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**THE EASTWARD ENLARGEMENT OF THE EUROZONE
FINAL REPORT ON "EXCHANGE RATE REGIMES"**

Renzo Orsi
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The Eastward Enlargement of the Eurozone

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The Eastward Enlargement of the Eurozone
Final Report on "Exchange Rate Regimes"

Abstract

The CEEC are approaching the accession to the EU with a variety of exchange rate regimes. The authors find that these differences depend on economical factors as well as on the history of the countries. For that purpose, they discuss the role of the exchange rate in the stabilization of the inflation rate at the beginning of the transition from the central planning to the market economy, finding that, combining internal price liberalisation, openness to the international trade and a commitment to exchange rate stability the countries in transition – with the exception of Slovenia – provided the system with a nominal anchor by importing the price structure of the trade partners. Later, the capital liberalisation required for the progressive integration in the EU exposed the CEEC to speculative attacks and exchange rate pressure and most of them weakened the exchange rate commitment or withdrew it at all. The Baltic States are the only ones still maintaining a strong exchange-rate commitment. The authors conjecture that this is due to the smaller size of these countries, which makes the interest rates of the domestic currency of little importance to the economy when compared to the exchange rate. Policy advice completes this report.

JEL-Classification: E0, E5, F0

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The Eastward Enlargement of the Eurozone (Ezoneplus)

Final Report on “Exchange Rate Regimes”¹

by

Renzo Orsi

and

Fabrizio Iacone

(June 2003)

1. Introduction

Despite of sharing a number of common economic features and the common target of becoming a member of the European Union (EU) and of the European Monetary Union (EMU), the Central and Eastern European Countries (CEECs) exhibit remarkable diversities in the exchange rate regimes, ranging from a currency board agreement to a free float.

This diversity bears some relationship with the structural features of each country, but the choice of a specific regime also reflects historical factors, different reactions to economic shocks along with the preferred approach to disinflation: the appropriate exchange rate regime to attain the objectives of the monetary policy is not obvious, because it is a key determinant of a country’s macroeconomic stability, which, in turn, is an important determinant of investment and economic perspectives in the country. This is even more the case for the CEECs, which underwent an impressive revolution in the macro and microeconomic organisation of production and of distribution, in the structure of the interaction with international partners and even in the nature of the relations between economic agents. Moreover, exchange rate regimes, like other important aspects of economic policy of a country, are not chosen once and for all, and this is especially the case for the CEECs: unlike in the Western Countries, the general framework has long been unstable and subject to a transition, so that

¹ We are particularly grateful to Jakub Borowski from the National Bank of Poland for helpful comments provided in the discussion on a previous version of this report. We also thank the participants to the Workshop *Eurozone Enlargement Exchange Rate Choices and Adjusting Markets* held in Brussels on May 9, 2003.

policies that were adequate in the early stages may well not be suitable in the following ones, so that the diversity of exchange rates regimes has often been experienced even within a single country, as it happened to Poland, to Hungary and to the Czech Republic, which went from a fixed peg to a relatively free float, or to Bulgaria, which took the opposite way and moved from the free float to the currency board. Countries change their regimes frequently, either voluntarily or involuntarily: a particular exchange rate regime may suit the country's needs at the time, but eventually be abandoned even though inflation has been brought down, because a substantial loss of competitiveness occurred. This is the typical sequence followed by the so called "exchange rate based stabilizations", and only rarely they lead to permanent pegs.

The exchange rate management proved very important for the macroeconomic stabilisation required during the transition to the market economy for the CEECs, and it will be no less relevant in the final integration in the EU. This process, which formally begun with the Accession negotiations in 1998², entered its final phase in October 2002, when the Commission recommended conclusion of negotiations with ten candidate countries, eight of which from the CEECs group³, considering that they will be ready for membership from the beginning of 2004⁴.

EU membership does not immediately grant participation to the EMU, even if the obligation to join EMU is a part of the *Acquis Communautaire*. On the contrary, according to the exchange rate condition in the Maastricht criteria⁵, EMU candidates have to join previously an ERM2 system, with the 15 percent bands arrangements. The exchange rate has to be stable, without using capital or exchange controls, for at least two years before joining EMU.

²Only the Czech Republic, Estonia, Hungary, Poland, Cyprus and Slovenia opened a formal negotiation in March 1998; Bulgaria, Latvia, Lithuania, Romania, Slovakia and Malta joined in December 1999.

³The Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovenia and the Slovak Republic; Cyprus and Malta too are the other two countries, while Bulgaria and Romania are considered as not ready for accession yet.

⁴As far as Bulgaria and Romania are concerned, the Commission took note of their proposal to join in 2007.

⁵The full set of macroeconomic Maastricht criteria for EMU membership are: Financial criteria stating a ceiling on the general government deficit to the GDP ratio of 3 percent and a ceiling on the general government debt to GDP ratio of 60 percent; Interest rate criteria stating that the long term nominal interest rate on the public debt has to be within the 2 percent of the average in the three countries with the best inflation record; Inflation criteria stating that the annual inflation rate cannot exceed the average of the three best performing countries by more than 1.5 percent; Exchange rate criteria stating that the EMU candidates will have to join an ERM2 arrangement for two years prior to join EMU.

The perspective EMU membership prompted a very wide discussion in the theoretical and in the applied literature: is the enlarged EU an Optimal Currency Area (OCA)? To which extent should the Maastricht criteria be relied upon? When should the EMU membership be granted to the selected CEECs? Which is the best exchange rate regime meanwhile? Which is the correct parity towards the euro for the currencies of the accession countries?

2. Macroeconomic and exchange rate dynamics.

2.1 Transition and stabilisation.

The transition to the market economy of the former socialist countries required the introduction of a radically different institutional and legal framework, along with 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 emphasis of central planners on material production gave the heavy industries the priority in the allocation of resources, while services were largely neglected. This acted like a subsidy, distorting prices, allocation of resources and output composition, so it is not surprising that transition to a market economy and market determined prices have caused massive changes in output, employment and relative prices.

As many empirical studies on transition economies indicate, the temporary disruption of the economy is usually summarized looking, among other things, 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. Similar outcomes can be quoted for the Baltic States, with 1992 inflation of 480%

(Estonia), 590% (Latvia) and 798% (Lithuania), while the figure for Slovenia (73%) was more moderate.

To a certain extent, the differences in these figures represent alternative approaches to the early stages of the transition⁶: academic literature indeed largely discussed the gradual vs. sudden and fast transition issue, suggesting that a certain flexibility was given to the CEECs countries in choosing how much disruption they were willing to take at any single point in time. In practice to carry out transition and stabilisation, many reforms were to be taken together to work (think, for example, to the liberalisation of the internal credit market, the hardening of the budget constraint of firms and public authorities and the price liberalisation, or to opportunity to introduce the price structure of the international trade partners once that the country is open to that competition), and a too mild approach just failed, as the cases of Rumania and Bulgaria testify. These differences in macroeconomic development also depended on historical factors: according to Horvath and Jonas (1998) Hungary and Poland were more advanced in terms of decentralisation, with the Czechoslovakia following; Slovenia was very advanced too, but the situation was of course very different, due to the peculiar history development following the Yugoslavia's break up. Finally, the Baltic States lagged behind, being at the beginning even part of the Soviet Union.

The successful macroeconomic stabilisation 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: the removal of the public subsidies to certain activities was of course one preliminary condition for the strategy, in order to force the local producers to face a hard budget constraint and prevent them from shielding some economic sectors from the conditions of the demand and supply.

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. Monetary overhang, inherited from the past, fostered in some cases the phenomenon.

The second element of the stabilisation policy was the integration in the international markets: 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. Moreover, the price structure in the international market was already given and it was easily observable; it was, above all, stable (the CEECs being only small countries), and this possibly speeded the transition up because in the beginning the economic agents had to become familiar with the system too, and this made the local demands and supplies rather unstable.

Committing to a fixed exchange rate was the last element, because 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.

Notice that this stabilisation procedure combines integration in the international trade and exchange rate management, but does not necessarily impose a formal pegging of it.

Pegging the exchange rate is more than simply smoothing the volatility and it requires a certain evaluation of the trade off involved, as it may jeopardize stability amplifying the adverse effect of some internal or external shocks. The additional advantage, often emphasised in the academic literature and indeed proposed to justify a formal peg in the beginning of the transition, is the opportunity to gain credibility to low-inflation policies: these countries “imported” central bank credibility by adopting a fixed exchange rate with a more stable currency (e.g. see Fratianni and Von Hagen (1992) or Giavazzi and Giovannini (1989)).

Even for transition countries that started transition with more moderate inflation rates, the exchange rate coupled with the participation to the international trade represented the appropriate nominal anchor provided that fiscal policy was sustainable.

This strategy of committing the exchange rate was then undertaken in most of the transition countries that we are analysing: Poland started (in 1990) by introducing a

⁶ And this is much more the case if we take Bulgaria and Rumania into account: the inflation over that

fixed peg to the US dollar, and a similar policy was undertaken by Hungary and by the Czech Republic (Czechoslovakia at the time) with respect to a D mark/US dollar basket; Estonia introduced the currency board (with respect to the D mark) as early as in 1992, while Lithuania only followed in 1994; Latvia fixed the peg with respect to the SDR. A different strategy was followed by Bulgaria, Rumania and Slovenia, who did not take any explicit commitment, albeit Slovenia and Bulgaria in the early '90s are considered in the literature as managed float; the convertibility of Rumania's currency was more limited.

Inflation stabilisation followed in the leading CEECs quite quickly: by 1992 the growth rate of prices was already below 30% in the Czech Republic, in Slovakia and in Hungary, while Slovenia passed that threshold in the course of the following year, Poland and Latvia by the end of 1994, Slovenia in 1995 and Lithuania only during 1996 (see Table 2 for a detailed breakdown of the yearly inflation rate in the CEECs and in the Euro Area). When we consider the pervasive nature of the transition, such a dramatic stage of falling output and high price instability seems to be inevitable, and it is almost a surprise the speed with which these countries recovered from the recession, regained a certain control of the inflation and implemented a preliminary conversion to a market economy.

The overall success of the macroeconomic stabilisation is impressive but concentrating on it too much is misleading, with the twofold effect to both underestimate and overestimate the extent of the transition. The effort undertaken by these countries was much more than simply regaining control of prices during a phase of hyperinflation in a market economy: indeed, a market economy was simply missing at the beginning, and the most important achievement is that the basis of it were introduced at the same time as the macroeconomic stabilisation was carried out. In fact, for a long while macroeconomic dynamics were more dictated by the pace of the economic reforms than by the sources typically outlined by the standard textbook theory for a market economy, and the conventional interpretation in terms of supply and demand shocks did not apply. To formally assess the effect of the transition on the real exchange rate dynamics, disentangling the effects of the progress of the reforms

period was only 83% and 170%, but in this case these figures indicate the failure of price liberalisation.

from those due to labour productivity differentials and other demand and supply side effects, Jazbec (2002) proposed a panel data analysis (extended to other countries of the Eastern Europe and of the former Soviet Union). He concluded that, on average, the factors typically outlined in the classical macroeconomic theory dominate the real exchange rate dynamics only after approximately five years, marking in this way the extent of the transition. This result is broadly consistent with the pattern exhibited by the future EU members, and it matches a widespread praxis in the applied analysis, in which only data generated in 1994 or afterwards are considered on studies referred to the four leading CEECs (Poland, Hungary, the Czech Republic and Slovenia). Coricelli and Jazbec (2001) too found that the features related to the transition are only relevant for the real exchange rate dynamics up to the 5 or 6 years after the beginning of the process.

Of course a fixed nominal exchange rate in the presence of two or even three digit inflation induced a strong real appreciation of the currency, and in fact the real exchange rate rose since the beginning of the transition, as it can be noticed in the three panels composing Figure 1, where the real exchange rates are presented. In the Czech Republic, for example, the ratio between the 1995 and 1991 levels is 1.32, corresponding to a real appreciation of 32%, while in Slovakia that is 11%. Such a real appreciation continued even in countries like Poland, which switched to a preannounced crawling devaluation as early as 1991, and in Hungary, which followed an adjustable peg policy with occasional devaluations, albeit the real appreciation was in these two cases milder: the real appreciation over 1991-1995 was 25% for Poland and 12% for Hungary (95% and 24% if we consider 1990 as the starting year). Finally, albeit we lack data for the years before, the real appreciation over the single 1994-1995 was already between 6% and 18% for the Baltic States.

Yet it seems not fair to attribute the real appreciation to the exchange rate commitment only: the crawling band in Hungary and in Poland was run with the purpose of realising a certain real appreciation. Furthermore Slovenia, which kept the currency formally free to float but managed the exchange rate in practise⁷, experienced a relevant appreciation too: +14% over the period 1992-1995. Moreover, a strong

⁷ Slovenia formally targeted the tight money for a while.

devaluation of the currency prior to the exchange rate commitment was often undertaken, in the attempt to keep the pressure of the international competitors on the local producers low in the first years.

Real appreciation then was part of the stabilisation policy, and may have contributed to the transition too: it maintained the competitive pressure on the sector open to the international competition high, possibly increasing price setting discipline and incentivating firms to raise productivity from the abysmal initial level.

Inflation reduction, anyway, only gives the aggregate picture: the participation to the international trade in fact should also induce in the transition countries a structure of relative prices similar to the one of the major commercial partners: using a detailed, “micro” dataset, Čihák and Holub (2001) found with this respect that indeed this convergence was in place as early as in the years 1990-1996 for the Czech Republic, Slovakia, Hungary and Slovenia (but not for Poland). Despite the encouraging result, anyway, it should also be noticed that the price structure of the selected CEECs was still distant from the benchmark one (Germany), while the other European countries were on average relatively close. Evidence of price convergence (on an absolute level, this time) was also provided by Rogers (2001), who estimated 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.

2.2 Convergence.

From 1995 onwards, the further reforms implemented were also aimed at the specific goal of joining the EU, that is, one of the most developed and sophisticated market economy in the world. The second stage, often termed as “convergence”, involved other interventions on the legal framework to foster even more competition and to implement the *Acquis Communautaire*: this is the institutional framework in which the single market is based, and includes the Treaties, the legislation and the actions defined in order to apply the principles expressed therein.

Meanwhile, the CEECs also needed further progresses in terms of real economic integration in the EU in terms of international trade, synchronization of

macroeconomic fluctuations and convergence of real and nominal economic indicators: it is enough to maintain the focus on inflation here, for its close relation to the exchange rate. With this respect, in 1995 the EMU level was approximately 2.5% while the selected CEECs ranged between 7.2% and 35.7%.

Implementation of the *Acquis* also involved the liberalisation of capital controls, although the pace of liberalisation was different in CEECs. While in fact some countries liberalised all types of flows at the beginning of transition, most of them only removed controls on long term capital movements, initially relying on direct controls to regulate short term capital flows.

Nonetheless, the path of full liberalisation was set by the *Acquis*, and it seems that while the transition and stabilisation period was mainly characterized from fixed exchange rates, during the convergence phase most of the countries, with the noticeable exception of the Baltics, weakened the commitment widening the bands around the parity or withdrawing it at all.

This phase also required the progressive removal of capital controls, and left then the exchange rate commitments exposed to extensive flows of international capital.

The Czech Republic underwent a speculative attack and abandoned the commitment in 1997: the $\pm 7.5\%$ oscillation band did not prove sufficient to contain the pressure, and the Czech authority switched to a flexible exchange rate. Analysing this devaluation, Horvath and Jonas (1998) reached the important conclusion that the crisis was not prompted by inadequate fiscal policy but by the sustained current account deficit run during the previous years: the devaluation took place when the economy slowed down and the expectations worsened (also because of the contagion effect of the Asian crisis), and despite high interest rates on the Czech koruna (the repo rate reached 75%) and large interventions on the foreign exchange market. In any case, according to the authors, the speculative attack only speeded up a regime change that was, in that macroeconomic situation and given the wide structural current account imbalance, unavoidable: according to the estimates quoted by Horvath and Jonas the Czech kroon was overvalued of 2% to 13% at the time.

Slovakia devaluated one year later (the oscillation band being at $\pm 7\%$ at the time), due to the pressures generated on the international foreign exchange market

generated by the Russian crisis, and to the structural macroeconomic unbalance due to excessive government spending, as discussed by Beblavy (2002), but also to the excessive real appreciation over time.

Despite formally floating the currencies, both the Czech and the Slovak monetary authorities keep a careful watch on the foreign exchange market, to smooth and absorb excessive capital flows and reduce volatility. A similar policy (formal free float but in practice supported by direct interventions to steer the evolution of the exchange rate and prevent excessive volatility) is also run by the Slovenian central bank.

Hungary and Poland proceeded with the crawling band allowing up to a $\pm 15\%$ margin. According to Borowski, Brzoza-Brzezina and Szpunar (2002) the introduction of the crawling bands in 1995 (to 7% at the beginning) was due to the fact that the interventions to keep the exchange rate stable became excessive for frequency and volume because Poland was running a current account and a capital account surplus. A certain anecdotal evidence of exchange rate pressure is often reported for Poland, albeit the different exchange rate regime, with the frequent devaluations allowed by the crawling band, may have reduced the incentive to target the zloty for speculative attacks. The National Central Bank of Poland, anyway, did not wait for an exchange rate crisis and passed to free float in 2000, applying a policy orientation already proposed two years before by the Monetary Policy Council (1998). The National Central Bank of Poland motivated the change in the policy orientation as a test to see which exchange rate is set by the market when totally free of interference from the monetary authority. Opposite to the case of tolar and of the Slovak and of the Czech kroon, the zloty is then floating freely and the National Bank of Poland does not intervene on the foreign exchange market. In a country which did not experience a truly free float before, this may have seemed a bold move, but indeed the market rewarded it by keeping the path on the same line followed during the previous phase. In fact, as also noticed by Borowski *et al.* (2002), the real appreciation of the zloty did not increase when the full float was officially introduced.

Hungary, on the other hand, still keeps the exchange rate commitment, and recently (June 2003) implemented a small devaluation in order to reduce the competitive pressure. At the same time, the Hungarian government announced a

programme of fiscal adjustment, providing another indirect piece of evidence that a precondition for fixed exchange rate policy is a sound fiscal policy. Consisting only in a 2.26% devaluation, this is by no means a relevant crisis, but it signals again that it can be difficult to keep an exchange rate commitment when the fiscal policy is not tight, because the fiscal deficit may generate a current account deficit and consequently a credibility problem⁸.

Finally, the Baltic States maintained a stable exchange rate for most of the time. Estonia opened the way committing with a currency board the kroon to the DEM in 1992 (at the rate of 8 EEK for 1 DEM), updating it with the euro in 1999 (15.6466 EEK for each euro); Latvia and Lithuania followed in 1994 when the lat was pegged to the SDR (0.7997 LVL for 1 SDR)⁹, and the currency board of the litas towards the US dollar was introduced at 4 litas per US dollar. In February 2002 the Lithuanian CBA switched towards the euro, with the exchange rate of 3.4258 litas for 1 euro.

These exchange rate regimes exhibited a remarkable stability despite the exposure to speculative attacks. Evidence in one case is presented by Sulling (2002) for Estonia, where the central bank had to react pushing the short term interest rate (Tallin inter-bank offer rate) to reach approximately 15% in December 1997 and 19% in October 1999. To appreciate the extent of the pressure, the inflation over those years was far below 5%, so the effective, ex post real interest rate on the Estonian kroon was similar to the one in the Czech Republic at the 1997 devaluation. Despite these high yields, the foreign currencies crowded the Estonian kroon out and passed from 32 to 78% of the total lending by 2000. We also notice that the spread between the 1-month and the 3 months contracts was nearly 2% in January 1997 and stayed above 1% for

⁸ Another possible explanation is that the Hungarian government also took the chance and devaluated now in order to prevent exchange rate tensions after the accession to the EU, and to build a cushion with which to face the final ERM2 phase.

⁹ Despite formally a fixed peg, in a document reported on the web page of the Bank of Latvia, the Governor Repse (1999) stated that “to sustain the current exchange rate regime, the Bank of Latvia intervenes in the foreign exchange market by selling or buying the national currency at a pre-determined exchange rate, thus acting in a close analogy with the currency board arrangement. We are also in line with another important feature of the currency board: Latvia's monetary base is permanently covered by Bank of Latvia's net foreign reserves at more than 100%”. We then associate Latvia to Lithuania and Estonia and consider its exchange regime analogue to the CBA.

most of that year, which may indicate a tendency for the market to expect a devaluation of the currency¹⁰.

An overview of the exchange rate since 1992 is in the panels of Table 3 (average over the year of the US \$ and DEM daily quotations) and of Table 4 (standard deviations); a review of the current exchange rate regimes and monetary policy commitments is in Table 5, and a summary of the dynamics of the exchange rate regimes is in Figure 2.

The general result is the gradual substitution of the US dollar with the D mark (and then with the euro) as an anchor during the convergence phase. Notice in particular that the volatility of the Czech and of the Slovak kroon, with respect to the dollar, soared when the exchange rate commitments were abandoned, while with respect to the D mark this effect is much less observable. The standard deviation of the daily quotations of the Czech kroon doubled in 1997, but in the following two years it returned to values comparable with the situation before the crisis, and the dispersion of the Slovak kroon, which was four times bigger in the 1998, returned to the pre-crisis levels within three years. Since the two central banks intervene on the market with the exact purpose of reducing volatility, we can not conclude that the commitment would have been irrelevant in these last years, because the monetary authorities may have just operated to replicate the desired exchange rate dynamics, but we also remark that for Poland, which indeed has a purely free float, the dispersion is minimal and apparently it was not affected, if at all, by the change of regime.

As one can expect, the three Baltic States, having the tightest exchange rate regimes, are also characterised by the lowest volatility. Notice anyway that the standard deviation of the Polish currency is just slightly higher despite the float, and that the progressive widening of the oscillation bands and the final removal of them did not affect volatility very much.

This is at total odd with the performance of Hungary, which experienced the largest fluctuations, even though the exchange rate commitment was still formally in

¹⁰ We acknowledge that in alternative such a large spread may indeed be due to a different liquidity of the two markets; notice anyway that it is currently (May 2003) below 0.1% (data as from the Bank of Estonia web page).

place. Finally, Slovenia too experienced rather large fluctuations, despite the interventions taken.

3. Capital mobility, exchange rate regimes and inflation targeting.

Despite most of the CEECs having begun the transition to the market economy by pegging the exchange rate, it is now widely acknowledged that monetary policy should primarily aim at prices or inflation stabilisation¹¹. The discussion of the exchange rate dynamics then can not exclude an investigation of the relation with the inflation.

Darvas (2001) identifies two aspects of this link: “fundamental issues”, such as the transmission of monetary policy, the role of asymmetric shocks, labour mobility and wage and price flexibility, and “sustainability issues”, such as the vulnerability of rigid regimes to speculative attacks and the possible role of different regimes in reinforcing or opposing the destabilising effect of capital flows. Darvas claims that more flexible regimes are considered in the literature as superior with regard to both issues, but acknowledges that some authors suggested that the choice of a regime should be based on fundamental issues (and that for particular cases rigid regimes may be preferable). As he notices, the key element is the role of the exchange rate in controlling inflation, either by direct exchange rate targeting or by the indirect influence of other regimes.

One of the advantages of a fixed exchange rate commitment is the fact that it provides the system with a clear link with the price structure prevailing on the international markets. In addition to this, it also provides a target which is easily seen by the economic agents at any moment, allowing them to immediately see if the commitment is met from the monetary authority.

¹¹ The CEECs central banks share the same sentiment, and such a statement appears as the broad definition of the ultimate goal of monetary policy on their web pages.

Pegging the exchange rate may then help the central bank during a difficult situation, such as the transition or a phase of hyperinflation, because the economic agents may perceive the inflation only with imprecision and with some delay, keeping the uncertainty high. This may induce a conservative behaviour so that inflation is sustained by the expectation of it, as in a self-fulfilling prophecy, and it may impose a relevant risk premium on the interest rates and on other financial assets.

If the exchange rate commitment is broadly consistent, the agents will have a way to observe the attitude of the central bank clearly and with no delays, reducing the uncertainty. The central bank that pegs the exchange rate may then buy some of the credibility of the target currency. This argument should not be pushed too much, because the sustainability of an exchange rate commitment may be challenged and fail either to a speculative attack or to structural macroeconomic unbalance, and if the peg is not credible most of the advantages are lost because it will not be taken into account by the agents when they form the prices. The exchange rate commitment may then increase the credibility of the central bank mainly under favourable situations: restrictions to capital movements, especially with respect to short term and financial flows, can make a speculative attack difficult; a large supply of international reserves to sustain the commitment, and of course the support of the monetary authority of the target currency are other relevant factors to enhance stability.

As an alternative, anyway, the central bank may avoid the explicit commitment and let the exchange rate float: since most of the damages come from the excessive fluctuations of the nominal rate, the central bank may just be content to smooth most of the volatility away, but without intervening to impose a certain medium – long run trend: there is a widespread sentiment that the exchange rate management contributed to the inflation stabilization, but it is less clear whether the commitment had an additional positive impact on the inflation control. Assessing whether this alternative approach has a cost in terms of higher inflation may provide an insight for Rumania, and other countries like Albania and the remaining members of the former Yugoslavia and of the former Soviet Union, which are still in the process of transition or early in the convergence, but it is also important to compare costs and benefits of alternative approaches to the EMU for the CEECs accessing the EU in the next round.

Finally, the countries that entered the transition phase were of course far from being a modern market economy, so an indirect procedure¹² similar to the one implemented by the Bundesbank, and subsequently by the Eurosystem, could not be put in place, because it requires a degree of sophistication of the financial markets and an integration of them with the real economy that simply did not exist at the beginning of the transition.

3.1 Exchange rate regimes on the way to EU accession.

The bipolar view says that in a world where countries have a free access to international capital markets and where capital moves freely, only flexible exchange rate and fixed exchange rate are sustainable regimes, both meaning a commitment to give up altogether an independent monetary policy. As far as CEECs are concerned, the more frequent movements are towards an increasing number of intermediate regimes and a shift towards flexibility: looking at Figure 2 we see that the Czech Republic, Slovakia, Hungary and Poland move from binding exchange rate arrangements towards more flexible ones, joining Slovenia. Nevertheless it must be remarked that all these countries kept a close watch to the foreign exchange market, and indeed most of them, Poland being the only exception, continued to operate on that market with the intention to prevent excessive fluctuations and to sterilize large flows of funds, such as those generated by a substantial Foreign Direct Investment (FDI) or by sudden swings in confidence, but also to finance current account deficits.

It is widely acknowledged that fixed exchange rate regimes, when combined with a high degree of capital mobility, are exposed to speculative attacks and exchange rate pressures, as in fact it has been experienced by the Czech Republic, Slovakia, Poland and Estonia, so that countries should avoid unstable combinations of capital mobility

¹² The “Bundesbank approach” to monetary policy prescribes that the central bank only operates on the market for its own activities, i.e. the reserves of the commercial banks held in form of deposits on the central bank. Since the demand is grossly known in advance (it is approximately just slightly more than the minimal reserve requirement), the central bank may determine the interest rate on that reserves market (the interbank market) acting as the residual supplier. This rate is then transferred to markets for instruments with longer duration on the term structure of interest rates and to other financial assets according to the expectations of future monetary policy. These will in turn affect the rates that are relevant for the macroeconomic dynamics, in particular the ones for the demand of money and of credit, and indirectly affect the economic cycle and then the pressure on prices.

and exchange rate fixity, since high capital mobility makes exchange rate commitments increasingly fragile.

The common goal of low inflation and the diversity of exchange rate regimes may seem an indication that policymakers in the CEECs lacked a consensus view with regard to the best monetary regime to be adopted in the pre-EMU period. In choosing an exchange rate regime on the way to EU accession anyway other factors too came into play. First and most important is of course the historical legacy of the transition: with the exception of Slovenia, the CEECs already had a fixed exchange rate agreement (possibly with crawling bands) in place, and the liberalisation of capital flows has not been instantaneous, but often well spread over time. Maintaining the exchange rate commitment, and the potential benefits in terms of credibility gain and internal stability of international prices, was an option at least until the current regime was really put under pressure. Even then, we must remember that at the end of the convergence phase the CEECs expected to join the euro sooner or later, so the exchange rate commitment can be seen as limited in time: as long as the speculative attack fails to mobilise enough financial capital in the short run, the CEEC under attack can, in a sense, gamble and make a relevant effort to sustain the attack now because the deadline is set and (probably) near¹³.

Furthermore, the tight exchange rate commitment has been retained only by the Baltic States, which from the one hand had not undergone much exchange rate pressure so far, despite the experience of Estonia, and from the other are those who can gain more and lose less from the commitment. Indeed they are extremely open to the international trade and have much of their public debt in foreign currencies, so they can gain a lot from the exchange rate stability, and are not seriously affected by a very high interest rate in the local currency.

¹³ There are of course limits to this argument. Estonia accepted a 15% ex post real exchange rate, but might have found unbearable a much higher rate. Moreover, the exchange rate criterion of the Maastricht Treaty also requires the absence of pressures during the phase of assessment of convergence, so this argument only applies to attacks realized before the beginning of the evaluation period.

3.2 Inflation targeting.

The situation at the beginning of the transition phase was favourable for exchange rate commitments because the credibility of the central banks was inexistent, making the potential gain very large, and because the restrictions to capital movements were very tight, reducing the sources for speculative attacks. When the progress of the convergence required the removal of these controls, the exchange rate commitments become exposed to speculative attacks. Without explicit support from the target currencies, the credibility of the commitment was weakened even more.

After nearly a decade, anyway, the central bank of the eight CEECs had acquired some credibility and when the Czech Republic dropped the exchange rate commitment, it replaced it with a formal inflation targeting; Poland introduced it in 1999, while Hungary followed in 2001. Poland and Hungary did not replace the exchange rate commitment with the inflation targeting one so suddenly as in the case of the Czech Republic: they both kept the two commitments at the same time for a little time (in fact, Hungary still keeps them both), but the introduction of the inflation targeting signalled nonetheless a relevant shift in the management of monetary policy.

The introduction of the inflation targeting scheme offers to the central bank an alternative approach to inform the expectations, maintaining the commitment to price stabilisation implicit in the old exchange rate peg, and in fact making it explicit. As such, the shift in monetary policy conduct is more apparent than real.

Furthermore, assuming that the CEECs are intended to join the EMU, an inflation targeting framework may help the public to become familiar with the monetary policy strategy pursued in the Euro-area.

3.3 Is inflation targeting feasible in the CEECs?

It is often argued that a successful inflation targeting policy requires a favourable institutional framework, including monetary authority independence, sound fiscal policy and a communication strategy of the central bank based on transparency and accountability¹⁴. As noticed by Amato and Gerlach (2002), these conditions are anyway

¹⁴ Christoffersen, P., T. Slok and R. Wescott (2001) and Golinelli and Rovelli (2001) discuss these conditions for Poland, Hungary and the Czech Republic, finding the overall situation satisfactory. The

not less important for an exchange rate commitment, and even for very advanced economies with well developed markets, as the experience of the ERM 1 shows.

In order to avoid potential conflicts in the management of monetary policy, it is also usually advised to establish the inflation rate as the single target, while Poland (for a while) and Hungary (still) coupled it with the exchange rate. With this respect Amato and Gerlach remarked that when the credibility of the central bank is not fully established yet the exchange rate commitment may still play a role in informing the expectations on a daily base. Since the central bank will probably have to use the exchange rate as a monetary instrument to stabilise inflation anyway, Amato and Gerlach argue the possibility of a conflict between the two targets is limited, especially when the policy makers maintain a sound economic and fiscal policy.

4. Exchange rate management and inflation control, the empirical evidence.

The CEECs placed a strong emphasis on the objective of low inflation both because of its inherent benefits and because of their aim to fulfill the Maastricht criteria so that they can participate in the EMU. In spite of the variety of approaches to exchange rate policy, the CEECs made substantial progresses in reducing inflation which is now 8% or less and in some cases (Poland, the Czech Republic, the Baltic States) very close or even below the average of the Euro Area, and in establishing low levels of exchange rate variability (see Table 4). Even if the inflation rates of the CEECs are above the level of EU countries, the trend exhibits a decrease in inflation, more significant for Baltic States and less important for Slovenia and Slovakia. As a whole, the European transition countries that are joining the EU in 2004 show for 2000, 2001 and 2002 an (unweighted) average inflation rate of 6.2, 4.5 and 2.5 respectively, versus 2.5, 2 and 2.4 of the whole Euro Area.

Commission of the European Communities (2002) too acknowledged that “most candidates have established an independent central bank”.

The success of the stabilisation and inflation convergence induced with the exchange rate management and the exposition to the international competition is generally acknowledged in the literature. There is anyway much less consensus on the importance of the exchange rate commitment with respect to a managed float that maintained the same appreciation, especially after that the transition has been accomplished and if the central bank has already gained some credibility.

4.1 Exchange rate pass – through and the control of inflation via the exchange rate.

The extent to which exchange rate changes are eventually reflected on import and export prices, consumer prices, investments and trade volumes, is commonly referred as the degree of exchange rate “pass-through” and can be empirically evaluated. Nearly all the empirical studies estimate a relation between inflation and exchange rate, implicitly then dealing with the pass through of the effect on the former of a variation of the latter, but only a few of them compare the results of estimates for different countries to draw conclusions on the exchange rate regime too.

The simplest approach to the analysis is a pooled VAR as in Gottschalk and Moore (2001), in Horská (2001) and in Borowski *et al.* (2002): unfortunately they all study the same country (Poland), not being then informative about the validity of alternative exchange rate regimes, but we can at least verify the importance for the stabilisation and inflation control of the exchange rate in alternative to the interest rate, and generalize the effect of the technique chosen (unrestricted VAR) on the evidence found. The VAR they consider is in level, under the assumption of I(1) and cointegration, disregarding then the issue of identifying the long term components. The advantage of this approach is in its generality: it does not impose any restriction and it is then very robust. As it is often the case, unfortunately, the cost of robustness is precision: Gottschalk and Moore and Horská specify the VAR in order to include both variables corresponding to the exchange rate channel and the conventional monetary policy transmission, via the real sector of the economy, while Borowski *et al.* only specify the policy variables and the inflation rate.

On the basis of the impulse response functions of the larger VARs, the existence of the conventional monetary policy transmission channel can be dismissed; a weak link from the interest rate to the inflation is found in Borowski *et al.* but a precise assessment is difficult due to the absence of the elements corresponding to the real component of the economy. The control of inflation is anyway still possible in Poland because of the exchange rate: in all these models an appreciation of the nominal effective exchange rate reduces the inflation quite strongly and well within one year¹⁵. A similar result (the nominal effective exchange rate is a valid tool to control inflation, while it is much more doubtful for the interest rate channel) is claimed by Christoffersen, Slok and Wescott (2001) with an approach that may be termed as “nonparametric” since it mainly looks at pairwise correlations¹⁶.

A more complex VAR specification, in which the long run restrictions are identified and discussed, is presented by Coricelli, Jazbec and Masten (2003). In their interesting analysis the authors combine an I(2) and an I(1) specification, estimating the long run pass-through of the exchange rate as the cointegration coefficient linking the inflation differential with respect to a reference country and the exchange rate depreciation. The estimated impact is larger for Slovenia and Hungary (and it is very close to 1), with Poland following (approximately at 0.8) and then the Czech Republic (less than 0.5). Once again, the indirect, interest rate channel is not explicitly modelled, and only a reduced form type of link between inflation and interest rates differentials is reported: Poland is the country with the largest (long run) sensitivity of inflation to the interest rate, followed by the Czech Republic, Hungary and then by Slovenia. These results confirm that the exchange rate is an important tool to control inflation in the CEECs. The I(2) analysis also allows the authors to assess the fact that the contribution to the I(2) stochastic trend (for prices and the exchange rate) of the exchange rate relative to the CPI or the PPI is larger in Slovenia, followed by Hungary and the Czech Republic and then by Poland. Considering the different exchange rate regimes in these

¹⁵ A variation of the nominal effective exchange rate of 2.5% to 4% is estimated to be sufficient for a 1% effect on inflation.

¹⁶ And considers first differences of the data. This may be inappropriate if there is cointegration but we think the sense of the analysis remains the same.

countries, Coricelli *et al.* conclude that a policy directed to the stabilisation of the real exchange rate may be internalised by the agents and result in higher inflation¹⁷.

The primary focus of empirical investigation on the pass-through, anyway, is on import and export prices: it is in fact assumed that consumer prices, investment and trade volumes react to these prices. Since invoicing in the CEECs is carried out almost exclusively in foreign currency, it could happen that there is a complete pass-through into import and export prices but not necessarily into consumer prices. A different approach is discussed by Darvas (2001), who considered a time varying parameter model with an error component formulation incorporating the equilibrium real exchange rate. Prices and exchange rate changes are discussed jointly, and the model allows the identification of real exchange rate shocks and equilibrium real appreciation as alternative sources of prices dynamics. Time varying parameters are of particular interest in the analysis of the CEECs because of the structural changes that these countries faced and the application of different exchange rate regimes over time. The short term pass-through declined over time for Hungary, Poland and Slovenia, while increased for the Czech Republic, and it is interesting to observe that the major shifts for both Poland and the Czech Republic took place when they abandoned the exchange rate commitments, so it seems that the effect on inflation depended more on the individual characteristics of the country than on the exchange rate regime. The long run effects anyway declined all over time, so it is possible that a weaker commitment results in a lower pass-through because exchange rate fluctuations are less likely to be perceived as definitive. Darvas also remarks that the exchange rate commitment may, on the other hand, induce a higher pass-through, a conclusion that he seems to draw on the basis of his estimates of the long run pass-through: these in fact declined for all the four countries.

The author concluded that he was unable to determine whether country differences can be attributed to the exchange rate regime, to exchange rate volatility or to the level of inflation, but it still seems that credible exchange rate management can play a useful role in reducing inflation.

¹⁷ The agents will in fact expect a depreciation and will feel the pressure from the international competition lower, setting higher prices and so inducing the central bank to devalue the currency.

Finally, a structural approach is discussed by Golinelli and Rovelli (2002): they specify a structural model where relationships between the output gap, inflation, the real interest rate and the exchange rate during the course of transition are modelled by using an open macroeconomic model with forward-looking inflation and exchange rate expectations, along the lines of Svensson (2000). This approach uses extensively more information from economic theory in order to identify the structural parameters and may then result in a more precise estimation. Iacone and Orsi (2002) followed the same approach, but modelled inflation as backward looking. A second difference between the two papers is in the fact that Golinelli and Rovelli modelled the variables introducing first or second differences in order to obtain a statistically stable model, while Iacone and Orsi preserved the macroeconomic sense of the variables in levels even when these might have resulted in insignificant coefficients over a certain part of the sample period.

Golinelli and Rovelli perform several counterfactual simulations to analyse the potential macroeconomic dynamics of alternative policy stances for Poland, Hungary and the Czech Republic. Overall, the trade off between inflation and output remains, so that a more aggressive disinflation policy would have induced mostly negative output effects. These simulations may also serve as a tool for Central Banks to assess the relative costs of alternative inflation targets on the way to the EMU, but the authors warn that if a more aggressive policy stance goes together with more credibility and hence less persistence, then plausibly its costs would be correspondingly reduced. If this is the case, then it is also possible that the simulation results indicate an upper bound for the output loss resulting from a faster disinflation.

With a small econometric model for Poland, the Czech Republic, Hungary, Slovenia and Bulgaria, Iacone and Orsi find that indeed the real exchange rate management played a key role in the macroeconomic stabilisation and in the integration in the European production structure. They also find evidence of a certain evolution of the economic structures over time, which become closer to the “textbook” benchmark of a market economy. The additional reference to Bulgaria here is of interest too, because it provides an example of transition at an early stage: the stabilisation effort in Bulgaria failed until a currency board was introduced, resulting in a relevant structural break in the model. From that point onwards, the macroeconomic

specification of the inflation (supply) equation become similar in style to the one of the other transition countries, while the demand equation remained still unstable.

4.2 Inflation targeting: the empirical evidence.

Tacking everything into account, we can conclude that the integration proceeded quite fastly during the decade. At the beginning of the transition it was probably easier to control the exchange rate than the inflation, because the latter can only be influenced in an indirect way. Given that the evolution of the economic structure has quite reversed this relationship in the countries more advanced in the convergence, Iacone and Orsi considered that the policy switch in the Czech republic, Poland and Hungary was also appropriate with respect to the timing even when the macroeconomic structure, rather than the institutional aspect, is considered. They also verified that inflation targeting does not represent a discontinuity with respect to the previous strategy of monetary policy, and the inflation dynamics were not adversely affected.

The performance of the Czech Republic, Poland and Hungary is mixed: too tight target bands, still rather unprecise macro models of the economy and a certain dependency on administrated prices resulted in some disappointing performances in terms of inflation targeting. This policy has anyway achieved some successes recently, and it was explicitly praised by the European Commission in the Regular reports (2002b).

The switch from a tight exchange rate commitment to the inflation targeting in the Czech Republic, Poland and Hungary does not then indicate that they are reducing their efforts towards the EMU: at the contrary, it seems to be a consequence of the lift of capital control as required by the transition process. Coupling the inflation targeting with a continuous attention on the foreign exchange market, where the excessive fluctuations are smoothed away, revealed to be a successfull way, for the transition countries, to implement the intermediate approach without giving the impression of slowing down the reforms; Poland did not even need to openly resort to this additional instrument to control inflation in a satisfactory way.

Coricelli *et al.* (2003) argue that controlling the exchange rate ex post without any preliminary commitment is likely to create a situation in which inflationary pressures build up, because the economic agents may expect that the central bank will accommodate the inflation generated in the current period with a devaluation in the following one. Albeit they only propose a fixed exchange rate (in fact, the euroization) to counter this effect, any credible commitment, including the inflation targeting, will serve the purpose.

The experience of Slovenia and Slovakia, which floated the currency but did not adopt a formal inflation targeting, provides a partial example: both the countries experienced a certain difficulty in reducing inflation below a certain threshold; other factors anyway intervened too¹⁸, making the identification of the alternative causes rather difficult.

4.3 Perspective for the euro area.

The estimated models for the CEECs are still statistically weak, especially when the indirect transmission of an interest rate shock is considered, as it is designed to take place in the operative model of the Eurosystem. Yet inflation targeting proved overall successful in the countries which experimented it, and it is possible to suggest that the European monetary authority will still be able to control the growth rate of prices relying on the fact that the intra EU trade maintains a positive correlation of the local inflation with the overall one when the exchange rate is fixed. There are anyway some costs: the CEECs might experience more inflation and output volatility than they would if they retain their monetary independence, while the management of monetary policy and the inflation stabilisation could become marginally more difficult for the Eurosystem.

¹⁸ This is particularly a problem in the case of Slovakia, where the central bank monitors inflation carefully but does not attempt a formal inflation targeting because the weight of administrative prices in the CPI is still too high to allow a successful control. It is also suggested that the relatively high inflation recorded in Slovakia for 2002 – 2003 was mainly due to a relevant correction to the administrative prices.

5. EMU accession in an optimal currency area perspective.

The accession to the EU represents the conclusion of the process of convergence: in a little more than a decade, these countries became “functioning market economy” and “the continuation of their current reform paths should enable them to cope with competitive pressure and market forces within the Union” according to the assessment of the European Commission (2002).

Participation to the EU will also open the discussion of membership of the EMU, which in turn is one of the chapters of the *Acquis Communautaire*. Countries accessing the EU will not have the right to opt out of the single currency, and are expected to join the euro if and when the Maastricht criteria are met.

The accession countries will not be forced to immediately join the ERM 2 (but they are given the opportunity, if they want), and this, being one of the parameters considered in the Maastricht criteria, leaves in practise a certain degree of flexibility to the accession countries. It is then of interest to assess whether the accession countries and the current EU/EMU members may benefit from the expansion of the euro area and are then willing to join it as soon as possible, as it is usually stated in many official speeches.

Traditional Optimal Currency Area (OCA) theory suggests that the advantage of the EMU includes the removal of uncertainty in pricing in the international trade, and the removal of that premium as a consequence, and the saving of transition costs. Fixing the exchange rates and entering a monetary union has also potential drawbacks, because the real, asymmetric shocks can not be countered adjusting the exchange rate but are transmitted from one country to the other. An OCA will then be desirable if the potential gains are high, as it is when the countries involved are open to each other (they have a large trade in common), and if the risks are limited: local flexibility of prices and of wages, or international mobility of labour, for example, will prevent an asymmetric shock in the partner country to have effects on the quantities in the home country; a system of fiscal transfers could otherwise be established; the adverse effects of shocks can be also reduced if the countries reach a high diversification of production, because the exposure to a single type of shocks is reduced. Finally, a good degree of

macroeconomic convergence is necessary: the inflation rates in the two countries must be similar, so that there is no loss of competitiveness¹⁹, and the economic business cycles should be synchronized in order not to have one acting as a shock for the other.

The first exercise consists in discussing the factors separately. The scope for monetary unification is guaranteed by the small dimension of the CEECs associated to a large degree of openness; the conditions to counter an asymmetric adverse shock are not favourable because of the rigidities still present in the labour market and of the low synchronisation of the economic cycles, this one being the most important concern in the majority of the applied works.

For an overall assessment, aggregate indexes are devised, often in the path of the original contribution of Eichengreen, B., T. Bayoumi (1996), and in general the conclusion is favourable, or at least comparable, to the one that would be given for some peripheral countries that are already in the euro-area, as discussed for example in Schweickert (2001).

It is also often remarked that the advantages are understated and that the costs are overstated in the conventional OCA analysis, and that the balance should then shift in favour of integration: the trade patterns in fact are endogenous and the monetary integration has a highly positive effect on them²⁰, while the economic cycles tend to synchronize after the monetary union (possibly also because of the larger trade).

Should we evaluate optimality of a currency area on the basis of the classical arguments only, the original EMU itself could be not optimal, due to a certain rigidity in the labour market and to the low dimension of the federal budget.

When one considers the CEECs, the potential losses are larger, but the gains are larger too: in a paper published by the European Parliament, van Eden *et al.* (1999) conclude that “the consensus opinion of the economic profession seems to be that full EMU participation will have net positive effects for first wave accession countries in the medium term”; subsequent country-specific researches confirmed this conclusion.

¹⁹ Of course a country may keep a higher inflation if it is matched by higher productivity.

²⁰ This was very clear to European institutions, which considered the euro essential to foster the intergration of the single European market.

The additional advantages are even larger in the EMU accession of the CEECs because the gains in credibility are to be taken into account too²¹ (in the analysis of Schweickert, for example, these are crucial to tilt the result in favour of the EMU): these are indeed relevant for central banks that are very young and are then still struggling to establish themselves a reputation. Moreover, at the moment the financial markets are still weak, fragmented between the local currency and the euro in a situation where the funds may be too little to make both of them working efficiently, and this too increases the incentive to introduce the euro.

6. Real exchange rate determinants: productivity dynamics and the Balassa Samuelson effect.

6.1 Productivity dynamics

In general, the nominal exchange rates devaluated during the decade, but not enough to compensate the local inflation, generating an appreciation of the real exchange rate.

The extent to which this also implied a loss of competitiveness anyway depends also on the increase in productivity: the transformation of the productive structure and the inflow of international investment allowed the replacement of the local capital stock with more productive one, and the substitution of the production and allocation organisations, yielding a substantial productivity gain.

Over the period 1995 to 2001 (inclusive) labour productivity in the EU grew of just 1.2%, compared to the 2.8% of the Czech Republic, 2.9% of Hungary and 6% of Poland, according to the OECD economic outlook (2002); the real GDP/employment index passed between 1995 and 2003 from 100 to 107.04 in the euro-area, to 145.6 in Poland, to 127.2 in Hungary and to 118.4 in the Czech Republic. Over the same period the (multilateral) real exchange rate of these countries appreciated of 30% in the Czech

²¹ In this case, the monetary arrangement must be designed in such a way that the public perceives that the future monetary policy decisions will be taken using the approach of the more credible central bank: to this end, several commentators remarked that the original constitution of the Eurosystem resembled the one of the Bundesbank; one should similarly argue, then, that the accession of the CEECs should not alter this perception.

Republic and in Hungary, and of 32% in Poland, while the appreciation vs. D mark was 51%, 39% and 43% respectively. This of course is only a naïve comparison of raw data, but suggests that the real appreciation could be compensated by the productivity catch up. Another way to see this phenomenon is discussed by Golinelli and Orsi (2002) who noticed that the competitive loss is far less relevant when producer prices (PPI) rather consumer prices (CPI) are compared.

6.2 The Balassa–Samuelson effect

With per capita income between 33 percent (Latvia) and 69 percent (Slovenia) of EU levels²², a sustained period of growth can be expected as the CEECs catch up. Comparing broad measures of productivity may allow a general assessment of the effective competitiveness, but for a more precise measure (and for a more detailed forecast of the effects on inflation) a distinction must be drawn between goods traded on the international markets and goods and services not exposed to foreign competition and produced for the internal market only. During the catching-up process, prices of nontradable goods may be expected to rise more rapidly than prices of traded goods, due to improvements in the quality of services and on the so called Balassa-Samuelson (BS) effect arising from more rapid productivity growth in the traded good sector relative to non-traded goods or other sectors. The idea behind the BS effect is that the international prices and the technology conditions fix the capital/labour ratio in the sector of traded goods, and that the same wage will be passed to the sector of nontraded goods (and services) because factor inputs are mobile within the country. As a consequence, if the productivity grows at a lower speed in the sector of nontraded goods than in the other one, the difference will be compensated with more inflation in the non traded goods. Since the catching up of the less developed economies is likely to take place in form of import of more efficient technology and increased productivity in the sector competing on the international markets, we may expect that the productivity gap between the sector exposed to the international competition and the one operating

only locally without external interference can be very large. As a consequence the CEECs may experience higher inflation during the catching up, and the real exchange rate would tend to appreciate on a Consumer Price Index (CPI) basis, but not necessarily on a unit labour cost or on a PPI basis: the idea of a long run Purchasing Power Parity (PPP) then may remain, and prices of traded goods still converge in the long run because of competition: Golinelli and Orsi clearly interpret the difference in the CPI and in the PPI dynamics along the PPP argument.

Quantitative studies vary both for the approach (country specific vs general for all the CEECs) and the methodology, but they mainly converge on the idea that the estimates can be placed in the 1 – 2% additional inflation points per year or more, making then the effect relevant towards the fulfilment of the Maastricht criteria. Surveys are in Borowski et al. (2002), where 1.5% per year is suggested for Poland, and in Coricelli (2002), where the range for the CEECs is 2 – 4%, implying approximately a 1% appreciation of the real exchange rate per year; Coricelli also remarks that the catch up of productivity to the levels of the least developed EU countries will still take a considerable time (he suggest 15 years), so the BS effect could still be a relevant source of inflation during the evaluation of the Maastricht criteria and waiting is not a feasible option. Finally, a very extensive survey is in Egert (2003) but unfortunately no estimates are provided therein (except for Estonia).

More structural estimates, based on a VAR methodology and the identification of long run coefficients, are in Golinelli and Orsi (2002) and in Egert (2002a). The estimate of Golinelli and Orsi of the supplementary inflationary impact in the three largest CEECs ranges between 3.3 to 5.3 percent for the Czech Republic, from 0.6 to 3,7 per cent for Hungary and from 4.4 to 5.8 percent for Poland, while Egert (2002a), combining a panel and a cointegration approach concluded that the inflation induced by the BS effect ranges between 2.2 and 3.1% for Hungary and 1.5 to 2.2% for Poland, but it is negligible for the Czech Republic, Slovakia and Slovenia, and placed the result for the panel at about 1%.

²² As from the Commission of the European Communities (2002), GDP compared on the PPP basis; Bulgaria (28%) and Romania (25%) have not been considered since they are not part of the countries accessing EU in 2004.

The effects are larger, covering the ranges 3.7 – 4.3% for Hungary, 3.8 – 3.9% for Poland and 0.4 to 1.5% for Slovenia (but maintaining the BS effect for the the Czech Republic and Slovakia negligible) when the period starting in 1995 onwards only is considered. Egert notices that this is partially due to a phase of exceptional productivity growth in that period, and we should not expect it to remain as such in the future; nonetheless, according to Coricelli and Jazbec (2001) only from that period onwards demand and supply conditions (and then the BS effect) played a relevant role in the determination of the real exchange rate, while factors more connected to the transition determined the previous phase. Coricelli and Jazbec also argue that the real exchange rate dynamics can now be assimilated to the one of previously acceding countries like Spain, Portugal and Greece, with the Balassa-Samuelson effect playing a dominant role.

Studies dedicated to the Baltic countries are less frequent, and seem mainly dedicated to Estonia. These countries experienced the largest real exchange rate appreciation and yet kept the exchange rates fixed; the starting productivity was lower than in the other CEECs and the production and allocation technologies were even more distant than the ones of a functioning market integrated in the European economy, requiring an even larger transition and then a priori suggesting the possibility of a more intense BS effect.

The estimates quoted in Egert (2003) for Estonia range between approximately 0.5% and 4% additional inflation per year, and the author's estimate is in the same range, being between 0.5% and 2.5%.

7. Implications on the way to the EMU

7.1 The Maastricht criteria the Balassa Samuleson effect

The catching up of the productivity of the CEECs with the euro area countries is far from concluded, and it will last for several other years. Meanwhile, the BS effect will continue to push the inflation in the accession countries: keeping the exchange rate fixed the risk is that the inflation in the accession countries will overshoot the threshold, unless a restrictive policy is implemented.

As Szapary (2001) pointed out, pressure on the economic activity and on the inflation will also come from the reduction of the interest rates to the level of the euro area and from the reduction of the premia paid on the CEECs currency once that the markets expect them to join the euro.

Since the monetary policy is constrained by the Maastricht criteria, the burden of the restrictive policy to counter the pressures on the inflation will be on the fiscal authority.

The potential conflict between inflation and real exchange rate stability may endanger the fulfillment of the Maastricht criteria without signalling a real misalignment of the economies, or force a recession which may be unnecessary at least in the size. This may suggest a revision of the Maastricht criteria: a first best solution would obviously be to revise the inflation criterion taking the estimated BS effect into account, but the reliability of the point estimates is clearly low and an *ad hoc* solution for each country could leave to some candidates the impression of an unfair treatment. Szapary suggested a more approximative solution, and proposed to consider for the criterion the reference inflation on the whole euro area rather than on the three best performing countries. This proposal, or similar ones (increasing the acceptable spread with respect to the reference inflation of 1% or of 2%) are often presented in margin to the discussions of the BS effect.

The BS effect is likely to cause a systematic imbalance between the inflation rate of the core euro area (the current members) and the newcomers even after the EMU. Weighting the estimated effect for the size of the CEECs economies relative to the EMU area, it is unlikely that the general inflation is affected in a relevant way, so the

risk that the Eurosystem runs a monetary policy that is too restrictive for the current members to counter the inflation in the CEECs is indeed limited.

7.2 The Maastrich criteria and the feasibility of a stable exchange rate

Once into the EU, the CEECs will have the chance to peg their currency to the euro in the ERM 2, adopting in that case a fluctuation band that may be as wide as up to $\pm 15\%$. The alternative arrangement of a CBA is clearly satisfactory as well, as long as the referent value is the euro only.

The definition or the change of the central parity in the ERM2 must be agreed from both the ECB and the local national central bank. This provision is not intended to impede changes due to the market conditions and possibly on the inflation differential, but just to prevent competitive devaluations. In fact, the considerations on the BS effect and the difference in the inflation dynamics may occasionally suggest a devaluation.

Participation to the ERM 2 then does not impose a relevant change in the monetary policy for those countries having a floating exchange rate and possibly another anchor for the monetary policy, because the oscillation bands are wide enough and the option of changes of the central parity is not ruled out, so that the commitment may be more formal than real: the recent experience of inflation targeting of Poland, Czech Republic and Hungary can continue without relevant modifications. Things may be different for Estonia and Lithuania, because the current parity has been univocally decided many years ago, while the one in the ERM 2 will have to be decided in agreement with the European counterpart and will have to be in line with the macroeconomic fundamentals, and for Latvia, whose current anchor is not the euro yet.

A different policy, consisting of the immediate substitution of the euro to the local currencies, is proposed by Sulling (2002) Nuti (2002), Coricelli (2002) and discussed in Bratkowski and Rostowski (2002). The advantage of a euroization is that the benefits in term of lower interest rates and credibility of monetary policy of the EMU may be acquired immediately by the CEECs, at the cost of not sitting for the

moment at the desk of the ECB. The EU too may benefit from the faster re-orientation of trade of the CEECs towards the Union.

Euroization, anyway, has always been opposed by the European institutions, which insisted on the “ortodox” Maastricht criteria. Accepting the euroization in fact may appear as a shortcut to avoid the discussion on the effective convergence: if the ECB is involved in the definition of the conversion rate, this would be seen as a form of endorsement of the arrangement, crowding out any discussion on convergence. Avoiding to be involved in the conversion is not a much better policy for the ECB, because it leaves the CEECs the power to fix the rate at which they will enter the euro area in the future. Moreover, the supply of euro in the EU or in an area with which the EU is well integrated would be out of the final control of the ECB, reducing the effect of the management of monetary policy. We finally notice that another potential source of concern for the ECB is that euroization does not constitute a totally safe shortcut to avoid the potential instability, because even currency substitutions may be subject to credibility crisis, as the Argentinian experience proved again recently.

The Maastricht criteria remain then the main rout towards the euro accession. They impose two years of stable exchange rate with respect to the euro, during which any devaluation must obviously ruled out: a strict intepretation of the criterion requires the formal participation to the ERM2, albeit in the past for Italy, Finland and Greece a preliminary period of stable exchange rate has been considered even without participation to the ERM2.

The candidate country anyway can still choose the width of the fluctuation band and the length of the participation to the ERM 2.

Bofinger and Wollmershäuser (2000), for example, argue that a perfect float is not desirable for countries still in the process of catching up with the most developed ones, because the local foreign exchange markets are typically very thin and sudden flow of funds may then trigger excessive swings of the nominal rate. They also think that a fixed exchange rate can be mantained from countries that are very small because they can afford concentrating their effort on that only, leaving the interest rate endogenous, and making in this way monetary policy dominated by the exchange rate only, and for countries having very close macroeconomic fundamentals (an argument that seems

could be extended to countries with different fundamentals, if the exchange rate is regularly crawling). Corker, Beaumont, van Elkan and Iakova (2000) too accept a fixed exchange rate (in the form of the currency board) for Estonia, and the same argument could be clearly extended to the other Baltic States. The same conclusion for Estonia and Lithuania (but again the argument seems appropriate for Latvia as well) has been reached by Gulde, Kahkonen and Keller (2000), who again stress the importance, for the stability of the currency board, of “strict policy discipline”.

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.

The opposite policy is suggested by Masson (1999), Corker et al. (for the majority of the CEECs), and Buitert and Grafe (2002), under the assumption that a fixed exchange rate without restrictions to the movement of capitals is exposed to speculative attacks.

Considering the pressure undergone by France, which in the 1992 ERM 1 crisis did not have worse macroeconomic fundamentals than Germany, we are actually sceptical about the stability of fixed pegs as exchange rate regimes, unless both the countries explicitly commit and actively intervene in defence of the attacked currency. Narrow bands in general could make the defence of the exchange rate more difficult and then increase the risk of a speculative attack: notice here that the arrangement chosen by the current ERM2 participants, with the 15% oscillation bands per side, seem to acknowledge all that.

Since the supply of international reserves is limited, even a currency board is not a fully credible exchange rate agreement and can be subject to a speculative attack or exchange rate pressures (as it already happened in Estonia) or bank runs.

Factors reducing the risk of attacks are the availability of foreign currency reserves to defend a fixed exchange rate, along with the consistency of macro economic policies. Sustainable public finance represents a fundamental requirement at this regard. Another important support to a fixed exchange policy in a context of capital mobility is the endorsement of the central bank of the anchor currency: speculative attacks are often triggered by the fact that the reserves that a central bank can mobilise to defend the exchange rate are limited, and very little when compared to the volume of funds

that can be risen on the market. If anyway the monetary authority of the anchor currency is credibly oriented to support the exchange rate agreement, the chance of a success are much reduced, to the point that the expected gain from a speculative attack in such a case can even be negative.

We think that these exchange rate regimes can not be managed for an indefinite time, and indeed the failure of several of these arrangements has been a relevant source of instability on the international financial market recently; the situation of the currencies joining the ERM 2 in the run up to the EMU may be more favourable because the length in time (up to two years) is short and known, because the final reference is grossly known too, and because they may probably count on more support from the ECB than it is typically the case of a small country pegging the exchange rate.

We suggest then at least to the countries that are now floating their currencies (including Hungary, despite the formally different arrangement) not to take an hard commitment in the ERM 2 but in the last two years before the EMU membership is discussed. A soft commitment, in which pressure to devaluation is smoothed but not contrasted by the monetary authorities, could be introduced too for the period preceding the two years run up into the euro, but inflation targeting rather than the exchange rate commitment should remain the anchor of monetary policy meanwhile. We also think that, since the run up into euro may experience some cost in terms of exchange rate pressures, than a country should first put itself in the condition that those pressures are minimized. A sound fiscal policy seems a preliminary requisite for the run up into euro.

Finally, we follow Borowski *et al.*, who notice that a depreciation above the 2.25% with respect to the central parity may appear as evidence of tension on the exchange rate, and that the role played by interventions in support of the exchange rate will be considered too. If their interpretation of the documents of the ECB discussed therein is correct (as it seems) the depreciation during the run up into euro can not exceed 2.25%, so Borowski *et al* suggest to set an informal intervention rate at 2%. They also notice that for that 2% informal threshold there is no commitment from the ECB to the intervention to sustain the exchange rate of the CEECs currency, so the burden of the adjustment is all on the CEECs central banks: to the point that this is perceived

from the markets too, the exchange rate regime is also weakened by this different reference.

Albeit the wide bands ($\pm 15\%$) can not totally prevent a speculative attack, they may allow the local currency to absorb some short term capital fluctuations and even impose some (minimal) costs for a speculative attack, should it fail, reducing the incentive to initiate it, so we suggest using these for the duration of the participation to the ERM 2.

The Baltic States on the other hand managed to maintain the hard pegs possibly acquiring some credibility in the process, and they currently seem to intend to maintain the same regimes even into the ERM 2. Since the current parities have been fixed unilaterally and a rather long time ago, we suspect that a renegotiation of the central parity may take place prior to the ERM 2 accession, slightly weakening the credibility acquired so far. Latvia will also have to change the exchange rate anchor from the SDR to the euro.

In any case, they could try and exploit the credibility acquired so far and enter the ERM 2 with the hard pegs. They anyway should not forget that their goal is not the stability of the hard peg but the euro accession, and that this purpose is also served by a wide oscillation band, so they can consider resorting to that in the wake of a speculative attack rather than waiting for it and opposing it putting at risk the internal stability. As in the case of the other countries, a sound fiscal policy must accompany the evaluation phase.

To summarize, there is not a totally safe approach to the EMU that complies with the stable exchange rate condition within the ERM2, but the countries that are currently floating their currency could minimize the risk adopting the 15% oscillation band and keeping the central parity fixed only for the duration of the run up to EMU. Despite the exposition to speculative attacks, it is encouraging to notice that in the run up to the EMU of Italy or Greece the “convergence play” helped these countries, increasing their credibility and leading them to a smooth accession to the euro.

7.3 When should the EMU membership be granted to the selected CEECs?

There is a general consensus on the idea that the EMU enlargement should take place as soon as possible: the real issue is to define when the possibility arises. Most of the academic contributions to the discussion suggests that the EMU enlargement should take place at the same time as the EU enlargement. Even without neglecting the adverse consequences of the Balassa Samuelson effect, it is commonly argued that waiting for a closer convergence of the real variables could simply take too long, surely more than the two or three years that the mechanism of ERM2 would impose. As the President of the Commission stated²³, “enlargement is not just about economics. It is important primarily for political and ethical reasons”, and there is the risk that the CEECs people could perceive an enlargement without EMU as incomplete.

EMU accession then should be considered as soon as possible, as long as the conditions that ensure stability of the country in the euro area are ensured. With this respect the most important one is the introduction of a sound fiscal policy for the near and the medium term.

Two years waiting in the “evaluation phase” will admittedly represent a cost in terms of postponed gains from the introduction of the euro and exposure to exchange rate tension. They anyway will also have some benefits, because the ECB will have a longer time to better assess the effect of the monetary policy on the whole extended EMU area; the additional years could also give to the accession countries some additional time to increase the flexibility of the labour market and to increase the fiscal discipline.

7.4 Defining the parity towards the euro

Defining the parity towards the euro in the ERM 2 and the future conversion rates for the EMU is a delicate task, because any adjustment of a potential misalignment must fall on the real sector, and, given the limited flexibility of the supply side on both the EU and the CEECs, this may take some time. The concept is even more complicated by the fact that alternative definitions are possible: a PPP based one, a

Fundamental Equilibrium Exchange rate (FEER) and a Behavioural Equilibrium exchange rate (BEER).

The notion of the PPP based parity is the most intuitive one: prices of goods are compared across the two countries and the exchange rate is the one equalising them. Since in practise such a strict version of the PPP does not take into account differences in productivity, the equilibrium exchange rate is rescaled correcting it by the per capita GDP.

The FEER is computed as the exchange rate that equalizes the current account deficit with the capital financing of it (via FDI) in the long run, while keeping the economy in a steady state type of condition (for example, on the long run, equilibrium unemployment level). In the advanced countries the long run external equilibrium should be at zero current account deficit, but for the CEECs a certain deficit can be tolerated in the long run, if properly financed, because in this way the catching up can be financed by investments from the more productive EU. The FEER is computed from the trade equations as expressed as a function of the real exchange rate and the internal and international economic activity.

Finally, the BEER is based on the estimation of a potentially cointegrating relationship between the real exchange rate and its macroeconomic determinants.

A long term Equilibrium Real Exchange Rate can then be estimated either with the FEER or with the BEER approach.

An extensive survey of the methodologies and of the results in the literature is in Egert (2002b). The overall conclusion that we can draw on that survey is that the CEECs begun the transition with undervaluated currencies, and experienced a real appreciation during the years even after correcting for productivity gains. The consensus seems to be that Hungary and Slovenia were quite close to the equilibrium, while the Czech Republic overevaluated the currency before the 1997 crisis, and, after a short period of underevaluation after the crisis, it was back to overevaluation. The results are anyway rather disperse, different studies reaching opposite conclusions for

²³ in his speech to the European Parliament on 9 October 2002.

the same country over the same period. Evidence that Poland and the Baltic States are overevaluated is even more controversial.

The most interesting conclusion that can be drawn on the basis of the survey of Egert is that the econometric results are very fragile and as such not very reliable.

As far as Egert, he too finds that (in 2001) the Czech Republic had an overevaluated currency (of approximately 30%), and the same conclusion is drawn for Poland (+15%) and Slovakia (+10%), while Hungary and Slovenia were close to equilibrium.

Evidence of overevaluation for Hungary, Czech Republic, Poland and Slovakia in 2002 is also in Šmídková, Barrell and Holland (2002), who still find that Slovenia is approximately at the equilibrium level.

These results are particularly surprising when we consider that Poland floats the currency freely, so the current real appreciation (if it exists) must be induced by the market. Borowski *et al.* in fact found that this is not the case, and that the current rate is close to the equilibrium one.

8. Conclusions and summary of policy advices

The CEECs are approaching the accession to the EU with a variety of exchange rate regimes. We find that these differences depend on economical factors but also on the history of the countries. To this purpose, we discussed the role of the exchange rate in the stabilization of the inflation break out at the beginning of the transition from the central planning to the market economy, finding that, combining internal price liberalisation, openness to the international trade and a commitment to exchange rate stability (possibly in the form of a crawling peg too) the countries in transition provided the system with a nominal anchor by importing the price structure of the trade partners. The capital liberalisation required for the progressive integration in the EU later exposed the CEECs to speculative attacks and exchange rate pressure and most of them weakened the exchange rate commitment or withdrew it at all. The Baltic

States are the only ones still maintaining a strong exchange rate commitment, and we conjecture that this is due to the smaller size of the countries, which makes the interest rates of the domestic currency of little importance to the economy when compared to the exchange rate, and to the fact that the only speculative attack was fended off by the monetary authority and bolted before the situation became critical. Slovenia followed a different path, not having an exchange rate commitment at the beginning of the transition. We argue that this may have been possible because it was initially more advanced on the way to the transition, and because it kept a constant attention towards the real exchange rate dynamics nonetheless.

The Czech Republic, Hungary and Poland provided the system with an alternative anchor introducing an inflation targeting after the fashion of the Bundesbank and of the Eurosystem. This proved to be a successful policy: the expectations were not adversely affected, and the disinflation path proceeded. Slovakia and Slovenia, who did not take that commitment, may have suffered because the system may have endogenized a monetary policy which *ex post* stabilised the real exchange rate.

We verified that the exchange rate is indeed a very effective instrument to fight inflation, while the evidence supporting the conventional mechanism of transmission of monetary policy is weak (albeit it is recently getting more convincing). This anyway should not affect much the ability of the Eurosystem to stabilize inflation in the extended euroarea because it will still be able to operate through the link established by the PPP.

With respect to the EMU accession, we find that, when credibility gains and endogeneity of intra EU trade are taken into account, then there is scope for the extension of the euro area to the CEECs too.

The application of the Maastricht criteria to the CEECs brings in a problem not faced by the original members of the EMU: the Balassa Samuelson effect. The productivity differential between the sector exposed to the international competition and the internal one in fact may cause inflation in the CEECs because the latter does not advance as fastly as the former one. This in turn implies a potential conflict

between the inflation and the exchange rate Maastricht criteria. We also notice that it is unlikely that the monetary authority may solve the conflict because the interest rate too is constrained by the Maastricht criteria. Estimates of the Balassa and Samuelson effect have a certain variability but seem to be in the range of 0 – 4 % additional inflation per year: Poland and Hungary seem to be more exposed.

Upon accession, participation to the ERM 2 can be considered. Oscillation bands can reach up to $\pm 15\%$, but the CBA are compatible too, as long as the reference currency is the euro; euroization on the other hand does not seem a realistic option as it would appear an attempt to avoid the examination of the convergence of the country to the euro area.

Fixing the parity is a very delicate issue, and the results published in the applied research are scattered and partially contradict each other, so it is difficult to suggest a parity on that basis. Mainstream results seem to suggest that Slovenia is near to the equilibrium already, while the currencies of the Czech Republic and the Baltic States may be overvalued; the situation of Poland, Slovakia and Hungary seems to be intermediate.

Fixed exchange rate agreement are rarely stable, especially when controls to capital flows are not imposed. There is no totally safe strategy to protect a currency from a speculative attack or another form of exchange rate pressure in the ERM 2. Factors that anyway reduce the risk of these events are a sound fiscal policy coupled with a sustainable current account deficit, the knowledge that the participation is limited in time (especially when a certain indication of the future conversion rate is implicitly given), an explicit commitment of the central bank of the target currency to support the exchange rate agreement.

In the run up to EMU, exchange rate pressures should be avoided: these seem to include depreciation of the currency after 2.25% with respect to the central parity.

The experience of the other countries which joined euro in the past seems favourable, since no country suffered exchange rate pressures in the run up to EMU. Looking at the long term interest rates and the term spreads, we conjecture that the

markets are already discounting participation of the CEECs to the euro: this should increase the credibility and the stability in the final round.

8.1 Policy advises.

On the way to EU, we suggest that a credible inflation targeting programme is introduced, possibly after a fast completion of price liberalization if the weight of administrated prices is too high in the CPI basket.

We also suggest to operate to increase the flexibility of markets and prices, and to operate a sound fiscal policy. This will also help reducing the inflationary pressure due to the Balassa Samuelson effect, and it will also be important for the duration of the ERM 2 membership and then in the EMU.

With respect to the ERM 2, we suggest a wide band to the countries that are currently floating their currency or to Hungary, which has a wide band regime already. For the Baltic States, we acknowledge the possibility that keeping the CBA may still give a credibility benefit, but we suggest not to risk stability for it, the final goal being participation to the euro and not the defense of the CBA.

We also suggest to enter the final two years run up into euro only when the proper reforms have been taken, to increase the credibility towards the market and also to better cope with the restrictions to monetary policy induced by the Maastricht criteria. The widest possible bands should be considered: appreciation up to 15% and depreciation up to 2.25%.

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Figure 1. Real exchange rates

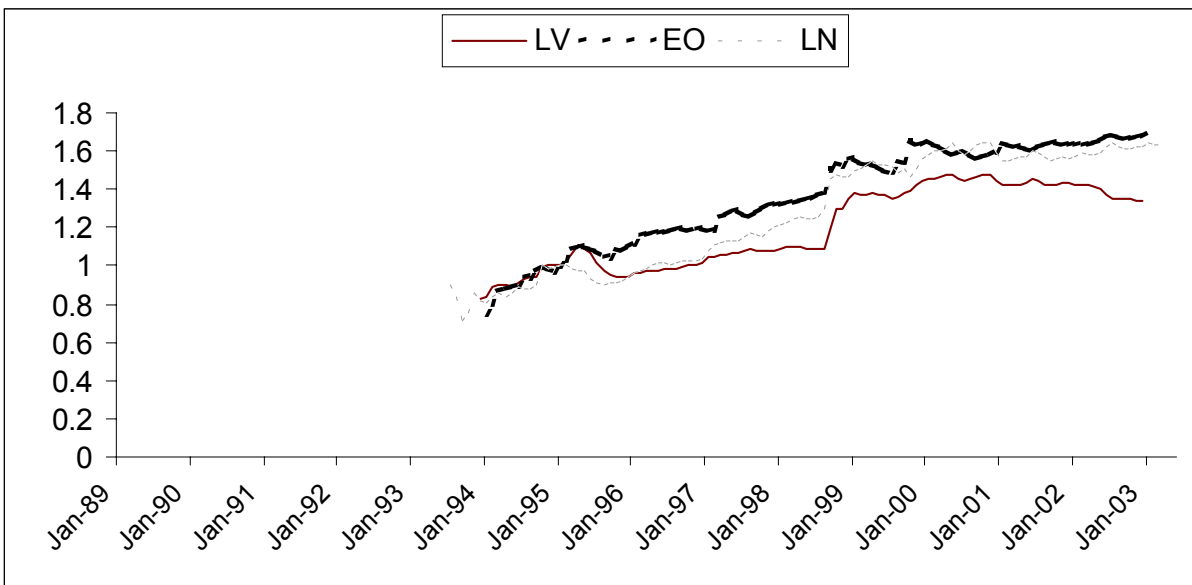
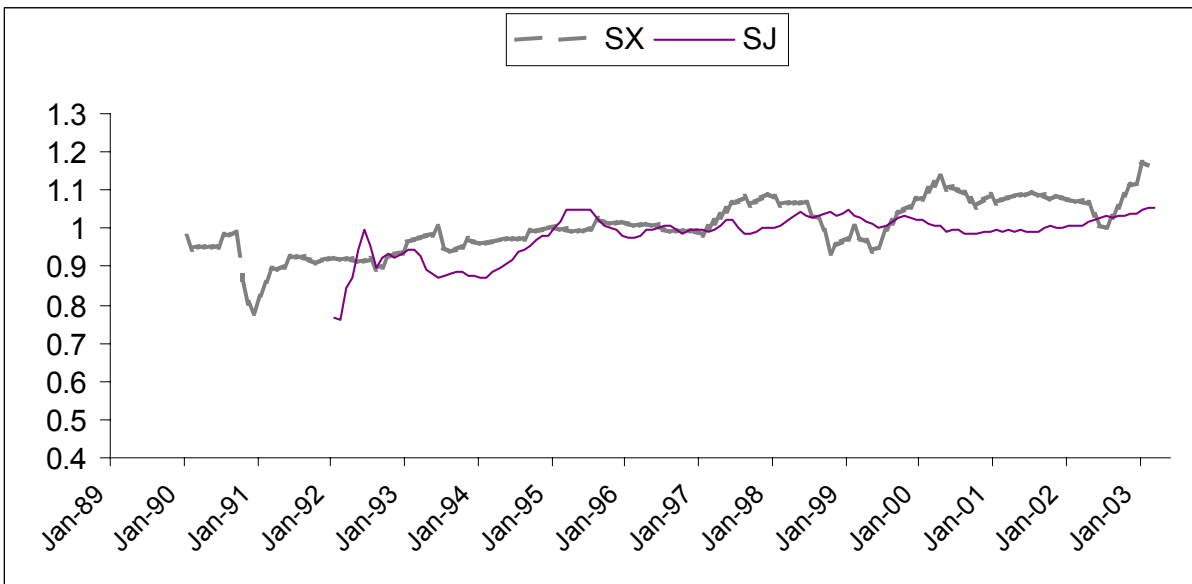
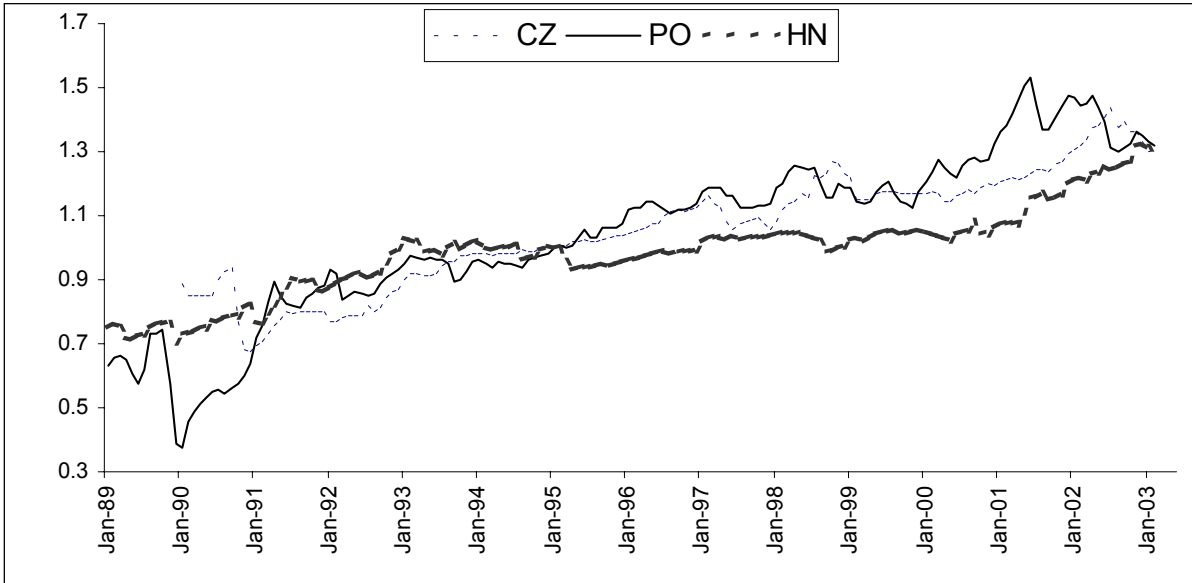


Table 1. Real exchange rates.

	CZ	SX	PO	HN	SJ	LV	EO	LN
1989	...	...	0.631	0.742	...	...	...	...
1990	0.836	0.928	0.531	0.769	...	...	...	...
1991	0.772	0.901	0.831	0.850	...	...	...	...
1992	0.808	0.917	0.884	0.924	0.896	...	...	...
1993	0.939	0.967	0.949	1.005	0.895	...	...	...
1994	0.987	0.976	0.957	0.994	0.927	0.930	0.909	0.893
1995	1.020	1.004	1.035	0.954	1.023	1.010	1.071	0.947
1996	1.088	1.001	1.126	0.981	0.993	0.984	1.174	1.007
1997	1.097	1.050	1.153	1.031	1.000	1.068	1.266	1.144
1998	1.187	1.028	1.211	1.024	1.031	1.156	1.408	1.322
1999	1.171	1.003	1.162	1.040	1.022	1.384	1.557	1.517
2000	1.172	1.094	1.259	1.047	0.998	1.462	1.596	1.610
2001	1.237	1.082	1.432	1.131	0.996	1.430	1.627	1.567
2002	1.365	1.062	1.386	1.253	1.025	1.377	1.658	1.605
2003	1.304	1.168	1.325	1.305	1.052	...	1.696	1.638
1995/1992	1.263	1.095	1.171	1.033	1.142	...	...	...
2003/1992	1.614	1.274	1.499	1.413	1.175	...	...	...

Notes to Figure 1 and Table 1:

CZ: Czech Republic; SX: Slovakia; PO: Poland; HN: Hungary; SJ: Slovenia; LV: Latvia; EO Estonia; LN: Lithuania.

Sources: Datastream (quoted sources: OECD, IMF or National Central Banks); National Central Banks;

The entries in Table 1 are averages over the whole year (except 2003, which is up to March or less according to the data availability); base: 1995, January = 1.

Table 2 – Inflation rates.

	EA	CZ	SX	PO	HN	SJ	LV	EO	LN
1990	...	...	...	224.24	33.21	...	...	...	...
1991	4.39	...	...	60.28	32.09	...	...	...	...
1992	3.30	12.51	8.86	44.61	25.60	89.77	...	...	1160.67
1993	3.19	18.25	25.15	37.70	21.07	22.80	34.76	37.91	188.61
1994	2.67	10.26	11.61	29.43	21.26	19.45	26.22	41.65	45.09
1995	2.49	7.86	7.18	21.83	28.24	8.93	23.17	26.53	35.70
1996	2.13	8.53	5.34	18.76	19.91	9.06	13.16	14.81	13.07
1997	1.49	10.09	6.36	13.21	18.36	8.75	6.96	11.88	8.36
1998	0.88	6.74	5.63	8.43	10.28	6.50	2.76	4.28	2.42
1999	1.75	2.59	14.19	9.81	11.20	8.02	3.20	3.88	0.29
2000	2.48	3.93	8.41	8.64	10.07	8.90	1.81	5.05	1.41
2001	2.05	4.20	6.56	3.63	6.85	7.01	1.91	4.20	1.97
2002	2.37	0.55	3.23	0.72	4.84	7.28	1.39	2.68	-0.95
2003	2.07	-0.03	7.73	0.26	3.84	5.33	2.48	1.26	-0.95

Notes:

EA: Euro Area (12 partners).

Sources: Datastream;

The entries in Table 2 are the inflation rates over the whole year (December vs. December of the previous month) (except 2003, which is referred to April or less according to the data availability).

Table 3 - Exchange Rates vs. US \$.

	CZ	SX	HU	PO	SJ	LN	LV	EO
1992	27.65	...	77.77	1.29	...	...	...	...
1993	28.59	...	90.41	1.74	113.34	...	...	13.22
1994	28.76	32.07	105.05	2.27	127.90	3.97	0.56	12.97
1995	26.51	29.89	125.65	2.41	119.30	4.00	0.53	11.49
1996	27.14	30.56	152.65	2.70	134.89	4.00	0.55	12.02
1997	31.75	33.27	186.96	3.28	159.85	4.00	0.58	13.86
1998	32.24	35.21	214.38	3.49	166.20	4.00	0.59	14.07
1999	34.64	41.42	237.42	3.97	182.83	4.00	0.59	14.70
2000	38.65	46.28	282.51	4.35	224.57	4.00	0.61	16.99
2001	38.02	48.37	286.63	4.10	243.66	4.00	0.63	17.49
2002	32.69	45.24	257.56	4.08	239.54	3.67	0.62	16.60
2003	28.72	37.73	223.64	3.87	211.00	3.14	0.57	14.23

Exchange rates vs. DEM.

	CZ	SX	HU	PO	SJ	LN	LV	EO
1992	17.73	...	49.90	0.83	...	...	...	...
1993	17.29	...	54.65	1.05	68.47	...	...	7.99
1994	17.76	19.81	65.03	1.41	78.93	2.46	0.35	8.00
1995	18.52	20.88	87.89	1.68	83.31	2.80	0.37	8.03
1996	18.04	20.31	101.41	1.79	89.63	2.66	0.36	7.99
1997	18.29	19.19	107.73	1.89	92.12	2.31	0.33	7.99
1998	18.31	20.05	122.09	1.99	94.51	2.28	0.33	8.00
1999	18.86	22.54	129.23	2.16	99.47	2.18	0.32	8.00
2000	18.21	21.78	132.97	2.05	105.67	1.89	0.29	8.00
2001	17.41	22.15	131.28	1.88	111.53	1.83	0.29	8.01
2002	15.75	21.82	124.17	1.97	115.58	1.77	0.30	8.00
2003	16.15	21.21	125.84	2.18	118.67	1.77	0.32	8.00

(Note: market rates; data for 2003 only up to May 2003; entries are standard deviations of daily exchange rates; source: Datastream).

Table 4 – Volatility (st. dev.) vs US \$.

	CZ	SX	HU	PO	SJ	LN	LV	EO
1992	0.76	...	2.08	0.12	...	...	...	...
1993	0.48	...	5.42	0.17	9.22	...	...	0.36
1994	0.87	0.86	3.51	0.08	5.94	0.05	0.02	0.62
1995	0.60	0.63	8.97	0.05	5.74	0.03	0.01	0.39
1996	0.43	0.55	6.37	0.11	2.91	0.02	0.00	0.23
1997	2.41	1.16	11.06	0.20	8.02	0.02	0.01	0.52
1998	1.98	0.80	5.00	0.07	5.06	0.00	0.01	0.53
1999	1.35	1.99	9.43	0.18	9.25	0.00	0.01	0.54
2000	1.81	3.04	18.21	0.18	15.80	0.00	0.01	0.92
2001	1.09	1.09	7.76	0.10	8.10	0.00	0.01	0.51
2002	2.35	2.55	16.06	0.10	11.07	0.22	0.02	0.95
2003	1.17	1.60	6.45	0.11	7.26	0.12	0.01	0.54

Volatility (st. dev.) vs DEM.

	CZ	SX	HU	PO	SJ	LN	LV	EO
1992	0.46	...	2.07	0.09	...	...	...	...
1993	0.23	...	2.58	0.09	4.37	...	...	0.11
1994	0.35	0.45	4.77	0.11	1.29	0.14	0.01	0.05
1995	0.23	0.44	7.39	0.05	3.02	0.09	0.01	0.09
1996	0.34	0.29	2.99	0.05	0.97	0.06	0.01	0.06
1997	0.87	0.26	3.48	0.07	1.76	0.09	0.01	0.04
1998	0.57	1.07	6.44	0.09	1.07	0.09	0.01	0.03
1999	0.42	0.58	1.41	0.06	1.66	0.08	0.01	0.03
2000	0.30	0.35	1.55	0.05	2.01	0.10	0.01	0.03
2001	0.37	0.23	4.01	0.08	1.07	0.05	0.01	0.03
2002	0.36	0.54	1.58	0.10	1.59	0.01	0.01	0.02
2003	0.10	0.20	2.96	0.06	0.71	0.01	0.01	0.03

(Note: market rates; data for 2003 only up to May 2003; entries are standard deviations of daily exchange rates; source: Datastream).

Table 5 – overview of the current exchange rate regimes.

	Exchange rate regime	Inflation Targeting
Czech R.	Free float + interventions	Net of indirect taxes and regulated prices
Slovakia	Free float + interventions	
Hungary	Fixed exchange rate; $\pm 15\%$ oscillation bands	CPI inflation
Poland	Free float	CPI inflation
Slovenia	Free float + interventions	
Latvia	Fixed exchange rate: 1 SDR = 0.7997 LVL	
Lithuania	Currency Board: 1 EUR = 3.4528 Litass	
Estonia	Currency Board: 1 EUR = 15.6466EEK	

Source: National Central Banks

Figure 2. Changes Occurred in the Exchange Rate Regimes.

	Currency Board /Fixed peg no band	Fixed peg narrow bands	Fixed peg wide bands	Managed float	Free float
Czech R.	• —————>	• —————>	• —————>	X	
Slovakia	• —————>	• —————>	• —————>	X	
Hungary	• —————>	• —————>	X		
Poland	• —————>	• —————>	• —————>		X
Slovenia				X	
Latvia	X				
Lithuania	X				
Estonia	X				

(Note: regime are ordered in terms of flexibility of the exchange rate).

(*) An X indicates the current exchange regime, a • denotes a previous regime, and an —————> indicates a regime change