Exchange Rate Management and Inflation Targeting in the CEE Accession Countries

Fabrizio Iacone
Renzo Orsi

Ezoneplus Working Paper No. 8

August 2002

FIFTH FRAMEWORK PROGRAMME

Ezoneplus

The Eastward Enlargement of the Eurozone
Research Project HPSE-CT-2001-00084
Fifth Framework Programme 2001-2004
European Commission
www.ezoneplus.org

Jean Monnet Centre of Excellence

Freie Universität Berlin
Ihnestr. 22, 14195 Berlin, Germany
Phone: +49 (30) 838 – 54966
Fax: +49 (30) 838 – 52357
Email: info@ezoneplus.org

Ezoneplus Working Paper No. 8
August 2002

Exchange Rate Management and Inflation Targeting in the CEE Accession Countries

Abstract

We consider a small structural model to describe the transmission mechanism of monetary policy and the dynamics of inflation. We first verify the validity of the general structure estimating it for Germany which represents a sort of benchmark model. At least one of the links required for the transmission mechanism of monetary policy, when we analyse the Central and Eastern European Countries (CEECs), reveals to be not significant when considered on the whole sample. On the contrary the results are closer to a textbook description when the attention is shifted to the second part of the sample only. We interpret this as a piece of evidence indicating that the transition is indeed operating, but it is still ongoing and in some cases it is not complete yet. We also verify that the effects of the exchange rate on both the aggregate demand and on the inflation are in agreement with the economic theory. We conclude that the exchange rate should be actively used to control the inflation in the CEECs.

Corresponding authors:

Fabrizio Iacone
Department of Economics
University of Bologna (Italy)
and London School of Economics (GB)
F.Iacone@lse.ac.uk

Renzo Orsi
Department of Economics
University of Bologna (Italy)

orsi@economia.unibo.it

This paper has been prepared as a part of a broader Ezoneplus project that evaluates European Monetary Union (EMU) and its enlargement to prospective members in central and eastern Europe. The project is financially supported by European Commission (HPSE-CT-2001-00084).

EXCHANGE RATE MANAGEMENT AND INFLATION TARGETING IN THE CEE ACCESSION COUNTRIES[1]

by

Fabrizio Iacone[2] and Renzo Orsi[3]

(June 2002)

Abstract

We consider a small structural model to describe the transmission mechanism of monetary policy and the dynamics of inflation. We first verify the validity of the general structure estimating it for Germany; we then find that for the Central and Eastern European Countries (CEECs) that we analyse at least one of the links required for the transmission mechanism of monetary policy is not significant when considered on the whole sample, but that the results are closer to a textbook description when the attention is shifted to the second part of the sample only. We interpret this as a piece of evidence that the transition is indeed tacking place, but it is still ongoing and in some cases it is not complete yet. We also verify that the effects of the exchange rate on both the aggregate demand and on the inflation are in line with the economic theory, and the evidence is already convincing in the first part of the sample. We conclude that the exchange rate should be actively used to control the inflation in the CEECs.

[1] Paper prepared for the Ezone*plus* project: The Eastward Enlargement of the Euro-zone, Bologna Workshop 4-7 July 2002. Preliminary version.
[2] Department of Economics, University of Bologna and London School of Economics.
[3] Department of Economics, University of Bologna

1. Introduction

Since the beginning of the transition process to the market economy a great care was paid by the CEECs to the choice of the exchange rate regime. It is well known that we cannot say that a particular exchange rate regime is optimal for transition economies. Looking at what happens we see that we have a large variety of approaches, going from the currency board agreement to a market float within a narrow band; with time, the CEECs also switched from a regime to another. In the meanwhile it is undoubted that the exchange rate provides a sort of nominal anchor for domestic price stability.

In the most recent years anyway the Czech Republic, Hungary and Poland shifted their attention towards an explicit inflation targeting, weakening the exchange rate commitment. This may seem to be a paradox, because the membership of the European Monetary Union (EMU) requires a preliminary two years participation to the Exchange Rate Mechanism (ERM), where the exchange rate is set to be fixed (albeit a 15% oscillation band is allowed on each side). Note that the adoption of the euro is also part of the *acquis communautaire*, which in turn is required for the European Union (EU) membership (the UK and Denmark are at the moment benefiting of a derogation, but it is fair to suspect that such a request would seriously reduce the chances of accession of a country external to the EU, and in any case it seems that the CEECs regard the participation to the EMU as a final goal in its own).

In the section 1 we first discuss the importance of the exchange rate management for the transition to the market economy and the macroeconomic stabilisation, of relevant importance for the first part of the last decade of the century. We then move to the discussion of the choice of the best exchange rate policy towards the accession to the EU. These issues have been widely discussed in the literature: we briefly review these contributions integrating several, different arguments.

To assess the importance of the exchange rate management over the last decade and the feasibility of an inflation targeting policy we consider in section 2 a small structural model similar to the one proposed by Svensson (2000) to describe the transmission mechanism of monetary policy and the dynamics of inflation.

In section 3 we first review the contributions of the applied literature on the issue, and then we proceed to a quantitative analysis using the framework of section 2. We first verify the validity of the general structure estimating it for Germany over the last decade, and then we apply it to the Czech Republic, Poland, Hungary, Slovenia and Bulgaria, finding that at least

one of the links required for the transmission mechanism of monetary policy is not significant when considered on the whole sample.

We note that the results are closer to a textbook description when the attention is concentrated on the second part of the sample only. We interpret this as a piece of evidence that the transition is indeed tacking place, but it is still ongoing and in some cases it is not complete yet. We also verify that the effects of the exchange rate on both the aggregate demand and on the inflation are in line with the economic theory, and the evidence is already convincing in the first part of the sample.

Since the progress towards EU membership requires the CEECs to abandon capital controls, we argue that the shift in the monetary policy goal in the countries where the transition is more advanced came at about the right time, but from our analysis we conclude that the exchange rate should be actively used to achieve the inflation target.

In section 4 we compare the results and draw the conclusions.

2-Transition and Accession.

2.1 Transition: how and where. About the interpretation of the macroeconomic data.

The transition to the market economy of the former socialist countries required the introduction of a radically different institutional and legal framework, and the simultaneous transformation of the production and allocation structures. It involved the establishment of a proper framework of contractual obligations, the liberalisation of prices and production, the hardening of the budget constraint for the public finance and the creation of a relevant financial market with a two tier banking system.

The temporary disruption of the economy is usually summarized looking at fall of the industrial production and at the explosion of the inflation: in Poland, Hungary and Czechoslovakia the industrial production dropped by about 30% between 1990 and 1992, while the annual inflation rates for 1990 (computed as growth of the prices between January 1990 and January 1991) were above 100%, 30% and 60% respectively. When we consider the pervasive nature of the transition, such a dramatic stage seems to be inevitable, and it is more a surprise the speed with which most of the CEECs recovered from the recession and regained a certain control of the inflation.

This success is impressive but concentrating on it too much is misleading, with the twofold effect to both underestimate and overestimate the extent of the transition.

Despite the massive effort produced by the accession countries, Piazolo (2000) concludes that "the CEECs can not yet completely fulfil the Copenhagen economic criterion of the existence of a functioning market economy and the ability to stand the competitive forces within the EU". Using the convergence indicators of the European Bank for Reconstruction and Development (EBRD), Schweickert (2001) finds that the CEECs are still lagging behind in terms of goods and capital markets development when compared to the average industrialised country with qualifications (Hungary and Poland appear to be leading the pack). Nuti (2000) also comments that "the EBRD indicators suffer from an over-optimistic bias", and that "they neglect any notion of minimum requisites for a country to operate as a market economy" making the evaluation of this transition even more doubtful.

The Commission of the European Communities (2001) is somehow optimistic, suggesting that the Czech Republic, Poland, Hungary, Slovenia, Estonia, Slovakia, Lithuania and Latvia are "functioning market economy" but remarking that they could be able to cope with the competitive pressure of the EU only "in the near term" and urging them to proceed further with the reforms (it is interesting to note that in the same report Cyprus and Malta are already considered able to cope with the European competition), while Bulgaria ("close to being a functioning market economy", but a perspective integration should take place in the "medium term" and only if the reforms proceed) and Rumania ("has made progress towards establishing a functioning market economy" but "it would not, in the medium term, be able to cope with competitive pressure and market forces within the Union") are lagging behind.

2.2 The role of the exchange rate and of the international trade in the early stages.

A key role in the quick and successful macroeconomic recovery is usually attributed to the integration in the European economy and to the careful management of the exchange rate.

Price liberalisation had the effect of bringing an adjustment of the relative prices: due to a natural rigidity of the prices with respect to negative corrections and to a certain tendency of the public finance to use seignorage, the realignment of the prices took the form of a sudden increase and a steep inflation followed. Opening to the international trade, the countries in transition had a chance to import a price structure similar to the one of their commercial partners if the local producers were forced to face a hard budget constraint. By fixing the exchange rate, in fact, the internal inflation could not rise too much without losing competitiveness with respect to the foreign producers. It is reasonable, then, the local enterprises react to this pressure partly reducing inflation, and partly reducing the output, for example because the less productive units are pushed out of the market.

To exploit this effect, Poland, the Czech Republic and Hungary explicitly committed to a fixed peg in the beginning of the transition, and Estonia introduced a currency board agreement.

A supplementary dynamics, called "Balassa-Samuelson" effect in the literature, goes through the "real" convergence of the productivity levels, that is assumed to stem from the sector of traded goods: the wages of the workers producing them are pushed upwards, positively affecting the salary in the production of the non-traded goods too.

That a combination of these effects was at work during the last decade can be observed simply comparing the level of the prices in the accession countries with respect to the one in the European Union in 1990 and in 1999: Rogers (2001) estimates that at the beginning the absolute prices in Prague, Warsaw and Budapest ranged from 30 to 40% of the corresponding prices in the major European cities, reaching a ratio of 60 to 70% in 1999. Using a detailed, "micro" dataset, Èihak and Holub (2001) show how the price structure in the Czech Republic evolved so that the relative prices of goods of different types is now much closer to the one observable in the EU. They argue that in the Czech Republic the inflation in excess to the realignment of the price structure over the period 1993-1999 was on average just 3.4% per year, and that another 20 to 35 % adjustment of the level of prices is to be expected. Looking at aggregate data, Corker, Beaumont, van Elkan and Iakova (2000) argue that in Hungary, Poland, the Czech Republic Slovenia and Estonia the Balassa Samuelson effect is responsible for at least 1 to 2% additional inflation points per year; a more detailed and quantitative analysis is in Golinelli and Orsi (2001): they introduce a measure of the labour productivity, and effectively estimate that the supplementary inflationary impact in the three largest CEECs ranges between 3 to 6%.

2.3 The effect of an integration in progress.

The difference in the inflation rate in the transition economies and in their trade partners resulted in a progressive loss of competitiveness, but also provided a basis to enforce price disciplines in the local economies.

Furthermore, the CEECs successfully imported more efficient technology from their international partners, experiencing then a faster growth in productivity: it is commonly acknowledged that if this effect is taken into account the effective loss of competitiveness is far less, as for example argued by Masson (1999).

It is anyway fair to suspect that the technology gain did not completely compensate the inflation differential, because most of the countries devaluated the currency during the

decade. Poland switched to a regime of preannounced crawling peg as early as 1991, later introducing a narrow oscillation band which was gradually widened until it was finally abandoned in 2000; the Czech Republic resorted to a free float without explicit commitment as early as 1997; Hungary devaluated the currency discontinuously until 1995, when a preannounced crawling peg was introduced, with a fluctuation band that is 15% wide per side, making the exchange rate in practise similar to the free float.

Estonia stuck to the original commitment, and a fixed exchange rate without float is also followed by Latvia (towards the SRD) and Lithuania (towards the US$). A currency board agreement was introduced Bulgaria in 1997 in the attempt to favour stabilization, after having introduced full convertibility. Also Rumania introduced fully convertibility in the near past.

Despite having withdrawn or largely weakened the exchange rate commitment, the monetary authorities of the Czech Republic, of Poland and of Hungary maintained a watch on the foreign exchange market in order to smooth the fluctuations and possibly influence the course of the local currencies. A similar policy was followed from Slovenia, who resorted to a managed float to direct the depreciation of the exchange rate.

To explain the progressive reduction in the explicit commitment in three largest CEECs, it is often remarked in the literature that a certain rigidity in the labour market prevented a quick realignment of wages, making the internal burden of the adjustment of a tight exchange rate management very heavy; it is also noted that the incentive to keep the exchange rate firmly fixed depends on the size of the country, making the advantage bigger for those having a high degree of openness to the international trade: these two points are usually proposed to explain the different policy of the Baltic States with respect to the largest CEECs.

Flexibility of the labour market and international openness are considered by Masson (1999), Corker, et al. (2000), Coricelli (2001) and other authors, but the main argument in the literature is the progress in the capital liberalisation. It is usually observed that a fixed exchange rate commitment can only be sustained in presence of capital controls, but the removal of these controls is part of *acquis communautaire* and of the reforms effort required for the EU accession (in fact, in the Conclusions of the Convergence Reports from the Commission of the European Communities reported above CEECs that did not complete the removal of these controls were urged to do so). Exchange rate pressure fostered by international speculation is usually explicitly considered to be the cause of the Czech shift towards the inflation targeting, and it is often proposed for the Polish first widening of the oscillation band too. Having given up the exchange rate commitment (or having weakened it to the point of making it irrelevant), it is important for the monetary authorities to ensure that

the public, both to help forming the expectations and to assess the consistency of their actions with their announcements, perceives a clear target for their policy. Furthermore, assuming that the CEECs are intended to join the EMU, an inflation targeting framework may help the public to get familiar with the monetary policy strategy pursued in the euro-area.
Bofinger and Wollmershäuser (2000) propose an argument in favour of a successful exchange rate peg for a very small economy, as in the case of the Baltic States. They also argue that an agreement can also be sustained in the case of two countries having similar fundamentals (an argument that seems could be extended to countries with different fundamentals, if the exchange rate is regularly crawling); for a "narrow band, backed by adequate supportive policies" is also arguing Szapáry (2001), at least for countries of the size of Hungary or larger. Yet considering the pressure undergone by France among the others in the 1992 ERM crisis, we are a little sceptical about this point, at least if the band is too narrow. It is also interesting to remark that at the moment the structure of the ERM2, with the 15% oscillation bands per side, seem to acknowledge that a tight commitment may be too exposed to speculative attacks. Furthermore, the evidence provided by Bofinger and Wollmershäuser makes us suspect that not even a tight exchange rate commitment or a currency board arrangement may prevent a large interest rate differential.
Corker, Beaumont, van Elkan and Iakova propose an intermediate approach, with an effort to avoid the trade disruption caused by an excessive exchange rate volatility, but also to avoid the massive capital flows under a tight exchange rate commitment suggesting to maintain the short term capital controls as long as possible.
We suspect that this is not feasible in the medium term, because it would be seen as a delay in the reforms. We argue then that the switch from a tight exchange rate commitment to the inflation targeting in the Czech Republic, Poland and Hungary does not indicate that they are reducing their efforts towards the EMU: on the contrary, it seems to be a consequence of the lift of capital control as required by the transition process. Coupling this with a continuous attention on the foreign exchange market, where the excessive fluctuations are smoothed away, may be a way for the transition countries to implement the intermediate approach without giving the impression of slowing the reforms.

2.4 Looking forward.

For a successful inflation targeting, it is widely acknowledged that the central bank should be independent, in order to be fully accountable to the citizens, and a high degree of transparency should be met. In terms of central bank independence Hungary is the leading

country, while other efforts are still necessary to Poland and the Czech Republic according the European Commission (2001).

Broadly speaking anyway Christoffersen, Slok and Wescott (2001), Amato and Gerlach (2001) and Horska (2001) conclude that Poland and the Czech Republic too meet the institutional preconditions for inflation targeting.

Abandoning the exchange rate commitment is anyway not without costs, as noted by Coricelli, who remarks the possibility of an increased interest rate to counter the exchange rate risk in the CEECs and argues in favour of a jump into EMU of these countries as soon as the conditions are favourable, a suggestion widely supported in the literature.

Euro accession is often introduced in the literature looking at the macroeconomic performances in terms of the Maastricht criteria. It is often argued that they are not good indicators of the convergence, and this is even more the case when the CEECs are considered.

In this case, two orders of arguments should be added. First, they neglect the initial conditions: countries starting with a lower level of prices will experience a higher level of inflation just because of the catching up: this was observed in the run to the euro and will be even more the case for the CEECs, whose initial level of prices is far below the one of Portugal, Spain and Greece when they begun the process of convergence. Second, they neglect a number of institutional and structural features that were given for granted in the EU at the moment in which the Maastricht criteria were set, but are not necessarily present in the accession countries.

This is usually discussed examining indicators of institutional convergence, as the ERBD ones: we think it is also interesting to analyse if the main macroeconomic relations are broadly compatible with the ones in the EMU area.

3. A structural model for monetary policy

3.1 Model specification, data description and estimation method.

There is now a wide consensus in the market economies on the fact that monetary policy should be aimed at the stabilisation of the inflation rate, and that an independent authority should be assigned this task. In order to avoid any interference with the functioning of the market, it is also important that the policy action is run without any direct imposition, and its transmission is rather left to the market itself. In the mature market economies the monetary authority is the central bank, which operates as the residual supplier of reserves on the short term interbank market, directing in this way the corresponding interest rate. The success of

monetary policy is ultimately left to the financial markets and institutions, that transmit this stimulus to the economy, and it depends on the fact that this indeed affects the decision of the economic agents. This model for monetary policy was pioneered by the Bundesbank, and it was adopted in most of the other European countries; in 1999 it was also inherited by the Eurosystem, and it is, then, a formal guideline for the CEECs willing to join the monetary union.

A successful representation of this scheme was first in Svensson (1997). Following a widely accepted notation, we let y_t be the measure of the economic activity, (usually the output gap, that is the gap between the actual and the potential production), i_t be the nominal interest rate and $E(p_{t+1} \mid I_t)$ be the expected value of the inflation p_t for the following period, using the information set of time t I_t. All the variables are supposed to be differences from sample means.

The Aggregate Demand (AD) is a dynamic IS curve: the economic activity depends on its past level and on the real interest rate; monetary policy is ruled by the central bank setting the nominal interest rate: for a given level of expected inflation, the higher real rate adversely affects the economic activity, this in turn feeds back in the Phillips Curve (PC) where the dynamic of inflation is described.

$$y_t = by_{t-1} - l\,(i_{t-1} - E(p_t \mid I_{t-1})) + e_{y,t} \qquad \text{AD}$$

$$p_t = p_{t-1} + gy_{t-1} + e_{p,t} \qquad \text{PC}$$

Finally, we assume that two serially independent shocks affect the economy. For simplicity, we also assume that these shocks have finite second moment and are not perfectly correlated.

By choosing the current level of the interest rate, the central bank has a chance to stabilise inflation using the output gap as an intermediate tool. Note that the degree of persistence is directly affected by the monetary policy: suppose for simplicity that $b = 0$, and consider the case in which the central bank follows the policy rule

$$i_t = E(p_{t+1} \mid I_t)) \qquad \text{R1}$$

Then

$$y_t = e_{y,t} \text{ and } p_t = p_{t-1} + ge_{y,t-1} + e_{p,t}$$

so the inflation has a unit root.

If, on the other hand, the central bank follows the policy

$$i_t = E(p_{t+1} \mid I_t)) + a p_t \qquad \text{R2}$$

then

$$p_t = (1 - lga) p_{t-1} + g e_{y,t-1} + e_{p,t}$$

so for $a \in (0, 2/(gl))$ we obtain a mean reverting process for p_t: the central bank is stabilising the inflation rate (around 0 in this model). The policy that minimises the variance of p_t has $a = 1/(gl)$.

In case of a small open economy, an important component of the demand is the one generated by the trade partners; the local demand will be also affected by the international competition: a too high level of prices (in real terms) will result in a shift of the domestic and foreign demand towards the external producers. When we consider a small open economy, to take these effects into account we augment the Aggregate Demand equation by the level of the economic activity in the international partners ($y_{w,t}$) and by the percent real exchange rate appreciation ($q_t - q_{t-1}$). With the variable q_t we measure the natural logarithm of the real exchange rate formulated as the ratio between the local level of prices and the international ones, corrected by the nominal exchange rate. Taking these modifications into account, the augmented aggregate demand equation has the form:

$$y_t = b y_{t-1} - l_i (i_{t-1} - E(p_t \mid I_{t-1})) + b_w y_{w,t} - l_q (q_t - q_{t-1}) + e_{y,t} \qquad \text{AD.}$$

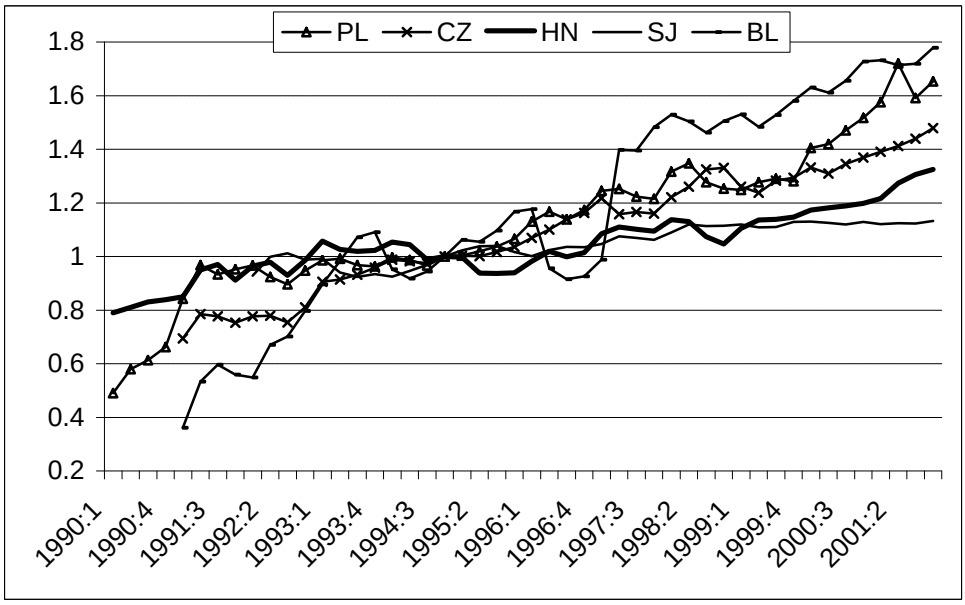
In practise we always consider Germany as the international correspondent, even if in the first part of the sample period some countries pegged the exchange rate to the US$: in fact the EU constitutes by far the biggest trade partner for the CEECs. As far as the PC equation is concerned, the international competition should impose some price discipline to the local producers; we then augment the PC equation with the percent real exchange rate appreciation ($q_t - q_{t-1}$), and its new formulation is given by:

$$p_t = p_{t-1} + g_y y_{t-1} + g_q (q_t - q_{t-1}) + e_{p,t} \qquad \text{PC.}$$

This is a simplified version of the one in Svensson (2000), where the generalized small open economy model is considered. Svensson formulated these models for mean-corrected data. In practise we will allow in the estimation a constant in the equations, but we will remove it when it is clearly not significant, in order to increase the theoretical efficiency of the estimates.

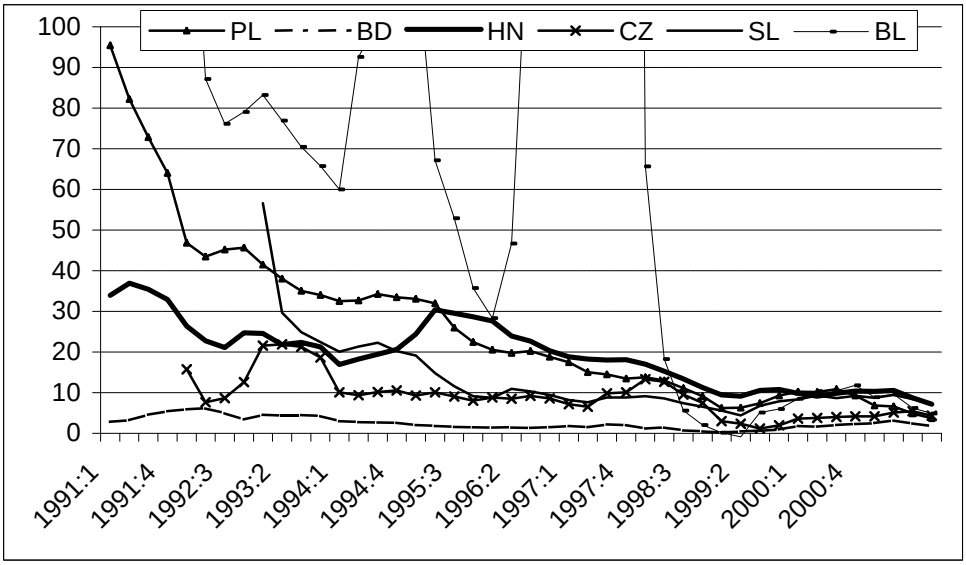
In the original model Svensson considered the real exchange rate rather than the percent appreciation. Over the years 1990-2001 the real exchange rates of most of the CEECs appreciated constantly: this anyway did not induce a negative trend in the economic activity because the productivity of the CEECs with respect to the EU increased, compensating this effect, as shown by Golinelli and Orsi (2001). To mimic the effect of both these factors, we use the first difference of the real exchange rate.

The real exchange rate (base 1994Q1)



Most of the CEECs managed to control inflation early in the decade: the Czech Republic and Hungary show a certain stability of the growth rate of prices already at the beginning of the period, while Poland and Slovenia got below 40% only in 1993. On the other hand Bulgaria reached stability only recently, and its success looks still very fragile according to the European Commission evaluation.

Inflation (growth rate of prices in the preceding year)



Our sample period then begins in 1990, and to avoid the risk of model instability till 1992 the data are only used to compute the output gap or as lagged instruments. In some cases we did not find adequate data so the sample period is even shorter.

The data we are considering are sampled monthly, but in order to reduce the volatility we used quarterly averages[4]. We took the CPI to compute of inflation p_t, and the seasonally adjusted industrial production to derive a measure of economic activity y_t; for the nominal interest rate i_t we preferred a 3 months interbank rate, but when not available or not apparently relevant we either used shorter interbank maturities or the 3 months Treasury bills rate. Details are at the end of the paper.

We plotted the graphics using the annual growth rate of prices because this convention is widespread in the literature. In our analysis anyway inflation is the annualised rate of growth of the CPI (formulated as the first difference of the natural logarithm). We observed a strong seasonal component in the quarterly inflation, which is not modelled in the PC equation above. We could filter the data with a deseasonalising procedure, such as for example the X-12, but we preferred to model this directly, also because in this way we can in the future extend the dataset without the need of treating the data again. We then replace p_{t-1} with the weighted average $qp_{t-1} + (1-q)p_{t-4}$, and the percent real exchange rate appreciation

[4] the frequency of the dataset was properly adjusted by deleting two observations every three ones

$q_t - q_{t-1}$ with $q_t - q_{t-4}$ in the PC and in the AD equation. For the same argument, we also augment the definition of the real relevant rate in the AD equation with

$$r_{t-1} = (i_{t-1} - E(p_t \mid I_{t-1})) + (i_{t-2} - E(p_{t-1} \mid I_{t-2})) + (i_{t-3} - E(p_{t-2} \mid I_{t-3})) + (i_{t-4} - E(p_{t-3} \mid I_{t-4}))$$

.

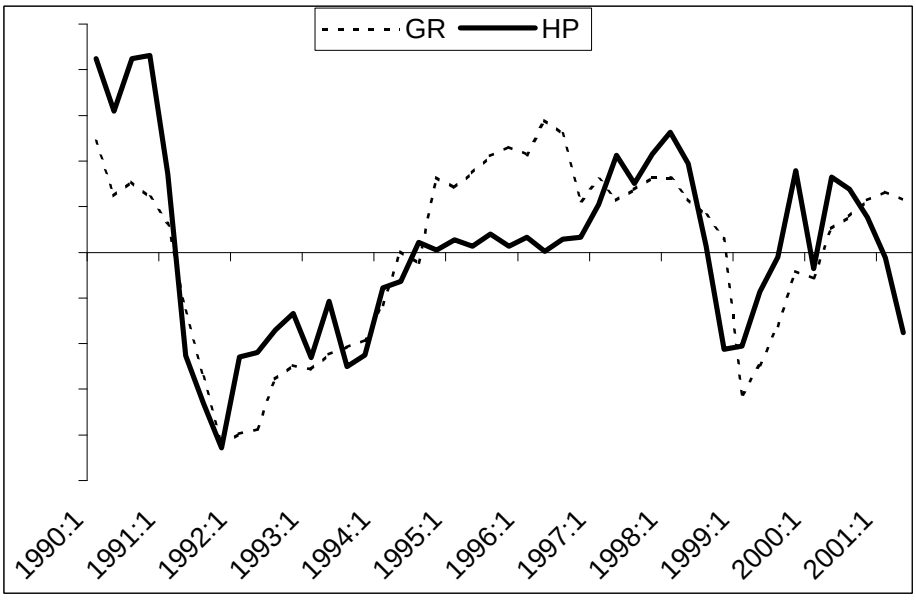
This extended formulations have also the advantage to take the possibility of a longer lag into account.

The output gap is computed using the Hodrik Prescott filter on the quarterly average of the production index.

The praxis of using the Hodrick Prescott filter is quite widespread but rather controversial too. Golinelli and Rovelli used the capacity utilisation to measure the economic activity, but they also remark that "the time series properties of capacity utilisation are quite similar to those of an HP filter on GDP", and "the two variables indicate a very similar evolution of the business cycle".

The dynamic of the capacity utilisation in Golinelli and Rovelli (obtained from the very well endowed Roberto Golinelli's home page) and of our HP gap are indeed rather similar, as the graphic below displays:

HP gap and Golinelli and Rovelli capacity utilisation for Poland



We then preferred to use the HP gap because the time series of capacity utilisation is not always present (in the Polish case, for example, Golinelli and Rovelli obtained their time series deseasonalising and merging two different ones; for some other countries we did not find

valid data at all). We recognise and agree with the arguments for which the HP gap cannot be considered an exact measure of the economic cycle, but we still hope that it is at least informative of the effective output gap.

We estimate the inflation equation with the OLS, but in the AD equation we have to replace $E(p_{t-j} \mid I_{t-1-j}))$ with $p_{t-j} - e_{t-j}$ as in the rational expectation assumption, and we then estimate it with GMM, using $r_{t-5} = (i_{t-5} - p_{t-4}) + (i_{t-6} - p_{t-5}) + (i_{t-7} - p_{t-6}) + (i_{t-8} - p_{t-7})$ and three more lags of y_t as instruments (the other instruments being the explanatory variables, except, of course, r_{t-1}). In the GMM, prewhitening is employed, and the kernel is the Bartlett one with bandwidth 3 (2 when the sample is extremely short).

We estimate the equations singularly because the choice of the exchange rate and the interest rate are decided by the monetary authorities, and given the frequent shifts of target (from a fixed to a crawling peg or vice versa, or possibly to the inflation targeting) and the sequence of innovations that regularly affected the financial markets, we argue they are affected by remarkable parameter instability[5].

Correct specification is checked by looking at the tests for heteroskedasticity (White test with cross terms) and autocorrelation (up to the fourth lag: LM test) in the OLS equation; we also look at the Q Box-Lijung test for autocorrelation (albeit strictly speaking the exact asymptotic c^2 distribution only follows when original observations, rather than residuals, are considered).

4. The analysis of empirical evidence

A generally broad analysis in which output, inflation, the interest and the exchange rates are jointly considered for Poland is in Gottschalk and Moore (2001). Comparing the results is difficult, because Gottschalk and Moore estimate a VAR assuming unitary roots and cointegration, a model-building strategy that is not consistent with inflation stabilization; in any case, they do not find any effect of a nominal interest rate increase (for given level of inflation) on the economic activity, possibly barring the one induced by the subsequent variation of the exchange rate. Ignoring for the moment the reliability of the cointegration

approach in this case, we think that in general the high number of parameter estimated by the VAR seems to pay a high price in terms of precision, generating very high standard errors in the impulse response function. We think that when data of this type are considered a careful model construction is necessary, despite being time consuming.

With this respect we find Golinelli and Rovelli (2001) presentation far more convincing and inspiring. Nevertheless, they also fail to find a clear link as the one established by the AD and the PC equations. To be precise, they actually claim they obtained it, but to get that result they have to replace several relevant variables with some transformations (such as first or even second difference) until a tenuous statistical significance is established. We find difficult, though, to provide an economic interpretation for some of those variables, especially because the estimated equations are substantially different for the different countries. We think that the evidence provided by Golinelli and Rovelli is too weak to sustain the presence of a systematic relation over the whole sample, and this weakness depends on the peculiar nature of the transition process: a link from the expected real interest rate on the economic activity for example may be present in the second part of the sample, when the development of the financial market progressed, but fail on the first half. A similar argument could be applied when we evaluate the impact on inflation of the condition of the economic cycle. Another difference with respect to that contribution is our refusal to model the dynamics of the interest and the exchange rate in order to generate the expectations in a model consistent way: our procedure is less efficient but more robust, not depending on the stability of the parameters in the exchange rate and in the interest rate equations.

Germany

As a benchmark case, we first estimate the model for Germany over the period 1991Q1-2001Q3. The choice of the sample is twofold: first, only data after the German reunification are considered, leaving many of the problems related to that particular transition out of the discussion; second, this time span is the same as the one covered by the data of the CEECs in most of the applied analysis. We called this a benchmark model because it is widely assumed that this transmission mechanism for monetary policy was at work in Germany in the years we are interested in. Furthermore, Germany is geographically and economically close to the CEECs, accounting for a large share of their international trade. Finally, it is an interesting

[5] In presenting and interpreting the results we think it is important to take the fundamentals of the economic theory into account, in order to reduce the probability of a type 2 error, and formulate the tests on the coefficients with a one sided alternative.

reference because Germany is the biggest country in the euro area, and we can expect that the monetary policy of the Eurosystem will be based on a structure similar to the German one: if the monetary transmission in the CEECs work in a very different way, their integration in the euro may adversely affect the dynamics of inflation.

The estimated AD equation for Germany is given by:

$$y_{BD,t} = \underset{(0.506)}{1.122} + \underset{(0.078)}{0.801}\, y_{BD,t-1} - \underset{(0.051)}{0.115}\, r_{BD,t-1}$$

Note that the data in the model are going back to 1991, but the instruments for inflation and the interest rate date back to 1990, which are still referred to the West Germany only. We argue that these are still valid instruments (possibly having just a bigger variance); estimating the model for the 1993Q1-2001Q3 data would not change the sense of the results.

The transmission of the monetary impulse to the inflation is described by the Phillips Curve.

$$p_{BD,t} = \underset{(0.100)}{0.235}\, p_{BD,t-1} + (1-0.235)\, p_{BD,t-4} - \underset{(1.069)}{2.756} * dummy93 + \underset{(0.139)}{0.251}(y_{BD,t-1} + y_{BD,t-5}) * dummy93$$

The structure of the inflation also depends on the seasonal component, but there is a significant contribution of the most recent observation too. The presence of the sum of two or more observations of the past level of the output gap is more representative of an effective level of the economic activity. The presence of the dummy93 deserves some comments: it seems that the 1992 dynamics does not match the rest of the sample period, and it is interesting to observe that it is exactly the period of the recovery of the inflationary shock due to the German unification, a phenomenon that was usually regarded as temporary even when it was tacking place. This can be verified introducing a dummy for the year 1993 to shift the constant (the remaining constant is largely not significant) or by dropping 1992, and estimating on the period 1993Q1-2001Q3 only.

None of the specification tests signal a possible misspecification, and the estimated coefficients are in lines with the ones suggested from the theory: overall, the model fits the theory in a satisfactory way.

Poland

Opposite to Germany, we cannot consider Poland (and the other CEECs later) as a country large enough not to be affected by the international trade. The AD equation is then augmented with the real exchange rate appreciation with respect to Germany and with the German output gap.

The estimated AD equation for Poland (starting in 1993Q4) is given by:

$$y_{P,t} = \underset{(0.763)}{2.062} + \underset{(0.127)}{0.765}\, y_{P,t-1} - \underset{(0.019)}{0.047}\, r_{P,t-1} + \underset{(0.312)}{0.505}\, y_{BD,t} * dummy97 - \underset{(5.266)}{11.717}(\ln q_{P,t} - \ln q_{P,t-4}) .$$

The link between the real interest rate and the economic activity is surprisingly significant over the whole period, and it does not change over time: the effect of an increase in that coefficient in 1999 or later is largely insignificant. The effect of the German activity, a proxy of the world demand, is weaker: the computed t statistic is on the hedge of the 5% critical value (the p-value is 0.058), and a shift is allowed for the second part of the sample.

The price behaviour is described by the PC equation, and starting estimation in 1993 we obtain:

$$p_{P,t} = \underset{(0.155)}{0.377}\, p_{P,t-1} + (1-0.377) p_{P,t-4} + \underset{(0.733)}{0.804}(y_{P,t-1}) * dummy99 - \underset{17.079}{39.167}(\ln q_{P,t} - \ln q_{P,t-4})$$

The transmission mechanism to the prices is far less stable: in 1992 the annual inflation lost about 20%, and by 1993 it was about half the one of the beginning of the sample. This instability is reflected in a fairly high coefficient of $p_{P,t-1}$ (0.6, about 4 times the one estimated for Germany) and in the presence of residual autocorrelation (the p-values for the F and the c^2 versions of the LM test are 0.032 and 0.027 respectively if 1992 is taken into account). Starting in 1993Q4 on the other hand, the autocorrelation seems to have been ruled out (the p-values for the F and the c^2 versions of the LM test are 0.053 and 0.0466 respectively) and the presence of heteroskedasticity is not detected by the White test.

Finally, we test the stability of the equation to see if the change in the shift from the exchange rate targeting (in the form of the crawling peg) to the inflation targeting affected the inflation dynamics. We considered then a break in 1998Q4, but we confidently (p-value of 0.35) not rejected the hypothesis of absence of a break (to increase the power of the test we removed the output gap from the estimated model, because strictly speaking it is not significant).

Czech Republic

Due to the split of Czechoslovakia, the data referred to the Czech Republic are only available since 1993, so the output gap is computed starting from that point. Since the instruments in the AD equation date back to two years before, the effective sample is 1995Q1-2001Q3; the estimated relationship is:

$$y_{C,t} = \underset{(1.408)}{2.590} + \underset{(0.117)}{0.578}\, y_{C,t-1} - \underset{(0.041)}{0.113}\, r_{C,t-1} + \underset{(0.225)}{0.364}\, y_{BD,t} * dummy98 - \underset{(8.004)}{17.516}(\ln q_{C,t} - \ln q_{C,t-4})$$

whose structure is very similar to the Polish one. As in that case, the effect of the German activity is on the edge of statistical significance, with a p-value of 0.06.

The sample for the estimation of the PC equation starts on 1994Q1: the structure we obtain is again similar to the Polish one, with the output gap being significant only at the end of the period. The estimated results are:

$$p_{C,t} = \underset{(0.104)}{0.521} p_{C,t-1} + (1 - 0.521) p_{C,t-4} + \underset{(0.542)}{0.709}(y_{C,t-1}) * dummy99 - \underset{(25.036)}{52.673}(\ln q_{C,t} - \ln q_{C,t-4}) + \underset{(1.766)}{2.407}$$

.

Note that the shortage of the sample does not seem to have penalised the estimates very much with respect to the Polish case: for Poland we were not able to exploit the additional length very much because we observed that it was still very influenced by the fact that the transition is still on. Furthermore, the evidence against heteroskedasticity and autocorrelation in the residuals is now even larger, possibly just because of the fact that it is the first part of the observations, the one more at risk of instability, that had to be trimmed away.

As for the Polish case, we test for the possibility of a structural break in correspondence with the shift in monetary policy to the inflation targeting regime (again, we first drop the elements statistically non significant in the equation above) and we not reject the hypothesis of stability (p-value of 0.62).

Hungary

The estimated AD maintain the standard textbook formulation, and, opposite to the previous countries, the German cycle is significant for Hungary over the whole period 1993-2001. The estimated results are:

$$y_{H,t} = \underset{(1.491)}{5.146} + \underset{(0.200)}{0.09}\, y_{H,t-1} - \underset{(0.075)}{0.223}\, r_{H,t-1} + \underset{(0.529)}{1.838}\, y_{BD,t} - \underset{(6.754)}{19.519}(\ln q_{H,t} - \ln q_{H,t-4}).$$

Surprisingly, it is its own past level of economic activity to be non significant: to explain this result we can only note that the correlation between the Hungarian and the German gap exceeds 60% (it is 0.605 over 1993Q1-2001Q3), making the point estimates very erratic and with high standard errors.

As in the Polish case before, despite the dataset starts as early as 1990, we find some instability in the first part of the sample, that leads to the rejection of the hypothesis of no autocorrelation and no heteroskedasticity in the PC equation. To remove these problems we drop the part 1990Q1-1992Q4 of the sample in the analysis of inflation. The dynamic described in the estimated PC equation is

$$p_{H,t} = \underset{(0.089)}{0.239} p_{H,t-1} + (1-0.239) p_{H,t-4} + \underset{(0.237)}{0.385}(y_{H,t-1}) - \underset{(15.273)}{26.038}(\ln q_{H,t} - \ln q_{H,t-4}):$$

where again the sensitivity of inflation to the economic activity is at the edge of the significance level (p-value is 0.057).

Slovenia

As we did for the Czech Republic, in the case of Slovenia too we only consider the part of the sample corresponding to the existence of an independent state (in practise, we started to compute the output gap in 1992). The evidence in this case is less in line with the Svensson model, because the exchange rate appreciation does not affect the economic activity in the estimated AD equation in a statistically significant way (the p-value is 0.10) even if we only restrict our attention to the last part of the sample. The estimated results we obtained are:

$$y_{SJ,t} = \underset{(0.135)}{0.253} y_{SJ,t-1} - \underset{(0.044)}{0.081} r_{SJ,t-1} * dummy97 + \underset{(0.126)}{0.580} y_{BD,t} - \underset{(11.344)}{14.827}(\ln q_{SJ,t} - \ln q_{SJ,t-4}) * dummy99$$

.

Once again, we explain the relatively small value of the coefficient for the previous economic situation by observing that the correlation with the German cycle is rather high (0.55).

The estimation of the PC equation over a period including data generated in 1993, as in the case of Poland, produces residual autocorrelation. Since the inflation rate was more than halved in that period, we again argue that the dynamics of 1993 are different with respect to the subsequent years. In fact, when the model estimates start in 1994 we do not reject the hypothesis of absence of autocorrelation and of heteroskedasticity. We also drop the economic cycle of the model, because the estimated sign is not consistent with the theory:

$$p_{SJ,t} = \underset{(0.114)}{0.524} p_{SJ,t-1} + (1-0.524) p_{SJ,t-4} - \underset{(17.585)}{37.432}(\ln q_{SJ,t} - \ln q_{SJ,t-4}).$$

Bulgaria

As noted above, according to the European Commission, Bulgaria is lagging behind, but some efforts have been made in the most recent years. The recovery from the inflation only begun in 1997, after having introduced a Currency Board (CBA) that linked the currency to the DEM. We then estimate the PC equation over the whole sample and then test for a break in 1997Q2, obtaining a strong rejection of the hypothesis of stability (p-value of 0.002). We then estimate the inflation equations separately in the sample; for the period 1992Q2-1997Q1 we obtain:

$$p_{BL,t} = \underset{(0.390)}{1.41} p_{BL,t-1} + (1-1.41) p_{BL,t-4} + \underset{(27.646)}{38.689} - \underset{(131.845)}{122.624}(\ln q_{BL,t} - \ln q_{BL,t-4})$$

while for the sample 1997Q2-2001Q3 we have:

$$p_{BL,t} = \underset{(0.064)}{0.643} p_{BL,t-1} + (1-0.643) p_{BL,t-4} - \underset{(76.505)}{258.501} (\ln q_{BL,t} - \ln q_{BL,t-4}) + \underset{(1.761)}{5.16}\, y_{BL,t-1}$$

On both the subsamples the hypotheses of no autocorrelation was not rejected, and furthermore the heteroskedasticity might be present in the first sample (we used the reduced White, without incorporating the cross-products, because the number of observations is very small; the p-values are 0.039 and 0.09 in the first and in the second sub-sample respectively). We are anyway extremely careful in the interpretation of these results, considering both the extremely small size of the two subsamples and the particular instability of the data. Yet if a conclusion can be drawn, it is that until the introduction of the CBA Bulgaria did not have a way to control inflation properly, so the unstable behaviour was unavoidable. The CBA might have convinced the economic agents (and maybe the fiscal authority too) that any competitively loss due to the inflation was not to be matched by a future devaluation of the nominal exchange rate, making inflation less appealing.

Not having found a measure of industrial production for Bulgaria, we had to resort to the GDP. Unfortunately, we fail to estimate an AD relation consistent with the economic model (but note that it is still relevant as a measure of the economic activity in the PC equation). Whether this depended on the fact that the economic structure of Bulgaria is really different from being a functioning market economy, as suggested by the European Commission, or on the fact that the GDP could be a rather poor proxy, we are unable to say.

5. Some concluding remarks

We estimated a small model in which the Aggregate Demand (AD) and the Phillips Curve (PC) are described for Poland, Hungary and the Czech Republic, which recently adopted a policy of inflation targeting in the accession to the European Union. We also estimate this model for the German economy to provide a benchmark case of a developed country and to verify that the time span is indeed large enough to capture the most basic features that characterise a modern market economy. Finally, we estimate it for two other CEECs at a different point in the transition process: Slovenia, that is very close to the three countries above, and Bulgaria, that according to the European Commission is “close (enough)” to be a functioning market economy.

In a closed market economy, the transmission of monetary policy is the result of two stages: the central bank may direct the nominal interest rate, affecting the aggregate demand; in a second moment, the excess or the reduction of the economic activity increases or curbs the inflationary pressure. We verified this dynamics for Germany during the sample period.

As far as the CEECs, a systematic effect of the real interest rate on the economic activity was observed using data from 1992 onwards in the Czech Republic, in Poland and in Hungary. If we consider that a two tier banking system and that private property of the production units were established just a few years before, this result seems to exceed even the most optimistic expectations, since at the beginning of the transition a heavy adoption of nonmarket instruments, such as credit ceilings and direct allocation was nearly inevitable (after all, in the past these were in place even in very well developed countries like Italy and France).

A significant effect for Slovenia only takes place after 1997, while we fail to observe it at all for Bulgaria. It is interesting then to note that the three CEECs above are also leading in terms of financial development according to the analysis of Schweickert on the ERBD indicators, with Slovenia following and Bulgaria lagging behind.

For this channel to work, anyway, we also need that a stable link between the output gap and inflation exists, and the evidence for this is far less convincing. According to the estimation results, the firms are not as able or willing to transfer on the prices the conditions of the state of the economy: a positive (but still not significant) correlation emerges for the Czech Republic and Poland only when the last part of the sample is considered. A stronger result is obtained for Hungary and (after 1997) for Bulgaria. At the moment we do not interpret the weakness of the second link of the transmission mechanism as a rejection but rather as a warning that a larger dataset should be considered before a final conclusion is drawn.

Transition usually begun with an exchange rate commitment, either in form of fixed exchange rate, currency board, or a tightly managed crawling peg. Coupling it with a careful openness to the international trade, this provided an anchor to a system that had none, and contributed to the stabilisation of inflation. It also contributed to the integration in the international economy, because the domestic producers were given a stable idea of the comparative advantages of their country, with a positive effect on the local economic activity too.

The Czech Republic, Poland and Hungary committed the exchange rate at the beginning of the period, and it proved to be a valid tool in the direct control of inflation; we also verified that the relevance of the exchange rate appreciation for the inflation stabilisation in Bulgaria dates to the moment in which the commitment was undertaken (in 1997). Note that the change in monetary policy may be spotted in the plot of the real exchange rate too: Bulgaria

experienced a steep real appreciation, and it is the country with the largest competitively loss over the decade; this could suggest that postponing the macroeconomic stabilisation has a cost in its own. In Slovenia, where the management of the exchange rate was tight but not explicitly committed, the real appreciation does not affect inflation significantly.
We anyway refrain from assigning causality: a possible explanation is that the exchange rate commitment signalled to the producers that any price increase was to result in a competitive loss, inducing a less inflationary behaviour. But it is also possible that Slovenia did not undertake the explicit exchange rate commitment precisely because the central authority was aware of the fact that it would not have worked as systematically as in the other countries.

We verified that the effect of the conventional ("closed economy") channel of monetary policy is weak, but that the central banks might still control inflation effectively managing the exchange rate.
With the progress of the reforms and the liberalization of capital flows, the Czech Republic, in Poland and in Hungary had to choose between the exchange rate stabilisation and the removal of capital controls required to progress in the transition: we argue that by switching to the explicit inflation targeting the monetary authorities are still pursuing the same stabilisation policy that in the early moment of the transition was addressed with the exchange rate commitment. If this is the case, the switch in monetary policy is only nominal. We think that the public perceived this fact, and expected the central banks to coordinate the exchange and the interest rate to achieve inflation stabilisation as before. We also verified that when the Czech and the Polish central banks withdrew the exchange rate commitment and passed to the inflation targeting, the stability of the inflation equation was not affected.

SUMMARY OF THE RESULTS

AD equations

	Germany	Poland	Czech Rep.	Hungary	Slovenia	
Sample (adjusted)	92Q1;02Q3	93Q4;01Q3	95Q1;01Q3	93Q1;01Q3	93Q1;01Q3	
C	1.122**	2.062**	2.590**	5.146**		
gap(-1)	0.801**	0.766**	0.578**	0.094	0.253**	
real rate	-0.115**	-0.047**	-0.111**	-0.223**	-0.081**	
foreign gap		0.504*	0.364*	1.838**	0.580**	
Exchange appr.		-0.047**	-17.516**	-19.519**	-14.828	
Q (5)	1.355 (0.92)	2.613 (0.76)	3.28 (0.66)	9.07 (0.105)	0.77 (0.98)	

PC equations

	Germany	Poland	Czech Rep.	Hungary	Slovenia	Bulgaria
Sample (adjusted)	92Q2;02Q3	93Q1;01Q3	94Q1;01Q3	93Q1;01Q3	94Q1;01Q3	97Q1;01Q3
C	-2.756**		2.406*			
infl(-1)	0.235**	0.377**	0.521**	0.239**	0.524**	0.643**
infl(-4)	0.765**	0.623**	0.479**	0.761**	0.476**	0.357**
gap(-1)	0.251**	0.804	0.709	0.385*		5.166**
Exchange appr.		-39.163**	-52.673**	-26.038**	-37.432**	-258.501**
LM-autocorr.	0.63 (0.16)	9.66 (0.0466)	9.25 (0.055)	9.10 (0.06)	1.12 (0.89)	3.65 (0.45)
White heterosk.	22.39 (0.17)	27.98 (0.36)	28.11 (0.35)	27.90 (0.11)	15.13 (0.37)	16.20 (0.09)

Notes:

c is the constant; gap(-1) is y_{t-1}; real rate is r_{t-1}; foreign gap is $y_{BD,t-1}$; exchange appr. is $\ln(q_t)-\ln(q_{t-4})$; infl(-1) is p_{t-1}; infl(-4) is p_{t-4}; Q(5) is the Box Lijung statistic for the fifth lag; LM-autocorr. is the autocorrelation test for the fourth lag; White heterosk. is the White test for heteroskedasticity; for all the coefficients, ** indicates significant at the 5%, and *

indicates significant at 10%; in the specification tests, the Pvalues (for the c^2 versions) are in brackets.

c in the German PC equation is multiplied by dummy93;

gap(-1) in the German PC eq. is multiplied by dummy93 & includes gap(-5);

foreign gap in the Polish AD is multiplied by dummy97;

gap(-1) in the Polish PC eq. is multiplied by dummy99;

foreign gap in the Czech AD is multiplied by dummy98;

exchange appr. in the Slovenian AD is multiplied by dummy99;

real rate in the Slovenian AD is multiplied by dummy97;

White test in the Bulgaria PC does not include crossterms.

REFERENCES

Amato, J.D. and S. Gerlach (2001) Inflation targeting in emerging market and transition economies: lessons after a decade, CEPR d.p. 3074.

Bofinger, P., and T. Wollmershäuser (2000) Monetary policy and exchange rate targeting in open economies Würzburg Economic Papers nr. 14.

Christoffersen, P., T. Slok and R. Wescott (2001) Is inflation targeting feasible in Poland? Economics of transition, 9, 153-174.

Èihak, M. and T. Holub (2001) Convergence of relative prices and inflation in Central and Eastern Europe, IMF w.p. 01/124.

Commission of the European Communities (2001) Annex 1: conclusions of regular reports.

Corker, R., C. Beaumont, R. van Elkan and D. Iakova (2000) Exchange rate regimes in selected advanced transition economies-coping with transition, capital inflows and EU accession, IMF pdp/00/3.

Coricelli, F. (2001) Exchange rate arrangements in the transition to EMU: some arguments in favor of an early adoption of the euro, preprint.

Golinelli, R. and R.Orsi (2001) Modelling inflation in the EU accession countries: the case of the Czech Republic, Hungary and Poland, preprint.

Gottschalk, J. and R. Moore (2001) Implementing inflation targeting regimes: the case of Poland, Journal of comparative economics 29, 24-39.

Horska, H. (2001) Inflation targeting in Poland, a comparison with the Czech Republic, preprint.

Masson, P.R. (1999) Monetary and exchange rate policy of transition economies of Central and Eastern Europe after the launch of EMU, IMF, pdp 99/5.

Nuti, D. M. (2000) The costs and benefits of euro-isation in Central-Eastern Europe before or instead of EMU membership, William Davidson Institute, w.p. 340.

Piazolo, D. (2000) Eastern Europe between transition and accession: an analysis of reform requirement, Kiel Institute of World Economics, working paper 991.

Rogers, J.H. (2001) “Price level convergence, relative prices and inflation in Europe”, International finance d.p. 699, FED.

Schweickert, R. (2001) assessing the advantages of EMU-enlargement for the EU and the accession countries: a comparative indicator approach, Kiel Institute of World Economics working paper 1080.

Svensson, L.E.O. (1997) Inflation forecast targeting: implementing and monitoring inflation targeting, European Economic Review, 41, 1111-1147.

Svensson, L.E.O. (2000), Open-economy inflation targeting, Journal of International Economics, 50, 155-183.

Szapáry, G. (2001) Maastricht and the choice of the exchange rate regime in transition countries during the run-up to EMU, ENEPRI w.p. n.6.

DATASTREAM CODES

	Germany	Poland	Czech R.	Hungary	Slovenia	Bulgaria
CPI (not s. a.)	BDOCPCONF	POI64...F	CZCONPRCF	HNCONPRCF	SJCONPRCF	BLI64...F
Exchange rate (vs US$)	BDXRUSD.	POXRUSD.	CZXRUSD.	HNP2USA.		BLXRUSD.
Exchange rate (vs DEM)					SJP2DMA.	
industrial prod. (s.a.)	BDINPRODG	POOCIPRDG	CZOCIPODG	HNOCIPRDG	SJOPR035G	
GDP (s.a.)						BLOSN029D
3 months rate	BDEURO3.R	POI60C..	CZOC3MB%	HNOCTBL%		BLGBILL.
money market rate (on)					SJI60B..	