetary stance than, say Ireland or Slovakia. We draw two policy lessons from the past experience. First, a tight Maastricht inflation criterion provides incentives for fiat measures. It would seem preferable to either exclude the countries with negative output gaps, or to calculate the reference Maastricht rate over the full length of the business cycle. This should be a feasible change – the estimates of the output gap are published regularly by the EU. Second, the short, 12-month testing period during the ERM II period may further stimulate the use the fiat strategy.

A longer testing period, covering the full business cycle of the applicant country, would seem more appropriate.

## V. Conclusions

The Maastricht inflation criterion has been an influential nominal rule for the past 15 years. While it swayed the public stance toward low inflation, it biased the choice of the disinflation strategy toward fiat measures, in particular in high-inflation countries that have a lot to gain from the euro. Inflation in these countries declined only temporarily, giving these countries a pronounced V-shaped pattern of inflation. These countries tended to opt for “low inflation now, reforms later” approach, which yielded low inflation quickly at the cost of postponing long-term structural reforms. While the Maastricht inflation criteria can be fulfilled relatively painlessly by fiat measures, such a strategy results in inefficient transmission mechanisms and costly disinflations, complicating future ECB decision making.

The paper documents the link between the choice of disinflation strategies and costs of future disinflation. Disinflation appears costly in reform laggards with backward-looking expectations, while it appears less costly in reformist countries with forward-looking agents. The differences stem from the slope of the national Phillips curves, the expectations formation, and the persistence of output, inflation, and exchange rate. Countries that choose the fiat disinflation strategy of “low inflation now, reforms later” have modest short-term costs of disinflation, mostly attributable to “borrowed credibility” from the ECB. But their long-term costs are high, reflecting structural rigidities inherited from the past and limited productivity gains in the nontradable sector. In contrast, reformist countries benefit from flexible markets and forward-looking agents, both of which push disinflation cost down. Thus, we argue that the member countries benefit from a criterion that would make to the choice of a fiat disinflation less likely.

## Notes

1. We observe the V-shaped pattern also in Lithuania that missed the criterion by a mere 0.1 – percentage point in 2006 – the country’s application was rejected primarily on sustainability grounds. With the benefit of the hindsight, this seems like a good decision: inflation in Lithuania accelerated to more than 11 percent at end 2008.
2. We use the December vintage of consensus forecast surveying inflation predictions for the end-period of the following year.
3. See the ECB’s HICP available at: [www.ecb.int/stats/prices/hicp/html/hicp\\_economic\\_activities\\_inw\\_2009.en.html](http://www.ecb.int/stats/prices/hicp/html/hicp_economic_activities_inw_2009.en.html)

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#### Appendix. The model

The model used in our simulations is as follows:

$$y_t = a_1 y_{t-1} - a_2 r_{t-1} + a_3 q_{t-1} + u_t \quad (A1)$$

$$\pi_t = b_1(b_2 \pi_{t-1} + (1 - b_2)E_t \pi_{t+1}) + (1 - b_1)\pi_{t-1}^{imp} + \gamma y_{t-1} + \eta_t \quad (A2)$$

$$\pi_t^{imp} = m_1 \pi_{t-1}^{imp} + (1 - m_1)(\pi_{t-1}^* + \Delta s_{t-1}) \quad (A3)$$

$$E_t \pi_{t+1} = e_1 \pi_{t+1}^e + (1 - e_1)\pi_{t-1} \quad (A4)$$

$$\Delta s_{t+1} = c_1 \Delta s_t + (1 - c_1)(i r_t - i r_t^* - \text{prem}_t) + \nu_t \quad (A5)$$

$$i_t = d_1 i_{t-1} + (1 - d_1)(\pi_{t+1}^e + d_2(\pi_{t+1}^e - \pi^T) + d_3 y_t) + \varepsilon_t \quad (A6)$$

$$i r_t = f_1 i r_{t-1} + (1 - f_1) \left[ \frac{i_t + i_{t+1} + i_{t+2} + i_{t+3}}{4} \right] \quad (A7)$$

$$r_t = i r_t - E_t \pi_{t+1} \quad (A8)$$

$$q_t = q_{t-1} + \frac{\Delta s_t + \pi_t^* - \pi_t}{4} \quad (A9)$$

where equations (A1)-(A9) represent aggregate demand, aggregate supply, import price formation, inflation expectations formation, uncovered interest rate parity, policy reaction function, interest rate term structure, Fisher equation, and real exchange rate formation, respectively. Table A1 defines the model variables. For the country-specific calibrations see Bulir and Hurnik (2006).

**Table AI.**  
Model variables

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|                      |   |
|----------------------|---|
| $y_t$                | The deviation of the log output from its steady state level                   |
| $r_t$                | The deviation of the long-term real interest rate from its steady state level |
| $q_t$                | The deviation of the real exchange rate from its steady state level           |
| $\pi_t$              | Inflation, quarter-to-quarter change of the price level                       |
| $E_t \pi_{t+1}$      | Inflation expectations  |
| $\pi_{t+1}^e$        | Model consistent inflation expectations                                       |
| $\pi_t^{\text{imp}}$ | The rate of growth of import prices   |
| $\Delta S_t$         | The change in the nominal exchange rate                                       |
| $i_t$                | The short-term (three-month) nominal interest rate is the policy rate         |
| $i_t^*$              | The long-term nominal interest rate   |
| $\pi_t^*$            | Foreign inflation   |
| $i_t^*$              | The foreign long-term nominal interest rate                                   |

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