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On Some Currency Regime Considerations for the Visegrad Countries

Edited by

Günter Heiduk and Julius Horvath

Duncker & Humblot · Berlin

GÜNTER HEIDUK / JULIUS HORVATH (Eds.)

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Acknowledgement

To Roman and Robert

Julius Horvath

This volume is the result of a co-operation project that started at the end of 1999 and was finished with a conference at Gerhard-Mercator University Duisburg in October 2001.

Co-operation with colleagues from Warsaw School of Economics already has a longer history than this project and started even before the year 1989. The first book together with Prof. Stanislaw Ladyka was published in 1987 and more publications followed in 1991 and 1992 in this series. When some of the Central and Eastern European Countries applied for European Union membership, this provided an impetus to expand the co-operation that was at that time limited to colleagues from Warsaw School of Economics. We were very glad to gain the Institute for World Economics, Hungarian Academy of Sciences, Budapest, as well as the Vienna Institute for International Economic Studies, Austria as partners. Finally, the project team was completed when Julius Horvath, Central European University, Budapest, joined us. Our teamwork was embedded in a series of three workshops. For the final conference, external experts were invited whose contributions are included in the conference volume.

Cooperation with the colleagues from Poland and Hungary was made possible by funding within support programs of the German Academic Exchange Service (DAAD). The Peter-Klöckner Foundation supported the participation of a larger circle of scholars in the final conference. We also gratefully acknowledge their support in the publication of this conference volume. Both editors and project participants highly appreciate the support given by both

institutions. My special personal thanks go to my co-editor Julius Horvath. The timely preparation of the manuscript would not have been possible without his commitment.

Finally, this multilateral project has set the stage for a network that will – there is little doubt – promote future knowledge exchange. Even after the accession of the CEECs many exciting questions related to integration on commodities and factor markets will certainly remain to be answered.

We would like to acknowledge the carefull work done by Nadja Kremser in editing this volume.

Duisburg, in Spring 2003 *Günter Heiduk*

Contents

Editors Introduction

This volume contains, for the most part, the papers and their formal discussions presented at an International Symposium EUFORIKZ held at Gerhard Mercator University at Duisburg on October 26-28, 2001. Some papers presented at the conference were not included into this volume; however, in addition the volume also contains invited papers. Each paper was assigned a discussant. Authors were given the opportunity to revise their papers after the conference.

First group of papers - by Jürgen Jerger, Peter Backe & Cezary Wojczik, Jarko Fidrmuc, and Julius Horvath - addresses the general considerations of the exchange rate policies of European as well as Visegrad countries. Ansgar Belke, Volker Clausen, Shin-Ichi Fukuda, and Rainer Schweickert were discussants to these papers.

Second group of papers by Adam Budnikowski & Rafal Wieladek, Kálmán Dezséri, Josef Pöschl and Julius Horvath analyzes specific problems of the particular Visegrad countries (Poland, Hungary, the Czech Republic, and the Slovak Republic). Andrzej Kazmierczak, Harald Sander, Luboš Komárek, and Bas van Aarle, respectively were discussants to these papers.

This introduction by the editors highlights the main issues discussed in this volume.

In the first paper Jürgen Jerger discusses the policy of the European Central Bank. More specifically, he follows the track record of the ECB monetary policy since 1999 and investigates its impact on member-countries' inflation and output record. He also discusses policy coordination in the monetary union, and the ECB policy rules. All in all, he presents a positive view concerning the performance and consequences of the ECB policy. Jerger concludes with an advice about desirability of the EMU membership for the accession countries. He writes that in this respect it is vital to evaluate the importance of the exchange rate policy for a particular economy and to judge the maturity of the

economy in terms of the Maastricht criteria. Last but not least – Jerger argues – it is essential to have a strong public support for the EU and EMU membership.

Peter Backe and Cezary Wojczik provide a general discussion of possible alternative options for the monetary integration of the accession countries. They evaluate different strategies of joining of the euro area. The new member countries of the European Union will join the euro area, at the earliest, two years after their EU accession. The authors argue that against this background, it is for the accession countries to decide whether they would aim for an early introduction of the euro or opt for a more gradual strategy of monetary integration. Their paper in a stimulating way reviews the main arguments for and against either of these approaches.

Jarko Fidrmuc discusses the issue of proper exchange rate regime in the framework of the optimum currency area criteria, with a specific emphasis on the endogeneity hypothesis. His paper addresses the importance of structural variables for the harmonization of business cycles. In particular, intraindustry trade is shown to cause the convergence of business cycles in the OECD countries. His paper confirms earlier findings that the Visegrad countries have rapidly converged to the EU countries in terms of business cycles and trade integration. On the other hand, he argues that the observation period is still too short to conclude that the business cycles have already become similar. Fidrmuc's results indicate that there is a sound base for business cycle convergence, and thus for a fulfillment of optimum currency area criteria in the medium and long run. These results do not confirm the hypothesis that the Central and Eastern European countries already constitute an optimum currency area with the EU. But it seems that in the future they will fulfill these criteria to the same degree as the current EU-members do.

Christopher Klisz in his paper considers the consequences ofthe Harrod-Balassa-Samuelson real exchange rate effect for the consistency in the inflation and exchange rates targets for joining the European monetary union. This issue has some relevance for the future members of the EU and EMU to the extent that their economies converge towards the average of current Euro-land economies. Klisz demonstrates that the Harrod-Balassa-Samuelson effect does not necessarily require a higher rate of inflation for those countries experiencing relatively more rapid growth.

Julius Horvath comments on some aspects of unilateral euroization. He reviews some of the main arguments of proponents and opponents of unilateral euroization. Then he discusses the benefits and costs of unilateral euroization with an emphasis on the relevance of asymmetric shocks, seignorage, and the lender of last resort function of the central bank.

The second part of the volume deals with country studies.

Adam Budnikowski and Rafał Wiełądek depict Poland's progress towards fulfillment of the Maastricht convergence criteria. They describe this process as relatively slow, but successful with respect to the general long-run tendency of the Polish inflation rate to fall. They illustrate that situation is similar concerning the convergence of interest rates. Discussing budget deficit they point to differences in definitions between various concepts. The authors also argue that the Polish deficit is expected to be slightly higher than the convergence requirement. However, they expect that Polish public debt would remain well below the Maastricht threshold level.

Kálmán Dezséri describes how Hungary is handling problems of joining the EU and later the Euro land. The author reviews different exchange rate regimes in Hungary in the 1990s. He also discusses potential dangers on the exchange rate policy due to volatile short-term capital inflows.

Josef Pöschl provides the reader with a general picture of the Czech economy. He evaluates the growth performance of the Czech economy as well as the external economic relations and the monetary and fiscal policy of the country. His emphasis is not only on the fulfillment of the nominal Maastricht criteria but also on the general competitiveness requirements of the Copenhagen criteria especially concerning the wage level and the level of non-tradable prices.

Finally, Julius Horvath discusses different exchange rate perspectives for small transition economy as Slovakia. Some optimum currency area considerations – as the smallness of the economy and the diversification of the production – suggest that Slovakia should opt for the fixed exchange rate regime. However, the asymmetry of shocks affecting Slovakia and Germany implies that this solution may be costly.

The Monetary Policy of the ECB: Observations and Issues

By Jürgen Jerger

I. Introduction

On January 1st 1999, the European Central Bank (ECB) took over the responsibility for monetary policy in eleven member states of the European Union. Greece joined the European Monetary Union (EMU) in January 2001, completing thus the first dozen of member countries. A typical citizen of EMU – without a special interest in monetary policy issues and the development of exchange rates between the member countries – would have had a hard time to spot the difference between the world with and without EMU. However, it became very visible by January 2002, when the Euro banknotes and coins replaced the national currencies.

Perhaps the single most remarkable thing to say about EMU is that remarkably little has changed in the everyday life of most citizens inside and outside the Euro area. In particular, the fears expressed by opponents of the whole EMU project did not materialize. Among the doomsayers' favorite topics were the following: There was widespread apprehension – mostly, but not exclusively in Germany – that EMU might lead to higher inflation on average since a new institution, necessarily without successful track record, was to replace the de facto leadership of the Bundesbank with its valuable and undoubted reputation.[1]

[1] One might recall the famous statement by 200 professors of economics in the Frankfurter Allgemeine Zeitung in April 1998. In this statement, the introduction of the common currency in 1999 was deemed too early, although it was conceded that the Euro would be desirable or even necessary "in the long run".

Moreover, there were concerns about the interdependence between monetary policy and other major macroeconomic policies. These doubts came in two very distinct varieties. It was argued that a successful common monetary policy has to be complemented by co-ordination e.g. in the area of fiscal policy or social policy. As long as this co-ordination does not work (or is not even intended to work), a common monetary policy may not work properly. On the other hand, those who in general champion decentralized solutions feared this very harmonization process. A common monetary policy, they fear(ed), may serve as a Trojan Horse that brings costly institutions (e.g. in labor market and social policies) from one member country to the whole of EMU.

Next, it was – and still is – often argued that the ECB will face substantial difficulties in formulating a common monetary policy if the needs of member countries differ. This potential problem clearly becomes bigger if EMU is to expand still further.

The aim of this paper is to look at these issues in more detail. More specifically, in section 2, I follow the track record of the ECB monetary policy since 1999. This should ideally answer the question what is the difference theECB has made in comparison to nationally autonomous monetary policies. In section 3 I list the main arguments relating to the discussion of policy co-ordination in a currency union. Finally, a brief discussion of monetary decision rules is given in section 4 before section 5 offers some concluding remarks.

II. The Track Record

In this section, I briefly discuss the inflation and output developments in the twelve memberstates of the Euro area in order to give an idea of the influence of EMU on the macroeconomic performance in these countries.

1. Inflation

The ultimate and overarching goal of the ECB, laid down in Article 105 of the Maastricht Treaty, is to maintain price stability. Both the desirability of this

goal and the allocation of the responsibility for its achievement to monetary policy are rather undisputed in the scientific community (Blinder 1998). This consensus basically rests on two pillars. First, high and/or more volatile inflation (and deflation) blurs price signals and hence distorts the efficient allocation of resources (Friedman 1977; see Barro 1996, 1997 for empirical evidence). Second, inflation is widely perceived as a purely or at least mainly monetary phenomenon in the long run (Friedman 1959). The second tenet is one of the hallmarks of every macro textbook. But De Grauwe and Grimaldi (2001) and De Grauwe and Polan (2001) have been recently challenging this view for countries with low inflation. According to their data the proportionality of prices and monetary aggregates is not present in countries with single digit inflation rates. It should be noted, however, that this does neither preclude an influence of monetary policy on prices nor that the former high-inflation countries would have found their way back to price stability without the borrowed credibility of EMU.[2]

The ECB defines price stability as a medium term increase of the Harmonized Index of Consumer Prices (HICP) of below 2% per annum (ECB 1998). Figure 1 summarizes the development of consumer price inflation (or estimates and projections thereof for the last three data points) for the 12 member states of the Euro area from 1985 to 2003.[3]

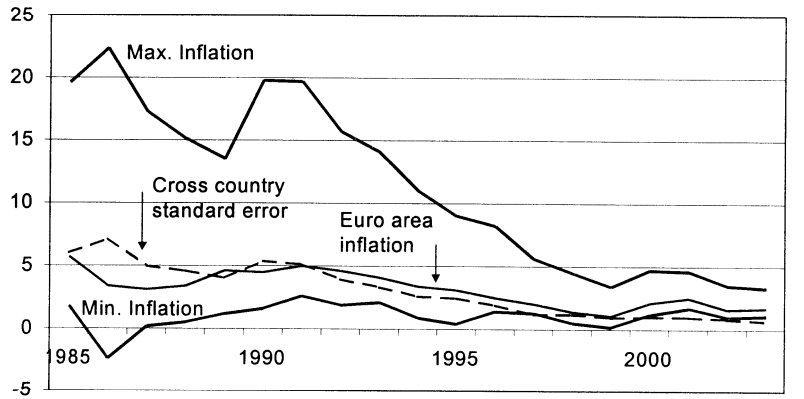
The thick lines show maximum and minimum inflation rates across the 12 nations, respectively. The data show that there were always countries that achieved rather low inflation rates during the last approximately two decades, whereas the maximum inflation rate fell below the 10% mark only in (and after) 1995. Overall inflation in the Euro area (thin and solid line) reached its minimum at 1.1% in 1999 and crept back to 2.1% and 2.5% in 2000 and 2001, respectively, thereby (slightly) violating the 2%-goal of the ECB. Projections for 2002 and 2003 indicate that inflation is back on track again, however.

The last (thin and dashed) line in Figure 1 summarizes the inflation dispersion among Euro area nations by the standard error for inflation rates across

[2] See also the discussion in Galì (2002) who challenges the focus on monetary aggregates from a theoretical point of view.

[3] All data points refer to all countries that presently form EMU: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal and Spain.

these countries for each year. It is evident that the implicit co-ordination of monetary policy during the run-up to EMU already delivered most of the reduction of inflation dispersion which is now at a level of one percentage point or below.



Source: OECD (2001, p. 219) and own calculations

Figure 1: Price Developments for Private Consumption in the Euro Area, 1985-2003.

Summing up the message of Figure 1, it is fair to conclude that to a large extent the ECB was able to fulfill its mandate to achieve price stability.[4] Not surprisingly, EMU also led to a substantial reduction of inflation differentials between member states. These differentials, however, are far from negligible. The differential between the highest and the lowest inflation rate averages at 2.9 percentage points from 1999 to 2003. It is an ongoing debate whether and to which extent this differential can be explained by Samuelson-Balassa effects

[4] It should be noted that the HICP includes very volatile components such as the indices for energy and unprocessed food, both of which displayed large swings since the inception of the ECB and together account for about 17% of the index. Looking at core inflation (i.e. excluding the two aforementioned components from the HICP), it is worth noting that this measure stayed below 2% until mid-2001 and climbed to about 2.5% thereafter (see Michaelis and Pflüger 2002).

and whether this should lead to an upwards revision of the inflation rate the ECB deems consistent with price stability.[5]

With regard to inflation in the Euro area, a further point has to be mentioned. The inflation figures discussed so far have the mystifying property not to be in line with widely publicized opinions about consumer price developments since prices were converted from their national denominations into Euros and a fortiori since the introduction of the Euro banknotes and coins. Media reports are full of examples of dramatic price increases allegedly due to the introduction of the Euro. In Germany, the term "Teuro" – a play with the German word for "expensive" – epitomizes this rather strange divergence of measured inflation on the one hand and inflation perceptions on the other hand.[6] A quantitative hint to which extent these perceptions are really off-track is possible with data the European Commission collects on consumers' "price sentiments".[7] Consumers are asked on a monthly basis to classify price developments over the last twelve months into qualitative categories ranging from "very much higher" to "lower". The answers are then condensed into a single number by calculating the percentage point difference between those who felt that prices rose and those who felt that prices stayed roughly constant or declined. Although this may be considered a rather crude measure of inflation perceptions, it was very well in line with measured inflation over the last decade. Since about the third quarter of 2000, there is a marked divergence in the development of the two measures.[8] Explanations for this phenomenon are plenty – although there is no evidence on their relative importance. First, consumers may generalize bad examples (i.e. huge price increases at the time of the price conversion) which certainly do exist. Second, consumers may simply be confused by the "new" prices, and when in doubt assume that prices are on the rise, thereby contribut-

[5] See Sinn and Reutter (2001) and Remsperger (2002) for two discussions of this issue.

[6] The German government tried to initiate a "Teuro summit" with the aim to exert moral persuasion on firms not to raise prices "excessively" by (among other things) posting on internet a black list of non-obliging firms. This project never took off, however, since firms and their federations rather unsurprisingly refused to co-operate.

[7] The following discussion on inflation perceptions is based on the data reported in EZB (2002), p. 19-20.

[8] In a recent interview Otmar Issing (2002b) referred to this phenomenon as "a case for the psychologist".

ing to the mood that anyone else feels the same. Third, price developments of goods that are regularly bought, but nevertheless of minor importance for the overall price index, are perceived more than proportional. The strong increase of energy prices in 1999, (aggravated by the devaluation of the Euro), the consequences of BSE and the foot-and-mouth disease as well as the hefty (although temporary) price increases for vegetables in early 2002 (due to frosty weather conditions) were real enough and probably contributed to the "Teuro" perception. Be this as it may, it is not the job of a central bank to comment on (or even try to influence) any particular price. Thus, the only thing the ECB can do about this problem is to convince the public that the HICP is really a sensible measure – and that there are no dangerous long-run trends.

2. Output

The rather satisfactory inflation performance in the Euro area leaves the question how a common monetary policy affects the real economy. On the theoretical side, things are quite complex and no unanimously discernible professional consensus regarding this question was established before the start of EMU. There are several channels through which a common monetary policy may affect output. Here, I will only mention a non-exhaustive list of these arguments.

First, one may argue that a common monetary policy precludes the use of exchange rate policy and an appropriate reaction of monetary policy to a country-specific shock. This should clearly lead to more volatile business cycle fluctuations and to more pronounced differences between EMU member states (De Grauwe 2000). The relevance of this argument hinges on the frequency and size of idiosyncratic shocks and on the availability of other policy instruments that could make up for the lost room for maneuver. In this context, the fiscal constraints imposed by the Stability and Growth Pact are often interpreted as destabilizing since they further restrict the ability to react to country-specific shocks (see e.g. the decisive pledge for revamping this institution by De Grauwe 2002).

A second argument relates to the substantial changes in *real* interest rate differentials between the EMU member states since the inception of EMU (Jerger

2002a). This re-ordering of real interest rates across EMU is due to an almost perfect convergence of nominal interest rates in most segments of the financial markets.[9] Hence, inflation differentials became the most important determinant for real interest rate differentials, which in turn implies that countries with relatively high inflation in the Euro-area enjoy the lowest real interest rates. Whereas German firms enjoyed the lowest real interest cost before EMU, they now pay the highest rates in the EMU. In other words: EMU has led to a considerable degree of convergence in nominal interest rates as opposed to real interest rates. In general, this effect tends to hurt growth in low inflation countries and boost growth in high inflation countries.

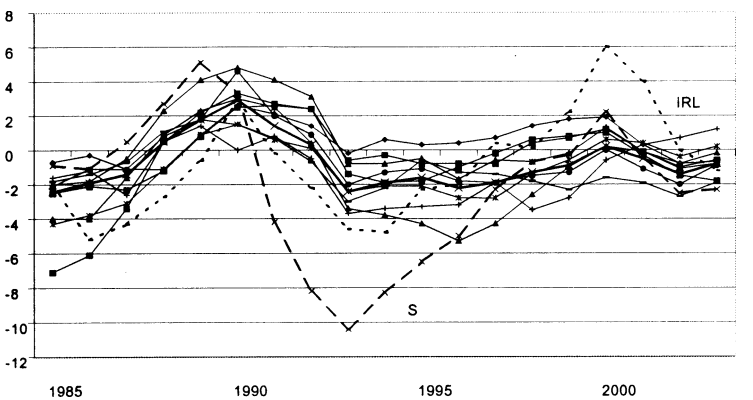
Third, EMU was expected to entail substantial effects for the willingness of labor market participants to seriously engage in reforms targeted at labor market frictions, which are per se orthogonal to any monetary policy regime. Calmfors (1998) put forward the optimistic hypothesis that EMU would lead to a higher willingness for labor market reforms. The logic of the argument is straightforward: With monetary policy conducted in Frankfurt and fiscal policies tied by the requirements of the Stability Pact, labor market policies simply remain the only option. In view of this "lack of other suspects", labor market participants will therefore recognize the need to solve national problems on their own. Berthold and Fehn (1998) and Sibert and Sutherland (2000) arrived at a more pessimistic conclusion, however. They note that a reduction of structural unemployment is not only desirable per se but also reduces the incentive to engineer surprise inflation for national monetary policy makers in a standard Barro and Gordon (1983) framework. Since this effect vanishes if monetary policy is transferred to a supra-national level, EMU might diminish the willingness to enact labor market reforms. A further aspect can be identified in an augmented Barro and Gordon (1983) set-up that allows for inflation aversion of wage setters (or, more generally, the private sector). This inflation aversion reduces nominal wage claims for any given stance of monetary policy. A crucial point, however, is the extent to which wage setters take into account the effect of their action on aggregate inflation. Since in a monetary union wage setting necessarily gets more decentralized vis-à-vis the monetary authority, the

[9] This also means that there are all but very low country-specific risk premia. Whether this reflects the judgement that all countries are equally solvent or that the no-bail-out clause in the Maastricht treaty lacks credibility is not clear. See Belke (2001) and Eichengreen and von Hagen (1995) on this issue.

effect of wage setters on inflation will be internalized to a lesser extent. This may lead both to adverse inflation and output effects in equilibrium (see Cukierman and Lippi 1999 and Jerger 2002b).

The three strands of arguments listed above suffice to understand the doubts of economists concerning even the sign of the effect of EMU on the real side of economy. These doubts apply to the impact of EMU on the business cycle as well as on long-run equilibrium values of output. Thus hindsight is – as often – the only reliable source of information. Figure 2 looks at the development of output gaps in the EMU member countries.

Only the time series for Finland (dashed) and Ireland (dotted) are marked since the developments in the other countries have been quite similar. (The somewhat thicker solid line represents the Euro area average.) Whereas the sharp downturn in Finland in the early 1990s can be mainly attributed to the breakdown of the export markets in the former Soviet Union, the large positive output gap in Ireland in 2000 and 2001 at least coincides with the start of EMU. In 1999 and 2000 (as well as in the projections for 2002 and 2003), Ireland had the highest inflation rate in the Euro-area. Furthermore, the inflation rate in Ireland since 1999 is perceptibly higher than it had been in the early 1990s. Hence, it seems fair to conclude that the common monetary policy is too expansive for this particular country.



Source: OECD (2001), p. 215, Luxembourg not included. Output gap determines the percentage deviations of actual from potential GDP.

Figure 2: Output Gaps in the EMU Member States, 1985-2003

Also very visible in Figure 2 is the "Maastricht recession" experienced by most countries during the run-up to EMU. It is quite evident that the inability of policy makers to commit themselves very early and unmistakably to EMU has had enormous cost. Only the Netherlands (where no adjustment of inflation expectations had been necessary, since monetary policy consisted in pegging the Dutch guilder to the German mark) managed to stay slightly above potential output during most of the 1990s.

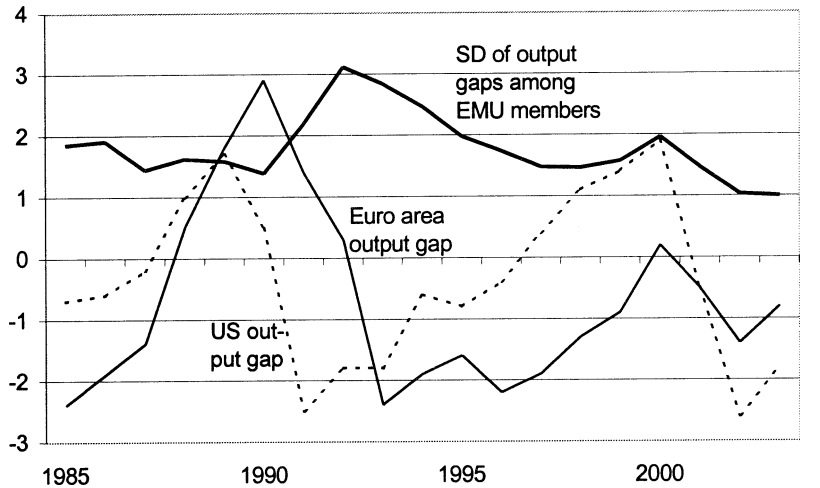
Given the large extent of nominal interest rate convergence mentioned above, the inflation differentials reported in Figure 1 imply the possibility of a destabilizing positive feed-back: A positive inflation differential leads to relatively low real interest rates which in turn further boost investment. This boom then will further strengthen the inflationary impulse.[10] According to the OECD projections, however, the boom in Ireland will cool down in the immediate future. For the other countries, EMU seems not to have had a discernible impact on business cycle fluctuations so far. Figure 3 sheds further light on this issue.

The thick line displays cross-country standard deviations of the output gaps in the EMU countries. This measure clearly rose in the early 1990s, due to strong and country-specific shocks (German reunification, breakdown of the Soviet Union, EMS crisis), however gradually decreased thereafter. Hence, there is – at the very least – no indication that EMU gave rise to more pronounced country differentials in the business cycle and hence that the abolition of the exchange rate instrument did any harm.[11] The same conclusion emerges if one compares the output gap measures of the Euro area (thin and solid line) and the USA (dashed line). After ending the last doubts whether EMU will take place or not (in May 1998), output in the Euro area approached potential output pretty soon. The present recession is (projected to be) less pronounced in the Euro area in comparison to the United States despite the fact that the Federal

[10] This channel potentially reinforces the Feldstein (1997, p. 32) conjecture that the inability to set national interest rates will cause macroeconomic instability.

[11] One might argue that EMU did not yet experience large idiosyncratic shocks and hence that the jury on this issue is still out. Although the German reunification probably was the most clear-cut country specific shock in recent history, one should bear in mind that the ECB was confronted with events like the Y2K problem, the effects of September 11 2001, large swings in energy prices – and not least the introduction of a new currency.

Reserve System made every effort to end the recession by very aggressive interest rate cuts.[12]



Source: see Figure 2 and own calculation.

Figure 3: Output Gaps in the Euro Area and the USA, 1985-2003

Judging by the evidence available so far, EMU did not lead to any dramatic shift in the patterns of business cycles, although there is evidence that at least initially the common monetary policy was too expansive for (small) countries with above average inflation, primarily for Ireland.

The next question then is to evaluate the impact on the structural component of unemployment. Here, any firm conclusion should be based on more than the currently available data. Nevertheless, the estimates of structural unemployment rates contained in OECD (2002) show that the developments in the EMU countries are quite mixed. This may suggest that labor market performance is

[12] To put some numbers on this observation: the three month interbank rate in the US declined from its peak in June 2000 of 6.79% to its trough at 1.82 in January 2002. The corresponding peak-to-trough numbers for the Euro area are 5.09% in October 2000 and 3.34% in January 2002. (Source: ECB Monthly Bulletin, various issues).

still mainly a question of national policies. Whereas from 1999 to 2002 there was a marked reduction of structural unemployment in Spain (from about 15% to 10%), there were smaller reductions in Belgium, Finland, France, Ireland, Italy and the Netherlands but also slight increases in Germany and Greece. Only Austria exhibited a fairly stable structural unemployment rate, around 5%. Again, no spectacular story emerges from the data; i.e. EMU seems not to have brought about strong differences in either direction. Furthermore, there is no lack of explaining factors that link the aforementioned changes of structural unemployment rates to policy changes in the respective countries.

III. Policy Co-ordination in a Monetary Union

There is a long-standing debate whether and to which extent countries that pursue a common monetary policy should harmonize other policy areas as well.[13] Many observers claim that a monetary union necessarily has to be complemented by some degree of harmonization in the areas of taxes, labor market policy, social policy, competition policy, and financial market regulation just to name the most important areas. The extreme position in this debate is the assertion that a common monetary policy in effect requires the abolition of the nation states, i.e. full harmonization of the major policy areas.

A direct lemma of this position is the hypothesis that a monetary union between different (and distinguishable) national states is not viable.[14] The oppo-

[13] Given the existence of the ECB, we might well ignore the still older question whether a monetary union has to be *preceded* by a political union, i.e. whether a very high degree of ex ante harmonisation is required.

[14] Milton Friedman recently aired this view in an interview with the German magazine "Capital". He conjectured that the European Union will break down in 5 to 15 years due to the impossibility of a common monetary policy to take into account different cultural backgrounds and economic needs in the member countries. See Capital (2002).

site view holds that countries may very well have different policies, although these might eventually converge in a monetary union.[15]

The single most important instrument to align a major policy area, namely fiscal policy, among the members of EMU is the Stability and Growth Pact, which stipulates embarrassing and potentially painful procedures and fines for countries that fail to stick to the deficit criterion of the Maastricht treaty. Eichengreen and Wyplosz (1998) correctly anticipated that this pact would help to prevent countries from incurring very high deficits despite the fact that the pact is only loosely enforced.[16] The plausibility and even the desirability of loose enforcement comes from two arguments. First, the fines for fiscal misbehavior may amount to as much as 0.5% of the national GDP (first as a non-interest bearing deposit that is transformed into a fine if the country fails to correct the deficit). This is clearly a strong fiscal stimulus – in the wrong direction – for any country in trouble. Second, countries anticipating that they may be the next victims should be expected to be reluctant in dishing out embarrassments and fines to their neighbors. Nevertheless, there is clearly a theoretical possibility that fiscal behavior may restrict the ability of monetary policy to deliver price stability (see Canzoneri et al. 1996, 1998). Hence, fiscal responsibility of each single country exerts positive externalities for the rest of the union. This remains a valid argument for the idea of the loose kind of fiscal coordination envisaged in the Stability Pact. For an evaluation of the pact, it is again advisable to look at the data.

Figure 4 shows the developments of the structural imbalances of the general government as a percentage of the respective GDP in 1990, 1995 and 2000.[17] In every single member state of the Euro area the deficit declined dramatically,

[15] The merit of the Werner report in 1970 (Council of the European Commission 1970) is that it recognised the interdependence of monetary and political union without postulating that the latter is a prerequisite of the former. This idea was also the basis for the Delors report (see Committee for the study of economic and monetary union 1989) which then served as a blueprint to EMU. See Tietmeyer (1994) for a discussion of these issues.

[16] The successful effort the German government put into avoiding a "blue letter" from the European Commission in early 2002 is an indication for both parts of the claim by Eichengreen and Wyplosz (1998).

[17] The numbers include the accounts for the central, state and local governments as well as social security. One-off revenues from the sale of mobile telephone licenses are excluded. Note that this definition does not match the deficit concept of the Maastricht treaty.

leading from an average deficit of 6.1% in 1990 to just 0.9% in 2000. This trend to (or even state of) fiscal discipline will continue in the foreseeable future according to the OECD projections.

This general trend to more sustainable fiscal policies together with *increasing* correlation of business cycle (see Figure 3) clearly indicates that the Growth and Stability Pact at least did no harm in terms of overly limited responsiveness of national fiscal policies to the specific situations.

Although it must be made clear that a fiscal consolidation also took place outside the Euro area, the Stability Pact obviously helped to bring about fiscal discipline. To say the least, it is hardly imaginable that without this device the German government would have publicly committed to achieve a "nearly balanced budget" by 2004 – as it did to avoid the "blue letter" of the Commission. Although one might doubt the exact value of vague commitments, the awareness of the need for fiscal responsibility among policy makers thus was certainly enhanced by this instrument.

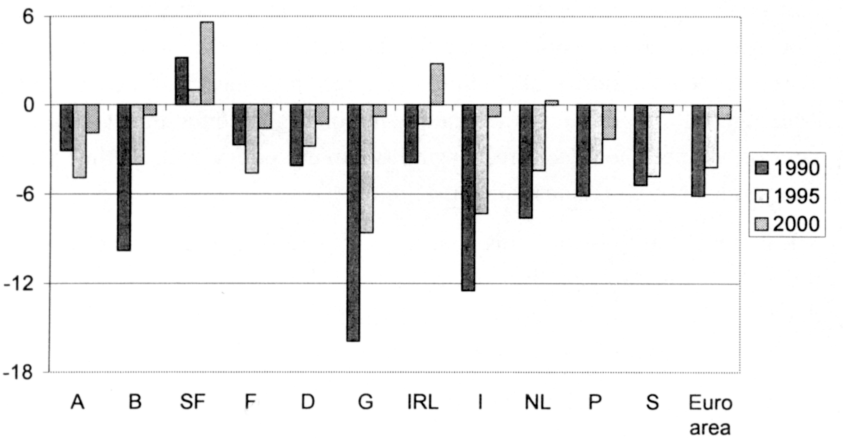
It is important to note in this context that fiscal discipline is a necessary prerequisite for the anti-cyclical use of fiscal policy according to the Keynesian doctrine. Fiscal deficits even in booms simply destroy the Keynesian arsenal – i.e. the weapons are wrecked when they are required.[18]

Hence, despite the harsh critique of the Stability Pact in parts of the economics profession (see e.g. De Grauwe 2002), the discipline required by the fiscal co-ordination instrument may just be necessary in order to buy the flexibility required by the Keynesian policy. Borchert et al. (2001) add the argument that this discipline is even more needed in view of the adverse demographic developments that will strain the social security systems.

Other areas of policy co-ordination in a monetary union pertain to labor market and social policies. After 3½ years of a common monetary policy, it is fair to establish that the heterogeneity among the EMU member countries in these policy areas did not yet lead to any dramatic results such as increased migration of workers to high-wage countries (or countries with higher social standards) or firms in the other direction. It did also not lead to the concentration of tax bases

[18] To put things into perspective, it may be interesting to note that Keynes himself recommended a stop to Keynesian policies in Great Britain as early as 1937, when unemployment still was at about 8%. See Keynes (1937).

in countries with lower (marginal) tax rates. Where these problems are important, they are connected to countries (tax havens or low-wage countries) outside the EMU. To be sure, this simple observation can not replace any serious theoretical and/or empirical work on the consequences and hence on the desirability of harmonization of national tax codes, labor standards, social policies and so on. What we know for sure by now, however, is that a certain degree of differences in these areas is not necessarily inconsistent with monetary union. Different people may well share one currency and nevertheless have (and practice) different tastes concerning other issues.



Source: OECD (2001, p. 233)

Figure 4: General Government Structural Balances as a Percentage of GDP

This optimism concerning the functioning of a monetary union should not be taken too far, however. More precisely, it should not be interpreted as implying that EMU enlargement (which will follow EU enlargement almost automatically) will be easy and smooth. A sound financial and regulatory system is certainly a prerequisite for EMU accession. The Asian crisis together with the failure of IMF programs to help the Russian transition remind us that well functioning market systems first of all need a well-established institutional framework. In my view, the requirement to accept and implement the "acquis communitaire" for accession countries and the immediate availability of the European judicial system thus is a really promising strategy to promote stability and economic growth in the transition countries of Eastern Europe. Despite all

sorts of possible problems with this acquis, especially in the area of agricultural policies, the availability of a comprehensive and well-tested framework takes serious the recommendations of *Ordnungspolitik* that is associated with Walter Eucken (1952). But even then, there are enough pitfalls along the way to monetary and economic union such as exchange rate problems before the accession and the danger of a new edition of the "Maastricht recession" to mention just two of them.[19]

IV. Policy Rules for the ECB

Exactly how a central bank formulates its policy is an issue that remains to be hotly debated. It is useful to distinguish three areas here: the transparency of monetary policy; the voting rules in the governing council; and the monetary policy rule or strategy to which the ECB might adhere. I will briefly discuss each of these in turn.

1. Transparency

Since its inception, the ECB is one of the most carefully observed and evaluated policy-making institutions. Besides the communication activities of the ECB, including regular hearings in the European Parliament, there are several "ECB watch" institutions, the most prominent of which is the group organizedby the London-based CEPR that produces the annual "Monitoring the European Central Bank" reports.[20] The ECB seems to welcome external criticism and judgments since it sponsors (also on an annual basis) "ECB watchers conferences" in which it takes an active part. As observed by the board member and chief economist of the ECB, Otmar Issing (2002a), this degree of openness to an academic debate over strategic and short-run aspects of monetary policy is something quite unique in the world of central banks (or for that matter for

[19] See Orlowski (2001) and Wagner (2002) for a more detailed discussion.

[20] Begg et al. (2002) is the most recent issue of this series.

any other policy making body). A further indication of this openness is the book by Issing et al. (2001) that gives a comprehensive account of the theoretical background and guidelines for the formulation of the ECB policy. Neither the Bundesbank in the past nor any other central bank put this amount of effort into the communication and discussion of its policy stance.[21]

Concerning the desirability of transparency, an academic debate re-surfaced that began with the Cukierman and Meltzer (1986). In an extension of the seminal Barro and Gordon (1983) paper, they argued that transparency destroys a potential leeway to produce surprise inflation and thus positive output effects. However, credibly committing not to do this is the very message of the analysis of the time-inconsistency problem. Second, and more recently, Jensen (2001) argued that forward-looking price setters may react to a central bank's future policy intentions if these are made "too" transparent, thereby causing avoidable price volatility. This, however, should be interpreted as calling for a constancy of central bank intentions rather than clouding erratic intentions. Winkler (2000) usefully distinguished between different aspects of transparency, namely openness, clarity, honesty and common understanding. Whereas it is true that there may be some subtle trade-off between these aspects – e.g. clarity asks for parsimonious communication of data, whereas complete openness would require every number to be published – intelligent and well-intended central bankers shouldn't find it too hard to practice transparency.

2. Voting Rules

In a monetary union that consists of countries that may have different preferences and/or are in different stages of the business cycle, a common monetary policy is unavoidably associated with compromises. Exactly how these different preferences and needs are brought together is of major importance for a monetary union. The ECB governing council presently uses a simple majority rule, which gives an equal weight to all member countries and the six board members of the ECB. It is rather undisputed that this rule has to be modified at

[21] Public discussions do not, however, substitute for the transparency of rules that enable the public to infer future moves of monetary policy.

least at some point during the enlargement process. The main argument for this necessity is the sheer size of the governing council that would result if all potential accession countries would join EMU.[22] It sounds plausible to everyone who experienced discussions in big groups that it makes sense to constrain the size of decision-making bodies. Most plausibly, some kind of rotation model which gives individual countries only temporary voting power will result from the discussions that are not yet concluded.[23]

It is quite reassuring, however, to look at the results of theoretical research on voting outcomes in a heterogeneous union. Apart from the theoretically straightforward – but probably unworkable – idea that side-payments are offered in order to enforce the monetary policy that is optimal from a union wide point of view (Brückner 1997, Tarkka 1997), it was shown in a wider variety of settings that majority voting will lead to rather reasonable results. These settings include among other things simple majority voting of countries with different preferences that are subject to idiosyncratic shocks; incentive contracts that may be offered to central bankers from individual countries; and interactions of decisions on monetary and fiscal policies (see Dixit 2001 for a comprehensive survey).

3. Which Monetary Policy Strategy for the ECB?

Since the start of EMU, the ECB tried to communicate and explain its policy decisions by means of the so-called "two-pillar strategy". The first pillar pertains to a normative reference value for the growth rate of M3 that is based on judgments on medium or long-term trends of potential GDP growth, velocity and a normative inflation rate. The ECB governing council announced on December 1, 1998 to set this reference value at 4.5% per annum. Any other information is contained in the second pillar that consists of a "broadly-based as-

[22] Presently, there are thirteen candidate countries that may sooner or later join the EU and hence EMU, ten of which are in Eastern Europe: Bulgaria, the Czech Republic, Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, the Slovak Republic, Slovenia and Turkey (see Buiter and Grafe 2002, p. 7).

[23] See von Hagen and Süppel (1994) and De Grauwe et al. (1999) for a discussion of different voting schemes.

sessment of the outlook for future price developments" (see ECB 1998). Although there are some further specifications, e.g. in Issing et al. (2001), the second pillar and its relation to the first remains very opaque – or intransparent. This strategy is thus widely criticized in academic circles, although the recommendations differ vastly. Whereas Begg et al. (2002, p. 18 ff.) speak of the first (monetary) pillar as a "poison pillar" that simply should be abandoned, von Hagen and Brückner (2001) advise the ECB to give *more* weight to monetary developments. As a third alternative, Borchert et al. (2001) recommend using the "price gap" concept to evaluate monetary developments. It seems fair to conclude that the discussion of the optimal central bank strategy is far from settled but that the ECB strategy certainly lacks precision and therefore transparency. In practice, it proved quite difficult, however, to distinguish between alternative monetary policy strategies even ex post (see e.g. Bernanke and Mihov 1997, who identified the Bundesbank policy as a strategy of inflation targeting[24]).

An alternative method to evaluate the stance of monetary policy is to use the framework of the Taylor rule (see Taylor 1993) in order to compare the actual interest rate movements with those implied by this rule. The Taylor rule assumes that the interest rate is chosen such that it raises (lowers) the real interest rate above (below) its natural level in response to a) a positive (negative) deviation of the inflation rate from its desired level and b) a positive (negative) output gap.

Von Hagen and Brückner (2001) apply this concept to Euro area data as a whole and to the data of the individual countries. Interestingly, they found that the ECB policy was too expansionary by this measure when using Euro area data, whereas the actual development is quite well matched by a Taylor rule applied to German and French data. This exercise thus does not confirm the median voter hypothesis that should apply in a policy-making body with majority voting.

The analytical instrument of the Taylor rule was also used by Begg et al. (2002) in order to compare the policies of the Federal Reserve System and the

[24] It is not surprising that it is not possible to tell these things apart, when whichever intermediate target is geared towards a normative inflation rate – something which the Bundesbank obviously and explicitly did with regard to the intermediate target of money growth.

ECB during the present slowdown. As reported earlier, the interest rate cuts in the USA have been much higher than in EMU. Hence, one might argue that by this standard, the ECB did "too little, too late"[25]. The main result, however, is that the responsiveness to the slowdown was quite similar on both sides of the Atlantic – which means that the problem was simply larger in the USA. This specific question is different from the question posed and answered in the aforementioned paper by von Hagen and Brückner (2001). However, it is interesting to note that even the basic question whether the ECB policy stance was too expansionary or too restrictive is answered different by the two studies, although they both use the Taylor rule as conceptual background. The ECB central bankers could be forgiven for taking this as evidence to have done a pretty good job.

V. Concluding Remarks

As befits an introductory conference paper, I tried to review the broad themes and discussions surrounding the ECB policy – with and without special relevance to the E(M)U enlargement process and its preparation that will be more thoroughly discussed by others in this volume.

On the whole, I arrive at an optimistic note concerning the performance and consequences of the ECB policy over the last 3½ years. The ECB policy neither fuelled a resurgence of inflation nor did it lead to a sustained slowdown in an effort to build a "hawkish" reputation.

Whether or not EMU is thus desirable for the EU accession countries can not be decided on this past performance alone, however. It is necessary to evaluate how important the exchange rate instrument for a particular economy is[26], how mature the economy is in terms of being able to achieve the Maastricht crite-

[25] See Goodhart (1996) for a discussion of this phenomenon in monetary policy.

[26] See the results in Korhonen (2002) who calculates monetary condition index ratios for the Czech Republic, Poland and Slovakia.

ria[27] and – last but not least – how strong EU membership in general and monetary unification in particular are backed by public support.

VI. Ansgar Belke: Comment

Jürgen Jerger's paper does a good job in surveying the current issues regarding the monetary policy of the ECB. I agree that the current monetary policy stance is broadly appropriate even if inflation has long been above the 2% limit set by the ECB, which is accounted for by shocks and the disappointing slowdown in productivity. Hence, this paper dispenses with further comments on his paper. Instead, it tries to complement Jerger's analysis and turns to an aspect which will be increasingly important for the analysis of monetary policy in the euro area and which might improve private sector's forecast of the ECB policy. More concretely, it addresses the question of whether the ECB systematically follows the US Federal Reserve and suspects that 2001 was the year of the decoupling.

The belief that the ECB follows the Fed is so entrenched with market participants and commentators that the search for empirical support would seem at one time a waste of energy and a trivial task. This comment engaged in this search and found it far less straightforward than conventional wisdom would have made one to believe. To anticipate the conclusion, this comment finds little support for the proposition that the ECB systematically follows the Fed (or its converse).

The question whether the ECB follows the Fed is intertwined with the question of whether the US business cycle leads and determines the European cycle. This is widely assumed, but it is not extensively evident in the data. There is one simple fact that suggests that if there is a determining influence of the US cycle on Europe, it cannot have come via the traditional channels. This fact is simply that net exports did not contribute to the 2001 slowdown in Euroland (the contribution of net exports to demand growth was approximately the same in 2000 and 2001). The contagion must thus have come via financial markets. Which financial markets?

[27] See Sell (2001) for an elaboration on the Maastricht criteria in the context of the E(M)U enlargement.

For stock prices it will be impossible to find out where the disturbance originated because stock markets react instantaneously to news. If market participants knew that European stocks were to follow US stocks down with a lag, they would immediately sell the latter short until the current price of European stocks reflected immediately whatever news had originated in the US. Hence it is not possible to find a pattern in which Euroland stock prices tend to lag systematically behind US stock prices. There is only one financial market price that could identify a consistent leader-follower pattern because it is heavily influenced by policy. This is the short-term interest rate, whose behavior is analyzed here.

A simple way to answer the question whether the ECB follows the Fed might be to look at the behavior of the official rates set by the ECB and the Fed. However, these rates do not move frequently enough to allow one to apply standard statistical methods. Hence one has to find indicators from financial markets, for example short term interest rates. Although central banks do not set directly the most widely watched indicator of short monetary conditions, namely the 3-months interest rate, they can nevertheless determine pretty much its evolution. If the ECB had systematically followed the evolution in the US (moves by the Fed as well as changes in US financial markets), one would expect to find that changes in US interest rates tend to lead changes in Euroland rates. At first sight this seems to have been the case if one looks at the short life span of the euro. Figure 5 plots the two series in question since the start of EMU.[28]

This figure suggests at first sight that the US was leading Euroland both when interest rates were going up, from the trough in early 1999 and when they fell starting in early 2000. Many observers concluded from this apparent relationship that the ECB mimicked the Fed in its monetary decisions. However, this popular belief[29] cannot be corroborated by statistical analysis.

[28] The data we use are from the International Financial Statistics database (IMF) and from the European Central Bank. *U.S.*: US3m LIBOR, *Eurozone*: until 1997:12: DM3m FIBOR Bundesbank, from 1998:01: EURO3m EURIBOR.

[29] Begg et al. (2002, p. 42) and Breuss (2002, p. 13) see a time lag between Fed and ECB interest rate decisions.

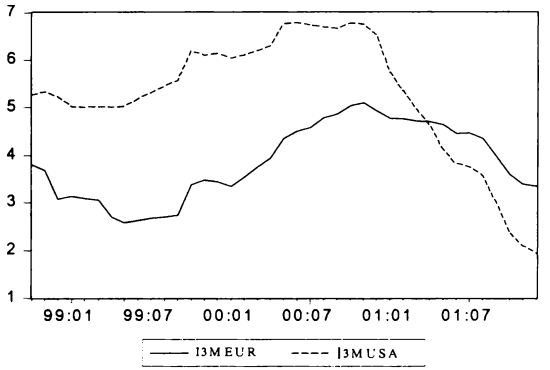


Figure 5: Three-Month Interest Rates in the US and the EMU

The procedure used here to ascertain the existence of a follower-leader relationship was Granger-causality tests. These tests can show whether past values of a certain variable (US interest rates) influence another variable (euro interest rates) after one has taken into account the patterns that might link the second variable (euro rates) to its own past. A battery of statistical tests was run covering the entire euro period (1999-early 2002). These tests supported the result that US interest rates influence euro interest rates during the same month. However, the US interest rate of the previous month did not have a statistically significant influence on the current monthly-euro interest rate when all the other factors were taken into account.[30] This suggests that the visual impression of a US leadership over the entire euro period might be misleading.

In order to make sure that our results do not depend on the particular test period chosen, we ran a battery of statistical tests for a number of periods, e.g. covering the entire euro period (1999-early 2002) and different periods from 1995 onwards.

Before the regressions were run, however, an important empirical caveat had to be taken into account. The level series seem to contain a unit root and Granger causality tests tend to give misleading results if the variables considered in the vector autoregressive regression (VAR) contain unit roots. There-

[30] Incidentally by looking at the behavior of US interest rates over time we found that euro interest rates also influence US interest rates, again during the same month.

fore, it was first tested whether the interest rates were actually stationary during the time period considered. The results of the unit root tests, not presented here, but available from the author upon request, seem to confirm that the series have to be differenced once in order to make them stationary. The conclusion that one has to draw from these tests is that one cannot reject that both the euro (I3MEUR) and the US interest rate (I3MUSA) are integrated of order one. This implies that the Granger causality tests must be done in first differences.

As the next step we use standard statistical package to establish whether there is a follower-leader relationship between the changes in these two interest rates. The results are tabulated below. One should be well aware that the results often heavily depend on the lag structure. For robustness reasons and with an eye on our hypothesis of a possible break in the relation around the turn of the year 2000-01, a variety of different sample periods was also used. Thus a range of results is summarized below.

In no case does one have to reject the null hypothesis that the US interest rate does not "Granger cause" the euro interest rate and vice versa. This result obtains if one operates at the usual 5% significance level. There is only one exception, using 12 lags and the sample period 1995:01 to 2000:12. Only in this one case is the US interest rate significant at the 10% level, in the equation for the euro interest rate. But using the same specification for the US interest rate, it is also found that it is determined by the euro interest rate.

Table 1

Results of Granger Causality Test by Sample Period and Lag Length

Sample period	Lags: 2	Lags: 4	Lags: 12
1990:01 2002:04	0/0	0/0	0/0
1995:01 2000:12	0/0	0/0	0/0
1990:01 2002:04	0/0	0/0	0/0
2000:01 2002:04	0/0	0/0	NA
1999:01 2000:12	0/0	0/0	NA
1999:01 2002:04	0/0	0/0	NA

An entry 0/0 means that that there is no statistically significant influence; neither from the US on the euro, nor vice-versa. NA: Not available.

One objection to the standard tests performed so far is that the "normal Granger causality tests" might be unduly influenced by particular episodes.

This is why one needs to look a bit more into detail in the bivariate relationship. VAR allows one to identify the lag structure that seems to give the best econometric fit. The euro interest rate change is taken as the dependent variable and we try to explain its variation by past changes of the euro interest rate as well as by contemporaneous and past changes of the US interest rate. The US interest rate can be said to "cause" the euro interest rate if at least one of the coefficients on past US interest rate change is significantly different from zero. Thus, a significant effect of a positive sign implies that one can reject the hypothesis that the change in the US interest rate does not influence the current change of the euro interest rate at the usual confidence levels.

Although regressions were run over the whole available sample, i.e. from 1990 onwards (these regressions essentially gave the same results), only the results from the regressions over the sample 1995:01 to 2002:04 are displayed. The best three specifications (according to model selection criteria) are presented. The first is the best specification possible without the implementation of dummies. In the second, dummies were used to capture the euro changeover and a surprise interest rate cut by the ECB. Although the lagged change in US interest rates was not found to be significant, a third specification was chosen to test, whether a structural break in the coefficient on the lagged change of the US interest rate could nonetheless be identified.

Both pairwise Granger causality tests and bivariate VARs give the result that, if at all, US interest rates influence euro interest rates during the same month. However, the US interest rate of the previous month did not have a statistically significant influence on this month euro interest rate when all the other factors were taken into account. Incidentally, we also find that euro interest rates also contemporaneously influence US interest rates.

One might still argue that interest rates in Europe tended to be influenced by what had happened on the other side of the Atlantic but that this had changed during 2001. In that year the Fed cut interest rates at an unprecedented speed (and of an unprecedented magnitude) because it feared an unraveling of the financial equilibria in the US. The ECB took a more relaxed stance on this point as the eurozone economy did not show any of the (potential) disequilibria of the US economy (current account, consumer financial position, overinvestment). Hence, one might be tempted to conclude that over the whole sample the lagged US interest rate change was insignificant in the regression equation for the euro interest rate change, while it would become significant if only a large sub-sample (namely until December 2000) had been considered. In

order to test whether this reasoning is correct some efforts were taken to search for break around the turn of the year 2000-01.

Table 2

Bivariate Regression Results

Sample: 1995:01 2000:12				
Variable	Coefficient	Standard Error	t-Statistic	Probability
Constant	-0.0037	0.0161	-0.2312	0.81
DI3MEUR(-1)	0.2612	0.1000	2.6107	0.01
DI3MUSA	0.5727	0.1177	4.8638	0.00
R-squared	0.3636	Mean depend. variable		-0.0055
Durbin-Watson	2.1591	Prob(F-statistic)		0.0000
Sample: 1995:01 2000:12				
Variable	Coefficient	Standard. Error	t-Statistic	Probability
Constant	0.0111	0.0142	0.7810	0.43
DI3MEUR(-1)	0.2713	0.0873	3.1075	0.00
DI3MUSA	0.5204	0.1038	5.0101	0.00
D9503	-0.4029	0.1195	-3.3720	0.00
D9812	-0.3172	0.1218	-2.6042	0.01
D9904	-0.3538	0.1198	-2.9524	0.00
R-squared	0.5446	Mean dependent variable		-0.0055
Durbin-Watson	2.1926	Prob(F-statistic)		0.0000
Sample: 1995:01 2000:12				
Variable	Coefficient	Standard Error	t-Statistic	Probability
Constant	0.0101	0.0143	0.7090	0.48
DI3MEUR(-1)	0.2278	0.0995	2.2893	0.02
DI3MUSA	0.5079	0.1049	4.8418	0.00
DI3MUSA(-1)	0.1067	0.1163	0.9171	0.36
D9503	-0.3925	0.1201	-3.2663	0.00
D9812	-0.3235	0.1221	-2.6490	0.01
D9904	-0.3559	0.1200	-2.9657	0.00
R-squared	0.5504	Mean dependent variable		-0.0055
Durbin-Watson	2.0950	Prob(F-statistic)		0.0000

From the previous analysis the following specification (1) of our regression equation looked best suited as a standard reference to test for breaks (D denotes first differences, I stands for interest rates):

(1) DI3MEUR = C(1) + C(2)*DI3MEUR(-1) + C(3)*DI3MUSA + C(4)*DI3MUSA(-1)

The coefficient C(4) of the lagged US interest rate is the coefficient of interest here. To start with, a Wald test of the coefficient restriction C(4)=0 was conducted.

Table 3

Wald-test of Significance of Lagged U.S. Interest Rate

Full sample 1995:1-2002:4		The null hypothese C(4)=0	
F-statistic	0.0228	Probability	0.8802
Chi-square	0.0228	Probability	0.8798
Limited sample 1995:1–2000:12		The null hypothese C(4)=0	
F-statistic	0.7852	Probability	0.3786
Chi-square	0.7852	Probability	0.3755

Both tests fail to reject the null hypothesis of C(4) = 0, i.e. the (first difference of the) lagged US interest rate having no impact on the current difference of the euro interest rate.

We examine whether all the coefficients in the regression equation (1) are stable around our guess of the structural break, that is 2000:12. Also we examine whether the parameter C(4) is stable across the sample without prior fixation of a breakpoint, and whether the coefficients are stable in general without prior fixation of a breakpoint.

At first, we conduct a Chow breakpoint test, i.e. the reference equation is fitted separately for each sub-sample to see whether there are significant differences in the estimated equations, the latter indicating a structural change in the relationship. Large forecast errors would cast doubt on the stability of the estimated relation between euro and US interest rates.

Both tests indicate a structural break in the relationship, which is located between 2000:12 and 2001:01. However, breaks might be indicated for neighbored points in time as well. A sequential plot of the F-statistics over all data points in the sample would have been useful here, choosing the highest point as the "true breakpoint".

Table 4

Chow Breakpoint Tests

Chow Breakpoint Test: 2001:01			
F-statistic	2.606219	Probability	0.041799
Log likelihood ratio	10.77937	Probability	0.029159
Chow Forecast Test: Forecast from 2001:01 to 2002:04			
F-statistic	2.085986	Probability	0.019064
Log likelihood ratio	35.14074	Probability	0.003802

Ad (b) A simple approach is that of recursive estimates (of the coefficient of the lagged difference of the US interest rate) starting with the start of the sample period and adding observations over time. With this approach one can trace the evolution of this coefficient as more and more data are used in the estimation. From Figure 6 it can be seen that the coefficient C(4) displays variation when more data is added, i.e. a sudden increase in the midst of 1999 and a fall at the end of 2000; there is a strong indication of instability and a structural break at the end of 2000. However, it has to be noted that the significance bands throughout embrace the null, meaning that the coefficient C(4) is never significantly different from zero (as mirrored by the regression results).

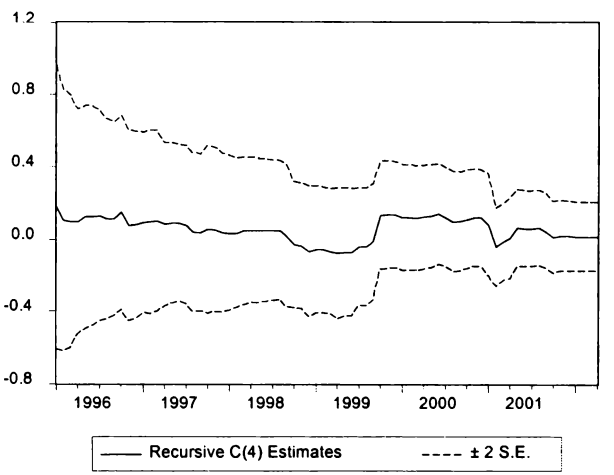


Figure 6: Recursive Coefficients of Lagged U.S. Interest Rate

Ad (c) A CUSUM of Squares test was also conducted, which is essentially a combination of recursive estimation and a Chow test. Movements outside the critical 5%-lines would be suggestive of parameter instability. Although not crossing the lines, our test statistic in Figure 7 in fact indicates some instability in the equation at the end of 2000, since the test statistic nearly touches the critical line at that point in time.

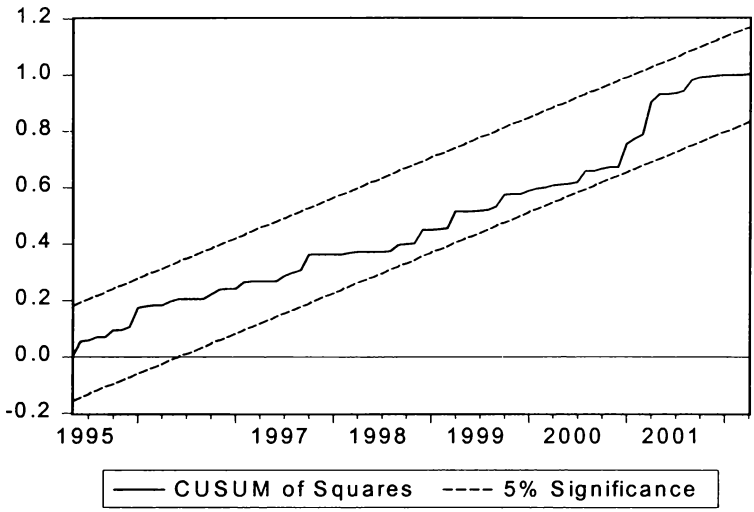


Figure 7: A CUSUM of Squares Test of Lagged US Interest Rates

All in all, it appears that there is no statistical evidence that proves that the ECB follows the Fed.[31] This absence of evidence also works the other way round, i.e. it is impossible to prove that the two are independent from each other, because the moves on both sides of the Atlantic seem to be so often contemporaneous. This is actually what one would expect if the most important shocks have come from global financial markets and both have been equally quick to respond to them. The Central and Eastern European candidate countries should take these stylized facts into account if they think about meeting the decision to give up their monetary autonomy and, for instance, to euroise

[31] Our conclusion is supported by Peiró (2002, p.149), who finds "a preponderance of synchronic over dynamic relationships [which] can be regarded as evidence in favor of those theories that attribute the origin of world cycles to common shocks."

unilaterally before entering European Monetary Union without derogations. The reason is that the monetary shocks, which will hit them in this case will not be independent from U.S. monetary policy.

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Alternative Options for the Monetary Integration of Central and Eastern European EU Accession Countries

By Peter Backé and Cezary Wójcik[1]

I. Introduction

Monetary integration in the European Union (EU) has advanced very far, based on the Maastricht Treaty which outlined a staged approach towards the creation of an Economic and Monetary Union (EMU). Within this framework, eleven EU Member States formed a monetary union in 1999 and the euro was introduced as the single currency in this newly formed monetary area. In the meantime, the euro area has been enlarged to twelve countries. Furthermore, the three remaining EU Member States, which have not yet adopted the single currency, have increasingly been attracted to the euro area, in particular by the successful introduction of euro coins and banknotes at the beginning of 2002.

Against this background, the final destination of monetary policy and integration for the Central and Eastern European EU Accession Countries (ACs) is obvious: at some point in the future, the Aession Countries are to join the euro area.

The *European Union* has outlined a *three-step approach* to the monetary integration of accession countries. The applicants will first join the EU, then enter the exchange rate mechanism (ERM II) of the European Union and finally, after fulfillment of the Maastricht convergence criteria, accede to the euro area, i.e. participate fully in Economic and Monetary Union. This means that the

[1] The views expressed in this paper are those of the authors and do not necessarily represent the position of the Oesterreichische Nationalbank.

euro is to be introduced in today's accession countries in a consensual manner, based on the standard convergence examination procedure and not sooner than at least two years after EU accession. The latter aspect results, in particular, from the exchange rate criterion, which foresees a two-year participation in the ERM II, after EU accession, without a devaluation of the parity rate against the euro.

The EU has made it clear that an introduction of the euro as a legal tender in an accession country without the consent of the European Union is not an appropriate way to move ahead towards full monetary integration with the euro area. The main argument is that such a unilateral euroization "would run counter to the underlying economic reasoning of EMU in the [EC] Treaty, which foresees the eventual adoption of the euro as the endpoint of a structured convergence process within a multilateral framework" (Ecofin, 2000). In taking this stance, the European Union reacted to a discussion that got momentum in 1999 and early 2000 whether a fast – if not instant – introduction of the euro in the ACs would economically be more advantageous, in particular for the candidates, than the monetary integration path outlined by the European Union.[2] Given the position of the EU, it is evident that such a rapid or even immediate adoption of the euro, if it were to occur, could only be done unilaterally by the accession country, which would – hypothetically – opt for such an approach. Backé and Wójcik (2002) argue that the institutional considerations that are usually invoked to validate the European Union's objection to unilateral euroization by accession countries are supported by economic considerations: Unilateral euroization would bring less benefits than joining the euro area on the standard pathway (no seigniorage revenues, no lender of last resort function under the former option). At the same time, the adoption of a foreign currency as legal tender, while eliminating the risk of exchange rate crises, does not do away with the balance of payments constraint. In addition, if nominal convergence is not far advanced at the point in time of the introduction of the foreign currency, major swings in real activity may ensue, with negative knock-on effects on financial stability and catching-up perspectives.

Another point the EU has underlined is that the Maastricht *convergence criteria* will not be changed for the ACs and that these criteria will be applied in the same manner as in the convergence examinations so far. This is to "ensure

[2] For a review of this discussion see Backé and Wójcik (2002).

equal treatment between future Member States and the current participants in the euro area" (Ecofin, 2000). Again, the European Union's emphasis on this point has been a response to a debate of whether the Maastricht criteria should be adapted for accession countries, mainly to take into account that these countries have embarked on a catching-up path towards average EU income-per-capita levels.[3]

The accession countries have essentially accepted the EU position in the course of the *accession negotiations*, and the negotiation chapter on Economic and Monetary Union has been concluded with all accession countries (but Romania where it has not been opened yet). Discussions about rapid unilateral euroization or an adaptation of the Maastricht criteria have not impinged upon the basic policy line to stick, in principle, to the three-stage approach proposed by the European Union. The awareness about the risks and costs of a rapid and unilateral introduction of the euro has increased in the accession countries, and there is a growing perception in the candidate countries that the predominantly nominal Maastricht convergence criteria form an acceptable set of criteria to qualify for monetary union, in particular if compared with other potential sets of benchmarks which may have included real convergence requirements.

This being so, the most important issue for the accession countries to decide is whether to aim for an *early introduction of the euro two or three years after EU accession or* to opt for a *more gradual strategy* of monetary integration. This paper reviews the arguments for and against either of these approaches. Thus, the focus is on the question of how speedily to introduce the euro in the ACs, within the standard path laid down in the EU accession negotiations.

This issue of what is the appropriate pace of monetary integration is being intensely discussed in the accession countries. Several countries, notably Hungary, Slovenia and Estonia, are aiming at joining the euro area as soon as possible after EU accession. In the other countries, the decision-making process is still evolving. Within this group, the central banks of Poland, Slovakia and Latvia are more or less clearly leaning towards going for a swift participation in the euro area after having joined the European Union, but an official policy

What are the issues that arise in assessing the merits and disadvantages of (relatively) fast monetary integration versus a more gradual approach? A state-

[3] For the main features of this debate see Backé (2002).

ment on the issue (accorded between the government and the central bank) has not been reached yet.[4]

Joining a monetary union holds considerable potential benefits, but also substantial potential risks if undertaken prematurely. However, there are *severe limitations to* making an economic *cost-benefit analysis* of a country's participation in a monetary union and, even more so, in using cost-benefit analysis for determining the optimal speed towards full monetary integration. This is so mainly for two reasons. First and generally, there is no uniformly accepted basis among economists for assessing the costs and benefits of joining a monetary union. Second and more specifically, in the case of the ACs, there is no satisfactory model to estimate all relevant effects jointly within a unified framework. In this latter respect, the situation in the ACs differs from the state that prevailed in the incumbent EU Member States when they did their cost-benefit assessments in the run-up to the creation of the euro area.[5]

Against this backdrop, a pragmatic approach is to *focus on* the presumably *most important effects* only and to assess these factors individually. In doing so, the key factors, which have to be discussed are the costs and benefits of giving up the monetary and exchange rate instrument, on trade and growth gains and on credibility effects. Other aspects, like e.g. the role of monetary integration as a potential catalyst to fiscal consolidation and to structural reforms are also relevant but appear, in overall terms, to be less central and are therefore not discussed further.[6] In the analysis, a dynamic perspective has to be taken which considers how the effects change over time. This is particularly important if the costs of full monetary integration tend to decrease over time, as structural convergence proceeds. Based on this line of reasoning, what has to be assessed is at what point in time the costs and risks of full monetary integration are sufficiently contained so that they are outweighed by the benefits of participation in the euro area. Obviously, the downside of this approach is that it essentially neglects possible linkages among the single effects and that it takes a very

[4] For a selective review of the monetary policy integration strategies of accession countries see Moser, Pointner and Backé (2002).

[5] For two of these country studies on the costs and benefits of euro area accession, pertaining to Austria and Sweden respectively, see Baumgartner et al. (1997) and Calmfors et al. (1997).

[6] For a review of these further effects see Backé and Wójcik (2002) and Backé (2002).

simplistic line on the aggregation of individual factors. Still, these shortcomings have to be accepted, as there is apparently no other feasible approach at this stage.

II. The Cost Side

The diversity of views among economists about the potential effects of joining a monetary union is particularly pronounced for the *cost side*. The standard approach to assess the costs of the adoption of a foreign currency as a legal tender is, or has until recently been the *optimum currency area theory* (OCA theory).

The optimum currency area theory considers a common currency optimal for countries which are exposed to mainly symmetric shocks or which have mechanisms in place for the adjustment to asymmetric shocks. The latter include, according to the theory, wage and price flexibility, factor mobility and/or fiscal transfers. The smaller the exposure to asymmetric shocks, the less is there the need to resort to such adjustment mechanisms. In order to lower the probability of asymmetric shocks, it is crucial that the trade of participating countries is highly integrated and that their exports are well diversified in terms of the structure of exported goods and services, which in turn will contribute to fostering business cycle synchronization.[7]

However, optimum currency area theory which was long "the organizing framework" (Eichengreen, 1997) for the analysis of monetary unification has recently met with *increasing criticism* within the economists' profession, mostly on three grounds.

The first argument is that the optimum currency area criteria are *endogenous*. Frankel and Rose (1998) maintain that joining a currency union (or a credible fixing of the exchange rate) will eliminate exchange rate uncertainty and reduce currency transaction costs, which will stimulate bilateral trade and hence deepen the economic integration between trade partners. This will foster business cycle synchronization and reduce the exposure to asymmetric real shocks which in turn will validate (ex post) the adoption of the common currency.

[7] For a detailed review of the optimum currency area theory see Horvath (2001a).

Second, *risk-sharing arguments* suggest that, under full financial market integration, countries, which are exposed to asymmetric shocks may profit from monetary unification. The idea is that using a common currency will facilitate portfolio diversification which allows countries to adjust more smoothly and at lower costs to asymmetric real shocks, due to mutual claims on each other's resources. This view was first put forward by Mundell (1973) and has increasingly been echoed in the recent debate on the optimum currency area theory (see McKinnon 2001, Buiter, 2002).

A third proposition is that the exchange rate tends to be a *source of shocks* rather than a *shock absorber*, in particular for small open economies. Thus, even if there were a potential for asymmetric real shocks to occur, the exchange rate would either be ineffective as an adjustment tool and/or any beneficial effects from retaining it may be more than offset by the costs caused by nominal exchange rate volatility and, in the worst instance, exchange rate crises (see e.g. Buiter, 2000). This stance which can be traced back to Friedman (1968) challenges the view that structural considerations are important for the choice of exchange rate regime – a view that at least implicitly assumes that monetary and exchange rate policy is an effective tool of economic policy. This criticism of the optimum currency area theory also features in the "fear of floating" literature (see Hausmann et al., 1999, Calvo and Reinhart, 2000) which essentially argues that emerging market economies cannot effectively utilize the nominal exchange rate to absorb shocks from abroad – due to credibility deficits, a strong inflation pass-through of exchange rates and/or wide-spread currency substitution.

How *valid* are these arguments and, consequently, how *relevant* does the optimum currency area theory remain as a tool for assessing the costs of monetary integration?

The *endogeneity* of the optimum currency area criteria appears to be fairly well established by the recent empirical literature. Still, reliance on endogeneity should not be taken too far, when evaluating policy choices about monetary strategies and monetary integration, at least for two reasons. First, the endogeneity proposition may not hold in each and any case. In extremis, the effects may even go into the opposite direction. Krugman (1993) develops a theoretical model which shows that more trade due to the use of a common currency could result in countries becoming more specialized in the goods in which they have a comparative advantage. As a result, the sensitivity of countries to industry-

specific shocks could increase and business cycles could become less synchronized. A second and probably more important caveat is that it may take a long time for the endogeneity to work its way through the economic system. The experience of the euro area since 1999 is a case in point. Gaspar and Mongelli (2001) conclude that "looking at the matrix of intra-euro area trade, such integration effects have not (yet?) become apparent". Thus, the transition period to the new equilibrium in which the potential for external shocks would become much smaller may well be fairly lengthy. During the intermediate period, the exposure continues to persist (or goes down only very gradually) and adjustment mechanisms remain particularly important. At the same time, it is notoriously difficult to increase an economy's adjustment capabilities quickly and, thus, to reduce the exposure to shocks in the transition period to the new steady state.

The second argument against the traditional optimum currency area theory, relying on *risk-sharing considerations*, presupposes a complete portfolio diversification in order to be effective. While a common currency removes one obstacle to diversification, there are other factors that make for a home bias. Market segmentation tends to be nurtured by national borders, and the full harmonization of regulations on financial services is an arduous process, as the EU experience shows. Differences in tax laws, difficulties in assessing credit risks adequately (partly due to divergent insolvency laws) and the not yet completed consolidation of financial infrastructure (in particular settlement systems) constitute further barriers to full integration in the euro area. A recent ECB study shows that diversification in the euro area has increased only slowly and in a limited manner since 1999 (see European Central Bank, 2001).[8] While accession countries have made major strides in aligning their regulations on financial services and capital movements to EU standards, full integration and thus a substantial degree of diversification will only be reached in the medium to longer term (partly also due to transition periods for some accession countries, e.g. limitations for domestic pension funds to invest abroad). Risk-sharing arguments, therefore, do not alter the cost-benefit equation substantially at this stage or in the near future.

[8] An alternative explanation for home bias is put forward by Obstfeld and Rogoff (2000) who argue that equity portfolio with home biases result from trading costs of goods from which these securities derive.

The debate on the *merits and costs of* retaining – or removing – the *monetary and exchange rate policy instruments* has led to a perception that in small open economies monetary and exchange rate policies cannot be effectively used to smooth cyclical fluctuations. On the other hand, there are benefits of retaining the exchange rate as a policy instrument to correct major exchange rate misalignments in cases when adjustment through wages and prices would be much more costly due to the presence of rigidities. In other words, there are advantages of an escape option in a period of substantial distress.[9] In this line of reasoning, removing the exchange rate instrument irrevocably therefore presupposes that any major risks and sources of potential exchange rate misalignments are sufficiently contained. The effectiveness of using the exchange rate instrument in exceptional circumstances to facilitate adjustment hinges to a large extent on the consistency and soundness of the overall policy compound a country has pursued. Backé and Wójcik (2002) argue that advanced accession countries have established a solid track record in terms of stabilization and reform, which may facilitate the effective use of the exchange rate if a major asymmetric real shock hits. Moreover, misalignment risks in accession countries should not be underrated. The completion of price liberalization and adjustments of regulated prices but also the upward adjustment on agricultural prices due to the prospective integration into the EU's common agricultural policy may lead to price-wage spirals. Furthermore, demand side effects associated with the catching-up process may affect the competitive position of a country, in particular if they lead to additional wage pressure in the tradables sector or if investment shifts to the nontradables sector (see Wójcik, 2001).

This leaves the flipside of the argument, namely that the exchange rate can be a source of shocks. How relevant this issue is for the accession countries, will be examined below in the discussion of the benefits of monetary integration.

The *overall conclusion* on this issue is that the optimum currency area theory still has some validity to assess costs and thus a fair weight has to be given to optimum currency area related considerations and conclusions in drawing an overall cost-benefit equation.

[9] This is also acknowledged by OCA critics like Buiter (2000) who argues that, in an overvaluation situation, "generating [the needed] differential rates of inflation [between the domestic economy and abroad] is likely to involve greater resource costs than achieving the same relative price or cost realignment through a change in the nominal exchange rate".

What is the *empirical picture* in the accession countries of Central and Eastern Europe with respect to the optimum currency area criteria? First, as regards the *susceptibility* of accession countries *to asymmetric shocks*, several, though not all, accession countries have already achieved a considerable degree of business cycle synchronization, at least in the area of industrial production (see e.g. Fidrmuc and Schardax, 2000). However, if one goes a step further and assesses the likelihood of asymmetric shocks by examining the correlation of supply and demand shocks between countries of the euro area and the Central and Eastern European accession countries, a less encouraging picture emerges (see Horvath, 2001b, Fidrmuc and Korhonen, 2001). The latter study, for example, in which shocks are recovered from estimated structural VAR models of output growth and inflation, finds that only Hungary, Estonia and, to a somewhat lesser extent, Poland display positive correlations of demand and supply shocks with the euro area in the period 1992/95 to 2000/01. Horvath (2001b) examines the correlation of supply and demand shocks of Central European and Baltic accession countries with four large EU economies for 1993/95 to 2000 and arrives at somewhat different but not very robust results, with Hungary and Slovenia displaying the relatively highest correlations for both types of shocks. Thus, the picture is diverse: Some accession countries – Hungary, perhaps also Estonia, Slovenia and Poland – show positive correlations, the others do not. Furthermore, caution is warranted when drawing conclusions from these results, in particular if one considers that the correlations for some euro areas countries like Greece and Ireland are not encouraging either.

As for the other side of the optimum currency area coin, i.e. the *functioning of adjustment mechanisms*, product and labor markets display considerable variation among candidate countries, and this is particularly true for the wage formation process and wage flexibility. No comprehensive empirical study appears to exist which would undertake an in-depth assessment of the functionning of product and labor markets in all ten accession countries.[10] In very general terms, it seems to emerge from the limited analytical body available that product markets in accession countries tend to function somewhat less effi-

[10] OECD (2000) has a useful analysis of product and labor market issues for the Czech Republic, Hungary and Poland. Two recent publications which cover part of the ground for a larger set or all accession countries respectively are Riboud et al. (2001) and the Transition Report 2000 (European Bank for Reconstruction and Development, 2000), the latter containing a concise overview chapter on labor market issues.

ciently than those of EU countries, while the accession countries' labor tend to be more flexible than those of the Member States of the European Union (see IMF, 2000).

Whether migration is an effective channel in accession countries for adjusting to idiosyncratic shocks is rather doubtful (see Fidrmuc, 2002). The same is true for the question of whether fiscal transfers can play a major role in easing asymmetric shocks. It should be noted, however, that these channels do not play a major role within the current euro area either. Finally, capital flows may also facilitate adjustment in the short run but capital mobility cannot solve the adjustment problem in the long term, i.e. if there are persistent external imbalances, as there are limits to negative net wealth positions of countries vis-a-vis the rest of the world (see Corden, 1973).

In sum, one can differentiate among accession countries which have made substantial advances towards meeting the optimum currency area criteria – and, in a few cases, progress appears to be about similar to that of some Southern and non-continental EU Member States – while others have moved ahead less. Thus, based on the optimum currency area theory, a *diverse picture* emerges, with considerable risks for a number of accession countries.

However, this is only a static snapshot. In a *dynamic perspective*, the correlation of shocks will probably increase with a further deepening of trade and financial integration in the run-up to membership in the European Union and beyond. The inclusion into the EU internal market will lower real trade costs and thereby foster trade. Financial integration will be nurtured by improved confidence and reduced uncertainty associated with EU accession. By a similar token, further reforms of product and labor markets, again in the EU membership context, will tend to increase the adjustment capabilities of as accession countries. On the other hand, EU accession itself may constitute an asymmetric real shock for some candidates, giving rise to adjustment processes a consequence of the full integration into the EU internal market during the early stages of membership in the European Union.

III. The Benefit Side

Moving to the *benefit side* of monetary integration, there are three major advantages. First, participation in monetary union eliminates the risk of exchange

rate crises. This is particular relevant for cases of sudden shifts in sentiment leading to abrupt stops or reversals in capital flows and thereby to currency crises. Second, monetary integration generates trade and growth gains which are driven by lower transaction costs and reduced uncertainty. Third, a perspective of joining a monetary union can have positive credibility effects.

When putting the first benefit, the *elimination of the risk of currency crises*, into perspective, two points emerge. First, assessing the risk of future exchange rate crises is notoriously difficult if not impossible. What is a widely shared view is that the risks of excessive capital inflows and sudden capital flow reversals can be mitigated by sound macroeconomic policies, by avoiding "soft" exchange rate pegs, by measures that strengthen financial institutions' risk-management capabilities and by supervisory activities concerning the financial sector and the foreign borrowing of the corporate sector. However, despite such measures, significant risks of nominal exchange rate shocks that are unrelated to any change in fundamentals may remain.

There are different ways to cope with this risk. One is monetary and exchange rate policy cooperation within the European Union upon accession. More specifically, ERM II can, in principle, contain such risks, if it is operated in a way which provides reasonable shelter against speculative attacks that are not related to changes in fundamentals, i.e. if the mechanism puts off "unjustified" capital flow reversals for those economies which are basically healthy in terms of their fundamentals. It could also be considered to complement existing arrangements by establishing an additional financial facility with automatic access for non-euro area Member States of the European Union that have a straight record within intra-EU economic policy coordination and surveillance.

Second, joining a monetary union per se does not contain the risk of financial crises other than exchange rate crises. On the one hand, this underlines how essential financial sector soundness and supervision are. On the other hand, it points at the crucial importance of achieving a high degree of nominal convergence, as embodied in the Maastricht convergence criteria, before adopting a common currency. If progress with nominal convergence were not sufficiently advanced, boom-bust cycles could develop (see Backé and Wójcik, 2002). Such cycles are often associated with banking crises emerging in the bust phase and also with a less dynamic GDP-per-capita convergence over the full cycle.

The second main benefit of monetary union relates to *trade and growth gains*. Until recently, these effects were thought to be relatively modest, based on a string of empirical research applying time series methods. During the last two years, a new strand of papers relying on panel date methods has questioned this view. The debate was kicked off by Rose (2000) who finds that the trade effects of using a common currency are statistically significant and huge: Countries with a common currency are found to trade over three times as much an countries using different currencies. Moreover, Rose concludes that the impact of a common currency is an order of magnitude larger than the effect of reducing moderate exchange rate volatility to zero but retaining separate currencies. Frankel and Rose (2000) also find that potential benefits from the use of a common currency on trade to be large and, moreover, that this additional trade has substantial positive effects on growth.

Subsequent studies by Rose and Van Wincoop (2001), Melitz (2001) and Persson (2001) look further into the impact of using a common currency on trade and arrive at considerably lower but still large positive effects, with trade expanding, according to most estimates, by 40% to 50%.

All this suggests that participation in a monetary union holds potential trade and growth gains, although there is limited knowledge on the issue to what extent these effects vary among countries participating in a monetary union. And what is unknown is the time profile, i.e. how quickly these effects will materialize, as discussed above for the case of the euro area.

The third benefit of joining the euro area pertains to *credibility* effects. The argument is that joining a monetary union solves credibility problems of monetary authorities that stem from the dynamic inconsistency problem and thus eliminates a potential inflationary bias.[11] These credibility gains – together with the reduction of the interest risk premium, due to the elimination of exchange rate risk, and with deepening financial market integration – lead to a reduction of real interest rates which in turn stimulates investments and spurs growth.

Evidently, the significance and the size of these effects depend on the degree of credibility a country's policies enjoy in the first place, i.e. before it engages

[11] Clearly, this is only true if the respective country joins a monetary union like the euro area which does not itself suffer from a dynamic inconsistency problem.

in a monetary unification process. In this context, two aspects that relate to the accession countries deserve particular attention. First, most accession countries have made substantial headway towards achieving macroeconomic stability. As a result, the credibility of the monetary authorities and the confidence in the national currencies has been on the rise, whereas inflation has been on a firm falling path. It is obvious that the prospects of EU integration have played and will continue to play a fundamental role in this respect. The external constraints that result from fulfilling the conditions for EU accession are helping to solve the commitment problem of monetary and fiscal authorities and constitute an anchor for macroeconomic discipline, but also for institution-building/reinforcement and for structural reforms. In particular, preparing for EU accession has fostered the creation of domestic institutions dedicated to price stability, as legal provisions on central bank independence have been strengthened substantially. Cukierman et al. (2001) as well as Dvorsky (2000) show that the legal independence of central banks in ACs is well developed.

Actual membership in the European Union and, in particular, participation in economic policy coordination and surveillance will further enhance the credibility of accession countries macroeconomic policies and, in general, eliminate any significant inflation bias of monetary policy. A coherent and thoroughly implemented strategy of joining the euro area and, subsequently, participation in the monetary union will further add to this, mostly by consolidating the credibility gains reaped at the earlier stages.

The implications of this discussion of credibility issues for the speed of monetary integration are not straightforward. In essence, credibility is largely endogenous to the soundness and consistency of the overall economic policy-mix over time. Whether the pace of monetary integration has an impact on the quality of the policy compound, is a question that can hardly be answered ex ante. There may be cases where a speeding up of monetary integration (e.g. setting an ambitious target date) will reinforce a virtuous circle of improving economic fundamentals and credibility. Conversely, if the policies pursued are perceive to be or to become inconsistent with the pace of monetary integration intended by the authorities, credibility will most probably suffer. All this suggests that credibility effects of EU and subsequent euro area accession are important; however, it is uncertain whether the pace of monetary integration does affect the build-up of credibility and thus the time profile along which the related benefits can be reaped.

IV. Conclusion

Three *conclusions* emerge from the preceding analysis:

First, the available evidence of the economic *costs and benefits* of a future participation in the euro area is *not uniform* for all accession countries. This implies that, on economic grounds, the appropriate speed towards euro area accession may well be different between individual ACs. In general terms, the costs of full monetary integration tends to decrease over time, as structural convergence very general terms, it seems to emerge from the limited analytical body available that product markets in accession countries tend to function somewhat less efficiently than those of EU countries, while the accession countries' labor functioning of product and labor markets in all ten accession countries – driven by the completion of transition and the accession to the European Union – proceeds.

Second, from today's perspective, there is *considerable degree of uncertainty about the optimal date* for joining the euro area. Results depend on what weights one assigns to individual effects, what probabilities one attaches to future events and with what interest rate one discounts future costs and gains, if they materialize at different points in time. Thus, based on economic reasoning, it is not possible, in most cases, to pinpoint a particular optimal target year for euro area accession for individual candidate countries, but most probably there will be a range of several years with similar cost-benefit balances.

Third, joining a monetary union is a political economy issue. As the economics are not sufficiently clear-cut, the decision about the date will, at the end of the day, very much hinge upon *political considerations*. This, in turn, may tip the balance in favor of a relatively speedy quest for euro area participation for a number of accession countries.

V. Volker Clausen: Comment

The ultimate goal of monetary integration of the Central and Eastern European Accession Countries (ACs) to the European Union (EU) is the adoption

of the euro. The EU envisages an integration in three stages. The ACs will first join the EU, then enter the exchange rate mechanism (ERM II) and ultimately, subject to fulfillment of the convergence criteria, enter the Economic and Monetary Union (EMU). Against this background, the paper by Backé and Wójcik discusses for the ACs the appropriate *timing* of their participation in the EMU. More specifically, the ACs have to decide between an early introduction of the euro two years after EU accession and a more gradual strategy of monetary integration (big bang versus gradualism). The paper provides a well-written, balanced and timely account of the current discussion on the appropriate transition of the ACs to the euro area. My comments are of complementary nature and deal with three issues: the diversity of current exchange rate arrangements of ACs, the selected criterion about the appropriate timing of the accession to the euro area, and some suggestions for further research. Diversity of current exchange rate arrangements of ACs

The paper reviews the arguments concerning the costs and benefits of monetary integration in a very general fashion without much reference to particular countries. In order to evaluate the relevance of the topic for the individual accession countries, Table 1 contrasts the current exchange rate systems of the EU accession countries and their expected date of earliest EU accession.

Table 1 illustrates that already at present the euro is the main if not the sole reference currency in most ACs. It further includes the most likely time profile of the EU accession. Obviously, the question raised in the paper is most relevant for those ACs, which maintain at present a relatively flexible exchange rate regime, but are about to accede the EU relatively soon. This holds for example for Poland. In contrast, the issue of the optimal timing seems less relevant for countries, which already now maintain a hard peg toward the euro such as Bulgaria, Estonia and Lithuania.

Also in the cases of Cyprus and Hungary, which peg their currencies to the euro with a wide fluctuation margin, it is likely that EU accession will be accompanied by immediate participation in the ERM II. On the other hand, for countries, which use a managed floating with the euro as the reference currency, the relevance of the topic depends in particular on the size of the actual variation of the nominal exchange rate with respect to the euro. The participation in the ERM is the more likely, the smaller the variation of the nominal exchange rate. What matters here is the variation in the very recent past, be-

cause nominal exchange rate stability can only be maintained with a reduction of inflation toward the EU level and nominal convergence

Table 1

Present Exchange Rate System of the Accession Countries

Exchange Rate System	Country	Accession Date (Baseline Scenario)
Hard Currency Fixing		
Currency Board to Euro	Bulgaria	Not before 2008
	Estonia	2005
	Lithuania	2005
"Soft" Exchange Rate Fixing		
Currency Pegged to the Euro with a Broad Fluctuation Margin (±15%)	Cyprus	2005
	Hungary	2005
Currency Pegged to SDR	Latvia	2005
Currency Pegged to Another Currency Basket	Malta	2005
Floating Exchange Rates		
Managed Floating with the Euro as a Reference Currency	Czech Republic	2005
	Slovakia	2005
	Slovenia	2005
Managed Floating the US Dollar as a Reference Currency	Romania	Not before 2008
Free Floating	Poland	2005
	Turkey	

Source: Deutsche Bundesbank (2002), p. 71; Deutsche Bank Research (2002), p. 24.

1. Optimal Timing of the Adoption of the Euro

Backé and Wójcik choose the following criterion in the decision about the timing of the participation in EMU. They ask "at what point in time the costs and risks of full monetary integration are sufficiently contained so that they are outweighed by the benefits of participation in the euro area." This criterion draws upon the optimum currency literature where *total* costs and benefits are compared in order to take a once and for all decision about forming a monetary

union. Abstracting for a moment from the requirement that EMU participation has to be decided in a multilateral consensual fashion, the optimal timing of EMU from the viewpoint of the ACs is a choice variable, which in principle ought to depend on the comparison of *marginal* costs and benefits. Figure 1 illustrates the different implications of the two decision rules.

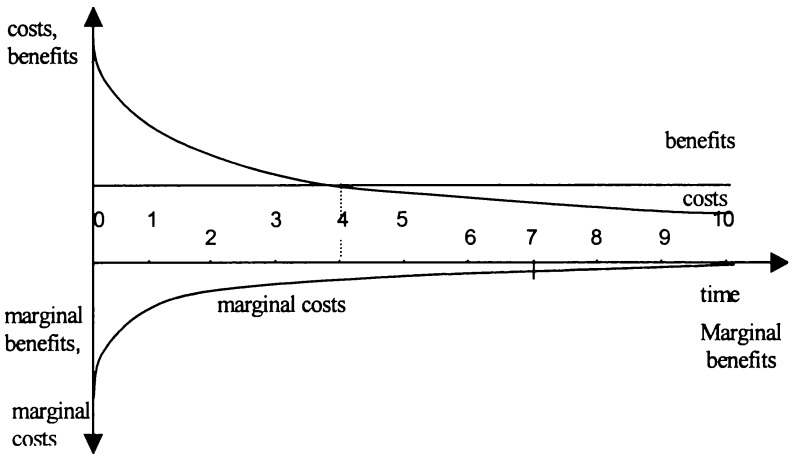

Figure 1: Determinants of the Optimal Timing of Euro Area Accession

The upper quadrant contrasts total costs and benefits. For simplicity, it is assumed that the present discounted value of benefits accruing from EMU participation is constant and independent from the date of EMU participation. On the other hand, as hypothesized by the authors, "the costs of full monetary integration tend to decrease over time, as structural convergence proceeds". The earliest date at which the total benefits outweigh the costs is the year 4 (i.e., 2004). This suggests a simultaneous accession to the EU and ERM II. The marginal benefit of waiting or of delaying the entry is zero. In contrast, marginal costs decline over time until 2010. In consequence, the *net* marginal benefit of waiting as the difference between marginal benefits and costs is positive until 2010. Taking this criterion, the ACs ought to wait until the end of the decade before entering EMU.

Up to now it has been assumed that the costs and benefits are known. As the authors correctly indicate there is considerable *uncertainty* concerning the costs and benefits. Furthermore, the membership in ERM II can be regarded as some

form of irreversibility, because, as long as the Maastricht convergence criteria are fulfilled, the ACs are obliged to enter EMU even if transition problems occurred in the aftermath of EU accession. It is well known from the literature on irreversible investment that this uncertainty generates an *option value of waiting*. It may be rational for ACs to wait how much the EU membership affects the domestic economies until it can be judged that the economies are also suited for the participation in EMU. It may be interesting to think about granting the ACs an option for delaying the entry to EMU after two years of ERM II participation. This may tip the balance toward an early EMU participation. Overall, the authors spend substantial effort in identifying and evaluating the costs and benefits of alternative roads to monetary integration with the EU but too little effort in discussing the specific nature of the timing decision.

2. Suggestions for Further Research

The *experience of Greece* in the accession to the euro area may provide useful insights concerning the optimal timing in the accession to the euro area. Greece and the ACs share many features, a low standard of living relative to the euro area, specific macroeconomic structures and a low correlation of output with the euro area. On the other hand, Greece has been a member of the EU for a longer period prior to the accession to EMU. Furthermore, Greece does not share some specific challenges of transition economies. Greece opted for a rapid adoption of the euro and it seems worthwhile to review the macroeconomic implications prior to *and* after the accession to the euro area.

Second, the paper correctly points out in the end that the timing of the participation in the EMU also depends on *political considerations*. Electoral cycles, the respective national degree of political consensus on EU and EMU participation and the level of public support are likely to influence the timing of the accession to the euro area. Undoubtedly, these also played a role in the establishment of the initial EMU. These political considerations deserve to be investigated in more detail.

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The Endogeneity of the Optimum Currency Area Criteria, Intraindustry Trade and EMU Enlargement

By Jarko Fidrmuc[1]

I. Introduction

Countries participating in a currency area have to face benefits and costs of a common currency. The benefits are directly related to transaction costs in countries' bilateral trade. Therefore, countries with intensive trade relations are likely to gain relatively more from the monetary integration. In addition, Frankel and Rose (1997 and 1998) hypothesize that business cycles are also becoming more similar across countries having close trade links. This hypothesis is supported by cross section estimations of the relation between the correlation of business cycles and trade intensity among OECD countries between 1959 and 1993. Moreover, Fatas (1996), Artis and Zhang (1995) and Hochreiter and Winckler (1995) show that a common European cycle has been emerging as predicted by the endogeneity hypothesis of optimum currency area criteria. Nevertheless, there remains a considerable doubt whether there is a causal relationship between trade links and correlation of business cycles of the involved countries.

[1] I benefited from comments by Peter Backé, Kurt Pribil, Doris Ritzberger-Grünwald, Július Horváth, Bas van Aarle, Jürgen von Hagen Jan Fidrmuc; and also the participants of the 2001 Annual Royal Economic Society Conference, University of Durham, April 9 – 11, 2001, as well as Kari Heimonen, Jukka Pirttilä, Wendy Carlin and other participants of the BOFIT Workshop On Transition Economics, Helsinki, April 19 – 20, 2001. The author appreciates the support of the LICOS, Centre of Transition Economics, K.U. Leuven. The views expressed in this paper are those of the author and do not represent the position of the Oesterreichische Nationalbank.

Kenen (2000) notes that the correlation of business cycles may increase with the intensity of trade links between these countries, but this does not necessarily mean that asymmetric shocks are reduced as well. Moreover, Hughes Hallett and Piscitelli (2001) show that a currency union may increase cyclical convergence, but only if there is already a sufficient symmetry in the shocks and institutional structure across the countries. Their findings thus support Krugman's (1993) discussion of the implications from the US currency union for the European Monetary Union (EMU). In Krugman's view, trade liberalization forces increased specialization according to comparative advantage of countries and possibly a divergence of business cycles in the EMU.

Indeed, Frankel and Rose' work lacks any relation to structural indicators which should also explain the similarity of business cycles, although they used them as arguments. Therefore, this paper tests the optimum currency area endogeneity using bilateral levels of intraindustry trade between OECD countries in the 1990s. It is shown that intraindustry trade actually causes the convergence of business cycles between trading partners, while there is no direct relation between business cycle and trade intensity. As far as intraindustry trade is positively correlated with trade intensities, the endogeneity hypothesis is confirmed, although the line of the argumentation follows actually Krugman (1993).

Finally, I ask whether the Central and Eastern European Countries (CEECs) should introduce the euro as soon as possible after accession to the EU or whether they should do so at a later stage. This question is addressed by applying the endogeneity hypothesis of optimum currency area criteria to five advanced transition economies (the Czech Republic, Hungary, Poland, Slovakia, and Slovenia). This paper applies the relation between the degree of trade integration, the shares of intraindustry trade, and the convergence in business cycles to CEECs and EU countries to predict the degree of business cycle harmonization of CEECs with EU countries in the medium term. Alternatively, these predictions can be interpreted as "Indices of Endogenous Optimum Currency Area" (EOCA indices) similar to those introduced by Bayoumi and Eichengreen (1997).

The paper is structured as follows. The next section tests the endogeneity hypothesis of the optimum currency area criteria. In section 3 the revealed relation between correlation of business cycles and trade intensity is applied for the computation of a potential correlation of business cycles (indices of endoge-

nous optimum currency area) in selected CEECs. Finally, the last section concludes.

II. The Optimum Currency Area Theory

1. Endogeneity of Optimum Currency Area Criteria

The theory of optimum currency areas (OCA), which was developed by Mundell (1961), McKinnon (1963), and Kenen (1969), has become particularly popular for analyses of the costs and benefits of monetary integration, in particular with reference to EMU. The basic point of the optimum currency area theory is that countries or regions exposed to symmetric shocks, or possessing mechanisms for the absorption of asymmetric shocks, may find it optimal to adopt a common currency. This literature therefore focuses on assessing the symmetry of output shocks in monetary unions, and/or evaluating the absorption mechanisms, such as labor mobility or fiscal transfers.

In particular, the optimum currency area theory discusses the following criteria: First, potential gains from the creation of an optimum currency area are determined by the *degree of openness*. A country in which trade within the optimum currency area accounts for a high proportion in domestic output can profit from participating in a currency area. Second, the optimum currency area theory stresses the importance of the *similarity of shocks and business cycles*. Asymmetric shocks and business cycles raise the need for country-specific adjustment policies; however, in a single-currency area, country-specific monetary policy is not possible.

Third, Mundell (1961) points at the *international factor mobility* (especially migration) as an alternative adjustment channel. High labor mobility facilitates adjustment to the adverse effects of asymmetric shocks and thus reduces the pressure for exchange rate adjustments. Fourth, Kennen (1969) stresses the importance of *product diversification*. A country exporting highly diversified products is less vulnerable to sector-specific shocks. Therefore, countries with a large product spectrum are less likely induced to use the exchange rate as an

adjustment tool. Fifth, Kenen (1969) also examines *fiscal transfers*, which can be used to counteract asymmetric shocks in a currency area.

Finally, the *degree of policy integration and similarity between rates of inflation* has been introduced to the optimum currency area theory more recently (see for example Dixit, 2000). On the one hand, differences between rates of inflation cause a loss of competitiveness in high-inflation countries, which calls for external adjustments (see Carlin, Glyn and Van Reenen, 2001). On the other hand, a high degree of policy integration already before the creation (enlargement) of a currency area is likely to result in lower costs for the participating countries.

The stronger any of the listed linkages between countries participating in a currency area are, the more gains may be expected by the participating countries. Frankel and Rose (1998) show that the first two criteria are endogenous. Closer trade relations result in a convergence of business cycles. Further, similar business cycles create good preconditions for policy integration and the creation of a currency area. However, this view is not universally shared in literature. For example, Krugman (1993) points out that, as countries become to a higher degree integrated, they specialize more. Thus, these diverging expectations regarding the relation between business cycles and trade integration may be illustrated in Figure 1.

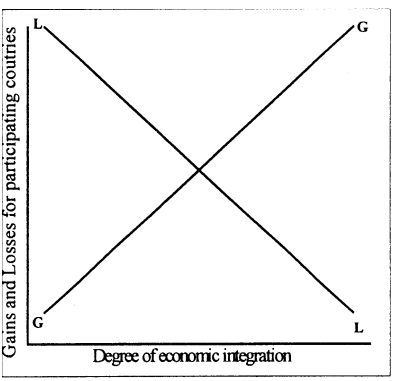
Generally, one expects monetary efficiency gains to be positively related to the degree of economic integration. This is illustrated by line GG in Figures 9A and 9B. However, the classical and alternative views of the relation between the degree of economic integration and the losses resulting from the participation in a common currency area differ with respect to the shape of the LL curve. The traditional optimum currency area theory expects a negative relation, while the alternative view predicts a positive relation between economic losses and the degree of economic integration. Still, there is a possibility that gains are higher than losses in the alternative view, when the GG line is significantly steeper than the LL line (see De Grauwe and Aksoy, 1999). Nevertheless, the potential gains from participation in a currency area are much lower in this case. Furthermore, the participating countries should be more integrated to achieve positive gains from monetary integration.

This discussion shows that we can relatively well describe when either the conventional or the alternative look at the optimum currency area theory ap-

plies. The former is suitable when intraindustry trade is high, while the opposite implies the latter case. Therefore, this paper discusses the structure of trade between the EU and the CEECs to establish whether the conventional view is appropriate for monetary integration of the CEECs, or whether the alternative view of optimum currency area should be applied to these countries.

However, Kenen (2000) and Hughes Hallett and Piscitelli (2001) argue that Frankel and Rose's results should be interpreted cautiously. Kenen (2000) shows in a framework of the Keynesian model that the correlation between two countries' output changes increases unambiguously with the intensity of trade links between these countries, but this does not necessarily mean that asymmetric shocks are reduced as well. Therefore, it is important to keep in mind that it is not trade relation alone which causes the convergence of business cycles in an optimum currency area. Indeed, Frankel and Rose's hypothesis underlines that bilateral trade is mainly intraindustry trade, although this indicator does not enter directly their analysis.

A: Conventional View of an OCA



B: Alternative View of an OCA

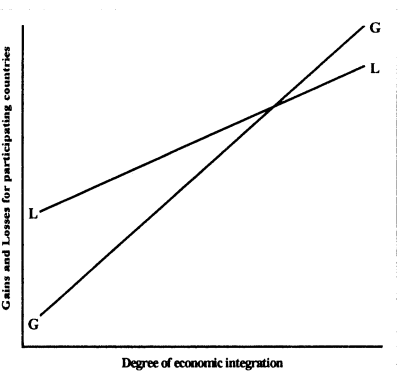


Figure 1: Contrasting Views on Optimum Currency Area Theory

III. Trade Integration and Business Cycles

Frankel and Rose (1998) argue that, if intraindustry trade accounts for a high share in bilateral trade, its intensity increases the convergence of business cy-

cles. They report a significant and positive relation between trade intensity and the correlation of business cycles as measured by various indicators of economic activity in a cross-section of OECD countries between 1959 and 1993. For empirical tests, the endogeneity hypothesis of the OCA criteria may be stated as

$$(1) \qquad \mathrm{Corr}\left(Q_i, Q_j\right) = \alpha + \beta \log\left(TI_{ij}^{T}\right) \quad \text{where} \quad TI_{ij}^{T} = \frac{T_{ij}}{T_i + T_j} a$$

where $\mathrm{Corr}(Q_i, Q_j)$ stands for the correlation of detrended (fourth differences of logs) indicator of economic activity and *TI* denotes the natural logarithm of the bilateral trade intensity between countries *i* and *j*. Trade intensity may be defined either in relation to exports, imports, or trade turnover.[2]

Table 1 reports several specifications of (1) for OECD countries between 1990 and 1999.[3] The OLS regression of bilateral economic activity on trade indicators may be inappropriate. Countries are likely to orient their monetary policy and fix the exchange rates towards their most important trading partners. The bilateral trade might already reflect the adoption of common exchange rate policy and not vice versa.[4] Therefore, the regressions have to be instrumented by exogenous determinants of bilateral trade flows. Such instruments are provided by the so called "gravity models" including the log of distance between trading partners, a dummy for geographic adjacency and a dummy for the 12 member states of the EC, and the aggregate income as well as the income per capita (in logs) of the included countries.

[2] The country sample includes Switzerland, Norway, the US, Canada, Australia, New Zealand, Turkey, and Israel in addition to 14 EU countries (Belgium and Luxembourg are reported as a single region). I use industrial production and GDP indices according to the International Financial Statistics of the IMF, lines 66 and 99. The quarterly GDP is not available for Greece. Trade intensities were computed for the most recent year (1997).

[3] Some explanatory variables which will be used later (intraindustry trade) are not available for the earlier periods due to changes in trade statistics. Therefore, the analyses have to be restricted to the 1990s throughout the paper.

[4] Rose (2000), for example, documents positive effects of currency unions and negative effects of exchange rate volatility on bilateral trade.

Trade intensity is revealed to have a significant and positive effect on the correlation of business cycles. This result is robust to the selection of the indicator of economic activity and the particular definition of trade intensities. The business cycles of industrial production seems to be better explained by trade than the business cycles as defined by the correlation of countries' real GDP. This corresponds to the high share of tradables in the industry. However, the adjusted coefficient of determination is relatively low for all specifications of (1). As might be expected, the coefficients estimated for trade intensity indicators are slightly higher in the 1990s than in the previous decades as reported by Frankel and Rose (1998). This could indicate that the role of trade relations has increased recently.

Table 1

Trade and Integration and Business Cycles

	Industrial Production			Real Gross Domestic Product		
	Exports	Imports	Total	Exports	Imports	Total
	1a	1b	1c	1a	1b	1c
Constant	0.683	0.686	0.715	0.688	0.681	0.705
	(8.005)	(8.517)	(8.355)	(6.832)	(7.064)	(6.939)
Trade Intensity	0.084	0.084	0.091	0.086	0.083	0.090
	(5.378)	(5.632)	(5.683)	(4.655)	(4.780)	(4.782)
No. observations	253	253	253	231	231	231
SER	0.287	0.284	0.284	0.326	0.331	0.327
Adjusted R^2	0.099	0.117	0.117	0.098	0.068	0.089

Note: The dependent variable is the index of correlation of detrended indicator of economic activity (fourth difference of logs) between trading partners. Trade intensity is measured as a share of bilateral trade aggregate in total trade aggregates of both countries as indicated by the columns' headers. The instrumental variables in the two-stage OLS include the log of distance, a dummy for geographic adjacency, a dummy for EC12, the log of aggregate income and the log of income per capita. Heteroscedasticity-robust t-statistics are in parentheses. Adjusted R2 and standard errors of regression (SER) are computed using the structural residuals (not the second stage residuals).

1. Intraindustry Trade and Business Cycles

However, equation (1) does not use any structural variables to explain the similarity of business cycles, although trade structure (e. g. the level of intraindustry trade) may be viewed as a major adjustment force inducing the convergence of business cycles between trading partners. Frankel and Rose (1998), Krugman (1993) and Hughes Hallett and Piscitelli (2001) use structural arguments in favor as well as against the endogeneity hypothesis of optimum cur-

rency area criteria. Therefore, I estimate the relation between the correlation of business cycles, trade integration, and the bilateral level of intraindustry trade,

$$\text{Corr}\left(Q_i, Q_j\right) = \alpha + \beta \log\left(TI_{ij}^{T}\right) + \gamma IIT_{ij} \tag{2}$$

where Q and TI are defined in the same way as in the corresponding formulations of (1) and IIT_{ij} stands for intraindustry trade.[5] Equation (2) is again estimated by two-stage OLS. Note that the selected instrumental variables are also highly correlated with intraindustry trade (see Hummels and Levinsohn, 1995, Loertscher and Wolter, 1980).

In this specification (see Table 2), the coefficients of intraindustry trade are significant if estimated for the industrial production, although they are insignificant (but positive) for two specifications applying real GDP. By contrast, the coefficients of the bilateral trade intensity are close to zero (indeed, they have wrong signs in several specifications) and insignificant for both indicators of economic activity. This pattern is very robust with respect to the choice of instrumental variables and country sample. This indicates that trade intensities have no direct effect on the correlation of business cycles. Therefore, I drop TI_{ij} from estimated equations,

$$\text{Corr}\left(Q_i, Q_j\right) = \alpha + \gamma IIT_{ij} \tag{3}$$

which are reported in the last column of the particular blocks of Table 2. The coefficients of intraindustry trade are highly significant in both specifications of (3).

As far as intraindustry trade is positively correlated with trade intensities, the endogeneity hypothesis of optimum currency area criteria is confirmed, although the line of the argumentation follows rather Krugman's (1993). Indeed, Table 2 shows that the coordination of the business cycles of trading partners is not driven by the simple aggregation of shocks, being transferred between the countries via direct trade channels, as argued by Kenen (2000). In contrast to

[5] Intraindustry trade as measured by the Grubel-Lloyd indices, see equation (5), was computed for three-digit SITC commodity groups in 1998. When available, data according to Eurostat were taken. Intraindustry trade at the same level of disaggregation between non-EU countries was computed using the UN World Trade Data.

this "mechanic" view of an optimum currency area endogeneity, equations (2) and (3) imply that it is the new structure of foreign trade and not the direct effect of bilateral trade, which causes the synchronization of countries' business cycles.

Table 2

Intraindustry Trade, Trade Integration, and Business Cycles

	Industrial Production				Real Gross Domestic Product			
	Exports	Imports	Total	Only IIT	Exports	Imports	Total	Only IIT
	(2.a)	(2.b)	(2.c)	(3.a)	(2.d)	(2.e)	(2.f)	(3.b)
Constant	0.259	0.468	0.379	0.499	0.444	0.578	0.543	0.476
	(1.598)	(4.325)	(2.576)	(11.934)	(2.361)	(4.381)	(4.038)	(9.636)
Trade Intensity	-0.085	-0.011	-0.042		-0.011	0.038	0.021	
	(-1.619)	(-0.323)	(-0.879)		(-0.188)	(0.913)	(0.468)	
Intraindustry Trade	0.335	0.207	0.257	0.187	0.195	0.103	0.095	0.175
	(3.597)	(3.043)	(3.047)	(6.554)	(1.812)	(1.304)	(1.095)	(5.324)
No. of observations	253	253	253	253	231	231	231	231
St. Error of regression	0.306	0.285	0.294	0.282	0.322	0.321	0.253	0.321
Adjusted R^2	-0.028	0.106	0.053	0.129	0.117	0.124	0.159	0.129

Note: The dependent variable is the index of correlation of detrended indicator of economic activity (fourth difference of logs) between trading partners. Trade intensity is measured as a share of bilateral trade aggregate in total trade aggregates of both countries as indicated by the columns' headers. The instrumental variables in the two-stage OLS include the log of distance, a dummy for geographic adjacency, a dummy for EC12, the log of aggregate income and the log of income per capita. Heteroscedasticity-robust t-statistics are in parentheses. Adjusted R2 and standard errors of regression (SER) are computed using the structural residuals (not the second stage residuals).

2. Sensitivity Analyses

Finally, the previous results are very robust with respect to the inclusion of other variables into (2). In particular, the countries wishing to participate in the EMU have tried to coordinate more their economic, fiscal and monetary policies during the 1990s. Therefore, a dummy for the EU countries which have qualified for the EMU in 1999 (that means the EU excluding Denmark, Greece, Sweden and the UK), denoted by *EMU*, is included. Furthermore, neighboring countries are likely to influence much more each other than other countries.

Therefore, a dummy for geographic adjacency, B, is included as well. Larger countries may also influence the business cycle of smaller countries.

Table 3

Sensitivity Analyses

	Industrial Production			Real Gross Domestic Product		
	Exports	Imports	Total	Exports	Imports	Total
	(4.a)	(4.b)	(4.c)	(4.d)	(4.e)	(4.f)
Constant	-0.327	0.046	-0.214	0.257	0.610	0.484
	(-1.872)	(0.283)	(-1.060)	(1.131)	(3.361)	(2.127)
Trade Intensity	-0.185	-0.062	-0.138	-0.068	0.037	0.002
	(-3.891)	(-1.802)	(-2.796)	(-1.085)	(0.953)	(0.041)
Intraindustry Trade	0.415	0.220	0.328	0.245	0.081	0.136
	(5.165)	(3.796)	(4.277)	(2.428)	(1.257)	(1.631)
Dummy:	0.231	0.136	0.192	0.095	0.024	0.046
	(3.083)	(1.910)	(2.540)	(0.968)	(0.260)	(0.477)
Dummy:	0.163	0.154	0.164	0.153	0.139	0.145
	(3.950)	(3.760)	(3.947)	(2.722)	(2.533)	(2.608)
GDP Difference	0.020	0.022	0.023	-0.011	-0.015	-0.013
	(1.876)	(1.964)	(2.146)	(-0.910)	(-1.179)	(-0.978)
No. of observations	253	253	253	231	231	231
SER	0.269	0.275	0.272	0.325	0.325	0.326
Adjusted R^2	0.201	0.172	0.187	0.103	0.101	0.099

Note: The dependent variable is the index of correlation of detrended indicator of economic activity (fourth difference of logs) between trading partners. Trade intensity is measured as a share of bilateral trade aggregate in total trade aggregates of both countries as indicated by the columns' headers. Trade intensity and intraindustry trade are instrumented by the log of distance, a dummy for geographic adjacency, a dummy for EC12, the log of aggregate income and the log of income per capita. Heteroscedasticity-robust t-statistics are in parentheses. Adjusted R2 and standard errors of regression (SER) are computed using the second stage residuals.

Therefore, GDP difference, $|Y_i - Y_j|$, is expected to have a positive sign. Thus, the augmented version of equation (2) may be stated as

$$\text{Corr}\left(Q_i, Q_j\right) = \alpha + \beta \log\left(TI_{ij}^{T}\right) + \gamma IIT_{ij} + \delta EMU + \lambda B + \theta \left|Y_i - Y_j\right|. \tag{4}$$

Indeed, these variables exhibit the correct signs in nearly all specifications (see Table 3). Equation (4) shows that institutional changes matter as well. The eleven countries participating in the EMU have had correlation of business cycles higher by about 0.15 on average during the 1990s. This is relatively high

as compared to the sample's mean of 0.25 (for both indicators of the economic activity).

However, the results for other additional variables are not very robust. The inclusion of the additional explanatory variables did not improve the goodness of fit either. Importantly, nevertheless, intraindustry trade is positive and significant in nearly all specifications. By contrast, trade intensities have a negative sign in nearly all augmented specifications. Thus, the sensitivity analyses further stress the importance of structural variables (both IIT_{ij} and *EMU*) for the harmonization of the business cycles between countries.

IV. The Endogeneity Hypothesis of OCA Criteria and the EMU Enlargement

Since the beginning of the 1990s, the CEECs have aimed at future membership in the European Union. After ten years of economic reform, these countries have largely succeeded in adjusting their economies to market principles. As a result, the EU started membership negotiations with five CEECs in 1998, which were extended to all ten associated countries two years later.

As part of this enlargement agenda, several CEECs have already expressed their aspiration to join the euro area as soon as possible after accession. Furthermore, several authors discuss the possibility of adopting the euro as legal tender in some CEECs already before the full membership in the EU. This discussion has been started by Bratkowski and Rostowski (1999), and Coricelli (2000) but also Portes (2001) and Buiter and Grafe (2001) have addressed this issue. Schoors (2001) and Wójcik (2000) provide a detailed discussion of the arguments for and against the so called euroisation.

By contrast, the European Union, including the Eurosystem, has outlined a three-step approach to the monetary integration of the candidate countries from Central and Eastern Europe, which is described in more detail by Kopits (1999) and Backé (1999). The applicants should first join the EU, then enter the exchange rate mechanism (ERM II) of the European Union and finally, after the fulfillment of the convergence criteria, accede to the Economic and Monetary Union.

Table 4

Similarity of Business Cycles of Selected Countries with Germany

	Industrial Production		Real Gross Domestic Product	
	1991-1999	1993-1999	1991-1999	1993-1999
Austria	0.79	0.81	-0.36	0.58
Belgium	0.26	0.25	0.02	0.88
Greece	0.34	0.48		
Spain	0.84	0.92	0.01	0.79
Finland	0.39	0.69	0.68	0.79
France	0.87	0.91	0.19	0.83
Ireland	0.38	0.44	0.19	-0.03
Italy	0.58	0.60	0.01	0.81
Netherlands	0.60	0.57	0.18	0.69
Portugal	0.59	0.56	0.01	0.78
Denmark	0.73	0.78	0.22	0.71
UK	0.46	0.56	0.41	0.76
Sweden	0.15	0.22	0.73	0.61
Czech Rep.		0.37		0.01[b]
Hungary	0.30	0.63		0.75[b]
Poland	0.23[a]	0.45[a]		0.38[b]
Slovakia		0.04		0.74[b]
Slovenia		0.77		0.80[b]

Notes: The similarity of business cycles is measured by the correlation of detrended indicator of economic activity (fourth difference of logs). a – Data according to the Vienna Institute for Comparative Economics (WIIW); b – Correlation of GDP growth according to IMF (2000).

V. Trade Integration Between EU and CEECs

Since the opening-up of Eastern Europe, the importance of EU countries for the CEECs' trade has increased dramatically. As of 1998, the European Union was the most important trading partner of all CEECs. The EU accounted for between 40% (Lithuania) and 70% (Hungary) of total exports of the CEECs.[6]

[6]As estimated by gravity models, Fidrmuc and Fidrmuc (2000) show that the trade between the CEECs and the EU, as well as the trade between individual CEECs, has already reached its "natural" level, corresponding to the economic size, the distance between these countries, and the stage of integration.

These export shares are comparable to or even higher than intra-EU shares for nearly all EU Member States. On the import side, the predominance of the EU is only slightly weaker. Furthermore, the shares of exports and imports going to and coming from an "enlarged EU," which is the current EU plus the ten accession countries are even higher. According to this indicator, the enlarged Europe is the most important export market for Slovakia and the Czech Republic, followed by Portugal, the Netherlands, and Austria.

The CEECs are relatively open economies. The exports account for about one third of GDP in Hungary, and above 40% in the Czech Republic, Slovakia and Slovenia. Thus, these countries are relatively more open than nearly all EU countries. There are only few EU countries including Belgium, the Netherlands, and Ireland which are significantly more open than the smaller CEECs (export shares between 50% and 70% of GDP). Only Poland's exports are relatively lower at 17% of GDP, but this corresponds to the larger size of the Polish economy. Buiter (2001) notes that the CEECs are also relatively open if we compare their trade to GDP at purchasing power parities.

From the point of view of the conventional optimum currency area theory, if intraindustry trade accounts for a high share in trade, then, *ceteris paribus*, business cycles are expected to become more similar across countries as illustrated by Figure 1A. By contrast, increased bilateral trade intensity may lead to the divergence of business cycles if the increase in trade is mainly due to the increased specialization as predicted by the alternative view of an optimum currency area (Figure 1B). Therefore, intraindustry trade may be used to identify which model is more appropriate for a particular group of countries.

The growth of intraindustry trade, which is observed in intra-EU trade, also dominates the recent East-West trade developments. This would increase net gains from the integration of CEECs into the euro area. According to Fidrmuc (1999), the shares of intraindustry trade in the EU's trade with the Czech Republic, Slovenia and Hungary, as computed by Grubel-Lloyd indices, *IIT*,

$$IIT = 1 - \frac{\sum_i \left| X_i - M_i \right|}{\sum_i \left(X_i + M_i \right)}, \tag{5}$$

where X_i and M_i denote exports and imports by three-digit SITC commodity groups i, were already comparable to or even slightly larger than in EU trade with e.g. Spain and Sweden (that is, about 60%) in 1998. Poland and Slovakia

report somewhat lower levels of intraindustry trade at about 50%. These levels are comparable to those of Ireland and Portugal. However, the shares of intra-industry trade in EU trade with Estonia, Lithuania, Latvia, Romania, and Bulgaria have still remained slightly above the level of EU intraindustry trade with Greece and Turkey (below 35%).

The convergence of the trade structure between the EU and the CEECs implies that we can apply the conventional view of optimum currency area (see Figure 1A) at least to the Central European membership candidates (the Czech Republic, Hungary, Slovenia, and, to a lesser extent, also to Poland and Slovakia). Therefore, the application of the endogeneity of optimum currency area criteria is restricted only to these countries in further analysis.

VI. Observed Convergence of Business Cycles in the EU and the CEECs

There is a mixed evidence on the convergence of business cycles in the EU and the CEECs. On the one hand, the level of GDP grew slowly in relation to the Western European countries during the period of the central planning system. The divergence of Western and Eastern Europe speeded up in the 1970s and the 1980s. Therefore, the increasing welfare difference between market and central planning economies in Europe was one of the major reasons for the introduction of early reforms in Eastern Europe. Furthermore, there were also little signs of convergence between Central and Eastern European countries in this period of time. Estrin and Urga (1997) find only limited evidence of convergence in the former Soviet Union, as well as within various groups of Central European commanded economies. Even more surprisingly, Fidrmuc, Horvath, and Fidrmuc (1999) conclude that the Czech Republic and Slovakia did converge neither between 1950 and 1990, nor within a sub-sample from 1970 to 1990.

Several authors report increasing similarities of business cycles between the EU (mainly Germany) and the CEECs since the economic reforms have been introduced. In particular, Boone and Maurel (1998 and 1999) find a significant convergence between business cycles (as measured by unemployment rates) in

Germany and selected CEECs (the Czech Republic, Hungary, Poland and Slovakia). According to Boone and Maurel (1999), between 55% (Poland) and 86% (Hungary) of the CEECs' cycles (given by detrended unemployment) are explained by German shocks. This figure is lower than the estimate for the French-German interdependence of business cycles (91%), but higher than the estimates for the German influence on Spanish (43%) and Italian (18%) business cycles. Therefore, the authors conclude that the benefits from eventually joining the euro area could outweigh the costs in the CEECs.

Indeed, business cycles in several CEECs has become strikingly similar to the business cycle of the EU (as proxied by Germany) since 1993 (see Table 4). At the beginning of the 1990s, the business cycles in the CEECs were determined by the so-called transitional recession. Therefore, the correlation of business cycles was low between 1991 and 1999. The recovery in these countries has been strongly influenced by the growing exports to the EU. As a result, the business cycle of the EU has determined the developments in CEECs' economies since 1993. In particular, the correlation of growth of industrial production or GDP between Germany and Hungary (0.63 and 0.75, respectively), and Germany and Slovenia (0.77 and 0.80, respectively), has been higher than the corresponding correlations of EU countries with Germany on average (0.60 and 0.68, respectively) during this time.

However, the period of about six years might be too short to conclude that the business cycles have already become similar. In particular, this period corresponds to only about one full business cycle. Moreover, this period was characterized by only few supply and demand shocks. Actually, the correlations of industrial production in Germany and that in the Czech Republic[7] and Slovakia have remained relatively low. In so far the Czech Republic and Slovakia are quite similar to other CEECs (see previous section), this indicates that country-specific shocks may still have significant effects on these economies. The difference between the Czech Republic and Slovakia, on the one hand, and the remaining CEECs, on the other hand, indicates that asymmetric shocks are still likely in the EU and the CEECs.

[7] In contrast to our results, Cincibuch and Vavra (2000) show that an alternative measure of similarity in business cycles – standard deviation of percentage changes in relative output in the Czech Republic and Germany – has declined during the reform period, meaning that the symmetry of business cycles has increased.

VII. Indices of Endogenous Optimum Currency Area

The revealed trend to the unification of business cycles in Europe is not surprising. It fully corresponds to the endogeneity of optimum currency area criteria. Therefore, I use equations estimated in the previous section to evaluate the potential correlation of business cycles in Germany and the CEECs given the current integration of these countries and the current level of intraindustry trade. Note that these correlations can be alternatively interpreted as indices of endogenous optimum currency area (EOCA indices) similar to those constructed by Bayoumi and Eichengreen (1997). A comparison of Table 4 and Table 5 shows that the correlations of business cycles in Germany and in other EU countries were on average slightly higher in the 1990s than those predicted by the EOCA indices. However, this is not so surprising. First, the European Union has reached a significant progress in the coordination of the economic policy in the member states. As a result of the introduction of the single market in 1992 and the preparations for EMU in this decade, the similarity of business cycles within the EU countries has likely been higher in the 1990s than in the previous decades. Second, Germany was selected as a proxy for the EU because it is known to dominate the European business cycle (see Bayoumi and Eichengreen, 1993). Using various specifications of equation (1), the correlation of industrial production and GDP in Germany and other EU countries is predicted at about 0.37 for both indicators on average. Actually, the corresponding correlations predicted for the CEECs (EOCA indices) are only slightly lower. The Czech Republic, Poland and Hungary could potentially reach correlations as high as 0.35 on average in the medium run, while Slovak and Slovene trade is less oriented towards Germany, resulting in a lower predicted correlation of about 0.24 on average. Similarly, I use (3) to compute the EOCA indices in Germany and in selected countries, which are even higher than the previous figures (see Table 5). In fact, the Czech Republic is predicted to have a higher correlation of industrial production with Germany than all EU countries except for France, although this prediction still remains below the realized levels in several EU countries. The comparison of predicted, or potential, business cycle correlations for selected Western and Eastern European countries shows small differences between both regions. Further coordination of economic policy in CEECs with the EU is likely to result in a fast convergence of business cycles. Thus, the CEECs face extraordinarily favorable pre-

conditions for a fast convergence to the business cycle in the EU (or EMU). This expectation is based on the high openness of the CEECs vis-à-vis the EU and the high shares of intraindustry trade in bilateral relations. Given first, the high potential gains from an optimum currency area between the current EMU countries and the CEECs, as illustrated by the high importance of EU trade in the CEECs, and second, the currently observed convergence of business cycles in both regions (which is partly caused by the first observation), we can expect a strong tendency of the CEECs to join the EMU in the future.

Table 5

Indices of Endogenous Optimum Currency Area of Selected Countries with Germany

	Industrial Production				Real Gross Domestic Product			
	(1.a)	(1.b)	(1.c)	(3.a)	(1.d)	(1.e)	(1.f)	(3.b)
Austria	0.42	0.44	0.41	0.43	0.42	0.44	0.40	0.41
Belgium	0.43	0.43	0.44	0.43	0.43	0.43	0.43	0.41
Greece	0.24	0.22	0.26	0.24	0.24	0.22	0.26	0.24
Spain	0.38	0.38	0.40	0.41	0.38	0.38	0.39	0.39
Finland	0.29	0.29	0.28	0.34	0.28	0.29	0.28	0.32
France	0.46	0.46	0.47	0.45	0.46	0.46	0.46	0.43
Ireland	0.27	0.30	0.22	0.28	0.26	0.30	0.21	0.27
Italy	0.43	0.44	0.44	0.39	0.43	0.44	0.44	0.37
Netherlands	0.44	0.46	0.45	0.41	0.44	0.45	0.44	0.39
Portugal	0.30	0.30	0.30	0.36	0.30	0.30	0.29	0.35
Denmark	0.34	0.35	0.34	0.38	0.34	0.35	0.34	0.37
UK	0.43	0.42	0.45	0.43	0.43	0.42	0.44	0.41
Sweden	0.35	0.34	0.36	0.36	0.35	0.34	0.35	0.35
Czech Rep.	0.36	0.36	0.36	0.43	0.36	0.36	0.35	0.41
Hungary	0.33	0.33	0.33	0.38	0.32	0.33	0.33	0.37
Poland	0.36	0.37	0.35	0.33	0.35	0.37	0.34	0.31
Slovakia	0.26	0.27	0.24	0.34	0.25	0.27	0.24	0.33
Slovenia	0.23	0.23	0.23	0.36	0.22	0.23	0.22	0.35

Notes: Indices of Endogenous Optimum Currency Area are computed according to particular specification of (1) and (3) as indicated by columns' headers.

VIII. Conclusion

This paper examines the endogeneity hypothesis of optimum currency area criteria originally introduced by Frankel and Rose (1997 and 1998). On the one

hand, this issue has significantly influenced the shape of the European monetary integration. On the other hand, there is considerable doubt whether there is a causal relationship between trade and business cycles. By contrast, Krugman (1993) argues that integration is likely to support the specialization of participating countries according to the comparative advantage. Indeed, Krugman finds empirical support for his arguments in the specialization pattern and business cycles of the US regions. Furthermore, Kenen (2000) and Hughes Hallett and Piscitelli (2001) demonstrate that the trade links alone do not ensure the convergence of business cycles if countries are not sufficiently similar.

This paper addresses the importance of structural variables for the harmonization of business cycles. In particular, intraindustry trade is shown to cause the convergence of business cycles in OECD countries. Furthermore, econometric analyses reveal that there is no direct relation between business cycle and trade intensity if regressions are augmented by additional structural variables. As far as intraindustry trade is positively correlated with trade intensities, the optimum currency area endogeneity hypothesis is confirmed, although the line of the argumentation follows actually Krugman (1993).

This result is robust with respect to the definition of trade intensity and the selection of the indicators of economic activity for comparison of business cycles. The sensitivity analysis reveals that the preparation of the EMU has already had positive effects on the synchronization of business cycles in the participating countries in the 1990s. This confirms the importance of the structural variables for the convergence of business cycles.

Furthermore, this paper addresses a controversial issue of the current enlargement agenda. The future enlargement of the euro area by Central and Eastern European countries has initiated an intense academic and political discussion, although the membership negotiations between the EU and the associated countries have just started. This discussion is characterized by a multitude of different policy proposals, ranging from the immediate adoption of the euro in some countries (mostly in Poland and in Estonia) to suggestions that the CEECs should not give up exchange rate flexibility in order to support their growth and convergence to the EU.

The contribution of this paper to the discussion focuses on five associated countries (the Czech Republic, Hungary, Poland, Slovenia, and the Slovak Republic). On the one hand, this paper confirms earlier findings, e.g. that the

CEECs have rapidly converged to the EU countries in terms of business cycles and trade integration. In particular, business cycles in several CEECs (Hungary, Slovenia and, to a lesser extent, Poland) are strongly correlated with the business cycle in Germany, in the period since 1993. In this respect, it may seem that Hungary, Slovenia and possibly Poland, not however the Czech Republic and Slovakia, have made headway towards constituting an optimum currency area with the EU.

On the other hand, this paper shows that the observation period is still too short to conclude that the business cycles have already become similar. In particular, this period has been characterized by only few supply and demand shocks. Furthermore, the business cycle in the Czech Republic is not correlated with that in Germany. As the Czech Republic is quite similar to other CEECs, this indicates that country-specific shocks may still have significant effects on these economies.

To shed more light on this ambiguous result, I compute the potential correlation of the business cycle in Germany and in the CEECs using Frankel and Rose's (1998) relation between the degree of trade integration and the convergence of the business cycles of trading partners. These figures may be alternatively interpreted as "EOCA indices" following Bayoumi and Eichengreen (1997).

As a result, the high degree of trade between the EU and the CEECs represents a sound base for business cycle convergence, and thus for a fulfillment of optimum currency area criteria in the medium and long run. These results do not fully confirm the hypothesis that the CEECs constitute an optimum currency area with the EU already now, but it seems that they will fulfill optimum currency area criteria to the same degree as current EU-members in future.

IX. Shin-Ichi Fukuda: Comment

The issue of optimal currency area (OCA) has been one of the hottest research topics in international finance during past decades. One obvious motivation of the researches is the establishment of European Economic and Monetary Union (EMU). The recent researches extend their interest to various directions

and explore the possibility of monetary unions in the other regions. The issue, thus, increases its importance not only in Europe but also outside Europe.

Joining a monetary union brings benefits such as lower transactions costs between countries with different currencies. It, however, brings costs at the same time. One frequently cited cost is foregoing the possibility of dampening business cycle fluctuations through independent counter-cyclical monetary policy. A high cross-country correlation of business cycles among member countries is, thus, an important criterion for entering a monetary union. However, the similarity of business cycles can be different before and after joining a monetary union. Frankel and Rose (1998) took this point seriously and investigated the "endogeneity hypothesis" that countries with closer trade links tend to have more tightly correlated business cycles.

From a theoretical point of view, the effect of integration on business cycle coherence is ambiguous. Closer trade ties could result in countries becoming more specialized in the goods in which they have comparative advantage. In this case, the countries might be more sensitive to industry-specific shocks, resulting in more idiosyncratic business cycles. However, if intraindustry trade accounts for most trade, and demand shocks predominate, then business cycles may become more harmonized across countries when countries trade more.

Using a panel of bilateral trade and business cycle data, Frankel and Rose showed that the latter case is empirically realistic. They then lead to a conclusion that continued European trade liberalization is expected to result in more tightly correlated European business cycles, making a common European currency both more likely and more desirable. Their message on the endogeneity of OCA is clear-cut. Their empirical study, however, did not clarify what really caused the strong linkage between business cycle correlations and trade intensity. Fidmuc's paper tackled this unresolved issue and showed that intraindustry trade actually causes the convergence of business cycles. This is a nice attempt to enforce the endogeneity hypothesis of OCA by Frankel and Rose.

Since joining a monetary union brings a cost to forego the possibility of dampening income fluctuations through independent counter-cyclic monetary policy, previous studies have investigated the similarity of output fluctuations as one of the OCA criteria. In particular, most of the studies examined the degree of de-trended output correlations between the members of a potential OCA. This paper followed this standard approach and explored the relationship

between bilateral trade intensity and de-trended output correlation. The use of the detrended output correlations, however, may not be sufficient to capture the similarity of output fluctuations in the following two cases.

First, high output correlations do not necessarily mean that business cycles are harmonized with similar amplitudes. For example, denote the detrended output of country A and B by Q_A and Q_B respectively and suppose that $Q_A = \lambda Q_B$. To the extent that λ is positive, the correlation between Q_A and Q_B is 1. However, unless λ is equal to 1, two countries have different amplitudes of business cycles. The different amplitudes of business cycles may call for different counter-cyclical monetary policy. In particular, when λ is small enough, the output decline in country A is negligible even when country B is in a serious recession. Under such circumstances, country A needs no active monetary policy even if country B needs a drastic interest rate reduction to stimulate the economy.

Second, output fluctuations are generally composed of three types of fluctuations: business cycles, seasonal cycles, and economic growth. The similarity of business cycles thus does not necessarily mean that output fluctuations are harmonized between countries in the broader sense. For example, suppose that two countries have different seasonal patterns. In this case, the two countries need different seasonal monetary policy to accommodate seasonal money demands even if their seasonally adjusted business cycles are synchronized. Several previous studies suggested that accommodative seasonal monetary policy had played an important role in stabilizing the economy (for example, Miron (1986)). Their result indicates that the cost of foregoing independent monetary policy would be large if countries have different seasonal patterns.

Since the impacts of monetary policy on long-run economic growth are limited, it is far from obvious what costs would arise when countries at different stages of development enter a monetary union. However, the meaning of recession may be different when their growth rates are different. For example, during the high growth periods in the 1950s and 1960s, the growth rates of Japan had never been below 5% even when the economy fell into a recession. In contrast, most of matured developed countries have rarely achieved 5% growth rates even when they are in a boom. This probably implies that developing countries with high growth rates would need different type of stabilization policy from what commonly used in developed countries.

As far as I know, there is limited number of researches that investigated what additional costs will arise when a monetary union is formed among countries at different stages of economic development. The issue, however, increases its importance because of the possibility that developing countries would enter a monetary union. Since the latter part of the paper explores the possibility that the CEECs join the euro area, it is the problem that the paper should take seriously.The cross-country regressions in the paper clearly show that intraindustry trade causes the convergence of business cycles. Based on the result, the paper concluded that entry into a monetary union would increase the degree of business cycle harmonization. The conclusion is, however, not straightforward from a theoretical point of view.

A monetary union is usually accompanied with trade liberalization which brings closer trade with the other members of the union. It is thus probably true that entry into a monetary union would increase international trade linkages. However, the increased trade linkages can arise either in interindustry trade or in intraindustry trade. If the increased trade linkage arises mainly in intraindustry trade, the paper's conclusion is supported. But if entry into a monetary union increases interindustry trade linkages, the empirical results in the paper leads to an opposite conclusion and rejects the OCA endogeneity hypothesis.

It is an empirical issue whether a monetary union brings larger intraindustry trade among member countries. It may be true that intraindustry trade has been more important in international trade among developed countries. However, when we focus on international trade between north and south, interindustry trade still seems to be dominant because of conspicuous comparative advantage. In particular, when wages differ significantly between countries, it is natural that countries with lower wages specialize in labor-intensive industry and that countries with higher wages specialize in capital-intensive industry.

For example, Japan has made a remarkable increase of trade linkages with other East Asian countries during the past decade. However, the typical trade patterns between Japan and the East Asian countries has been interindustry trade. Japan has mainly exported manufactured products with high technologies to the East Asian countries and imported natural resources and agricultural products as well as manufactured products of light industries. It is highly possible that the similar trade patterns prevail between other developed and developing countries.

When running regressions for OECD countries, the paper used the country sample that includes Switzerland, Norway, the U.S., Canada, Australia, New Zealand, Turkey, and Israel in addition to 14 EU countries. The country sample is similar to that used in Frankel and Rose.

However, linkages among EU countries are much larger than those between EU and non-EU countries. This implies that the regression results may simply reflect the fact that intraindustry trade linkages are high among EU countries but low between EU and non-EU countries.

For example, Australia and New Zealand are typical countries that have small correlations of business cycles with EU countries. These countries mainly export mineral and agricultural products and import manufactured products. The shares of intraindustry trade with these countries are thus very small for most of the countries.

It is not clear to what extent these outliners affected the regression results. However, to enforce the robustness, it is desirable to see whether the main results are still valid even if we expand the number of sampled countries and exclude outliers.

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Are the Inflation and Exchange Rate Targets for Joining the European Single Currency Inconsistent?

By Christopher Klisz

I. Introduction

The successful introduction of euro notes and coins in the beginning of the year 2002 completed the process of converting the separate national currencies of the European Monetary System (EMS) into a single multinational currency. Since it began operations in January 1999, The European Central Bank (ECB) has demonstrated its ability to manage the monetary policy over the respective member economies under its direct authority. With the introductory phase of euro at an end, the primary policy focus will inevitably shift towards deepening the integration of good, services and financial markets across the whole of the European Union and especially among the EMS countries.

Despite this generally optimistic scenario, some critics of the euro continue to question whether the ECB's one-size-fits-all policy is appropriate for the diverse national economies within the EMS. The problems may not be as acute some skeptics originally feared. However, compelling Euro-land countries to adhere to a single monetary policy may be the source of other types of distortions different than those the single currency was designed to remedy.

This issue is of particular relevance for the ten accession countries planning to join the European Union and presumably, the EMS. Of particular concern is the contention that the inflation and exchange rate criteria outlined in the Masstrict criteria for admission to the single currency are mutually inconsistent. The rules for membership stipulate that one-year prior to joining the euro, the accession country's rate of inflation should not exceed the average rate of infla-

tion in the three EMS countries where inflation is the lowest by more than 1.5 percentage points. In addition, each country is required to maintain a rigidly fixed exchange rate over the same time interval.

Due to the well-known Harrod-Balassa-Samuelson effect (Harrod 1933, Balassa 1964, Samuelson 1964, 1994), these criteria may be inconsistent during the accession country's probationary period if the country's per capita GDP growth rate converges towards the average of the current EMS countries as many of the accession countries hope to achieve. In addition, after joining the single currency, the accession country may be compelled to tolerate a domestic inflation rate greater than the EMS average for so long as the convergence process continues.

We will not attempt to access the merits of the convergence hypothesis as the empirical evidence so far remains rather mixed. For some relevant academic studies, see Canzoneri, Cumby and Diba (1999), Cecchetti, Mark and Sonora (2000), Chinn and Johnson (1997), De Gregorio, Giovannini and Wolf (1994), Froot and Rogoff (1995), Heston, Nuxoll and Summers (1994) Ito Issard and Symansky (1997), Lothian and Taylor (1996), Sinn and Reutter (2001) and Tamura (1996) among others in addition to the European Central Bank (1999). Rather, for purposes of this discussion, the convergence hypothesis will be given the status of a maintained assumption. The main purpose of this paper is to provide a unified explanation of the consequences of the convergence hypothesis in light of the H-B-S effect for the nominal exchange rate and for domestic inflation.

The policy dilemma for the accession country will be to select the timing for abandoning their national currency and the EMS. The policy dilemma arises from the fact that, due to the H-B-S effect, the exchange rate and domestic inflation rate convergence criteria are mutually incompatible. If the accession country were to satisfy the inflation rate convergence criterion, it could do so only by remaining outside of the single currency and allowing its nominal exchange rate to appreciate vis-à-vis the euro. Alternatively, the country can choose to meet the exchange rate criterion, this would require a positive divergence between accession country's domestic inflation rate and that of the EMS average. The accession countries must weight the relative benefits of these two mutually exclusive policy alternatives.

II. The Supply Side

We begin with a description of the supply side of the economy. (All outputs are in per-capita terms). The aim of the model is to provide a parsimonious description of a real economy in which the real H-B-S effect obtains. The implication for nominal exchange rate and aggregate demand policies will be considered in subsequent sections.

The economy produces a singe final domestic output Y using as inputs a single tradable intermediate good X_T and a single non-tradable intermediate good X_N. The technology for producing Y is described by a standard neoclassical production function $Y = F(X)$, where $X = (X_T, X_N)$, F is a non-negative, strictly increasing, concave and linearly homogeneous function in X and $F(0) = 0$.

Tradable and non-tradable intermediate goods are both produced using a single input capital, K. (In this model, capital can be interpreted as "broad" capital, including both physical and human capital.) The technology for producing the tradable intermediate good X_T is given by a positive, linear function $X_T = A_T K_T$, where $A_T > 0$ while the technology for producing the non-tradable intermediate good X_N is given by the function $X_N = A_N G(K_N)$, where $A_N > 0$ and G is a positive, strictly concave function of K_N and $G(0) = 0$. The domestic resource constraint for producing the intermediate tradable and non-tradable goods is

$$\overline{K} = K_T + K_N, \text{ where } \overline{K} > 0 \text{ and } K_T, K_N \geq 0.$$

With the convex production technologies described above, the familiar result equating a competitive equilibrium with Pareto efficiency in production obtains so we will dispense with a formal proof of the equivalence. The competitive equilibrium can be constructed directly from the allocative efficiency conditions derived from the constrained maximization of domestic output, Y:

$$\max_X \; Y = F(X_T, X_N) \text{ s.t. } A_T K_T \geq X_T, A_N G(K_N) \geq X_N,$$

$$K \geq K_T + K_N, X_T, X_N, K_T, K_N \geq 0.$$

The corresponding Lagrangian function for this maximization problem is:

$$L = F(X_T, X_N) + \lambda_T (A_T K_T - X_T) + \lambda_N (A_N G(K_N) - X_N) + \lambda_K (\overline{K} - K_T - K_N).$$

(The non-negativity constraints for X and K will be suppressed for notational convenience.) The interior optimality conditions for X and K equates the marginal rate of transformation (MRT, holding $\overline{K}$ constant) and the marginal rate of technical substitution (MRTS, holding $Y = Y^*$ constant), where Y^* represents the optimal value of Y.

$$-\frac{A_T}{A_N G'(K_N^*)} = \frac{\partial X_T}{\partial X_N}_{MRT(\overline{K})} = -\frac{\lambda_N^*}{\lambda_T^*} = \frac{\partial X_T}{\partial X_N}_{MRTS(\overline{Y^*})} = -\frac{F_N'(X_T^*, X_N^*)}{F_T'(X_T^*, X_N^*)}.$$

From this, we can also derive the equilibrium relative price of non-tradable goods to tradable goods

$$R^* = \frac{\lambda_N^*}{\lambda_T^*} > 0$$

the equilibrium domestic production levels of the intermediate goods (X_T^*, X_N^*) and the final good Y^*, all functions of the level of domestic capital stock, $\overline{K}$. Without loss of generality, it will be convenient to consider the optimum domestic production of intermediate goods and the relative price of non-tradable goods as implicit functions of the optimal level of the final good. Among the comparative static results that will be useful for future reference are:

$$\frac{\partial R^*}{\partial Y^*} > 0, \frac{\partial X_T^*}{\partial Y^*} > 0, \frac{\partial X_N^*}{\partial Y^*} > 0, \frac{\partial (X_T^*/Y^*)}{\partial Y^*} > 0, \frac{\partial (X_N^*/Y^*)}{\partial Y^*} < 0, \frac{\partial Y^*}{\partial \overline{K}} = \lambda_K^* > 0.$$

The model conforms to a number of stylized facts common to the H-B-S literature. In particular, an increase in domestic capital will result in an increase in the production of all intermediate input goods as well as the final good. The relative price of the non-tradable good will increase due to condition that the production function of the non-tradable intermediate good be relatively more concave than the linear production function used to produce the tradable intermediate good. Finally, as both final output and the relative price of the non-tradable good increase, the linear homogeneity and concavity of F will imply that (tradable/non-tradable) goods will increase proportionally (more/less) than final output.

III. The Domestic Price Level and Real Domestic Product

Domestic macroeconomic policy is less concerned with the prices and quantities of individual goods than with the aggregate levels of prices and domestic product. In this section, we will consider how the microeconomic fundamentals described in the previous section can be used to uniquely determine exact indicators for the domestic price level P and real domestic product Q. The same techniques, considered in a subsequent section, will also be used to develop the corresponding exact comparative cost-of-living index. The comparative cost-of-living index (also called the "real" exchange rate) determines the rate of conversion for comparing nominal incomes between two different countries such that the same standard of living is affordable in either country. The nominal version of the H-B-S effect is based on the relationship between the comparative the cross-country cost-of-living index with the country's nominal exchange rate for tradable goods.

Measures for the domestic price index and real domestic product closely adhere to the microeconomic approach for constructing index numbers described by Diewert (1991). The fundamental relation for constructing prices indexes the cost function that, given nominal prices, minimizes the nominal expenditures required to purchase an amount of final output at least as great as some predetermined level, $\overline{Y}$.

$$C(P_T, P_N, \bar{Y}) = \min_X P_T X_T + P_N X_N \text{ s.t. } F(X_T, X_N) \geq \bar{Y} \text{ and } X_T, X_N \geq 0.$$

The cost function will be increasing in $\bar{Y}$ and also linearly homogeneous and increasing in (P_T, P_N) when $(X_T^*, X_N^* > 0)$. In addition, based on the envelope theorem, the partial derivatives of the cost function with respect to the individual prices can easily be determined:

$$\frac{\partial C}{\partial P_T} = X_T^*, \text{ and } \frac{\partial C}{\partial P_N} = X_N^*.$$

Based upon this cost function, two alternative domestic price indexes with corresponding dual measures of real domestic product can be constructed relative to some base period of time designated as period "0" as a standard of reference. The first is the Laspeyres-Konus price index P_t^L with associated Paasche-Konus real domestic product Q_t^P defined as follows:

$$P_t^L = \frac{C(P_{Tt}, P_{Nt}, Y_0)}{C(P_{T0}, P_{N0}, Y_0)} \quad Q_t^P = \frac{C(P_{Tt}, P_{Nt}, Y_t)}{C(P_{Tt}, P_{Nt} Y_0)} C(P_{T0}, P_{N0}, Y_{0)}).$$

The second dual combination consists of the Paasche-Konus price index P_t^P paired with the Laspeyres-Konus real domestic product Q_t^L:

$$P_t^P = \frac{C(P_{Tt}, P_{Nt}, Y_t)}{C(P_{T0}, P_{N0}, Y_t)} \quad Q_t^L = C(P_{T0}, P_{N0}, Y_t).$$

Both combinations satisfy by construction the following identities:

$$\text{Period 0: } P_0^L Q_0^P = C(P_{T0}, P_{N0}, Y_0) = P_0^P Q_0^L.$$

$$\text{Period t: } P_t^L Q_t^P = C(P_{Tt}, P_{Nt}, Y_t) = P_t^P Q_t^L.$$

For a general aggregate production function F, the measure for the price level and real domestic product will be dependent on the choice of the index method used and the selection of the base year. However, when the function F is linearly homogeneous, there will be an exact price level and real product that will be the same for both methods. This follows from the fact that the linear homogeneity of F implies that the cost minimizing demands for tradable and nontradable goods are linearly homogenous in Y and thus can be written as

$$X_T^*(R,Y) = X_T^*(R,1)Y \text{ and } X_N^*(R,Y) = X_N^*(R,1)Y,$$

respectively. The linear homogeneity of F also implies that the cost function will also be linearly homogeneous in Y and can be rewritten in a special form:

$$C(P_T, P_N, Y) = C(P_T, P_N)Y \text{ where } C(P_T, P_N) = P_T X_T^*(R,1) + P_N X_N^*(R,1).$$

By direct substitution into the previous definition for P^L, P^P, Q^L and Q^P, we can obtain the following results:

$$P_t = P_t^L = P_t^P = \frac{C(P_{Tt}, P_{Nt})}{C(P_{T0}, P_{N0})} \text{ and } Q_t = Q_t^L = Q_t^P = C(P_{T0}, P_{N0})Y_t.$$

These results also imply that the inflation rate and growth rate of real domestic product will be independent of the choice of a base year. This can be seen by considering the cumulative gross inflation rate and the cumulative gross growth rate for real output between any two distinct periods s and t, where s > t:

$$\text{(Cumulative gross inflation rate)}\ \frac{P_S}{P_t} = \frac{C(P_{ts}, P_{Ns})}{C(P_{Tt}, P_{Nt})},$$

$$\text{(Cumulative gross real growth rate)}\ \frac{Q_S}{Q_t} = \frac{Y_S}{Y_t}.$$

As can be verified by direct inspection, neither of these relations depends on the choice of the base year.

IV. General Equilibrium Conditions for Determining Nominal Prices

So far, we have considered how the allocative efficiency of the competitive market system determines the production of intermediate goods, the final good and thee relative price of non-tradable intermediate good relative to the tradable intermediate good. We have also shown how to construct an exact index for the aggregate price level and for real domestic output when prices for the intermediate goods are exogenous. We'll now consider how domestic aggregate demand policy determines the general equilibrium level of the domestic price index and the nominal prices for the tradable and non-tradable goods, respectively.

Aggregate market equilibrium requires that the nominal value of aggregate product $C(P_{Tt}, P_{Nt}, Y)$ equals the level of aggregate expenditures D_t:

$$\overline{D}t = C(P^*_{Tt}, P^*_{Nt}, \overline{Y}^*t)$$

and where general equilibrium requires $\overline{Y}_t = Y^*_t$ and $P^*_{Nt} = R^*_t P^*_{Tt}$. Given that C is linearly homogeneous in (P_T, P_N) and, by virtue of the linear homogeneity of F, is proportional to Y, the general equilibrium values for P_T and P_N are:

$$P_{Tt}^{*} = \frac{1}{C(1,R_t^{*})}\frac{\overline{D}t}{Y_t^{*}} \text{ and } P_{Nt}^{*} = \frac{R_t^{*}}{C(1,R_t^{*})}\frac{\overline{D}t}{Y_t^{*}}.$$

The general equilibrium values for the aggregate price index and for real domestic product can be found by direct substitution.

$$\text{(Base Period 0) } P_0^{*} = 1 \text{ and } Q_0^{*} = \overline{D}0,$$

$$\text{(Period "t") } P_t^{*} = \frac{\overline{D}t}{Q_t^{*}} \text{ and } Q_t^{*} = \frac{Y_t^{*}}{Y_0^{*}}\overline{D}0.$$

The general equilibrium solution to the domestic price index is of special interest since is clearly demonstrates that the domestic inflation rate will be independent of changes in the relative price of non-traded goods, in accordance with commonsense intuition.

$$\frac{1}{P_t^{*}}\frac{dP_t^{*}}{dt} = \frac{1}{\overline{D}t}\frac{d\overline{D}t}{dt} - \frac{1}{Q_t}\frac{dQ_t}{dt}.$$

Domestic inflation occurs whenever the rate of growth in domestic aggregate demand exceeds the rate of growth of domestic production. When the domestic price index is constructed appropriately, the domestic inflation rate is independent of the change in the relative price of tradable to non-tradable goods so long as control over domestic aggregate demand remains the exclusive domain of the domestic monetary authority. Insofar as no explicit role for the conduct of fiscal policy has be considered in this model, the implication is that control of domestic aggregate demand policy rests exclusively with the domestic monetary policy authority. The implications of this policy for the nominal exchange rate will be considered in the next section.

The growth rate of the nominal prices for tradable and non-tradable goods can also be derived. First, define the current budget share for tradable goods as

$$s^*_{Tt} = \frac{P^*_{Tt} X^*_{Tt}}{C(P^*_{Tt}, P^*_{Nt}, Y^*_t)} \geq 0$$

And for non-tradable goods:

$$s^*_{Nt} = \frac{P^*_{Nt} X^*_{Nt}}{C(P^*_{Tt}, P^*_{Nt}, Y^*_t)} \geq 0.$$

Which also satisfies the identity: $s^*_{Tt} + s^*_{Nt} \equiv 1$. Then, based on the envelope theorem for the original cost minimization, the difference between the growth rates for the nominal price of tradable and non-tradable goods and the inflation rate are, respectively:

$$\left(\frac{1}{P^*_{Tt}} \frac{dP^*_{Tt}}{dt} - \frac{1}{P^*_t} \frac{dP^*_t}{dt} \right) = -s^*_{Nt} \frac{1}{R^*_t} \frac{dR^*_t}{dt} < 0,$$

$$\left(\frac{1}{P^*_{Nt}} \frac{dP^*_{Nt}}{dt} - \frac{1}{P^*_t} \frac{dP^*_t}{dt} \right) = s^*_{Tt} \frac{1}{R^*_t} \frac{dR^*_t}{dt} > 0.$$

These results follow from the maintained assumption that the real domestic product Q and therefore the relative price of non-tradable goods R are increasing over time. This demonstrates that in growing economies (tradable/non-tradable) prices will tend to grow at rates (below/above) the rate of average inflation. This, by itself, in no way precludes the domestic monetary authorities from controlling the average inflation rate as the average inflation rate is independent of changes in relative prices.

V. Cross-Country Cost of Living Index and the Nominal Exchange Rate

In this section, we now consider the derivation of Harrod-Balassa-Samuelson (HBS) theorem and its implications for domestic inflation under fixed and flexible exchange rate policy alternatives. Balassa and Samuelson independently developed a formal theory, based on some original insights due to Harrod, to demonstrate how purchasing power parity (PPP) based solely on tradable goods may be an inappropriate basis for comparing the average price levels among different regions. In general, PPP may fail occur when (1) not all goods are tradable and (2) the relative prices among goods differ across regions. Other things equal, the region with a (lower/higher) relative price of non-tradable goods will have a relatively (lower/higher) cost of living in comparison to the relative price of tradable goods between the two regions. The H-B-S effect will be analyzed utilizing the same index number techniques developed in previous sections. Of special interest will be the implications of the H-B-S effect under a free floating exchange rate policy and for two countries under a single currency. It will be convenient to consider the case in which the comparison is made between two distinct countries although the analysis is perfectly general and can be applied to other situations as well. The comparative cost-of-living index for Country 1, E_{1t}^{C} is defined as the level of income in Country 2's currency relative to level of income in Country 1's currency required for an equal the standard of living in either country:

$$E_{1t}^{C} = \frac{C(P_{2Tt}, P_{2Nt}, \bar{Y})}{C(P_{1Tt}, P_{1Nt}, \bar{Y})} \text{ and } E_{2t}^{C} \equiv \frac{1}{E_{1t}^{C}}.$$

By virtue of the Law of One Price, the real exchange rate for tradable goods is identically equal to one. The nominal exchange rate for tradable goods for Country 1, E_{1t}, is the nominal price of tradable goods in Country 2 in comparison to the nominal price of tradable goods in Country 1. This exchange rate will equate the domestic price of the tradable good in each country when quoted in the country's domestic currency. This implies

$$E_{1t} = \frac{P_{2Tt}}{P_{1Tt}}, \text{ and } E_{2t} \equiv \frac{1}{E_{1t}}.$$

When the production function F is linearly homogeneous and the same in both countries, the cost-of-living index will be independent of the choice of the base level for the common standard of living $\bar{Y}$. Using this and the fact that the cost functions are both linearly homogeneous in their respective prices allows us to derive the H-B-S equation relating the cost-of-living indexes to the nominal exchange:

$$\frac{E_{it}^{C*}}{E_{1t}^{*}} = H(R_{1t}^{*}, R_{2t}^{*}) = \frac{C(1, R_{2t}^{*})}{C(1, R_{1t}^{*})}$$

where H is the H-B-S comparative cost-of-living index.

Without loss of generality, we define (Country 1/Country 2) as having the relatively (higher/lower) domestic product. This implies it will also have a relatively (higher/lower) relative price of the non-tradable good and the country's nominal exchange rate will be an (upward/downward) bias indicator of the relative cost of living in the other country. The H-B-S cost-of-living correction depends in no way on either the absolute price levels in each country or whether the countries utilize a single currency or use separate currencies.

VI. The H-B-S Effect and the Maastricht Convergence Criteria

The H-B-S equation also highlights the dynamic policy trade-off between the objectives of domestic inflation stabilization and exchange rate stabilization. We now consider the evolution of the H-B-S equation over time. The growth rate in the relative cost-of-living index is the difference in the rates of inflation between the two countries,

$$\frac{1}{E^{C*}_{1t}}\frac{dE^{C*}_{1t}}{dt} = \left(\frac{1}{P^{*}_{2t}}\frac{dP^{*}_{2t}}{dt}\right) - \left(\frac{1}{P^{*}_{1t}}\frac{dP^{*}_{1t}}{dt}\right).$$

The dynamic H-B-S adjustment then defines the gap between the domestic inflation rate differential and the rate of change in the nominal exchange rate:

$$\left\{\left(\frac{1}{P^{*}_{2t}}\frac{dP^{*}_{2t}}{dt}\right) - \left(\frac{1}{P^{*}_{1t}}\frac{dP^{*}_{1t}}{dt}\right)\right\} - \left(\frac{1}{E^{*}_{1t}}\frac{dE^{*}_{1t}}{dt}\right) = \left(s^{*}_{2Nt}\frac{1}{R^{*}_{2t}}\frac{dR^{*}_{2t}}{dt} - s^{*}_{1Nt}\frac{1}{R^{*}_{1t}}\frac{dR^{*}_{1t}}{dt}\right).$$

This equation defines the policy dilemma for the accession countries and will be the primary focus for the remainder of the paper. So long as the right hand side of the equation is not exactly zero, there will necessarily be a policy tradeoff between stabilizing the nominal exchange rate for tradable goods and the inflation rate differential.

To illustrate this, assume that domestic production is increasing in both countries. Of particular interest is the case of absolute convergence in the relative price of the non-tradable good:

$$R^{*}_{1t} > R^{*}_{2t} \text{ and } \frac{dR^{*}_{2t}}{dt} > \frac{dR^{*}_{1t}}{dt} > 0.$$

This may be relevant for describing the situation in which member countries to the European Union with lower per capita domestic product than the average converge absolutely over time towards the EMS average. It may also describe the process by which the domestic economies of the EMS applicant countries converge towards the EMS per-capita average after joining the Union.

In general, the dynamic H-B-S effect demonstrates the domestic macroeconomic policy tradeoff between relative price stability and nominal exchange rate stability as both policy objectives cannot be achieved simultaneously. One

possible policy scenario would be for both countries to equalize their respective domestic rates of inflation. This would require that each country maintain separate control over the growth rate of their respective domestic aggregate demand. Under the assumption of absolute convergence in the relative price of non-tradable goods, the nominal exchange rate of the less rapidly growing Country 1 would depreciate and that of Country 2 would appreciate.

(Policy Alternative I: Floating Exchange Rate)

$$R^*_{1t} > R^*_{2t},\ \frac{dR^*_{2t}}{dt} > \frac{dR^*_{1t}}{dt} > 0\ \frac{1}{P^*_{1t}}\frac{dP^*_{1t}}{dt} = \frac{1}{P^*_{2t}}\frac{dP^*_{2t}}{dt} \text{ imply}$$

$$\left(\frac{1}{E^*_{1t}}\frac{dE^*_{1t}}{dt}\right) = -\left(s^*_{2Nt}\frac{1}{R^*_{2t}}\frac{dR^*_{2t}}{dt} - s^*_{1Nt}\frac{1}{R^*_{1t}}\frac{dR^*_{1t}}{dt}\right) < 0 \text{ and}$$

$$\left(\frac{1}{E^*_{2t}}\frac{dE^*_{2t}}{dt}\right) = -\left(\frac{1}{E^*_{1t}}\frac{dE^*_{1t}}{dt}\right) > 0.$$

Under a free floating exchange rate policy, this policy is possible as each country maintains its separate ability to determine its own level of aggregate demand. However, most EU member countries have adapted the euro as their money. For them, there is no possibility for a change in the nominal exchange rate as the tradable goods for all EMS countries is rigidly fixed.

We now consider the implications for economic convergence under a strict fixed exchange rate policy. Under this policy, any change in the relative price of non-tradable goods among EMS countries translates into domestic inflation rate differentials as can be seen below:

(Policy Alternative II: Fixed Exchange Rate)

$$R^*_{1t} > R^*_{2t}\ \frac{dR^*_{2t}}{dt} > \frac{dR^*_{1t}}{dt} > 0 \left(\frac{1}{E^*_{2t}}\frac{dE^*_{2t}}{dt}\right) = -\left(\frac{1}{E^*_{1t}}\frac{dE^*_{1t}}{dt}\right) = 0 \text{ implies}$$

$$\left\{\left(\frac{1}{P^*_{2t}}\frac{dP^*_{2t}}{dt}\right)-\left(\frac{1}{P^*_{1t}}\frac{dP^*_{1t}}{dt}\right)\right\}=\left(s^*_{2Nt}\frac{1}{R^*_{2t}}\frac{dR^*_{2t}}{dt}-s^*_{1Nt}\frac{1}{R^*_{1t}}\frac{dR^*_{1t}}{dt}\right)>0.$$

As the EMS countries with relatively lower per capita domestic product converge to towards the EU average, their respective domestic price inflation will generally be greater than the relatively slower growing countries with higher per capita income. It will simply be impossible for the European Central Bank to custom tailor a single policy that can provide each country with the same domestic rate of inflation.

VII. Policy Implication for Accession Countries

The policy issues raised by the dynamic H-B-S effect will be of special concern for the applicant countries as they still have the flexibility to decide when they will participate in the single currency after joining the EU. There are a number of the factors they will have to consider. (1) At what rate is the domestic economy likely to converge relative to the EU average during the next few years? (2) What is likely to be the absolute size of the domestic inflation rate differential? (3) How exposed is the domestic economy to nominal exchange rate risk if the adoption of the euro is postponed? (4) As a non-economic criterion, would the political costs in the form of reduced leverage within the European Union for those countries that delay joining the EMS?

If the past experience from large countries with diverse regional economies offers any guidance, casual empiricism would seem to suggest that the pure economic costs to the accession countries resulting from joining the EMS as soon as possible may be mild. In addition, when compared with the gains resulting from the elimination of nominal exchange rate risk and greater price transparency, the case in favor of early admission appears all the stronger. However, in the final analysis and as much as economists are loathe to admit, the ultimate decision is as likely to be determined as much by internal political as opposed to purely economic consideration within the European Union body politic.

VIII. Comment to the Paper by Christopher Klisz

The paper raises the interesting issue of a conflict in policy objectives – price and exchange rate stability – which form a part of the criteria for EMS accession. Although such conflicts are quite common in economics and constitute a necessary ingredient for economic policy making, the interesting point in this paper is to show that the inconsistency of these criteria is due to the Harrod-Balassa-Samuelson (HBS) effect. Given the assumption of absolute convergence in the relative price of non-tradable goods (i.e. lower price levels, thus, a higher non-tradable inflation rate of accession country as compared to an EMS member country) the HBS relationship implies that it would either require an appreciation of the nominal exchange rate to maintain the same rate of overall domestic inflation, or demand a positive inflation differential with an unchanged, fixed nominal exchange rate.

If price stability in the sense of minimal discrepancy of domestic inflation to the foreign one and, at the same time, exchange rate stability, meaning unchanged nominal rates, is desired, then in view of the HBS equation, there exists a policy tradeoff insofar as for any productivity differential an increase in the inflation differential can always be compensated by an appropriate revaluation of the nominal exchange rate.

This policy conflict has indeed been noticed by European institutions (see e.g. Buiter and Grafe, 2002)) and also mentioned by the vice president of the ECB Ch. Noyer (2001) addressing the Foreign and Commonwealth Office in London. An important question for the practical relevance of this conflict is the strength of the HBS effect and, of course, the appropriateness of the basic assumption of absolute price convergence. We note that the right hand side of the HBS equation can be considered equivalent to the share of non-traded goods multiplied by the difference of the productivity growth differentials between traded and non-traded goods of the domestic and foreign country. Therefore it is possible to specify empirical relationships based on the HBS equation with different independent variables, either relative price or relative productivity changes. Due to recent estimates a one percentage point increase in relative productivity levels of accession countries compared to EU tends to increase the real exchange rate on average by 0.4%. There seem to be, however, discrepancies across the individual countries. Larger values can be found for Slovenia,

smaller ones for the Czech and the Slovak Republic. The HBS effect might cause a real appreciation of around 1.5% to 2.5% per year according to some estimates (mentioned in Buiter and Grafe, 2002) and up to 4% according to others (Pelkmans et al., 2000) and thus contribute to a widening of the inflation differential to these extents with constant nominal exchange rates. On the other hand there are serious measurement issues and very limited data series for the CEE countries which make estimation of the HBS effect a doubtful exercise.

These studies may provide sufficient information to understand that the inflation target is not an easily achievable target under fixed nominal exchange rates, especially considering the number of additional factors likely to contribute to the inflation wedge. Floating the exchange rate would then seem to be the most obvious alternative measure to achieve the inflation target. The Maastricht criteria permit floating within a ±15% band within a period of two years, an interval which should provide some room for a flexible exchange rate policy which could assist in reinforcing other, possibly fiscal instruments to contain inflationary pressure. Except for a very large and sustained HBS effect would an accession country get then into a serious policy conflict. A situation which should not be discounted entirely. An additional difficulty possibly stimulated by floating could arise from the need to fend off speculative attacks against one country's currency during the period when the ERM is at work. To prevent such undesirable and costly risks the timing of joining the EMU becomes the more important issue and might eventually dominate accession policy. The two year period during which candidate countries will be members of the EU but not yet members of the EMU promises to be a challenging one for their economic policies. After joining the EMU the conflict in policy targets between inflation differentials and exchange rate stability will disappear, leaving the task to control inflation differentials mostly to domestic fiscal policy and the working of the HBS effect.

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Comments on Unilateral Euroization

By Julius Horvath

I. Introduction

Unilateral dollarization (euroization) is attracting attention. Partially, it is a reaction to series of financial crisis in the 1990s as well as to the emergence of euro, the Latin and Central American dollarization projects, and discussion about euroization in Eastern and Central Europe. Successful efforts to dollarize and/or to euroize are likely to alter the monetary map of the world in this century, implying a possible gradual movement towards a smaller number of currencies.

It may be useful to consider methodological clarification concerning the use of the term dollarization (euroization). Typically – especially in a Latin American context – dollarization means unofficial dollarization, i.e. the fact that the domestic currency as well as a foreign currency is used as means of payment or as a unit of account in the domestic country. Then one may define dollarization as "the degree to which real and financial transactions are actually performed in dollars relative to those performed in domestic currency".[1] In this meaning dollarization (euroizaiton) is sometimes used inter-changeably with the term currency substitution. On the other hand, the term dollarization has also a different meaning, i.e. introduction of foreign currency as a domestic legal tender.

[1] Giovannini and Turtelboom (1994, p. 392).

I use the term unofficial dollarization for the former meaning, and official dollarization for the latter.[2]

Only a small number of countries (independent nations and dependencies) is officially dollarized, i.e. only a small number of countries have officially adopted foreign currency as a legal tender. Cohen (1998) identifies reasons why countries typically do not dollarize, i.e. why countries typically prefer to use their own currency as a legal tender. These reasons include the national political symbolism, historical patterns, the loss of independent monetary and exchange policy, the loss of the seigniorage revenues and the loss of the ability to act as a domestic lender of last resort.

Officially dollarized economies may vary in different respects. Countries may differ with respect to the number of foreign currencies they allow to circulate as legal tender. There are territories where more than one currency is the legal tender. In some dollarized countries domestic coins are legal tender along with foreign notes. Thus dollarization need not mean that a foreign currency is the only legal tender; more than one currency may protect, in case the foreign currency becomes unstable, however this is a rare event.

Euroization is a term on par with dollarization. The official euroization means introduction of euro as a legal tender, while unofficial euroization means using euro as means of payment or unit of account along with the domestic currency being a legal tender. Unofficial euroization is already a practice in various Eastern and Central European countries.

This paper discusses the issue of unilateral euroization, i.e. the introduction of euro as a legal tender by Eastern and Central European countries before they would become full members of the European Union.

Official unilateral euroization means total replacement of domestic currency with euro. This means that the monetary base of the country needs to be converted into euros, since euro would become the domestic legal tender. Monetary base includes currency in circulation and the required reserves of commercial banks. Assuming that a country, which decides to euroize does not have

[2] Dean (2000) uses the terms "de facto dollarization", and "de jure dollarization". The process of unofficial dollarization to a large extent reflects preferences of domestic agents concerning domestic and foreign currency, while the official dollarization reflects the decision (preferences) of the policy makers.

sufficient amount of euros in cash to back the monetary base, then first what needs to be done is to convert international reserves into euro by selling dollar or euro denominated bonds for euro cash. In the next step then these euro notes need to be exchanged for the domestic currency. Once this has been accomplished, the domestic currency is eliminated from circulation and euro is the only legal tender. In the second round deposits, debts, contracts, securities, which were labeled in domestic currency need to be re-labeled and become euro-denominated. The pre-requisite for this operation to succeed is that the domestic country has sufficient international reserves at its disposal in ratio to the monetary base. Due to large amount of international reserves available to the most of the transition economies of the Central and Eastern Europe at this stage it seems that technically unilateral euroization may be executed relatively easily.

This paper is structured as follows. In Section II, I selectively review the arguments of proponents and opponents of unilateral euroization. In Section III, I present some comments on the issue. In the last Section I conclude.

II. Discussion on Unilateral Euroization

1. Proponents of Unilateral Euroization

The first proposal for unilateral euroization for a transition accession country, namely Poland, was put forward by Jacek Rostowski[3]. As I understand the line of his argumentation runs as follows. The first building block is that the growth rates in the transition accession countries are expected to be higher than the growth rates of the members of the European Union. This is the basis of the further argumentation and it seems to be grounded in empirical observations and also in belief in convergence between European countries. The empirical

[3] The first proposal appeared in the Polish daily, Rzecpospolita on 6 March 1999, later in August of the same year it had also appeared in the *Financial Times*. As I was told by Rostowski in an e-mail, Daniel Gros presented an earlier argument for unilateral euroization of some Balkan countries.

data presented in Table 1 show that on average higher growth rates were achieved in transition countries than in the most of the western Europe. Nine European transition countries in the sample achieved higher growth rates than any of the four large EU-members, but some smaller EU-member countries performed as well as the transition countries.

Table 1

Real Output Growth Rate for Selected European Countries, 1995-2000

COUNTRY	1995	1996	1997	1998	1999	2000
Ireland	100	107.69	119.25	129.46	142.18	155.18
Poland	100	106.03	113.27	118.75	123.61	128.66
Finland	100	104.01	110.55	116.45	121.30	128.23
Estonia	100	103.91	114.95	119.60	119.02	126.68
Latvia	100	103.34	112.24	116.60	117.85	125.60
Netherlands	100	103.12	106.88	110.83	120.42	125.23
Iceland	100	105.17	110.17	115.16	119.84	124.13
Slovenia	100	103.53	108.25	112.36	118.21	123.92
Portugal	100	103.19	106.76	110.49	118.51	122.44
Slovakia	100	106.21	112.80	117.42	119.65	122.29
Hungary	100	101.34	105.97	111.12	116.12	122.15
Spain	100	102.42	106.04	110.06	114.18	118.92
Greece	100	102.36	105.96	109.19	112.86	117.54
Norway	100	104.90	109.82	112.02	113.00	116.05
United Kingdom	100	102.55	106.15	108.96	111.45	114.88
Belgium	100	101.18	104.62	107.18	110.11	114.56
Sweden	100	101.08	103.08	106.12	110.14	114.54
France	100	101.06	102.95	106.55	109.77	113.45
Austria	100	102.00	103.36	106.73	109.74	113.41
Denmark	100	102.52	105.74	108.42	110.12	113.20
Italy	100	101.09	103.14	105.01	106.70	109.81
Germany	100	100.76	102.22	104.42	105.67	108.97
Czech Republic	100	104.29	103.50	102.26	101.86	104.86
Bulgaria	100	89.90	83.70	86.15	88.56	93.11
Romania	100	103.95	97.66	92.95	90.85	92.31

Calculated from various sources, mostly the IFS data, line 99.

These high growth rates are also expected to continue, which provides incentives to transition accession country residents to smooth consumption in time. This leads to a gap between investment and savings. This gap will be filled by

foreign savings, and would lead to large capital inflows and consequently current account deficits. Table 2 provides a picture concerning the current account deficits across Europe in the 1990s. I have calculated a simple cumulative value of the per capita current account balance in U.S. dollars for the 1990s. Table 12 indicates that all transition economies, except Slovenia, had cumulative deficits in current accounts.

To finance high current account deficits – the argument runs – large private capital flows relative to GDP are needed. But when these flows change direction, the shock to countries dependent on foreign financing may be unexpectedly large, and the effect abrupt, destabilizing and extensive. Rostowski (2001a, p.4) writes "High current account deficits, even when largely financed by foreign direct investment, expose a country to the danger of a sudden 'stop' in capital inflows (Calvo, 1998), which may result in a currency crisis."

Table 2

Cumulative Value of Current Account Deficit (-) or Surplus (+) per Capita in U.S. Dollars; Based on Yearly Data for the Period 1991-1999

Austria	-3870	France	3
Spain	-1706	Slovenia	377
Greece	-1618	Norway	969
Germany	-1541	Sweden	1311
Estonia	-1374	Italy	1578
Slovak Republic	-1273	Ireland	3169
Czech Republic	-1136	Finland	3804
Poland	-975	Denmark	4036
Romania	-658	Netherlands	9591
Portugal	-636	Belgium	10130
Hungary	-536		
Bulgaria	-224		

Calculated from IFS, line 78, and line 99.

This seems to be the essence of the argument for unilateral euroization. High growth rates and large current account deficits in transition accession countries create dependence on foreign capital inflow, which may be suddenly interrupted, thus having destabilizing currency effects. Rostowski (2001a, p.18) argues: "The traditional route to EMU membership seems to be fraught with difficulties, the most important of which is the absence of macroeconomic policy instruments which would allow CEE applicant countries to achieve the exchange rate and inflation criteria of the Maastricht treaty together with the maintenance of prudent levels of the current account deficit in the context of

rapid economic growth and free capital movements. Nor are the difficulties removed if the Maastricht inflation criterion were to be suspended for the CEE applicants as we have suggested. The problem of achieving the exchange rate criterion together with a prudent level of the current account deficit would remain. Unilateral euroization seems the best solution to this conundrum."

One can raise the question why the fiscal and monetary policy is not adequate to cope with this problem. Rostowski argues that expansionary monetary policy will speed up the inflation and thus contradict the Maastricht requirements. On the other hand the tight monetary policy would increase interest rates, increase the demand for the domestic currency, which appreciates the currency even more. Expansionary fiscal policy would tend to increase the current account deficit. Rostowski argues that neither the tight fiscal policy can cure the problem, "as a tightening of the fiscal stance may simply make foreign lenders more willing to lend to domestic private sector borrowers (we know that foreign investors do nowadays look at the overall indebtedness of a country's residents, both public and private)."[4]

Rostowski thus presents arguments especially in the context of Poland, but also with possible application to other transition accession countries to give up their monetary sovereignty. Dornbusch and Giavazzi (1998) present a similar argument in favor of abandoning national monetary sovereignty by the Visegrad countries. They do not propose the introduction of unilateral euroization, but they are in favor of introducing another rigid exchange rate regime, namely the currency boards. The essence of their argument is that Visegrad countries should draw lessons from Mexican and Asian crises: "hard money and sound credit are essential in a world where capital mobility is intensely mobile, contagion pervasive and the economic and social costs of crises nothing short of formidable." Dornbusch and Giavazzi suggest to introduce currency boards with domestic currencies fixed to euro. They emphasize the need to do everything to prevent the future crisis, which foremost needs credibility and commitment; both obtainable only in time. Visegrad countries' central banks should follow clear rules, discretion is important if you have Fed or Bundesbank, they argue. A currency board may thus become a springboard to implement the wider political agenda, a mechanism to assert the fundamental ambition to be part of the European community.

[4] Rostowski (2001b, p.1).

Coricelli (2001) seems also be in favor of unilateral euroization. He emphasizes some possible advantages as that "adoption of the euro would permit an immediate advantage in the elimination of the interest rate premium and, consequently, the reduction of real interest rates. In a context of liberalized capital flows the adoption of the euro would eliminate the vulnerability of the countries to sudden shifts in capital flows, and the attendant disruptive effects on the domestic financial sector." (p.12).

2. Opponents of Unilateral Euroization

The official position of the European Commission as expressed in ECOFIN from August 2000 is strongly opposing the idea and the implementation of unilateral euroization. "Any unilateral adoption of the single currency by means of 'euroization' would run counter to the underlying economic reasoning of EMU in the (EC) Treaty, which calls for the eventual adoption of the euro as the end of a structured convergence process within a multilateral framework." As I understand it the European Commission leaves the accession country with the possibility to choose any exchange rate regime in preparing its economy for the membership in the currency union. It identifies three successive stages in the transition process towards adoption of the euro, namely, the pre-accession stage, the stage following accession and the adoption of the euro.

During the pre-accession stage, exchange rate strategies should support economic policies in order to meet the Copenhagen criteria and ensure progress on real convergence and macroeconomic stability. After accession, candidate countries will not be able to adopt the euro immediately, they will first have to comply with all the relevant Treaty requirements, including the fulfillment of the Maastricht convergence criteria before finally adopting the euro. After accession, new members will be expected to join the ERM II, subject to a common accord on the central parity and fluctuation band. The ERM II could accommodate the main features of a number of exchange rates regimes. The only clear incompatibilities vis-à-vis the ERM II that can be identified already at this stage are fully floating exchange rates, crawling pegs and pegs against anchors other than the euro. This position of the European Commission seem to be also shared as Wojcik (2000) writes by the ECB and the national central banks participating in the euro area.

It seems that the official position is quite rigid. Nutti (2000) notes that the reason for such a position may lie in a legislative vacuum, since neither enlargement nor unilateral euroisation were being contemplated when the Maastricht Treaty was being stipulated, (quoted from Habib, 2000, p. 21). Furthermore, Habib provides two possible explanations of this rigid approach of the EC policy makers. "First, the document of the ECOFIN Council reaffirms the German position on the adoption of the single currency. This position is known in the literature on European monetary unification as the 'coronation theory', where the adoption of the euro is considered as the final reward after a lengthy process of structural and nominal convergence. Behind the rhetoric of the economic convergence there are the concerns of German authorities about the credibility of the euro. Second, euroisation could be politically uncomfortable for the European Union. A country that *unilaterally* (bold and italics in the original) adopts the euro is not obliged to agree with EU counterparts on a specific exchange rate. Even if the exchange rate were chosen in a mutual agreement, the candidate country would have greater bargaining power on this particular matter." (p.22).

There were some other critical voices towards unilateral euroization. The Austrian Central Bank in its regular Transition Report published a critical review of the unilateral euroization proposal by Wojcik (2000). Wojcik places Rostowski's contribution into the literature on vanishing intermediate exchange rate regimes. This is the view that in the globalized world the position of the intermediate exchange rate regimes is weakening, while the corner solutions (managed float, and truly fixed regimes) are strengthening.

Wojcik, probably rightly so, sees the issue of the choosing of an exchange rate regime not only as an academic question, but also as a political and power issue, and he remarks "the proponents of unilateral euroization have not garnered substantial official or public support for their propositions. In fact, Poland moved from a wide-band crawling peg exchange rate regime to a float in April 2000." (p.4).

Wojcik cross-examines different arguments of the proponents of unilateral euroization. He argues for example that the argument that unilateral euroization would lead to a significant decrease in interest rates is only correct if calculated ceteris paribus. However, after unilateral euroization, default risk may increase since investor may question the smooth functioning of the adjustment mechanism, when the effects of exchange rate misalignments and/or asymmetric real

shocks persist. "If external imbalances build up over time and if the adjustment mechanism indeed does not work properly, the risk premium will increase over time [...] the fall in the exchange rate risk which clearly results from unilateral euroization may be partly or even fully offset (in an extreme case even over-compensated) by a rise in the default risk at subsequent stages." This may happen, Wojcik argues because of the following arguments. First, even if the country euroizes, the international investors still may perceive this country as a separate, and thus less credible area. Second, the lack of the lender of last resort may add to financial fragility. Third, the devaluation risk cannot be ruled out, since country can reintroduce its currency, especially if the lack of broad consensus for euroization undermines the credibility of such a step.

III. Some Additional Comments

It seems that in the context of transition accession country the main argument for unilateral euroization is founded on reasoning close to the second-generation currency crisis theory.[5] One can build the argument that the most important policy issue in the transition accession country is to prevent a possible currency crisis, especially a large, costly crisis before joining the European integration structures. Such currency crisis can be avoided by unilateral euroization. So it is not that unilateral euroization will protect against inherently weak, contradictory, un-responsible government policy, Quite to the contrary despite responsible government policy a crisis may occur, since using the second generation crisis reasoning, there is a particular region for the fundamentals where multiple equilibria can occur. It is then the role of policy makers to prevent that the economy gets into the "crisis zone."

There is policy logic in the argument. Unilateral euroization may also be understood as a certain insurance scheme against the political as well as economic risks and uncertainties, which may occur in the period before the transition countries officially join the western European structures.

[5] See for example Obstfeld (1994, 1996) for review Masson (1999).

Generally speaking, one may compare the costs and the benefits of unilateral euroization. On the side of the benefits one finds decline in the level of interest rates due to significant reduction of currency risks, and increase in monetary stability and some transaction costs savings. This all may have positive effect on income and trade, however empirically the size of this effect is not clear. Among the costs of unilateral euroization one finds primarily the loss of seignorage, since if the country unilaterally euroizes it would not participate in sharing seignorage revenue schemes. The loss of the lender of the last resort function is typically also mentioned as a substantial cost of unilateral euroizing. In the context of the accession countries one also may count here the rejection of the idea by the European Commission as a possible significant cost, unless change of the position may be expected.

One of the strongest arguments against the unilateral euroization stems from the optimum currency area theory. One may assume that the anchor country does not take into account the business cycle in the euroized economy. As an example one may consider a shock that calls for a depreciation of the real exchange rate in the unilaterally euroized country but that has no effect on the other parts of western Europe, thus ECB does not need to consider it. Without exchange rate flexibility, the adjustment to such shocks may require adjustment of nominal wages and certain prices, which may not be feasible without a recession, particularly for economies with less flexible labor markets. Calvo (1999, p.8) answers this critique in the context of the unilateral dollarization in Latin America with the following empirical observations. "Devaluations in Latina America have been contractionary and, moreover, in recent crises no country has avoided depression, no matter how much the currency was devalued. Moreover, devaluations in emerging markets are typically accompanied by high interest rates, occasionally fully offsetting the competitive edge provided by devaluation." Furthermore, countries with firms, which have large anchor currency liabilities may force these firms to bankruptcy in case of large scale devaluation.

Empirical literature on shocks affecting the Central and Eastern European countries shows that these countries are exposed to asymmetric shocks compared to the anchor country of Germany. Table 13 provides results from two studies, Frenkel, Nickel and Schmidt (1999) and Horvath (2001), who use structural vector autoregressive model and measure demand and supply shocks affecting non-EMU countries, EFTA countries and EMU members. Frenkel,

Nickel and Schmidt (1999) summarize that "our results suggest that, so far, EMU enlargement towards central and eastern European countries would involve significantly higher costs than EMU enlargement towards countries of the other two groups."

Table 3

Correlation of Demand and Supply Shocks Between Selected Transition Countries and Germany

	A			B	
	supply shocks	Demand shocks		supply shocks	demand shocks
Poland	-0.370	**0.465**		0.000	0.143
Hungary	**0.267**	0.176		**0.281**	-0.406
Slovenia	-0.362	**0.601**		0.026	0.037
Czech Republic	0.151	-0.047		-0.059	0.104
Slovak Republic	-0.339	-0.299		-0.045	0.041
Estonia	**0.470**	-0.134		0.083	0.056
Latvia	-0.017	0.073		-0.075	0.116
Lithuania	---	---		-0.166	**0.331**
Bulgaria	-0.593	**0.389**		---	---

A - Frenkel, Nickel and Schmidt (1999); covers quarterly data for the period 1992:1-1998:2.
B - Horvath (2001), covers quarterly data for the period 1993:1-2000:3.

Euroization constrains the ability of the central bank to provide short-term liquidity to the system in need. The central bank would lose its ability to respond to a sudden run on bank deposits. Ultimately, the ability to print money is what allows a central bank to guarantee that all claims in domestic currency will be met. Euroization will take away this ability from the central bank. On the other hand, if all monetary assets will be euroized, depositors may be more confident in the domestic banking system, and thus the fact of euroization may decrease the need to act as a lender of last resort.

IV. Conclusion

This paper shortly discusses unilateral euroization, i.e. the introduction of the euro as legal tender in Central and Eastern European countries. I review the main arguments of proponents and opponents of unilateral euroization. Then I

discuss the benefits and costs of unilateral euroization with an emphasis on the relevance of asymmetric shocks.

V. Rainer Schweickert: Comment

The paper by Horvath does not bore the reader with a detailed listing of all possible pros and cons which are familiar to those doing research on exchange rate policies in emerging markets. Selectivity is of course a challenge because one has to pick up the most relevant issues. Horvath does a good job in this respect. Additionally, the issue presented is carefully argued and exceptionally readable. However, the paper is indecisive. It gives the pro and con arguments without a comment. Therefore, I would like to add three hypotheses which may fill this gap.

First, there should be a prior for fixing exchange rates if not for official unilateral euroization because of the institutional setting. In the introduction, Horvath claimed that "...(e)uroization is a term on par with dollarization ...". This is true in technical terms but not in reality. For the Argentinas and Mexicos, dollarization is something which they have to handle whether they like it or not. Most of the time they try to fight it, sometimes they make it legal, and all of the times they have no chance to integrate into the US money market.

For the accession countries, euroization is something which is already agreed on both by them and by the EU. It is possible that the first Central and East European countries accede to the EU already one year after the introduction of Euro banknotes and coins, i.e. in 2003. Countries entering the EU automatically become members of the economic and monetary union with a special status. The special status will allow for the participation in the European Monetary System (EMS II) After a two-year waiting period, the state of convergence of the new members will be evaluated based on the Maastricht criteria. Hence, the first new members could join the European Monetary Union (EMU) already in 2005 (Baldwin et al. 2000).

Additionally, it is debated whether a two-year membership in the EMS II under "non-stress conditions" is necessary to evaluate the state of exchange rate convergence. Given past experience, this provision of the Maastricht Treaty

does not seem to be binding for the Council of the European Union. It approved an early entry of Italy and Finland without EMS membership which could provide a blue print for the Eastern enlargement of EMU. Hence, disadvantages from unilateral euroization are only temporary, like forgiving seignorage and a lack of a lender-of-last resort, or they refer to euroization in general, i.e. they will also be present after entry into a monetary union, like bearing with asymmetric shocks.

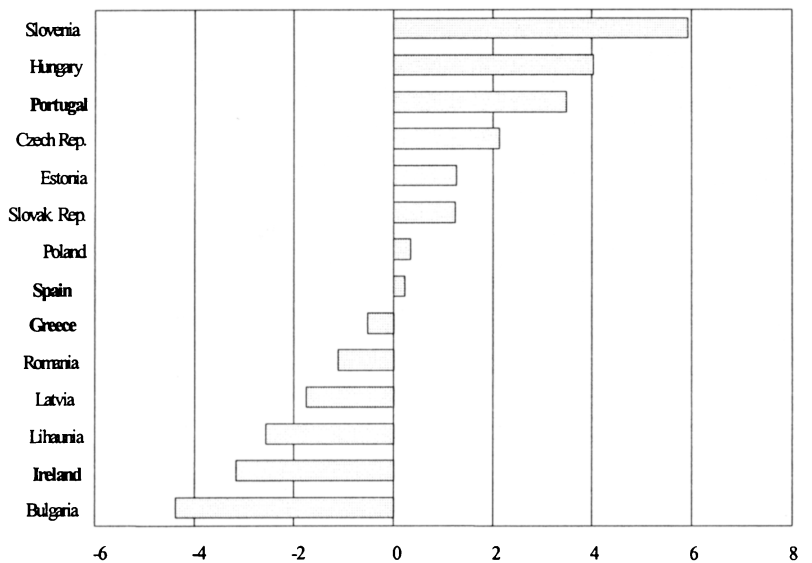
Second, the optimality of euroization is also an empirical question. If not optimal it should be shifted into the future in order to prepare for it (coronation theory). Horvath claims that "...(o)ne of the strongest arguments against the unilateral euroization stems from the optimum currency area theory...". He shows that accession countries are exposed to asymmetric shocks compared to Germany. At the same time, he cites Calvo with a statement on the irrelevance of this observation. So what should we learn from this? A first qualification on the issue is that the asymmetry of shocks does not represent the optimum currency argument, it is a part of it. A second qualification is that we can judge on the relevance on the basis of empirical evidence if we compare the performance of accession countries with the performance of low-income members of the European Monetary Union (EMU) which, so far, successfully integrated into Euroland (Schweickert 2001; 2002).

Figure 1 shows the results from calculating on index for the optimality of euroization based on arguments which can be derived from optimum currency area theory in a broad sense. As can be seen, all Visegrad countries figure above average and for all accession countries but Bulgaria the optimality of euroization is higher than for Ireland, the current star-performer within EMU. What this result cannot tell is whether or not euroization is optimal compared to flexible exchange rates, it shows that its advantages for accession countries are at least as high as the advantages for comparable members of EMU.

Third, if both institutionally pre-determined and sufficiently advantageous this has some consequences for the transition process. It gives some weight to the Rostowski argument in favor of unilateral euroization which is presented by Horvath. Euroization is to come anyway and there are no reasons to postpone it. Quite to the contrary, a lengthy transition period is highly risky. At the same time, unilateral euroization which may reduce risks constitutes only a theoretical option for the larger accession countries because the stock of foreign ex-

change reserves and money supply could only be matched by substantial deviations of the exchange rate.

The possibility to enter EMS II as soon as accession to the EU is finalized is also not adequate for reducing the riskiness of transition. With its wide bands and low support profile, it is actually a dirty block floating regime. Hence, accession countries have to target both exchange rates and inflation rates in a kind of muddling through strategy. If shortening the waiting period for an evaluation of the exchange rate policy is excluded because of political considerations, an alternative would be to allow the accession countries to enter EMS II as soon as possible, i.e. before entry into the EU. Additionally, countries which already pass the Maastricht criteria on inflation, interest rates, and public debt could be allowed to enter a regime with narrow bands. This could also help to smooth the transition of those accession countries which successfully implemented Currency Boards.



Source: Schweickert (2001; 2002).

Figure 1: Optimality of Fixing Euro Exchange Rates for Accession and Reference Countries (Index)

The indeces in Figure 1 represent sum of the differences from the average values of the four EMU-member countries in standard deviations according to four benefit and four cost variables based on the following assumptions. The benefits for the accession countries are higher: the stronger bilateral trade with

Euroland, the smaller the country relative to Euroland, the larger the weight of the Euro in a currency basket designed to calculate effective exchange rates, and the higher the gain in credibility from joining Euroland. The costs for the accession countries are higher: the more asymmetric the business cycle of the country concerned relative to the Euroland cycle, the larger the difference in trade structures, the stronger the trend for real exchange rate changes, and the larger the deviation of exchange rates from purchasing power parity.

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Polish Economy of 1990s in Perspective of the Convergence Criteria

By Adam Budnikowski and Rafał Wielądek

I. Introduction

In the last 12 years Polish economy was a subject to deep changes connected to the transition from the centrally planned economy to the market one. The progress in this field was considerably facilitated by an initiation of negotiations on the European Union accession. As this process was simultaneous to the Economic and Monetary Union creation, it is evident that having become an EU member Poland will have to face the perspective of joining the EMU itself. This, in turn, implies the necessity of fulfilling certain preconditions by Polish economy, commonly known as the convergence criteria.

The aim of this paper is to analyze the development of Polish economy in terms of approaching the convergence criteria thresholds. First, we provide a detailed consideration to the progress attained in monetary criteria (i.e. inflation and interest rate), then fiscal criteria (i.e. budget deficit and public debt) and finally we focus on exchange rate criterion. The latter is divided into two respectively relevant areas: Polish currency convertibility developments along with related liberalization of capital flows and exchange rate mechanisms applied during the transition period.

II. Inflation

Polish economy entered the transformation process with very high inflation rate, about 640 % in 1989, based on December to December indicator. Such an inflation rate was due to the monetary overhang released by decisions of the last communist government to free the food price. Therefore, one of the strategic goals of the economic policy of the first non-communist government was the quick reduction of the inflation rate[1].

The disinflation path may be divided into several characteristic stages.[2]

The very first stage started with the implementation of Balcerowicz Plan in 1990. The central elements of the Plan were nearly complete liberalization of prices and radical opening of the economy supported by an introduction of internal convertibility of the Polish zloty. The "anti-inflationary treatment" of the Plan consisted of the following measures[3]:

- stringent cuts of the budget expenditures, in particular the subsidies for state owned enterprises;
- conducting tight monetary policy aimed at radical reduction of the growth of the monetary base;

introducing so-called "nominal anchors of transformation", which were to provide the economic reform with a kind of security margin, *inter alia*, reassuring inflationary expectations and restoring the zloty's credibility. It was a special tax imposed on an extranormative rise of wages and a new exchange rate mechanism, which pegged the zloty against the dollar.

However, the strength of the price shock, being caused by the liberalization and loss in overall production were higher than anticipated. Moreover, "nominal anchor" produced its effect with a substantial delay and initially it had a

[1] L. Balcerowicz, 800 dni. Szok kontrolowany, Polska Oficyna Wydawnicza "BGW", Warszawa 1992, pp. 40-41.

[2] According to K. Lutkowski, Problematyka inflacji w procesie polskiej transformacji – doświadczenia i perspektywy, (in) Szkoła Główna Handlowa i dziesięć lat transformacji w Polsce, A. Noga (ed.), SGH, Warszawa 1999, pp. 83-105.

[3] K. Lutkowski, Transformacja systemu finansowego w krajach Europy Środkowej i Wschodniej, Szkoła Główna Handlowa, Warszawa 1999, pp. 52-53.

pro-inflationary influence. In 1990, as a result the actual inflation rate totaled 586% (yearly indicator of the consumer price index, CPI) and 250% (December to December). In contrast, according to the Polish Ministry of Finance provisions and the IMF forecasts, the inflation rate was to fall to single-digit level as early as in the second half of 1990.[4]

The next stage of disinflation path embraces the years 1991-1993. Poland entered this period with a shrinking production, growing unemployment and lowering social acceptance towards economic reforms. In addition the collapse of COMECON implied the necessity of reorientation of Polish exports towards West European markets. This objective was connected to indispensable zloty's devaluation.

In May 1991 zloty was devalued by 16.8 % against the US dollar and thereafter, in October 1991, the *fixed* exchange rate mechanism was replaced with the *pre-announced crawling peg*. It was followed by two considerable discrete devaluations at 10.7 % (1992) and 7.4 % (1993).[5] Despite the fact that these decisions were aimed at supporting the competitiveness of Polish exporters, they also had a strong, pro-inflationary influence upon the whole economy.

The second relevant inflationary impulse of that time was related to the fall of production resulted in drastic decrease of budget revenues that were unable to satisfy huge expenditures on unchanged and inefficient social security system, subsidies for energy carriers and municipal housing, and expenditures on public debt repayment. The budget gap was covered by National Bank of Poland (NBP) through purchase of Treasury bills, which, in result, stood for the main source of pro-inflationary increase of monetary base in Polish economy at the time.[6]

The economic policy measures aimed at alleviating the transformation shock proved successful. While during 1990-1991 period the GDP fell by an estimated 20 %, in 1992 the GDP grew by 2.6 % and in 1993 by 3.8 %. However, the inflation rate still scored high levels and amounted to (CPI yearly and De-

[4] K. Lutkowski, Problematyka inflacji w procesie ..., op. cit., p. 85-88.

[5] E. Chrabonszczewska, K. Kalicki, Teoria i polityka kursu walutowego, Szkoła Główna Handlowa, Warszawa 1996, p. 151.

[6] K. Lutkowski, Problematyka inflacji w procesie ..., op. cit., p. 89.

cember to December indicators, respectively): in 1991 70.3 and 60.4 %, in 1992 43.0 and 44.3 %, in 1993 35.5 and 37.6 %.[7]

The next stage of disinflation path embraces the years 1994-1995, when Poland experienced a rapid economic growth. This growth influenced gradual restoration of zloty's credibility; an increased money demand surpassed money supply, which in general contributed to diminishing the inflation level in 1994-1995. Besides, during this period a progressive reduction of devaluation coefficient within the crawling peg exchange rate mechanism had similar effect.[8] However, the negative inflationary impulses came form the rise of food prices caused by long-lasting drought as well as from loosening of wage-control due to "popiwek" tax abolishment in March 1994.[9] As a result, in 1994 the inflation totaled 32.2 % (yearly) and 29.5 % (December to December).

In 1994 Poland and the London Club signed an agreement on reduction of Polish external debt, initiating an intensive inflow of foreign direct investments (FDIs). It added a new element to the character of inflationary processes of Polish economy. The FDI inflow, which took place in 1995, caused an exceptionally high increase of Polish foreign exchange reserves[10] that, under conditions of constant zloty's appreciation, made the monetary base difficult to control. Although the exchange rate mechanism had been purposely changed, the growing foreign exchange reserves started to be the main source of pro-inflationary money supply at the time. Together with the increase of demand it seriously effected a slowdown of the process of inflation curbing.[11] In result in 1995 the inflation rate amounted to: CPI 27.8 % (annually) and 21.6 (December to December), respectively.[12]

The next stage of inflation developments in Polish economy concerns the years 1996-1998, when the trend of inflation fall regained its dynamics. The

[7] Ibidem, pp. 87-92.

[8] Raport o inflacji 1995, Narodowy Bank Polski , Warszawa 1996, pp. 53-54.

[9] S. Owsiak (ed.), System finansów publicznych w procesie transformacji gospodarki polskiej, PWN, Warszawa 1995, p. 143.

[10] The growth of the reserves was also due to non-registered trade surplus, which was revealed at the time; K. Lutkowski, Problematyka inflacji w procesie ..., op. cit., p. 93.

[11] For further analysis see: E. Rzeszutek, Polityka kursowa Polski wobec procesu europejskiej integracji monetarnej, Bank i Kredyt 1997, no. 6, pp. 95-99.

[12] Raport o inflacji 1995..., op. cit., p. 47.

CPI yearly indicator during this time totaled: in 1996 19.9 %, in 1997 14.9 % and in 1998 11.8 %. As far as December to December indicator is concerned, even higher progress could be observed, namely it amounted to: 18.5 %, 13.2 % and 8.6 %.[13]

The reasons for such outcome are of complex character. First of all, the inflation rate was fuelled by increased supply of consumer credits provided by commercial banks that eventually created difficulties in money supply control by NBP. It was due to banks' high financial liquidity ratio, having its roots in absorption of foreign exchange brought by FDIs inflow. Additional inflationary impulses came from unchanged rate of devaluation coefficient, unreformed structure of social expenditure and indexation of wages. Furthermore, rises of controlled prices, value-added tax (VAT) rates and liberalization of gasoline prices in 1997 also bore a negative influence upon the inflationary expectations of individuals.[14]

During 1996-1998 the inflation process in Poland was also indirectly influenced by the opening of the economy, especially through commitments to the EU, CEFTA and WTO.[15] The growth of imports put the additional burden upon increase of prices, this was particularly evident in 1998, when the Polish inflation rate dropped to 8.6 %. On the other hand the opening of the Polish economy caused a current account deficit (0.95% of GDP in 1996, 3% in 1997 and 4.4% in 1998)[16] reflecting high inflationary potential.

There were also two important domestic factors which contributed to curbing of inflation in 1996-1998: the low level of budget deficits that did not exceed the margin of 4 % of GDP and the fact of founding of the Monetary Policy Council (*Rada Polityki Pieniężnej* – RPP). In 1998 the RPP published "A Medium-Term Monetary Policy Strategy for 1999-2003" that announced a me-

[13] Raport o inflacji 1996, Narodowy Bank Polski , Warszawa 1997, p. 7; Raport o inflacji 1997, Narodowy Bank Polski , Warszawa 1998, p. 7 and Raport o inflacji 1998, Narodowy Bank Polski , Warszawa 1999, p. 8.

[14] Raport o inflacji 1996..., op. cit., p. 25-32; Raport o inflacji 1997..., op. cit., p. 37-46, 77; Raport o inflacji 1998..., op. cit., pp. 8-14.

[15] For further analysis on this issue see: E. Kawecka-Wyrzykowska, Stosunki Polski ze Wspólnotami Europejskimi od roku 1989, SGH, Warszawa 1997.

[16] K. Lutkowski, Problematyka inflacji w procesie ..., op. cit., p. 97 and also Raport o inflacji 1998..., op. cit., pp. 4-14.

dium-term inflationary goal of 4 % to be reached by the end of 2003.[17] What is even more important, the Council initiated employing direct inflation targeting strategy, within which the whole range of monetary policy instruments started to be oriented exclusively for price stabilization. These decisions considerably affected smoothing of the inflationary expectations.

The last stage of inflation developments in Polish economy embraces 1999-2000. During this period, Polish inflation regained its dynamics rising from 7.3 % yearly in 1999 to 10.1 % annually in 2000. The above inflation rate scores missed considerably the RPP inflation target being set for 1999 within the band of 6.6-7.8 % and for 2000 5.4-6.8 %. The reason for such developments are mainly due to the sensitivity of Polish economy to the external supply shocks (rise of energy prices) which were relatively quickly transmitted onto domestic market. In the last years, the other factors contributing to increase of prices were the rise of food prices related mostly to interventionist and protectionist practices at the agricultural and food market, and the rise of prices in the service sector. The latter results mostly from the lack of competitiveness within the markets of key services: telecommunication, electric energy and gas supply. Furthermore, the pro-inflationary tendencies in this sector are strengthened by the Balassa-Samuelson effect.[18]

Public finance sector had also certain influence upon the unsuccessful lowering of inflation. Costs of simultaneous implementation of four systemic reforms (education, administration, public health care, and social insurance) turned out to be higher than anticipated. Thus, excessively expansive fiscal policy stimulated internal demand, which in turn influenced acceleration of the pace of inflation and increase of deficit of the current account.[19]

Facing the above mentioned developments while having aimed at the inflation goal, since September 1999 the RPP decided to tighten the monetary policy. Then, since September 1999 until December 2000 the RPP had been steadily increasing the interest rates to oppose a tendency of general rise of prices and to counteract the possibility of re-establishment of high inflationary ex-

[17] Średniookresowa strategia polityki pieniężnej na lata 1999-2003, Rada Polityki Pieniężnej, Narodowy Bank Polski, Warszawa 1998.

[18] For further analysis on this issue see: Raport o inflacji w 2000 roku, Narodowy Bank Polski, Warszawa 2001, p. 19.

[19] Raport o inflacji 1999 ..., op. cit., pp. 102-120.

pectations. In short, such policy proved successful, but on the other hand it considerably rendered the economic growth slowdown (4.1 % of GDP in 1999 and the same in 2000) and general rise of unemployment rate (circa 16 % in the end of 2000).[20] According to the *Convergence Report 2000*,[21] the inflation reference criterion amounts to 2.4%, which, confronted with Polish outcome of 10.1 % in 2000, reveals the actual still-to-do effort on the Poland's way towards the EMU.

III. Interest Rates

In 1990-1998 period, in Poland there did not exist an instrument of 10-years government bond of fixed rate, which, according to the Maastricht Treaty, is a base of reference for long-term interest rate criterion. Emission of securities of this class was impossible due to high inflation and general uncertainty of portfolio investors towards future economic situation in Poland. However, the Ministry of Finance adopted a strategy of gradual introduction of treasury securities, which were adjusted to the economic situation of the country. Within this strategy each of the debuting securities were originally equipped with a variable interest rate and then – as economic situation was getting more and more stabilized – with a fixed one.

This procedure was also applied to 10-years government bonds. The very first securities of this class were issued in December 1996.[22] They were assigned the variable rate being indexed to 52-week Treasury bills and, in fact, were not the equivalent of securities mentioned by Treaty of Maastricht. As the inflation rate was decreasing gradually and the overall economic situation continued to improve, it was possible to issue 10-years bonds of fixed rate, which actually took place in May 1999. These bonds were available at public offerings, which had settled the interest rate at an average of 8.6 %. As the inflation

[20] Further on this issue see: Raport o inflacji 1999, op. cit and Raport o inflacji w 2000 roku, op. cit.

[21] Convergence Report 2000, European Central Bank, Frankfurt am Main 2000.

[22] S. Owsiak, Finanse publiczne, op. cit., p. 390.

regained its dynamics, however, the subsequent emissions of 10-year government bonds were priced as much as 12.3 % on average.[23]

Similarly to the case of inflation criterion, Poland still misses fulfilling the interest-rate criteria, which in 2000 was set at the level of 7.2 %.[24]

IV. Budget Deficit

The reorganization of public finance stood as one of the fundamental foundations of the systemic transformation in Poland. In general the reform within the public finance was to reduce the scope of budgetary redistribution in order to limit budget deficit extension, which, at the time, was the main source of "empty", i.e. inflationary, money supply.[25] The strategy of limiting the budget deficit also provided for reduction of subsidies, which represented considerable part of budget expenses.[26] As a consequence of the radical limitation of budget expenditures and simultaneous increase of budget revenues due to high dynamics of inflation, in 1990 the budget balance scored a surplus of 0.4% of GDP. It was, however, the only budget surplus reached during the transformation.

In 1991 the situation in public finance started to worsen rapidly having initiated a budget crisis period that lasted till first part of 1993. It was caused by two major factors: the economic breakdown of 1991 (7% decline of GDP) and the existing taxation system, which was based on direct taxes being paid exclusively by enterprises. Thereafter, the fall of remunerativeness of companies lowered budget revenues. These revenues, in turn, were insufficient to cover higher budget expenditures, being additionally magnified by high share of

[23] Ministry of Finance data. For further details see: www.mofnet.gov.pl.

[24] Convergence Report 2000, op. cit., p. 14.

[25] Mainly through credits drawn by Ministry of Finance at National Bank of Poland in a form of purchase of Treasury bills.

[26] As a result, in January 1990 prices of coal and gas rose by 400 per cent, electricity supply by 300 per cent and PKP (Polish State Railways) fares by: commodity freight 200 per cent and passenger transportation by 250 per cent; see: L. Balcerowicz, 800 dni, op. cit., p. 43.

undiminishable "fixed" expenditures[27] (i.e. public debt service, massive financial transfers to extremely inefficient social insurance system). The dramatic gap between budgetary revenues and expenditures resulted in much higher than anticipated deficit totaling 3.9 % of GDP.[28] In 1992 the crisis deepened still further and the budget deficit reached an absolute top-score of transformation period and as it equaled 6 % of GDP.[29]

The crisis of public finance revealed a fundamental need of conducting immediate, deep reform of taxation system aimed at stabilizing budgetary incomes and at facilitation of expenditures planning. The reform, which generally shifted the emphasis from direct taxes to indirect taxes, and from corporate to household ones, was divided into two phases. The first phase began on 1st January 1992 with an introduction of the Personal Income Tax (PIT), which replaced several previous taxes levied on household incomes (wage tax, income tax, remuneration tax and income-equalizing tax). It was supplemented by an introduction of Corporate Income Tax (CIT) in February 1992. The second phase covered reform of indirect taxes and it was carried out on July 1993, when the hitherto existing sales turnover taxes were replaced with the Value-Added Tax (VAT) on goods and services, accompanied by an introduction of an extensive excise tax system.[30]

As a consequence of the changes, in 1993 the budget deficit totaled only 2.8 % of GDP, while the GDP itself rose by 3.8 %.

Implementation of the reforms and overcoming of the crisis had finally formed, and then consolidated, the character of Polish budget. The extent of

[27] "Fixed" budget spending are the ones that are due to legislative commitments and can not be altered without amending an adequate act by parliament.

[28] R. Rapacki, The Polish Economy in 1997. Development Trends and Economic Policy, (in:) M. Lubiński (ed.), Poland. International Economic Report 1997/98, World Economy Research Institute, Warsaw School of Economics, Warsaw 1998, p. 42 and S. Owsiak, Finanse publiczne, op. cit. pp. 363-364.

[29] Ibidem, pp. 365-366.

[30] For further analysis on the tax reform in Poland see: S. Owsiak (ed.), System finansów publicznych w procesie, op. cit., p. 122-167 and A. Wernik, Public Finances, (in) M. Lubiński (ed), Poland. International Economic Report 1996/97, World Economy Research Institute, Warsaw School of Economics, Warsaw 1997, pp.175-183.

economic function of the budget had been diminished in favor of social one.[31] On the other hand the state of the budget was more and more influenced by the continuous increase of public debt service costs. Since overcoming the crisis, the "fixed" budgetary expenditures reserved for public debt repayment and social transfers had been settled at the level of around a third of the budget.[32]

Since 1993 the succeeding governments have been conducting the policy of low budget deficit. This policy correlated with the general disinflation strategy. Due to this policy – despite high dynamics of economic growth in the period 1993-1998 – the governments never fulfilled plans of budgetary spending. Thus, the deficits as a share of GDP amounted to 2.7 % in 1994, 2.8 % in 1995, 2.5 % in 1996, 2% in 1997, and 2.4 % in 1998.[33] However, taking into account the progressive rise of costs of public debt service,[34] since 1993 the governments have worked out a surplus of the so-called initial budgetary balance.[35] To illustrate the scale of this phenomenon it is enough to note that in 1998 the initial budget balance displayed a surplus of 0.9 GDP while an overall deficit totaled 2.4% of GDP.[36]

The period 1999-2000 introduces a certain change to the public finance developments. In 1999, for the first time the divergence between the central budget and the general government sector[37] has become to grow rapidly. The

[31] In 1989 budget's entries for industrial subsidies equalled 57.6 per cent and for social security system 12.1 per cent while in 1996 they stood for, adequately, 1.8 per cent and 42.3 per cent; ibidem, p. 181 and Rocznik statystyczny 1990, Główny Urzad Statystyczny, Warszawa 1990, pp. 138.

[32] In 1998 this ratio equalled 27.4 per cent; Raport o inflacji 1998, op. cit., pp. 70.

[33] Ibidem.

[34] The public debt cost GDP ratio equalled: in 1993 3.4 per cent, in 1994 4.1 per cent, in 1995 4.8 per cent, in 1996 3.9 per cent, in 1997 3.5 per cent and in 1998 3.3. per cent; E. Adamiak, A. Siarkiewicz, Obsługa krajowego zadłużenia budżetu w latach 1992-1996, Bank i Kredyt 1997, no. 10, p. 17 and Raport o inflacji 1998, op. cit., p. 69.

[35] The initial balance stands for budgetary revenues and expenditures lessened by public debt services costs.

[36] Raport o inflacji 1998, op. cit., p. 69.

[37] In Poland, the general government sector consists of the central government budget, the budgets of local governments, public social security funds (including the Social Insurance Fund (in Polish: Fundusz Ubezpieczeñ Spolecznych, FUS) and the Farmers' Social Insurance Funds (in Polish: Kasa Rolniczego Ubezpieczenia Spolecznego, KRUS)), other specific-purpose state funds, public health-insurance funds (in

reasons for that was an introduction of four systemic reforms, especially the social security and public health care reforms that generated tensions within the public finance sector. Higher than anticipated costs of this operation contributed to serious deepening of the budget imbalance. Although the central budget's deficit was smaller than of previous years, the central social security public health-care funds suffered financial resources shortage resulting in deficit of 1.2 % of GDP. Additionally, local governments' deficits amounted to another 0.2 % of GDP, which in turn was due to short-term costs of administrative reform.

In 2000, the slowdown of economic growth (4.1 % of GDP) resulted in diminished budgetary incomes while still higher inflation led to greater budgetary expenses, mainly due to indexation. The strains within the reformed sectors still existed but the very emphasis within it has been shifted.[38] Eventually, the public finance general-government deficit amounted to 3.0 %, including 2.2 % of the central budget[39]. In 2001 theses tendencies sustained their dynamics, which resulted in deficit equaling 3.8 % of GDP.[40] The extent of budget deficit reached in 2000 may give an impression that Poland already fulfils the budget deficit criterion stipulated by the Maastricht Treaty. In fact, Polish definition of budgetary deficit still differs from the European System of Integrated Economics Accounts (ESA) norms, although, the Polish conception of general government sector is convergent with the one described by the Protocol No. 5 of the Maastricht Treaty. The fundamental difference is placed in the very definition and the method of calculation of the budgetary deficit. According to Protocol No. 5, the general government deficit stands for net borrowings, i.e. the difference between accretion of gross indebtedness and accretion of assets.

Polish: Kasy Chorych), as well as "non-budgetary management" covering entities settling with either the central or local governments. Such definition of general government is in general convergent with the definition stipulated by Treaty of Maastricht; A. Wernik, Public Finances, (in) M. Lubiński (ed), Poland. International Economic Report 1996/97, op. cit., p.175 and Raport o inflacji 1999, op. cit., p. 104.

[38] E.g. the FUS's financial standing got improved due to enhanced collectibility of premiums, while the Work Fund (in Polish: Fundusz Pracy, FP) displayed a serious deficit being a result of amortization of rise of the unemployment rate. Raport o inflacji w 2000 roku, op. cit. p. 48.

[39] Raport o inflacji 1999 ..., op. cit., p. 102-105 and Raport o inflacji w 2000 roku, op. cit. pp. 46-49.

[40] Ministry of Finance forecast.

In turn, Polish definition concerns a balance of budgetary incomes and expenditures.[41]

As a consequence, Polish budgetary deficit may exceed the Maastricht stipulations by circa 1 - 1.5 percentage points. Nevertheless, during the EU membership negotiations Polish government agreed to adopt the ESA standards in the field of public finance by the end of 2002.

V. Public Debt

Polish economy has entered the transition period with an enormous burden of external public debt. That was a result of massive-scale foreign loans drawn in 1970s.[42] By the end of 1989 the debt burden, including cumulated interests, had reached an amount of $ 40.8 billion.

The strategy of transformation demanded resumption of the repayment torestore Poland's international credibility.

The first step towards this direction was an agreement reached in 1991 by Poland with the Paris Club. The agreement provided for 50 % reduction of Polish net debt within two phases: 30 % between April 1991 and April 1994 and another 20 % till 2009 (2014 in relation to certain small part of it).[43] The above agreement, supported by the general success of Polish reforms, made a pathway for restructuring of Polish debt held by the London Club in 1994. This agreement covers the period of 30 years (i.e. 1995-2024) and provides for reduction of debt as much as 45 %.[44]

[41] For further analysis see: A. Wernik, Perspektywy wst1pienia Polski do Europejskiej Unii Walutowej z punktu widzenia polityki fiskalnej, Bank i Kredyt 1997, no. 6.

[42] For further details see: Z. Polański, Dlug publiczny w Polsce, (in) Szkoła Główna Handlowa i dziesięć lat transformacji w Polsce, A. Noga (ed.), SGH, Warszawa 1999, pp. 173-174.

[43] Ibidem, pp. 135-138.

[44] Ibidem, pp. 174.

As a consequence Poland started to repay its external debt in time and at full extension[45] which helped to increase Poland's credibility at the international financial market.[46] Along with the capital flows liberalization it attracted external portfolio investors to buy Polish securities. Together with the emergence of the central bank and commercialization of internal public debt it had decisive influence upon development of both Polish capital market and modern public debt management.[47]

The actual development of institution of the internal public debt in Poland had been initiated in May 1991 with an introduction of "active" debt instruments designed for raising funds for financing budget deficits. Initially, the governments decided on issuing Treasury bills of high values and short periods of maturity. Along with the economic stabilization the government securities had evolved towards long-term maturity, first with variable and then with fixed rate.[48] Moreover, this evolution was accompanied by gradual lowering of bonds' nominal value aimed at shifting the source of funds from the banking sector to the non-banking one, and therefore at limiting the pro-inflationary influence of financing budget shortages. The diversification of creditors, prolongation of government securities maturity and introduction of fixed-rate instruments considerably contributed to stable distribution of state's indebtedness burden and precise planning of its repayment, which may be perceived as successful introduction of sound principles of public debt management in Poland.

The systemic and institutional change described above bore a crucial influence upon public debt/GDP ratio during the 1990-2000 period (Table 1). We

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[45] The attempts of reaching agreement with the Paris and London Clubs were taken repeatedly in 1980s, yet till the 1990s the actual debt repayment did not exceed 20 per cent of overdue interests lump sum; L. Balcerowicz, 800 dni, op. cit., pp. 129-131.

[46] See: Z. Polanski, Dlug publiczny w Polsce, op. cit,. p. 175 and A. Slojewska, Chętnych było więcej, Rzeczpospolita, 30 January 2001.

[47] A. Wernik, Polski dług publiczny a kryteria Traktatu z Maastricht, written material for conference Spełnienie kryteriów konwergencji EMU: problemy krajów w okresie transformacji, Polskie Towarzystwo Ekonomiczne, Warsaw, 15-16 September 1997, pp. 64.

[48] In 1998 long-term debt instruments denominated 36 per cent of internal debt, at which the highest share had 3- and 5-years bonds (adequately 10.2 per cent and 12.4 per cent); Z. Polański, Dług publiczny w Polsce, op. cit,. pp. 177.

can notice that in 1990-2000 the public debt nominally has risen nearly five times, although its GDP ratio has fallen more than by half.

Table 1

Public Debt of Poland; 1990-2000

	Gross public debt		Internal debt			External debt		
Years	Bill. PLN	% of GDP	Bill. PLN	% of GDP	% of gross public debt	Bill. PLN	% of GDP	% of gross public debt
1990	53.3	95.1	7.0	12.5	13.4	46.3	82.6	86.6
1991	65.8	80.6	12.6	16.1	19.2	53.2	64.5	80.8
1992	97.9	85.3	24.2	21.1	24.8	73.7	64.2	75.2
1993	134.0	86.0	35.9	23.1	26.8	98.1	62.9	73.2
1994	147.1	69.9	50.7	24.1	34.5	96.4	45.8	65.5
1995	160.7	55.6	59.6	20.6	37.1	101.1	35.0	62.9
1996	185.5	49.4	79.5	20.2	42.9	105.9	29.2	57.1
1997	213.6	46.2	96.0	19.8	44.9	117.6	26.4	55.1
1998	220.1	43.19	108.1	21.2	49.1	112.0	22.0	50.9
1999	255.5	43.21	125.7	21.26	49.2	129.8	21.95	50.8
2000	267.3	41.1	130.2	22.3	48.7	137.1	18.8	51.3

Source: Ministry of Finance.

Moreover, the internal public debt development was accompanied by relative fall of the external public debt. It was caused by two factors: the commercialization of the domestic debt, resulting in a rise of its service costs[49], and conversion of the external debt into internal one. The direct conversion of the external debt into internal one was rather of incidental character.[50] The actual and systematic conversion has been achieved through the process of budget deficit financing, which are mainly produced by high costs of pubic debt service, since 1993 the budget initial balance (i.e. the budget balance without including the public debt service expenditures) displays a permanent surplus.[51]

[49] A. Wernik, Sztywność wydatków sektora finansów publicznych a możliwości redukcji jego deficyt, Studia Finansowe No 56, Instytut Finansów, Warszawa 2001, pp. 24-25.

[50] Such character had, inter alia, the 1994 bonds issue for initiation of the agreement with the London Club as well as 1997 and 1998 bonds issue for ahead-of-time purchase of so-called the Brady securities, being emitted within the debt restructuring agreement reached with the Club; see: Z. Polański, Dług publiczny w Polsce, op. cit,. pp. 184, 189.

[51] Ibidem, p. 181.

Moreover, since 1995 the internal debt accumulation has been additionally propelled by higher interest of portfolio investors in Polish government securities, which was basically caused by progressive capital flow liberalization and by Poland's increased credibility at the financial markets. Besides, the monetary mechanism of pre-announced crawling peg that functioned within 1991-2000 had made certain Polish debt instruments more attractive.

Since 1994, the public debt GDP ratio has been a subject to permanent fall, due to realization of the debt restructuring agreements, persistence of high economic growth and the fiscal policy of low budget deficits initiated in 1993.[52]

As far as the public debt criterion of Maastricht treaty is concerned, Poland succeeded in fulfilling it nominally as early as 1995. Nevertheless, similarly to the budget deficit criterion there are still differences between Polish and the ESA definitions of the public debt. First of all, Polish notion refers only to the debt serviced by the central budget, not the general government sector as such. Moreover, Polish method of calculation of public debt does not include its consolidation and it basically applies a capital instead of nominal formula as stipulated by the ESA.[53] Poland's overall public debt still remains below 50 % of GDP,[54] thus it is far smaller than the Maastricht threshold of 60 %. It is worth to mention that the public debt criterion was indirectly introduced to the new Constitution of Republic of Poland on 17 October 1997. In particular, in Article 216 (5) stipulating that "*It is forbidden to draw loans, grant financial guarantees or warrants, which may result in accretion of the public debt exceeding 3/5 part of the yearly Gross Domestic Product*".[55]

[52] A. Wernik, Polski dług publiczny a kryteria..., op. cit., pp. 64-65.

[53] For further analysis see: A. Wernik, Perspektywy wstlpienia Polski do Europejskiej, op. cit.

[54] R. Wojnowski, T. Gromek, Unia Gospodarcza i Walutowa – konwergencja w państwach UE i w Polsce, Wspólnoty Europejskie 2001, no. 1, p. 38.

[55] Authors' translation. The Constitutional record is more precisely specified in the Act on the Public Finance of 1998.

VI. Exchange Rate Policy Evolution

1. The Zloty's Convertibility and the Liberalization of Capital Flows in Poland

The Polish currency – the zloty – was not convertible since 1936[56] until 1 January 1990. The Balcerowicz Plan, aimed at transformation of the Polish economy considered the zloty's convertibility as a major element of transformation strategy.[57] The restoration of the zloty's convertibility was conducted within two phases: from the internal convertibility to the external one.

The first phase was initiated with introduction of the internal convertibility, which was to facilitate price liberalization at the internal market and demonopolization/deregulation of the foreign trade. The introduction of the internal convertibility, being accompanied by the fixing of the exchange rate at substantially undervalued level, was in a way an instrument for protecting the internal market. The government secured the risk of failing the undertaking by raising the so-called Stabilization Fund, which was supplied by a tranche of US$ 1 billion being drawn from the IMF.

Within the period 1990-1994 the exchange rate control was gradually liberalized. The changes included free access to foreign exchange for residents who conducted foreign transactions (1989) as a dominant part of their activity (trade, transport, shipping and insurance). Moreover, Polish enterprises were

[56] K. Żukrowska, Przygotowanie Polski do EMU: polityka kursowa i realizacja kryteriów konwergencji, Wspólnoty Europejskie 1998, no. 10, p. 11.

[57] By changing the Act on Foreign Exchange of 15 February 1989 through Amendment of 29 December 1989; (Ustawa Prawo dewizowe [Act on Foreign Exchange] of 15 February 1989, Dziennik Ustaw [Journal of Law] 1989, no. 6, item 33); see more: E. Pietrzak, Wymienialność złotego, Biblioteka Menedżera i Bankowca, Warszawa 1996, p. 38-39. For more details on the theoretic aspects of an economic transformation see: K. Żukrowska, Przemiany systemowe w gospodarce: teoria i praktyka, Polski Instytut Spraw Międzynarodowych, Studia i Materiały no. 91, Warszawa 1995 and also P. Bożyk, 24 kraje Europy Środkowej i Wschodniej. Transformacja, Szkoła Główna Handlowa, Warszawa 1999.

allowed (1991) to provide the foreign partners with short-term commercial loans and services different than those mentioned above.[58]

Non-residents were granted (1991) the right to transfer abroad the total revenues (including dividends) gained on the investments made in Poland.[59] In 1993 non-residents obtained free access to portfolio investments including equities, Treasury bills and Treasury bonds.[60] This decision, though helpful in reduction of the Polish budget deficit, opened the immature Polish capital market to short-term capital inflow.

Within the next period (1995-1998) Poland had made a considerable move towards further capital flow liberalization, linked closely with the accession to the OECD. The new legal acts lifted all the restrictions on the current foreign transactions. Simultaneously, they granted a freedom of payments within the current account for both residents and non-residents. Unfortunately, the capital account transactions were still restricted, especially in terms of capital exports.[61]

The steady fall of the inflation rate, the restoration of Poland's credibility at the international financial markets,[62] and the gradual increase of Polish foreign exchange reserves created suitable circumstances for initiating the second phase of restoration of zloty's convertibility aimed at reaching the external convertibility.

This process was started on 24 May 1995 (of validity on 1 June 1995) when Poland declared readiness to accept the requirement of Article VIII of the IMF Statute. This decision did not change much the practice of the Polish exchange rate mechanism.[63] However, it had a profound psychological, political and social meaning.[64] After IMF's acceptance of zloty's convertibility Polish ex-

[58] E. Pietrzak, Wymienialnoœæ złotego, op. cit., pp. 40-41.

[59] K. Żukrowska, Przygotowanie Polski do EMU, op. cit., p. 12.

[60] Ibidem and also E. Pietrzak, Wymienialnoœæ złotego, op. cit., pp. 43-44.

[61] For more details see: ibidem, pp. 73-95.

[62] See: Z. Polański, Dług publiczny w Polsce, (in:) Szkoła Główna Handlowa i dziesięć lat ..., op. cit.

[63] For the fact, that this decision regarded the very basic variant of the IMF convertibility standard; E. Pietrzak, Polska polityk dewizowa i polityka kursowa w œwietle przystąpienia Polski do Unii Europejskiej, Bank i Kredyt 1997, no. 6, pp. 77-82.

[64] E. Pietrzak, Wymienialność złotego ..., op. cit., pp. 81-84.

change legislation was further liberalized. This process was promoted by three general reasons. Firstly, Polish currency was exposed to appreciation accompanied by rocketing foreign exchange reserves. Secondly, in the short view of the OECD membership, Poland had to take efforts on further opening of the domestic capital market for non-residents. And finally, the EU membership demanded essential adjustments in the field of capital flows.[65]

Most of the decisions on opening the Polish market to foreign capital inflows at the time were arranged within the framework of OECD membership negotiations. Having obtaining an OECD membership in 1996 Poland did not lift all the restrictions on the capital movement,[66] but committed itself to suppress the asymmetry between the exports and imports of capital. In terms of capital exports, Poland lifted restrictions on capital transactions connected to the FDIs, which enabled placing such investments in OECD member states since 1 April 1996. This regulation concerns a purchase of equities or shares in amount assuring at least 10 % of voting power, such as an establishment of branches or acquiring real estate in OECD member states. However, the other forms of capital exports from Poland were liberalized to a much smaller extent and limited with additional preconditions. This concerns portfolio investments and commercial loans by residents requiring authority permit.[67] On 12 January 1999 a new Foreign Exchange Act came into force, which introduced important modification to the existing law.[68]

First of all, it applied the definitions of "residents", "non-residents", "foreign exchange transactions" etc. at the full compatibility with international standards.[69] In principle, the Act adopts the fundamental rule of the non-interference in the exchange rate market trends at all of the market segments and it lifted the general exchange permits system in favor of the individual

[65] K. Żukrowska, Przygotowanie Polski do EMU ..., op. cit., pp. 13.

[66] E.g. there still existed serious divergence on the question of real estate acquisition; See: E. Pietrzak, Polska polityka dewizowa i polityka ..., op. cit., pp. 81-82.

[67] This condition was introduced by the Polish Securities Commission, which in fact is not fully utilized for there still is a great asymmetry between capital supply and capital demand in a country in transformation which still is Poland. See more on this issue: Ibidem, p. 79.

[68] Ustawa Prawo dewizowe [Act on Foreign Exchange] of 18 December 1998, Journal of Law 1998, no. 160, item 1063.

[69] E. Pietrzak, Polska polityka dewizowa i polityka . op. cit., p. 81.

ones. It also introduces the formal equality of Polish zloty in relation to convertible currencies.

The Act introduced also the general freedom of capital flows, except the ones demanding the separate exchange permit, which are:

- conducting FDI and portfolio investments by residents in the non-OECD states;
- conducting by residents and non-residents short-term portfolio transactions on securities and derivatives (excluding instruments subject to the Warsaw Stock Exchange and Central Offered Bid turnover);
- contracting by residents and non-residents credit transactions of maturity shorter that one year;
- raising and keeping by residents foreign exchange accounts abroad.

In order to introduce a total convertibility to zloty Polish government undertook to lift all the obstacles existing by the end of 1999. However, this decision was officially suspended in January 2000, since Polish economy was suffering a severe current account deficit exceeding 8 % of the GDP. It is however anticipated, that the complete capital flow liberalization resulting in granting to zloty total convertibility, will be completed by the end of 2002.[70]

2. Exchange Rate Mechanisms

The Polish exchange rate policy during 1990s has been assigned different, often divergent, functions. The most important of them: to provide an anchor of transformation and stabilization, to curb inflation, to stimulate economic growth and to increase competitiveness of Polish goods abroad. The exchange rate regime evolution may be divided into four phases:

- Administratively set fixed peg (1 January 1990-13 October 1991).
- Administratively pre-announced crawling peg (14 October 1991-15 May 1995).

[70] A. Slojewska, *Rynek obejdzie przeszkody*, Rzeczpospolita, 12 January 2000.

- Exchange rate set by Central Bank within a crawling band (16 May 1995-11 April 2000).
- Managed floating rate (since 12 April 2000).

A *fixed peg* was instrumental in implementing a uniform rate. This was done at a rate of 9500 zlotys per dollar,[71] which meant considerable devaluation of zloty.[72] The dollar peg was applied for as long as nearly a year and half till a serious zloty's overvaluation attained. This demanded rapid change of the fixed rate, which happened on 17 May 1991 when zloty was devalued by 14,4 % against the dollar. At the same time dollar was replaced by a combination of currency basket to which zloty was thereafter pegged.[73]

This mechanism survived only for few months. The new mechanism, named a *pre-announced crawling peg*, was introduced on 14 October 1991. The change was urged by the emergence of the new priority, which was to support Polish exporters against continuous hidden zloty's appreciation caused by differences between Poland's and its main trade partners' inflation rates. Therefore the hitherto existing fixed peg was equipped with the mechanism of pre-announced, monthly devaluation, which was to secure the real exchange rate at the desirable level.

Initially, the devaluation coefficient was set at 1.8 %, but thereafter it was gradually reduced to 1.2 %.[74] Moreover, simultaneously to the "crawling" rate of devaluation the mechanism admitted discrete devaluation (10.7 % on 26 February 1992; 7.4 % on 27 August 1993).[75] The new exchange rate was administratively set by the National Bank of Poland (NBP) in accordance with officially announced rules. The rate could fluctuate within the band of ± 2%.

[71] The choice of the US dollar was due to the fact, that most of Polish foreign trade operations were invoiced with this currency; see: K. Żukrowska, Przygotowanie Polski do EMU ..., op. cit., p. 15.

[72] In December 1989 the market rate totaled some 6000 zlotys for one US dollar; L. Balcerowicz, 800 dni..., op. cit., pp. 198.

[73] The basket was composed of US$ - 45 %; German Mark 35 %; Pound sterling - 10 %; French franc - 5 %; Swiss franc - 5 %. The share of individual currencies corresponded to their share in invoicing of the Polish foreign trade. K. Żukrowska, Przygotowanie Polski do EMU ..., op. cit., p. 16.

[74] E. Pietrzak, Wymienialność złotego ..., op. cit., pp. 60-63.

[75] K. Żukrowska, Przygotowanie Polski do EMU ..., op. cit., p. 16.

Such solution was possible only at the newly emerged inter-bank currency market.[76] It did not bind the NBP to conduct interventions at defending the zloty's exchange rate.[77]

The progressive stabilization of the zloty made the exchange rate policy face additional tasks of counteracting flows of short-term (speculative) capitals and neutralizing the rapid growth of the foreign exchange reserves. This led to introduction of a new exchange rate mechanism on 16 May 1995. This was the *exchange rate set by central bank within a crawling band.* Its principle was pegging the zloty to currency basket, being calculated by the NBP (the central rate), together with pre-announced monthly devaluation, which was reduced from hitherto existing 1.2 % to 1.0 percent in January 1996.[78] However, the new mechanism contained four new elements. First of all, the band of fluctuations *vis-à-vis* the basket had been widened from ±2 % to ±7 % and, on the contrary to previous rules, under the new regime NBP had to intervene to keep zloty within the defined band,[79] which was the second new element. The third one was an introduction of the institution of *fixing,* it concerned two main currencies of the basket: US dollar and German mark while the remaining basket currencies were still fixed in accordance with the Frankfurt Stock Exchange record. In short, the dollar and mark fixing was obtained in a way of confrontation of bids an offers at the inter-bank currency market being collected by the NBP everyday between 2.00 and 2.30 PM. Then, the rates given that way were incorporated into the daily zloty's basket structure.[80] The fourth element of the new regime was the fact, that commercial banks were free to set discretionary zloty's exchange rate for their clients.

The start of the Economic and Monetary Union on 1 January 1999, resulted in reduction of the number currencies in the basket towards which zloty was

[76] See more: E. Pietrzak, Wymienialność złotego ..., op. cit., pp. 64-72.

[77] Ibidem., p. 117.

[78] W. Małecki, Koniunkturalne czynniki kszta3towania kursu walutowego w polskiej gospodarce, Gospodarka Narodowa 1997, no. 1-2, p. 43.

[79] Which was not much difficult due to Polish foreign exchange market underdevelopment; K. Żukrowska, Przygotowanie Polski do EMU ..., op. cit., p. 17.

[80] For more details see: E. Pietrzak, Wymienialność złotego ..., op. cit., pp. 117-121.

fixed. Since this date zloty's basket has been rearranged into two components: US dollar (45 %) and the euro (55%).[81]

The RPP redefined the function of the exchange rate policy by applying so-called Direct Inflation Target (DIT) within the monetary policy. This in fact implies, that the exchange rate policy has been subordinated to the goal of fighting inflation. Therefore the RPP decided on gradual reducing of the monthly devaluation coefficient from 1 % to 0.3 %. Moreover, taking under consideration the capital flow liberalization, the RPP adapted the interest rate parity rule by progressive widening of the fluctuations band from ± 7 % to ± 15 % which was to add an element of uncertainty.[82] Another step confirming the RPP's intention to flexibilise and marketise the exchange rate mechanism was suppression of the fixing institution on 7 June 1999. Since this date, the zloty's basket is fixed on the basis of the average price offered by the ten most active foreign-currency banks at the inter-bank currency market at 11 a.m.[83]

On 11 April 2000 the Polish government introduced a *managed floating* exchange rate mechanism. The NBP is still entitled to influence the exchange rate but only through discrete instruments like interventions at the foreign exchange market conducted at the equal rights regarding other players (so-called "*float management*"). It also guarantees the exclusion of the administrative-like incentives.[84]

There were three main reasons for implementing the managed floating exchange rate. First of all, the DIT strategy necessitated removing any inflationary incentives from exchange rate mechanism. Secondly, under the new Act on Foreign Exchange of 1998 it was indispensable to get rid of the fluctuation band which was to eliminate the risk of speculative attacks and which was

[81] A. Słojewska, Rynek nie zrozumie, Rzeczpospolita, 10 February 1999. Such a weight of US dollar is due to the fact that most of the Polish external debt is denominated in this currency. This, inter alia, was a consequence of the London Club agreement, which provided for converting the Polish debt into so-called Brady bonds denominated in US dollars; B. Sokołowska, Wprowadzenie euro jako wyzwanie dla polityki kursowej oraz zarządzania długiem i aktywami (in:) B. Sokołowska (ed.), Konsekwencje realizacji III etapu Unii Gospodarczej i Walutowej dla Polski, IKiCHZ, Warszawa 1998, p. 152.

[82] A. Słojewska, W perspektywie model czeski, Rzeczpospolita, 11 Januray 2000.

[83] A. Słojewska, Złoty bardziej płynny, Rzeczpospolita, 4 June 1999.

[84] A. Slojewska, Sz. Karpiński, Złoty całkiem wolny, Rzeczpospolita, 12 April 2000.

particularly essential in the face of the widespread currency crises of 1997 and 1998. The third reason was to determine the medium-term level of zloty's equilibrium representing its real, market value,[85] which will be crucial during fixing the zloty against the euro on the verge of its participation at the Exchange Rate Mechanism II and replacing it with single European currency afterwards.[86]

VII. Conclusion

Firstly, it may be noticed that Polish economy distinctly proceeds on its way towards achievement of the Maastricht criteria. *Secondly*, it is important to notice that the Poland's ability of achieving the convergence criteria is, alike other EMU candidate countries, seriously burdened by the heritage of the past. The specificity of Polish heritage stands mainly for considerably high employment in the heavily partitioned agriculture, significant role of the coal mining industry being concentrated in one region and strong, historically conditioned role of trade unions. The other burden inherited from the past, which is characteristic to Polish economy, is huge external public debt. The debt's servicing incurs colossal expenditures upon the state budget and indirectly leads to the rise of the internal indebtedness. *Thirdly*, as the opening of the Polish economy proceeded, the progress in the field of the convergence criteria attainment became more dependent on the external factors. *Fourthly*, the very fundamental factor influencing the general trend of convergence criteria fulfillment by Poland is the slow progress in the field of stemming the inflation. Relatively high inflation rate is followed by the pressure upon maintenance of the relatively high interest rates, thus restricting the use of this tool in stimulating the economic growth and in lowering the unemployment rate. *Fifth*, the progress on the way of Maastricht criteria attainment is dependent on the further progress in the field of systemic transformation, especially privatization and deregulation

[85] For till 12 April 2000 the zloty's real exchange rate was more or less disturbed by the administrative elements of its exchange rate mechanisms.

[86] D. Rosati, W stronę rynku, Rzeczpospolita, 18 April 2000.

of the economy. Any evident development on this way moves Poland closer to the EMU convergence requirements. On the other hand, any slowdown in the transformation results in widening of the convergence gap. *Sixth*, relatively slow progress in the attainment of the convergence criteria by Poland may be to certain extent explained by the insufficient social pressure on carrying this goal out. This, in turn, may stand for the fact that Polish society is not really interested in these issues, which, at least till the date of the EU accession, appear to be too abstract and distant.

VIII. Andrzej Kaźmierczak: Comment

Joining Euro area will encourage trade and financial flows between Poland and EU countries at the expense of other economic areas.

Poland has become an open economy influenced by financial disturbances from outside. Joining EMU will provide better protection against international crises. One has to hope it would be more easy to overcome speculative flows jointly with Euroland while preserving the benefits of scale coming from the large trade and financial area.

International lending has become important factor of growth and stabilization of Polish economy. Most of lending has come from EU banks. Poland is closely integrated with Euroland in terms of financial links. Fast growth and stability will stimulate direct and portfolio investments to Polish economy from other EU members.

Deregulation of local financial and foreign exchange markets, free entry of foreign financial institutions will make financial sector in Poland more competitive, efficient and more safe. On the other side, one has to expect the development of phenomena of mergers and acquisitions in Polish financial sector. Non-bank financial intermediaries will try to increase their share in financial services market at the expense of commercial banks.

Polish banks are undercapitalized. It is necessary to create two or three Polish banking groups with sufficient core capital able to compete effectively with foreign financial groups on international markets.

Banks are only as good as their client base. Client business will continue to determine the overall business for banks. Corporate clients rely to a larger extent on Euro because of trade and financial links with western European partners. The Euro has become an important bond issue currency for Polish firms. One could expect the Euro to dominate these financial services at the expense of US dollar. Euro is also becoming an increasingly important currency in foreign trade invoicing of Polish enterprises.

Joining the European Monetary Union will oblige Poland to improve an efficiency of payments system and to develop new electronic payment products. So, the transfer of financial know-how will take place.

Polish central bank applies the same modern market instruments of monetary policy as European System of Central Banks. That's why the process of joining common monetary policy of Euroland should pass smoothly.

Poland is on the good way to fulfill Maastricht criteria. Inflation rate has dropped to 4,2%. Central bank and market interest rates have decreased substantially this year though their level is still too high. Public debt/GDP ratio doesn't exceed 50%. However, budget deficit problems have appeared, which need dramatic solution. Otherwise, budget deficit/GDP condition is threatened.

Joining Euro land has advantages as well as costs. Some economists typically stress the former rather than the latter. Costs of replacing national currency by Euro are not negligible. The most important disadvantage is loosing the possibility of exchange rate changes as important trade policy instrument. Additionally, the central bank will loose monetary policy instruments such as interest rate changes and money supply control. The central bank will not be able to shape economic activity level and to run full employment policy. Resignation of an official foreign exchange reserves can weaken the decision making process on the national level.

One has to hope that monetary integration process will promote an elimination of economic development differences in Europe instead of preserving it. That's why, each candidate country should calculate all advantages and all costs carefully before it joins Euro area.

Exchange Rate Regime of Hungary and Approaching EMU Membership

By Kálman Dezséri

I. Exchange Rate Policy in the Transition Economies – EU Enlargement and Joining EMU

The Eastern enlargement of the EU seems to be irreversible process. Participation of the accession countries in the EMU will be the final step towards their full economic integration to the EU. It was made clear many times that the accession countries can only become members of the EU if they fulfill the criteria of the Treaty of the EU and there will not be any automatic link between EU membership and participation in the EMU. Membership in the EU requires not only full implementation of community legislation (acquis communautaire) but also to build up the institutions of market economy in order to ensure the effective application of the EU legislation.

The next stage lies between accession to the EU and EMU membership. The CEECs as new EU members will have to view their economic policies, including exchange rate policies, as a matter of common concern to all EU members. The CEECs will have also to join ERM-2 and pursue the convergence criteria necessary to adopt the euro. There won't be any concession for them like the opting in facility granted to the UK or the opting out facility granted to Denmark.

The last stage will be the adoption of the euro and full membership of EMU. The stability criteria set up by the Maastricht Treaty for joining the EMU will apply to the accession countries as they applied to the present member countries of the EU. For formal reasons, the earliest possible date of joining the

EMU would be two years after membership in the EU. This step will follow a favorable decision of the European Council based on the convergence reports of the ECB and the European Commission.

Now, the accession countries are well advised by the EU Commission not to push too hard for early EMU membership. Their economies have to adjust first to the competitive shock of participation in the Single Market. This advice is based among others on the experience of German unification. The premature introduction of the German Mark in East-Germany and the abandoning the autonomous monetary policy as policy instrument as well as the abandoning the possibility of exchange rate adjustment have had adverse effects on the economy in the Eastern part of Germany. There was no political alternative at that time. Whereas accession countries may decide the optimal timing of their future joining EMU.

In the accession countries, political priorities do not go often along with economic rationality. In some accession countries, economic policies are already targeting the fulfillment of Maastricht criteria. Some of these countries do it because they have been able to achieve rather good budgetary and inflationary records. However, it is questionable whether these performances are in all cases appropriate for the economic catching up and the transition to a market economy.

In view of EU membership and preparation for EMU, the issue of exchange rate regime has particular importance. In the accession countries, a wide range of different exchange rate regimes were introduced. The applied regimes range from free-floating rates to rigid pegging systems with currency boards. Neither the theoretical economists nor the economic policy making economists share a common view on specific exchange rate regime, which can be useful for all accession countries during the pre-accession period. Exchange rate system should be consistent with the particular economic situation in each country. Thus, what is adequate exchange rate regime in one country can be harmful in another.

II. Exchange Rate Regime of Hungary

During the first half of the 1990s, Hungary had an adjustable pegged exchange rate regime. The relatively frequent devaluations provided a great deal of flexibility. The nominal devaluations did not, however, prevent real appreciation of the Forint. In 1995, as one of the most important elements of the stabilization package, a crawling peg was adopted. The crawling bands significantly reduced the exchange rate flexibility of the Forint. Thus, the deepening economic crisis prompted both a fiscal tightening and the adoption of a harder exchange rate path. The austerity economic policy showed its positive effects very soon. The pre-announced rate of monthly devaluation was reduced gradually.[1]

At the time when the other transition countries followed the new conventional wisdom of opting for very fixed or very flexible exchange rate, Hungary pursued successfully a middle ground policy. In certain situation it was a dangerous position. Moreover, it could have increased its vulnerability to capital flows. Apart from 1999, Table 1 contains little evidence of such a trend. Remaining capital controls may account for some of the explanation.[2]

The last three columns of Table 1 show whether the central bank attempted to sterilize reserve inflows to prevent them to influence the domestic money supply. The absence of sterilization brings about an increase in the central bank liabilities (domestic currency) accompanied by a balanced increase in both net domestic assets (NDA) and net foreign assets (NFA) of the central bank. The NFA growth vastly outstrips liability growth when domestic debt (negative NDA) is issued to sterilize the monetary consequences of reserve inflows. In the case of Hungary, foreign reserves were stockpiled on a large scale, financed by heavy issues of domestic debt that took net domestic assets well into negative direction.

[1] The monthly rate was 1.3 % in 1995 when the crawling peg system was introduced and 0.2 % in 2001 when it was abandoned.

[2] Begg and Wyplosz (2001).

Table1

Balance of Payments of Hungary 1991-2000

	Current Account in bn $	FA in bn $	of which			Balance of Payments in $ billion	Balance of Payments/GDP %	Short-term Interest rates, %	CA/GDP %	Real ex change rate
			FDI	Portfolio	Other					
1991	0.4	1.5	1.5	0.0	0.0	1.8	5.4	30	1.2	89.0
1992	0.4	0.4	1.5	0.0	-1.1	0.8	2.1	35	0.9	98.8
1993	-4.3	6.1	2.4	3.9	-0.2	2.5	6.5	23	-11.0	105.3
1994	-4.1	3.4	1.1	2.5	-0.2	-0.5	-1.2	17	-9.8	104.2
1995	-2.5	7.1	4.5	2.2	0.4	5.4	12.1	27	-5.7	100.0
1996	-1.7	-0.7	2.3	-0.4	-2.6	1.2	-2.7	32	-3.8	102.8
1997	-1.0	0.7	1.7	-1.0	0.0	-0.2	-0.4	24	-2.2	108.1
1998	-2.3	3.0	1.6	1.8	-0.4	1.0	2.1	20	-4.9	107.5
1999	-2.1	4.7	1.7	1.9	1.1	2.3	4.7	18	-4.3	109.5
2000	-1.5	2.4	1.2	-0.5	1.6	1.1	2.4	16	-3.3	109.6

	(BoP-CA) /GDP %	HUF/ US $	GDP US $ Bn	Budget/GDP %	CPI Δ P/P %	Monetary Authorities Balance sheet; Currency, NFA, NDA		
						Billion, Forints		
1991	4.2	75	33.3	-3.8	34	500	237	263
1992	1.2	79	37.2	-7.3	23	607	2741	333
1993	17.5	92	38.6	-5.7	23	624	549	75
1994	8.6	105	41.6	-7.1	19	614	635	-21
1995	17.8	125	44.5	-6.4	28	723	1550	-827
1996	1.1	153	44.6	-3.1	24	660	1560	-900
1997	1.8	187	45.2	-4.5	18	858	1590	-732
1998	7.0	214	47.5	-6.2	14	1033	2008	-975
1999	9.1	237	48.5	-3.7	10	1297	2836	-1539
2000	5.6	282	45.7	-3.5	10	1524	3054	-1530

Notes: FA denotes the financial account comprising of the foreign direct investment (FDI), portfolio investment, and other (short-term) capital flows. Although there is some ambiguity about the allocation of capital transfer payments and errors and omissions, they were added implicitly to the capital account. Thus, subtracting the current account from the overall balance of payments yields an estimate of the size of capital flows, normalized by dividing by GDP.

The last rules of capital control were abandoned in June, 2001, which meant that de facto full convertibility was achieved. The new law endorsed in October 2001 on currency regulations liberalized completely both the current and capital accounts transactions. Thus, de jure full convertibility was introduced at the end of 2001. In parallel with these steps, the crawling peg exchange rate regime was replaced by a flexible regime.

The process of shifting from crawling peg to a flexible exchange rate regime has had several stages. First, the crawling band was widened from ± 2.5 % to ± 15 % in June 2001. On October 1 2001 the crawling peg regime was officially abandoned and inflation targeting was introduced. The new exchange rate regime is a floating within a ±15% band. All these changes were necessary to meet the obligations, which were undertaken by Hungary when joining the OECD and to fulfill the preconditions of future EU memberships and EMU accession later on.

III. Hungary's Official View on Exchange Rate Regime Approaching EMU

The question for Hungary like for any other accession country is what is the best monetary policy to approach EMU membership. The official view of the Hungarian government on the participation in EMU seems to be too optimistic and very much influenced by political priorities. That is, economic rationality has been to certain extent ignored.

According to the government declaration Hungary shares the objectives of the EMU and accepts the acquis communautaire in this field. Hungary will take the appropriate measures and create the necessary conditions for the effective application from accession of the rules and requirements of the EMU. Thus, the acquis communautaire in this field will be directly applicable and does not require transposition into the national legislation because the Hungarian legislation and practice are already in conformity to a large extent with EU requirements. Upon joining the EU, Hungary will probably enter the ERM-2 of the EMU. The adoption of the single currency will take place later on, as soon as the Maastricht criteria are met. The government expects that the country will need 2-3 years to fulfill these criteria after the accession to the EU in 2004. That is, the Hungarian economy will be prepared for joining the EMU by 2006.

In its Opinion on Hungary's application for membership of the EU the European Commission concluded: "Hungary's participation in the third stage of EMU as a non-participant in the Euro area should pose no problems in the medium term, provided that central bank legislation is made fully compatible

with EC rules and that the stability orientation of current monetary and exchange rate policies is maintained."

The Hungarian government stated that "the government assumes that upon joining the EU Hungary will enter the third stage of the EMU as a non-participant in the Euro area, i.e. as a ‚Member State with a derogation' as defined by Article 109k of the EC Treaty. In this field the EC Treaty, its Protocols, implementing regulations and decisions will be directly applicable and do not require transposition into the national legislation. However, Hungary by the time of accession will take all possible measures of harmonization and will eliminate the incompatibilities with the acquis that still exist in the national legislation. These measures will cover all the elements of the acquis except for those that are inseparably attached to membership."

Hungary shares the objectives of the introduction and the functioning of the single currency and will adopt the Euro as soon as possible, i.e. as soon as the conditions laid down by the Treaty and its Protocols are met. In the meantime the Hungarian government intends to keep the national economy of the country on the path leading to the fulfillment of the convergence criteria.

The Hungarian legislation and practice was already years ago in conformity to a large extent with the Community requirements. Nevertheless, in order to achieve full conformity with the acquis communautaire, Hungary took, among others, the following specific legislative measures by the end of 2000:

a) The Act on the National Bank of Hungary (Act LX of 1991 as amended) was amended to guarantee the independence of the National Bank of Hungary in accordance with the provisions of the EC Treaty and the Protocol on the Statute of the ESCB and the ECB, in particular with Article 104 of the Treaty and Article 7 and Article 14, paragraphs 1 and 2 of the Protocol.

b) Although price stability is in fact the primary objective of the Hungarian monetary policy, the text of the Act on the National Bank of Hungary was amended to reflect this objective fully in line with the wording of the Treaty. The new text should stipulate that the primary objective of the National Bank of Hungary is to achieve and maintain price stability. It should also make clear that while the National Bank of Hungary supports the realization of the economic policy of the government, this support is without prejudice to the objective of price stability.

c) The short-term credit facility by the National Bank of Hungary available to the central budget to overcome temporary liquidity problems was eliminated. In fact this facility was not used since 1995.

d) In order to rule out the possibility of privileged access Act CXIII of 1996 on Home Savings and Loan Associations was amended by eliminating the preference afforded to the government securities in the portfolio composition of these institutions.

The Hungarian government considers that the maintenance of restrictions for which transitional periods are requested in the area of free movement of capital does not constitute a privileged access by the government and the regional, local or other public authorities of Hungary to financial institutions. Upon elimination of the preference afforded to government securities in the functioning of the home-savings associations as described in paragraph d, the Hungarian laws and regulations will contain no further rule providing any possibility for privileged access.

In view of the Hungarian government, the current balanced and dynamic growth can be maintained, and even some acceleration in the rate of growth is realistic over the medium term. The Hungarian government considers that the fulfillment of the criterion of sustainable financial position by the assumed date of accession (1 January 2004) is a realistic objective. As a consequence of the prudent fiscal policy to be pursued, both the deficit/GDP and the debt/GDP figures will continue to decline. The fact that after so many years of double-digit inflation the increase of consumer prices has recently fallen under 10% is considered by the government as a promising sign for the future. The continuation of the disinflationary process will create the basis for meeting the criterion of price stability within a few years after the accession.

The Hungarian government hopes that after the accession to the EU the country will be ready to join as soon as possible the ERM-2 and that the Hungarian currency will be able to stay within the fluctuation band. Until October 2001, the country applied a crawling-peg regime in which the rate of the crawl was gradually declining, in line with the disinflationary process. The central rate of the Forint was linked to a currency basket consisting of 70% euro and 30% USD and from 1 January 2000 it was linked solely to euro. The market rate could fluctuate within a band of ± 2,25% until June 2001 and since then a ± 15 % around the central rate.

Since 1995, the National Bank of Hungary had to intervene in support of the Forint only in the Autumn of 1998 (in the wake of the Russian financial crisis) for a limited period of time.

The Hungarian government issued its first ten-year bond in 1999, which has made since then possible the assessment of long-term interest rate developments.

In 1997, a Joint Assessment of Hungary's medium term economic policy priorities was established as a result of a joint project of the Hungarian Ministry of Finance and the European Commission. This practice of joint assessments serves as a means of preparation for drawing up convergence program required by the Treaty and for participation in the EC co-ordination procedures. According to the Hungarian government's view the effective application of the obligations of the EMU the necessary and adequate institutions already exist (Ministry of Finance, Ministry of Economic Affairs, National Bank of Hungary, Central Statistical Office) and they have the required capacity of operation.

The ultimate goal of the Hungarian monetary policy is the sustainable reduction of inflation. The exchange rate (crawling peg) and interest rate policies (repo) were the instruments of the central bank until 2001 to achieve this goal. Since October 2001, the inflation targeting is the main element of the monetary policy. Besides promoting savings and enabling the curbing of inflation, the interest rate policy has had to ensure that capital inflows, particularly its speculative elements, can be contained within reasonable limits.

The crawling peg system, which was effective between 1995 and 2001 served the Hungarian economy well, and proved to be the appropriate solution for the economy. It provided a degree of predictability in the development of the exchange rate system and at the same time maintained the necessary flexibility against external shocks. It also helped to consolidate external economic equilibrium and improve competitiveness. This was reflected in the dynamic growth of exports and a favorable movement in the real exchange rate indices.

IV. Economic Rationality

The government's evaluation of its policy achievements includes realistic elements as well as optimistic views. On the legal and institutional sides much has been done to fulfill various preconditions of EU and EMU membership. The shifts in the monetary and exchange rate policies include positive elements, which may facilitate the EMU accession. However, some trends of the economy do not support the optimistic view of the government concerning an early joining of Hungary to the EMU.

Hungary is a small open economy. The combined amount of exports and imports comes to about 125 % of the GDP. The share of the EU within the total trade turnover is about 70 to 75 %. Reflecting this high degree of openness and close economic integration with the EU, it was a reasonable decision when the composition of the currency basket used for the establishment of the exchange rate was replaced by single pegging to the Euro.

An earlier plan envisaged that the crawling peg regime would be replaced by a pegging to the Euro through a smooth transition. The date of this shift to a fixed exchange rate regime was to be determined by the speed of curbing inflation. The maintenance of the crawling peg was supposed to become unnecessary as soon as inflation fell below 5 % and the inflation differential relative to the inflation of the main trading partners has been reduced to below 3 %. The crawling peg regime was, however, abandoned in 2001 much before these ratios were achieved.

The crawling peg regime was replaced by a system of central rate fixed to the Euro with a 15% intervention band rate in October 2001. The government supposes that the full extent of the band won't be needed to accommodate actual exchange rate swings. Thus, by the date of EU accession Hungary will be ready to participate in the ERM-2 because of the expected Forint exchange rate stability. Nevertheless, further changes will be necessary so that Hungary could join the ERM-2. First of all the present method of determining central rate[3] has to be changed and single rate has to be declared as central rate.

[3] On each banking day at 11 a.m. the Hungarian National Bank declares the central rate which is the arithmetic average of the EUR/HUF exchange rates of foreign exchange deals made by the ten most active domestic credit institutes. The two highest and the two lowest rates of them are omitted from the calculation.

In the long run the reduction of inflation is a fundamental pre-condition for sound, rapid and balanced growth. As curbing inflation is one of the fundamental convergence criteria of the EMU, both the balanced economic growth and the integration of Hungary with the EU requires a sustainable reduction of inflation. Curbing inflation and keeping it in an appropriate range is fostered by reducing the role of the government, limiting the fiscal deficit and lowering public debt as a percentage of GDP. Accomplishment of these conditions – together with the two year participation in the ERM-2 – will enable Hungary to meet the Maastricht convergence criteria and introduce the single currency in the medium term.

Another important issue is the link between the liberalization of capital flow and the exchange rate regime. The establishment of sound and efficient financial services markets is an important precondition for the liberalization of capital movements. The Hungarian government has paid less attention to the domestic financial markets for the last some years. The financial deepening was ceased e.g. by blocking the reform of the pension system. The state of the domestic financial system is important issue because the process of accession entails increasingly pegged exchange rate without any support from capital account control.

V. Volatility of Capital Flows and Exchange Rate Regime

Accession countries are facing a dangerously exposed period of capital flows before the relative security of membership in monetary union. During this period, the accession countries will be committed to full capital mobility yet will have considerable constraints on the macroeconomic policies that they are allowed to follow. In particular, there is the prospect of substantial capital inflows which carry the double danger of initial domestic overheating and/or a subsequent capital outflow whenever confidence is declining.

During the transition period, Hungary has experienced capital flows to varying degrees. In the 1990s, the foreign capital inflows into Hungary reflected opportunities for profitable long term investments, the domestic savings were inadequate and the Hungarian capital market was underdeveloped and initial

distortions prevailed. Moreover, the economic transition process is characterized by big up front costs and by benefits mainly in the future. The first-best economic policy under such conditions is to borrow abroad for long term or attract FDI and to run trade surplus to service the debt.

It is fortunate case, when capital account surplus induces current account deficit of comparable size. Then, there is no change in the domestic money stock, nor much overheating of the domestic economy. The real appreciation switches the additional domestic spending to traded goods. It is important that this should not undermine the solvency of the country in the long run. The crawling peg system of the Hungarian Forint which was introduced in 1995 resulted in moderate real appreciation. This real appreciation has not deteriorated the international competitiveness of the country because the productivity of the industry particularly that of the tradable sector has improved more significantly.

To the extent the inflows are spent on capacity enhancing investments, it is possible to preserve competitiveness at an appreciated exchange rate in real term. In the case of Hungary the largest part of the capital inflow was FDI which improved the productivity of the industry and that of the whole economy. If inflows are long term and not subject to future reversal the size of the current account deficit should not be an alarming problem.

If monetary inflows reflect an increase in demand for domestic money, the money supply will correspondingly grow without raising expected spending and inflationary pressure. This theory is simple but the practice is complicated by two considerations. First, it is difficult to identify the reasons for capital inflows. If monetary accommodation of inflows are unconnected with increase in money demand, the inflationary pressure will increase. Second, if the direction of the flow of short term capital is suddenly reversed, the rapid contraction in money stock can be more costly than the earlier fast increase.

Because of these two considerations, sterilized intervention is often seemed as useful means of defense in economic policy making. Its consequences are basically threefold: increasing aggregate value of domestic liabilities issued by the central bank, growing value of international reserves, a balance of payments surplus unless the exchange rate appreciates. The question is whether the sterilized intervention can be effective policy means. The more volatile is the inflow and outflow of international capital the more difficult is to determine in-

dependently the money supply and exchange rate. Thus, under the condition of high capital mobility sterilized intervention policy may have very short-term effects only.

In Hungary like in the other accession countries, the level of capital mobility has risen from very low base. Capital mobility during financial market crisis can have particular importance. In the case of Hungary, inflow and outflow of capital during the Asian crises affected to a lesser extent the Forint exchange rate than some other currencies in the region. Since Hungary intents to join the EU and has almost completely dismantled capital controls by now, sterilized intervention policy doesn't seem to be a wise policy alternative.

The main effect of trying to sterilize capital inflows is that it disturbs the process of adjustment in interest rates. The adjusted interest rate could eventually prevent further inflow of speculative capital. Even if managed exchange rate and the prevention of large appreciation are considered as policy priorities, the policy of unsterilized intervention seems to be more appropriate. The inflow of capital increases the money supply; it reduces interest rates and attracts less additional capital inflows.

These conditions reduce to certain extent the significance of the distinction between fixed and floating exchange rates. Under floating exchange rate, capital inflow brings about a nominal appreciation that reduces international competitiveness of the country. Under pegged exchange rate, unsterilized inflow brings about monetary expansion, inflation, and a similar reduction of competitiveness. It happens unless higher money demand initiated the original increase in inflow of capital. Moreover, whenever the policy mix entails high real interest rates and real appreciation, capital inflows are likely to happen under both exchange rate regimes. The choice between fix or float may affect the size of the inflow of capital but none of them can prevent its excessive size.

If increasing capital inflow is not considered as a consequence of higher money demand and exchange rate appreciation is dispreferred, the only reliable policy alternative is a tightening of fiscal policy. The reduction of aggregate demand reduces both money demand and interest rates. The lower interest rates reduce the incentive for inflow of capital. Preventing waves of speculative and reversible inflows of capital can be an important element of sound economic policy, which aims at reducing vulnerability to sudden and damaging outflows.

As the credibility of the Hungarian economic and monetary policies increased and the market economy institutions developed Hungary experienced a growing capital inflow. The increasing exposure to capital mobility could not be easily and fully reconciled with adjustable pegged (until 1995) and crawling peg (between 1995 and 2001) exchange rate regime. Like in the other accession countries, there has been a trend towards greater exchange rate flexibility.

Sterilization policy has to be pursued independently of the exchange rate regime. Thus, countries with more flexible exchange rate regime also could not avoid to face with the perceived dilemma of how much to let reserve inflows show up in the domestic money supply.

As far as the links between the exchange rate regime of Hungary in the future and capital flow behavior are concerned there will be an important aspect, accession first to the EU and to the EMU. Hungary, like any other accession country will have to make some adjustment to their exchange rate regime along the path by which she can join the EMU. There can be several ways to evaluate how perilous this path will be and what policies can sensibly be adopted to make this path more safe.

Economic theory discusses the "holy trinity" issue, that is whether a small open economy can follow and independent monetary policy with fixed exchange rate and under the conditions of free capital movement. The EU policy requires that the future member countries have to fulfill the same preconditions as the present member countries had to do before they were qualified for EMU. The advocates of early joining of the accession countries to the EMU see the Maastricht criteria in general and in particular the requirement to stay for two years languishing in the vulnerable half way house of the ERM2 as senseless. They highlight the potential danger of this period in which capital controls are already abandoned, exchange rate flexibility is curtailed, but the euro is not yet adopted.

From this point of view there are several questions for the accession countries. E.g. whether the scale of capital flows will increase as the date of EU accession and EMU entry approaches. Or, the convergence criteria on interest rate would effect capital inflows, or will be offset by other items on the capital or current accounts. Moreover, fiscal tightening would induce increase in competitiveness despite membership of ERM2. Since the Maastricht criteria will further downward pressure on fiscal policies which have been generally quite

tight in the accession countries, there is every prospect that competitiveness can remain intact along the transition to accession.

VI. Inflation and the Exchange Rate Regime in Hungary

Regarding the Maastricht conversion criteria and the macroeconomic performance of Hungary the high inflation rate and high interest rates are among the main problems because they are significantly higher than the EMU countries' reference rates.

Between 1995 and 2000, the CPI was slightly higher than the industrial PPI and it is probable that this difference will increase in the future. The structure of the consumer prices in Hungary varies significantly that of the EU member states. These differences can be detected in the case of services, food products, and household energy.[4] It is hard to foresee how much the structure of the prices in Hungary will be maintained after the accession of Hungary to the EU or how fast it will adjust to that of the EU member states.

In the long run, according to some expert evaluation, the consumer prices of food products and household energy in Hungary may remain cheaper by 20 to 30 % than that in the EU member countries. As the experience of Spain and Portugal shows after their EU accession, the 70 to 80 % of the current price difference will have to be abolished during a relatively long period of 10 to 12 years.[5] This process of price adjustment in Hungary would add about 3 to 4 percentage points to the CPI.[6] These estimations suppose that the adoption of the EU's rules and regulations (CAP, taxes, etc.) and the expected increase in the prices of Hungarian agricultural lands in the future will bring about cost increase which will raise the consumer prices.

The catching up process makes necessary that the Hungarian GDP growth rate should substantially exceed that of the EU member states for rather long

[4] In the case of household energy (gas, electricity) the prices in Hungary are half or less than those of the EU member countries.

[5] Vissi (n.d.).

[6] Vissi (n.d.) and GKI (2000).

time. A sustainable high GDP growth rate may create the conditions on the demand side to accommodate the price increases, which will result in growing costs. The higher the GDP and private consumption growth rates, the faster the adjustment of the price structure in Hungary to that of the EU member countries. It will also bring about that the difference will widen between the increase in consumer price level and increase in producer price level. This difference between the increases of the two price levels will be partly caused by the growing demand for services.

The productivity increases faster in the tradable sector than in the service sector (Balassa-Samuelson effect), meanwhile, the wages tend to level off in the whole economy. The faster the productivity of the tradable sector increases the faster the price increase in the service sector. If the GDP growth rate is slow, the price level adjustment towards the EU level will take longer time because the consumer prices will increase rather slowly. The difference between the consumer price level increase and the producer price level increase will be narrower. Moreover, this difference may vary year by year depending on several factors (e.g. regulations, wage increase, consumer behavior, productivity, effects of weather on food products, etc.). The monetary policy can effect this process in two ways: a) the exchange rate policy effects the producer price level and influences the changes in the structure of consumer prices, b) the changes in interest rates can influence the consumption and savings rates and consumer prices.

If the Forint is pegged to the Euro, the industrial producer price level can be stabilized or its increase can be limited in the long-run. In this case the industrial producer price level would be affected by significant changes in terms of trade only. Such situation would take place if the world energy prices change. Pegging of the Forint to the Euro would not harm international competitiveness of the country if the productivity in the tradable sector increased at least by the same ratio as wages grew and the production per unit labor costs did not decrease. More precisely, the changes in the production per unit labor costs has to be similar that of the main trading partners. It means that the real exchange rate should not revalue and the relative unit labor costs should not increase. E.g., if the real wages increase by the same pace as the GDP grows, then the nominal wages should not increase by larger pace than the CPI. In such situation the Hungarian competitiveness would not deteriorate.

What concerns the main trends of the last decade, the situation may be promising. The wages have increased by smaller pace than the productivity did. During the last more than five year period, the international business cycle was rather favorable. The fast Hungarian GDP growth rate improved the possibility to higher productivity growth rate. However, it should not result in a permanent appreciation of the Forint vis-a-vis the euro. Such a step would suppose a significant decrease of Hungarian industrial producer price level. Even if the productivity increased significantly an appreciation would be too risky because it would have deflationary impacts. Pegging of the Forint to the Euro would indicate the limits of possibilities to increase prices and wages. The key question is, however, the credibility of this exchange rate regime.

According to the experience of the last more than five years, the exchange rate peg and the antiinflationary policy have been undermined not by the wage increase but by the loosening of the monetary and/or fiscal policies. The loosening of these policies create excess demand which brings about inflationary pressure. Thus, the Hungarian economy needs capital accumulation, savings which necessitates positive real interest rates of substantial size. Credible antiinflationary policy supposes the ability of interest rate increase. The loosening of fiscal policy could not be offset by tightening the monetary policy (interest rate increase).

Some estimation[7] has suggested that the CPI will exceed to a greater extent the PPI in the coming years than it happened during the last five years. Under such conditions the monetary policy will have to face more severe difficulties which will result in capital inflow. The widening to ±15 % of the exchange rate band alone won't be able to solve these problems. Until October 2001 when the crawling peg regime functioned, the monetary policy remained on the inflexible side of the spectrum, with extensive intervention at the upper margin of the band and high sterilization costs. The widening of the band resulted immediately in a real appreciation of the Forint.

The real appreciation adversely affects exporters, small and medium size enterprises, and the growth rate. Thus, the elaboration of a proper intervention policy could be necessary which includes intervention not only at the margins of the band but anytime whenever the monetary policy or the economic situa-

[7] Vissi (n.d.) and GKI (2000).

tions require it. The unexpected interventions may increase the risks of the investments of speculative capital. This policy may reduce the short-term speculative capital flows.

VII. Conclusion

The convergence of monetary policy between the EU and Hungary will be a necessary, though by no means sufficient, precondition for establishing exchange rate stability between the euro and the national currencies of the accession countries. Fixed exchange rate between an accession country and the Euro can most likely inspire mutual confidence and realize the full benefits of economic integration. Such exchange rate regime can facilitate a rapid growth of foreign trade without the possibility of "beggar-thy-neighbor policy" including devaluation or unfair trading practices.

As far as the joining of the accession countries to the EMU is concerned, the EU Commission already accepted two basic principle. First, each accession country will have discretion about the time that elapses between EU accession and the subsequent entry to the ERM-2. Second, the ERM-2 membership may be consistent with various exchange rate regimes if the central parity remains constant for two years. This precondition is consistent either with a currency board regime which has a parity against the euro, or with a regime of central parity within a band of maximum ±15 %. The former regime cannot be an option for the Hungarian exchange rate policy. The latter one does not differ very much from the current regime which was introduced in 2001.

After the EU accession, the structure of the Hungarian consumer prices can adjust to that of the EU during a relatively long period, about 10-12 years. The increase of food and energy prices will result in a growing gap of 3 to 4 percentage point between the CPI and PPI. The prices of services will also increase faster than that of the industrial products. Thus, the price increase of service will further deteriorate the CPI.

Only a strict economic policy can guarantee that the price increase of the Hungarian tradable sector products should not exceed 2 % which is the expected inflation rate of the Eurozone. The feasibility of such a strict economic

policy is rather unlikely. Thus, the Hungarian CPI will exceed the average CPI rate of the EU member countries by minimum 3 to 4 percentage point even after the accession of Hungary to the EU for quite a long time.

VIII. Harald Sander: Comment

Kálman Dezséri concentrates in his paper on exchange rate and macroeconomic policy issues for the phase prior to entering EMU. The author does not directly discuss the idea of EMU membership, nor does he explicitly address cost-benefit-consideration along the lines of the optimum currency area debate. Since the EU Commission has made clear that accession countries will have to go through an at least two year transition period in ERM-2 before joining EMU, Dezséri also takes this situation as given and focuses almost exclusively on the pre-EMU phase. Regarding the timing of EMU entry the author evaluates the official view of the Hungarian government as too optimistic, in particular because of a lack in inflation convergence and problems in establishing "sound and efficient financial services markets".

My first group of comments concentrates on the author's analysis of two issues identified as outstanding in the pre-EMU phase: (1) the problem of vulnerability to speculative attacks during the transition period and (2) the implications of the so-called Balassa-Samuelson effect for inflation convergence. Exchange rate pegs are vulnerable to speculative attacks, particularly after a period of massive capital inflows as witnessed in the Asian crisis of 1997. This has prompted many economist to favor so-called corner solutions, i.e. either the adoption of an irrevocably fixed exchange rate, for example by dollarization or – in the CEEC context – by euroization, or a switch towards fully flexible exchange rates. In the light of the decision of the EU Commission, Dezséri dismisses the first alternative. And given the current Hungarian exchange rate regime of a "central rate fixed to Euro with a 15 per cent intervention band", he then concentrates on assessing the remaining implications of this exchange regime for fiscal and monetary policies. In doing so, he distinguishes two reasons for capital inflows: an increase in domestic money demand and otherwise. If the first cause is not relevant – and the author seems to think so – the monetary policy choice in the presence of a currency peg is between sterilized and

unsterilized interventions. Sterilized intervention, according to the author, may have short-term effects only, in particular when capital inflows are huge and highly volatile. He therefore finds unsterilized interventions a more appropriate policy response as it would – in his view – reduce interest rates and thus limit the influx of foreign capital. To counter the implied impact on money supply and inflation with the subsequent danger of a loss of competitiveness, Dezséri suggests an additional tightening of fiscal policy, which again would eventually limit capital inflows by imposing downward pressure on interest rates. Moreover, a fiscal tightening would also bring Hungary closer to the requirements of the (fiscal) Maastricht criteria. Is this middle way feasible? There are surely certain advantages with this policy mix as described by the author, including a dampening effect on net capital inflows and an increase in foreign reserves. While this may help in "normal" times, the experience with the workings of ERM-2 so far is very limited and restricted to non-transition countries. One should, therefore, be aware that attacks on a fixed exchange rate that the market may not consider as an equilibrium exchange rate cannot be excluded ex ante by such a policy mix, in particular when the inflation rate is exceeding those of the major trading partners and if financial contagion would eventually affect the region. In addition to the issue addressed by the author, a more detailed discussion of the appropriateness of the current exchange regime vis-à-vis the crawling peg that existed before in Hungary, or even vis-à-vis the Euroization alternative[8] would offer additional insights. Moreover, other important points worth a further discussion are whether or not the timing for the regime switch could be considered as reasonable and whether or not the central rate has now been fixed at realistic levels.

The latter point is indirectly addressed in the discussion of the presence of high inflation in the context of the Balassa-Samuelson effect. According to the author, the consumer price index used as an (limited) indicator of inflation in both the tradable and non-tradable sector might exceed the PPI by 3 to 4 percentage points in the coming years. While he is somewhat optimistic that productivity gains in the tradable sector will continue to outstrip wage increases, he reckons that the implied increase in measured consumer price index inflation

[8] See for example Dornbusch (2001, p. 242) who writes: "There is a whole range of economies that are doing all right (say, Hungary or Mexico) that would benefit from the immediate introduction of currency boards to deepen economic integration and hence build much better growth prospects."

may create a credibility problem for the currency peg. If inflation in the tradable sector can be restricted to an expected Eurozone inflation rate of about 2 per cent, a fixed exchange rate can be maintained without competitiveness problems, but it may still provide a cause for a speculative attack on the currency peg if the deterioration of the CPI-measured real exchange rate would be misread by the markets as a loss in competitiveness (again a possible answer to this would simply be a unilateral Euroization). The issue has, however, at least three more dimensions: First, the comparatively higher CPI inflation may eventually violate the Maastricht criteria. As such it may postpone EMU entry. Second, these implication for EMU entry could induce countries to pursue more restrictive macroeconomic policies with the consequence of a gain in competitiveness. The latter could either expose the country to an even higher and thus more dangerous influx of speculative capital or, if not, to an expenditure switching that may result in belt-tightening for the own population. Finally, one might entertain the idea of modifying the Maastricht inflation criteria for transition countries as for example suggested by Pelkmans, Gros, and Nunez Ferer (2000) or Szapary (2000). While this could, in principle, make sense for the countries wishing to enter EMU, it could also raise concern about possible negative repercussions on the credibility of EMU itself.

My second group of comments follows up on what I enlisted as missing in the first group of comments. While Dezséri rightly points out that there is no single solution for adopting an appropriate exchange rate regime for all countries, I would, however, have preferred to learn more about the structural determinants that speak in favor or disfavor of a certain exchange rate regime for a certain country, including the lessons to be learned from the Hungarian case. Moreover, the author could elaborate more on the timing of a possible EMU entry and give an assessment for the case of Hungary in the controversial debate on role of "real convergence" and "nominal convergence". [9] Such a discussion could eventually lead to a case-based re-evaluation of the net benefits of joining EMU, such as the benefits of avoiding a currency crisis versus the costs of joining in presence of a lack of real convergence, provided the latter would be a problem.

[9] Pelkmans, Gros and Nunez Ferer (2000), for example, question the usefulness of the real convergence debate for the issue of EMU entry.

In sum, while I find the paper analyzing a number of important issues, some others are not addressed and may require further attention in both, future research and policy-oriented analyses.

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Implications of the Introduction of Euro. The Case of the Czech Republic

By Josef Pöschl

I. Introduction

Appreciation pressure vis-à-vis the Euro characterizes the Czech currency. Those who regard exchange rate stabilization as an important target for EU candidate countries, have to admit that this goal is threatened now by appreciation pressure – something which has emerged only recently in most of the more advanced Central East European Countries (CEECs).

Let as look at empirical evidence of currency stability and appreciation trend as a first step (Table 1). The Czech Koruna is not pegged to any of the leading currencies. The Czech National Bank allows it to float, but intervenes if there is a threat of strong exchange rate fluctuation. In the last few years it intervened several times with the aim of avoiding strong nominal appreciation against the Euro, the most important foreign currency for the Czech economy. The Czech currency's exchange rate vis-à-vis the Euro/Ecu in 2001 was approximately identical to that in 1993. During the first months of 2002, the Koruna remained under appreciation pressure.

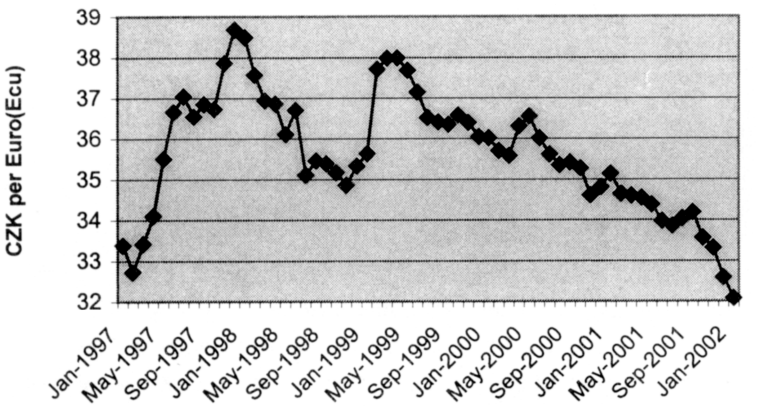
Table 1

Exchange Rate (CZK/EUR and CZK/USD) Between 1993 and 2001

	1993	1994	1995	1996	1997	1998	1999	2000	2001
CZK/EUR	100	100	101	100	105	106	108	104	100
CZK/USD	100	99	91	93	109	111	119	132	130

Source: WIIW Database

The depreciation vis-à-vis the USD, amounting to 30% from 1993 to 2001, reflects changes in the Euro(Ecu)-USD parity. As some import categories such as crude oil and gas are denominated in USD, this had an implication for the Czech economy, but a limited one compared to the appreciation vis-à-vis the Euro(Ecu).



Source: WIIW Monthly Database

Figure 1: The Czech Koruna, Nominal Values, Monthly Average Jan 1997-Jan 2002

The recent appreciation could represent a bubble, or, it may have a solid real background and therefore prove sustainable in the longer run. This is a question of significance for the Czech Republic's participation in the European Monetary Union (EMU). In the following pages we'll deal with the strength of the real sector and the adequacy of both the financial system and institutional settings in some detail. Thus, we shall look at growth figures and at the Czech economy's competitiveness vis-à-vis rest of the world. Balance of payment figures are the key indicators in this context. We shall also deal with cost competitiveness under the impact of currency appreciation. In this context we shall also try to assess the impact that Czech fiscal and monetary policies may have exerted and may exert in the future on the economy's growth performance and on the ability to withstand competition from within the EU. These considerations will support us in assessing the consequences of the Euro being introduced as legal tender in the Czech Republic.

II. GDP Growth Rates as an Indication of the Strength of the Real Sector

In 2000 and 2001, the Czech economy recovered from a long and painful recession. Growth restarted in the third quarter of 1999, but remained weak for quite a some time. Only between September 2000 and June 2001 it strengthened and approached 4%. Under the impact of the global deceleration of growth, in the second half of 2001 the Czech economy grew less than in the first half of the year.

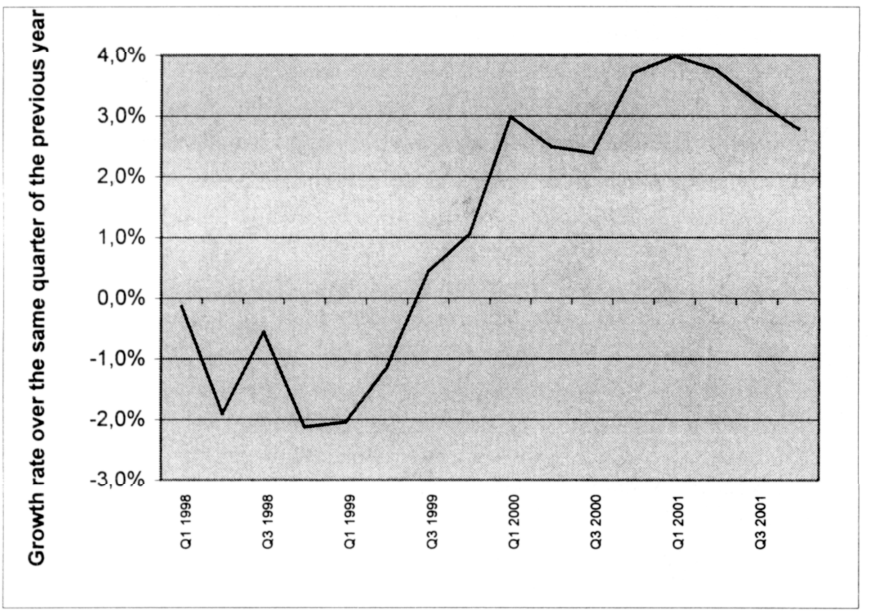


Figure 2: The Czech Republic, GDP Real Growth, Q1 1998 to Q3 2001

The Czech economy had fallen into recession when most observers thought it had overcome the transformation shock. The recovery in the early nineties had been artificial – it was based on the big banks' soft lending practices. The banks, at that time already formally privatized, but still government-dominated, supported the government's ambition of kick-starting economic growth in the most rapid way. The institutional setting was lacking regulation and transparency, so it was easy to hide the disregard of prudential rules. The period of high

growth – especially 1995 with a growth rate of 5.9% – would have offered the opportunity to launch institutional reforms and industrial restructuring without much pain. The authorities missed this opportunity. The industrial flagships of the previous regime expanded their activities, no matter that they did not yield profits. The current account deficit widened rapidly, a fact that was correctly interpreted as an indication of something being wrong with the Czech economy. The currency came under depreciation pressure; unfortunately, the Czech National Bank (CNB) tried to defend the peg existing at that time. When in May 1997 the CNB had to give up, the trust in the Czech economic miracle was gone.

The renewed GDP growth has more solid fundamentals. The loss-makers are still there, but they are no longer the backbone of the Czech industry. The governments in power from 1998 on did everything to stimulate foreign direct investment (FDI). The big banks now have foreign strategic partners. The period of state-stimulated soft lending is definitely over. The result was a continuous decline in the volume of the banks' outstanding loans. It is now up to the government to solve the problem of the big loss making companies – in coal mining, steel production and other industries. The Ministry of Trade and Industry is very active in developing restructuring schemes which so far in most cases ended up as vehicles for some kind of unsound survival.

The relations between the non-financial and the financial sector of the economy are sound. They are not perfect: for some enterprises it is easy to finance their investment, foreign-owned companies have easier access to both domestic and foreign borrowers – or to some financial injection from the mother company. Small or medium-sized companies, even if they are financially sound, may find it difficult to realize a promising project at acceptable borrowing conditions. For this type of problem, also the stock exchange is no remedy. This is no Czech specialty.

The economic infrastructure still needs much improvement, a fact often stressed by EU analysts. It is still difficult to get information about the performance of a company, at least if it is domestically owned. One of the motives is tax evasion, which is widespread. Both the state administration and the court system are still inefficient. Corruption is part of the culture, and it is fuelled by low public sector wages.

III. Relations with the Rest of the World as Another Aspect of the Real Sector's Strength

The Czech Republic is now highly integrated in international trade. In recent years, foreign trade grew much faster than the GDP. The ratio of both exports and imports to GDP are meanwhile quite high. This is true for both goods and services.

After the start of transition, the Czech economy was able to redirect its trade links almost completely. Instead of Russia, now Germany is by far the most important trading partner,[1] and in the meantime the EU absorbs more than two thirds of Czech exports. Within Czech imports, Russia still plays a certain role as supplier of gas, crude oil and raw materials.[2]

The structure of exports changed dramatically, especially in the more recent years. During the early transition years, the country sold predominantly materials. Now, more than half of the exports are more sophisticated goods: In 2000, 56% of exports belonged to the categories machinery, transport equipment and miscellaneous manufactured goods.

The growth of both exports and imports, which was especially pronounced in the last few years, is linked to the inflow of foreign direct investment (FDI), which gained momentum beginning with 1998. Before, the Czech way of privatization had consisted in an attempt to hand over Czech assets to Czech citizens.[3] In 1997, a currency crisis with a subsequent deep adverse impact on the real sector put an end to this attempt. Then, the Czech Republic started catching up rapidly in terms of FDI. Meanwhile, per capita the Czech Republic has attracted the highest amount of FDI among reform countries. FDI targeted, in the same way as in other countries, telecommunication, financial institutions, wholesale and retail trade, production of motor vehicles, electrical and optical

[1] In 2000, 40% of Czech exports went to Germany, and 32% of Czech imports came from there.

[2] In 2000, 1% of Czech exports had the Russian Federation as their destination, whereas 6% of Czech imports stemmed from there, most of it crude oil and gas.

[3] See for example Alena Zemplinerova and Martin Jarolim, "Modes of FDI Entry and Firm Performance: The Czech case. Transnational Corporations," vol. 10, no. 3, Dec. 2001, p. 95-129.

equipment, but additionally also a variety of other industries. Foreign-owned enterprises are the engine of export growth. They are also responsible for much of the high import growth, as the exports goods have a high content of imported material. Intra-industrial trade between subsidiaries of transnational companies plays an important role.

A permanent major deficit is one of the characteristics of Czech foreign trade in goods. Services are permanently producing a surplus, mainly thanks to tourism, which is, however, not big enough to fully cover the deficit in the trade of goods. The deficit in the current account is notorious, and in 1996/1997 its rapid expansion was one of the factors that led into the currency crisis. At present, the inflow of FDI by far exceeds the deficit in the current account. This fact not only calms down concerns about a sudden devaluation of the Czech currency, but also causes an appreciation pressure. Appreciation, if becoming too massive, could drive the deficit in the current account up to an unsustainable level.

IV. Low Prices and Wages Compared to the EU to Attract Export-Oriented Foreign Direct Investment

Compared to the EU in average Czech prices are much lower. In this context we have to distinguish between tradable and non-tradable goods. Domestic producers of tradable goods are exposed to competition from the rest of the world, and market forces tend to equalize prices of identical products from different origin. Whatever material need a consumer wants to satisfy, she or he always can choose between an ample variety of products from a large number of producers. These products are hardly ever fully identical: There are differences in technical terms, in design, in the image of the trademark. The consumer has a choice between large varieties of products with different prices. Czech producers belong to those that are covering rather the low-price segment. For investment goods the same line of argumentation holds. This means that if we look at a specific product species the Czech price per quantity unit (piece, kg) is lower than it is for competing goods of EU origin. The gap has, however, narrowed during the last years.

In the case of non-tradable goods, the gap between Czech and EU prices is very pronounced. Czech housing rents, prices for public transports, heating and electricity, basic food, childcare, insurances, contributions to the health care and pension system are low compared to the EU. Non-tradable goods bear most of the responsibility for the big price gap vis-à-vis the EU. Czech wages too are extremely low compared to EU levels, if we use the current exchange rate to recalculate them in Euro terms.

The result of this calculation could be misleading for people not knowing about the low prices of non-tradable goods and services: they would think that the average Czech standard of living is extremely low. Purchasing power parities, as another type of exchange rate, is a better approach for comparisons of living standards. The standard of living of Czech citizens is in average relatively modest, but certainly not extremely low. Having said this, let us return to calculations based on the current exchange rate. Low Euro-prices for non-tradable goods and services are the basis for low Czech wages in Euro terms. For foreign investors, this creates a very comfortable and attractive situation, especially if their intention is using the Czech Republic or another CEEC as the basis for sales on international markets. By locating at least part of the production chain in one of the CEECs, they can keep their wage bill small. At the same time, and this is the quite remarkable feature, they do not have be scared about the living standard of their CEE employees, as thanks to low prices for non-tradables it is not that bad. Companies of this type usually remunerate their employees with above-average wages.

During transition two spheres have developed within transition countries such as the Czech Republic. One is the low-wage and low-price sphere. It comprises the majority of the population: in Euro terms, these people receive low wages or social benefits, but do at the other hand not pay much for housing, food, heating and electricity, public transports and public sector services in general. The majority of tradables they consume stem from domestically owned producers who produce cheap low-quality products, or, as in the case of many textiles, from East Asia. Social security contributions are low, and correspondingly low are the payments out of that system, despite subsidization by the state. The other sphere is people who are already earning wages or profits close to the EU level or have managed to accumulate considerable property. They consume predominantly western high-price products and have contracted special schemes of health and pension insurance.

To some degree, one can observe this division into two different spheres in all market economies. Only, the gap can be wide or narrow. In many developing countries the gap is very high, much higher than in the Czech Republic. The two spheres can coexist indefinitely, but not without problems. Most of the state employees belong to the low-wage and low-price sphere, a fact that makes it easy for the other sphere to buy their benevolence. Corruption is correspondingly widespread. An even bigger problem is that the low-wage and low-price sphere is based on domestic producers of low-price products who are often loss-makers; on rents too low to cover maintenance and repair costs of houses; on social security contributions that do not cover all the costs of the system; on loss-making public transport companies and so on. As a consequence, the government has a difficult choice; either it continues to subsidy these structures that are fundamentals of the low-wage and low-price sphere, or, it removes price ceilings and cuts subsidies. In the latter case, housing rents and the prices and contributions just mentioned will start climbing.

The outcome will lay between two extremes: wages keeping path with the rise in living costs, or wages remaining constant in nominal terms, a scenario that would imply pauperization of large parts of the population. In the Czech case, the government has not too much choice. The budget deficit has risen considerably in the last few years, and the pressure to cut expenditures is high. So a hike in the people's obligatory social security contributions can be expected, the liberalization of rents and energy prices will progress further, and domestic low-price producers will be marginalized.

It will not depend on government decisions to which degree wages will be able to keep path with increases in the cost of living. The Czech overall rate of unemployment is slightly below 10%, which is relatively low for a transition country. The country already employs a number of foreign workers. In some segments of the labor market demand in excess of supply is quite feasible. Over time, gradually one of the big attractions of the Czech economy, cheap labor in an open economy in the heart of central Europe will vanish. Other attractions may remain or increase. With its long industrial tradition, the Czech society is highly qualified to meet the challenges originating from progressive globalization.

V. Structural Problems

We have already touched one major structural problem of the Czech economy. The business sector is divided into one part consisting of ailing domestically owned companies and a second part, that of foreign-owned companies. The former are burdened with debt they often cannot fully service. Part of that burden is still heritage from the previous system. They have no access to fresh loans from banks, at least now, after the big banks all have become affiliates of foreign institutes. They do not qualify for attracting fresh capital on the capital market either. Some of those companies are big, some are a region's nearly unique employer. Thus, shutting them down has proved difficult politically – as would be the case everywhere. They will die slowly if no foreign investor can be found. The foreign-owned companies are not troubled by any of these problems. They have got rid, in one or the other way, of the burden of inherited debt. Also, they have access to funds from the mother company, from capital markets, and from domestic as well as foreign banks. There is also something in between these two groups: a number of successful Czech-owned enterprises, most of them small or medium-sized.

VI. Czech Monetary and Fiscal Policy

Inflation in the Czech Republic is low, at least if we take into account that prices for non-tradable goods and services are disproportionally low but slowly catching-up. Inflationary pressure was more or less absent in the last years of the previous system, and inflation in the first phase of transition originated from the government's decision for strong exchange rate depreciation. Afterwards, the exchange rate entered a phase of long-run stability, at least vis-à-vis the Euro/Ecu and the DEM, and inflation calmed down.

Relatively low inflation gave the Czech National Bank (CNB) the possibility to lower the interest rates it can control. The low CNB-controlled rates did not boost the volume of loans the banks granted to the business sector. On the contrary: the credit volume shrank in the last few years, mainly because the commercial banks stopped pumping fresh loans into ailing industrial giants. The

loan policy of the commercial banks has become much more cautious. They are hesitant to grant loans even to viable companies, as the legal and judiciary system makes it extremely troublesome to recover overdue loans. In this respect, the inertia against biting reform proved insurmountable. Because of high risk, the commercial banks were hesitant to reduce their lending rates pari passu with the decline in CNB-controlled rates. Only when the recession was over, the lending rates went down. Apart from lending, the level of interest rates has a second implication, which is, as it seems, carefully considered by the CNB. If the domestic rate is low, the distance from US and EU rates is also low. This makes the currency less attractive for financial investors in search of opportunities for quick gains. In the last few years, the Czech interest rates declined continuously. In this way the CNB avoided additional appreciation pressure on the Czech currency.

In the last few years, the government has to pay the bill for delayed consolidation of the banking sector. It pumped several hundred billions of Czech crowns into the big banks, just to be able to sell them. This activity has widened the government's budget deficits. Apart from that, current revenues are not keeping path with current expenditures, so the budget is plagued by a structural problem. Transition started with very low government debt, and despite of larger budget deficits in recent years the government's indebtedness is still rather low by international standards.

VII. The Czech Economy After the Introduction of Euro

The Czech economy had no problem when the Euro-zone finally switched to Euro as its visible currency. The question is at which point of time the Czech Republic should follow and replace the Koruna by the Euro. Another question is how to behave in the transitory period.

In several respects, the Czech Republic comes close to the requirements defined by the EU. If we look at the Maastricht criteria, the performance concerning inflation is not sufficient, but relatively good. Probably, it will remain in a corridor between two and, say, six percent. However, it will take a number of years to settle down close to the EU average. This is quite natural as long as

the prices of non-tradables have to catch-up and converge to EU-levels. It is not advisable to fight this kind of inflation. The rate of interest is relatively low; the discount rate has come down to 3.25 % in the first weeks of 2002.

The deficit in the government's budget is at present too high in terms of EU standards, but a big proportion of it is related to the consolidation of the banking sector as well as the consolidation of some ailing industrial giants. This is a temporary phenomenon. Other sources of high deficit the government resulting from the elections in June 2002 can remove with some efforts. Public debt is still in harmony with the Maastricht criteria, even if we include the loan guarantees the state has granted so far.

The Czech Republic already has reached exchange rate stability vis-à-vis the Euro. There is no full guarantee that it can be maintained also in the future – at presence the currency is under appreciation pressure, but a future exploding current account deficit or some shock could still lead to depreciation.

All together, the exchange rate record gives the impression that a quick introduction of the Euro might not be too risky in the Czech case. What would be at risk? EU accession could cause a push on prices of non-tradables. The Balassa-Samuelson model assumes that the rise in labor productivity is high in the tradable sector, but not in the sphere of nontradables. Wages rise correspondingly in the tradable sector, and this rise spills over to nontradables. There, the producers face a cost-push and increase their prices correspondingly. The world market determines prices of tradables, for simplicity we can assume them as constant in dollar or euro terms, whereas the prices of nontradables should rise according to this mechanism. Empirical studies seem to conform that indeed such a mechanism may be working.

The EU accession, however, could cause a cost-push in the nontradables sector. It would be a kind of external shock. Some derogation agreement may serve as a softener. For example, the postponement of the liberalization of the labor market has the effect that the wage differential between EU-15 and the new member states will erode more slowly. The same is true for a delay in the liberalization of the land market. Nevertheless, in other fields the cost-push could come soon. For example, public transports and housing will become more expensive. The lifting of price ceilings will be faster. The prices of basic food may also see an upward shift.

With increasing costs of living, either nominal wages will rise, or the purchasing power of the population will fall. Should the costs of living increase fast and wages increase correspondingly, this could diminish the competitiveness of firms located in the Czech Republic. Weaker businesses would have to fight hard for their survival, and this could cause a regional problem and boost unemployment in general. In the case of the Czech Koruna still in place, the lack of competitiveness would start a mechanism, where a high current account deficit would show up and might lead to a depreciation of the currency. In this sense, maintaining the Koruna for a few more years would open the way for automatic response to a situation characterized by non-conformity to the Copenhagen criterion of competitiveness.

Maintaining the Koruna for the next few years would offer also another opportunity: that of gradual nominal appreciation of the Czech currency. It could not do the whole job of price adjustment, as it would not contribute to the narrowing of the gap between the prices of Czech tradables and non-tradables. Nevertheless it would be an elegant way of convergence of Czech prices and wages – in Euro-terms – to EU levels. With nominal appreciation, the same world market price of a tradable good would bring less revenue in domestic currency. So the producers would have to look for cost-reducing technologies. However, with improvements of the quality and reputation of Czech tradables their world market prices could also rise.

An early introduction of the Euro would be comfortable in the sense that balance of payment problems would cease, and monetary policy would stop being a task of the Czech National Bank. However, if a country enters a situation where permanently imports are much higher than exports, this means also an import of unemployment. If a country has its own currency, depreciation may come from itself in such a situation; this may take the form of a crisis, but in any way it will clear the situation. The authorities can use the exchange rate also as an instrument, for example through their influence on the interest rate. Of course, a bad monetary policy can make things worse than they would be in the case of an introduction of the Euro as the legal tender.

VIII. Luboš Komárek: Comment

This article consists of separate, interesting, however, less analytical analysis of the Czech economy. I comment on selected aspects connected with the paper.

In my opinion it could be useful to compare not only the "classical" view on the GDP growth, i.e. in nominal and real terms for each country, but also to make the comparison in the future currency – in euros. It is interesting to note that in the case of the Czech Republic the nominal GDP growth was much higher in euros than in the national currency; see Frait and Komárek (2001).

The successful/unsuccessful process of convergence to the EU/eurozone countries can be also viewed via developments in real exchange rates. It could be interesting to add the development of the exchange rate and their decomposition to inflation differential, the nominal exchange rate and the real exchange rate. Policy makers will be challenged by the issue as to what level of real appreciation is sustainable, i.e., compatible with sufficient external competitiveness and macroeconomic stability. My research with Jan Frait has established that if transformation is successful, the real exchange rate of a transitional country would appreciate. If transformation is unsuccessful, the reverse trend could be observed. This scenario holds until some other structural and institutional reforms have been implemented. We identified the set of factors that led to sustainable real appreciation of the Czech koruna and also the set of factors that possibly caused unsustainable real depreciation (see Frait and Komárek, 1999 and 2001).

I expected the article to focus more on the exchange rate convergence criterion (and also other convergence criteria), especially its definition, time frames and possible room from interpretation based on previous experience. The description of exchange rate experiences from the current EU/eurozone countries could be interesting for readers as well.

The discussion about the implication of the introduction of the euro on the currencies of CEEC may be complicated by the phenomenon of the so-called double-speed economy. This term is used to describe the situation when there are two different sectors in the economy (very visible in the transition countries). The first one is the sector comprised of dynamic companies usually with foreign ownership ("new" sector henceforth) and the second sector is the one

comprised of the traditional companies owned by the local investors and government ("old" sector henceforth). Trend for the real appreciation is in line with the performance of the foreign sector and we may say that it is caused by it (through the capital inflows to the sector and its export capability). In theory, the part of the old sector should adjust to the new sector by an increase in productivity, and the rest that is not able to do so should exit the market. In the reality of the transition economy with its weak institutional framework (barriers to bankruptcies, poor court performance, prohibitive transaction costs, week financial system etc.), the inefficient domestic firms are not often able to increase productivity and lower costs (and often they are not motivated to do so), they are not thus forced to leave the market and through the bank system and government bailouts they burden extra cost on the relatively efficient firms. Taking into account the links between both sectors, the excessive cost structure and low competitiveness may be transferred from the old to the new sector. In the long run the situation in both sectors may deteriorate and the economy may suffer from low growth and lack of convergence. The trend towards real appreciation may thus have rather asymmetric effects in the economy and some these effects can motivate the policymakers to slow down the real appreciation process. However, this may turn to be rather counterproductive especially in periods of strong FDI inflows aimed at green field investments. The new capacities in the new sector require not only capital and management skills, but also trained employees. If these employees are kept in the old sector by the means of structural and industrial policy, the restructuring process is being artificially delayed and its cost are higher than necessary. This suggest that the real exchange rate policy in the accession countries might be a razor's edge one with the run between the risks of losing competitiveness and losing the momentum in restructuring.

I would like also to stress an interesting point, mentioned by Mr. Pöschl, i.e. the phenomenon of deindustrialization of the economy. From my point of view, this is a typical feature of the transition economy given on one hand by the need for reduction in size of production of "socialist style" industrial conglomerates and on the other hand by desired development of the service sector. Deindustrialization itself is not a negative process and the real appreciation is not usually a prime cause of it. Generally, both deindustrialization and real appreciation are simultaneously determined by the productivity gains in industrial production (Rowthorn and Ramaswamy, 1998; Tatom, 1992). However, at a certain point,

it is rather difficult for the policymakers to tell whether the actual deindustrialization reflects the equilibrium potential growth in productivity or unsustainable disequilibrium real appreciation. This represents an additional challenge for the central bank policy.

With the ongoing convergence process, the central parity and the width of the fluctuation band will also become important factors in determining the conversion rate when the Euro irrevocably replaces the domestic currency. The relevant factors and approaches for a central parity and the width of the fluctuation band within the ERM2 mechanism must be therefore identified and evaluated. The specific features of convergence, potential volatility of the exchange rate and the relation between central parity and the market exchange rate are the main issues to be addressed in this process. Therefore this article also could mention (i) the incidence of shocks between the western EU members and the transition ("candidate") countries. To distinguish between different types of shocks, and to analyze their symmetry and incidence in order to assess potential adjustment problems in the euro area; (ii) to summarize the potential benefits and risks stemming from the ERM2 accession, discussion of the experiences from the ERM crisis in early 1990's and to evaluate the probability of repetition these events during accession process of candidate countries.

From my point of view, one can specify a recommendation for policy makers before introduction of the euro: sharp real appreciation can negatively affect real economic activity (together with finite price flexibility) and can also point to or create an exchange rate crisis. The presented behavioral models can indicate or provide an answer to some of the problems, but a complete solution to these problems can only be found after a complex analysis has been made.

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On Currency and Exchange Rate Regime. Example of Slovakia

By Julius Horvath

I. Introduction

This paper deals selectively with the question of currency and exchange rate regime in the context of the small open transition economy, the Slovak Republic.

The Slovak Republic became an independent country after the break-up of the former Czechoslovak Republic. In 1993, Czechoslovak Republic experienced a two-fold break-up: on January 1st, the country disintegrated as a political union, while preserving an economic and monetary union. Then, the Czech-Slovak monetary union collapsed after approximately six weeks, on February 8th 1993 and as a consequence Slovakia has introduced its own currency, the koruna.

After the break-up of Czechoslovakia, the Czech Republic has secured its position together with Hungary, Poland, and some other countries on the track to the accession to the European Union. Initially, Slovakia was excluded from this track. There were different reasons for this exclusion, but they were all connected with the practices of the former government. Thus, despite the fact that Slovakia has achieved relatively high level of development,[1] the country was not included into Atlantic structures and its integration efforts also seemed to be endangered.

[1] Most international comparisons show that Slovakia is still ahead of Hungary and Poland in the GDP per capita comparisons.

The parliamentary election in the second half of 1998 led to the change of government, consequently the Helsinki Summit in December 1999 reversed the former decision of the European Commission and the Slovak Republic was invited to participate in the accession negotiations at the end of which Slovakia joins the European Union and later also the European Monetary Union. From the currency perspective the introduction of euro in Slovakia would mean that three currencies would perform the function of the legal tender at the territory of Slovak Republic approximately in the period of twenty years: the Czechoslovak koruna, the Slovak koruna and in the near (or not so near) future the euro.

This paper discusses different issues, which emerge when answering the question of optimal currency and exchange rate regime for a newly independent small transition economy as the Slovak Republic. First, I discuss – from the political economy perspective – the issue of why a politically independent, sovereign country needs its own currency and on what conditions it may give it up. Second, I discuss the question of the optimal exchange rate regime for the Slovak Republic from the perspective of the optimum currency area theory and from a broader perspective of international macroeconomics.

I structure the paper in the following fashion. In Section II I review the political economy arguments why a particular country adopts its own currency as a legal tender, and then I evaluate the importance of these arguments in the Slovak context. In Section III I review the theoretical message concerning the optimum currency area perspective for the small country. In Section IV I apply the analysis from the previous Section to Slovak conditions. In the last Section I conclude.

II. Political Economy Approach

There are three basic reasons, which lead sovereign countries to use their own currencies as a legal tender. These are political symbolism, seignorage and the real or perceived ability of currency to have effects on real macroeconomic processes.[2]

[2] See Cohen (1998).

The first reason why a politically independent country chooses to issue its own currency is that it provides a political, national symbol. Own currency promotes a sense of collectivity, which may be useful especially if the society is rather non-homogenous. Shared stable money may help to homogenize diverse groups inside the society. For example during the twentieth century the Czecho-Slovak currency was more stable than the currency of the neighboring Hungary,[3] whose ethnic minority lives in the Slovak Republic. This may had positive effect on the political stability in the Slovak Republic (in the former Czechoslovak Republic).

It is difficult to evaluate how strong is the political, national bond to Slovak koruna in Slovakia. Koruna is one of the most visible signs of Slovak statehood, and giving it up may cause some tension, but whether this tension would be higher than in other – in a historical sense older Visegrad – countries seems to be too complex an issue to judge in a competent way.

The second reason why an independent country has its own currency is seignorage. Seignorage is an important source of revenue for the state, which stems from the monopoly function of the state to issue the currency. Seignorage is also a less costly way of taxing the public under the circumstances of high economic and political instability. While Slovakia to a certain extent is politically unstable,[4] it has credible and reliable monetary policy, relatively low inflation thus all in all seignorage is rather unimportant issue in the Slovak context.

The third reason for having own currency stems from macroeconomic management considerations. Own currency allows the country to perform monetary and exchange rate policy, which to a certain degree has an effect on the behavior of domestic macroeconomic variables. Own currency provides a source of power, which derives from money's potential – especially short run – impact on "real" economic variables. National money also provides a government with the possibility to avoid dependence on some other country or bloc of countries. Currency territoriality draws an economic boundary between the state and the rest of the world. Such boundaries enhance political authority. If a country

[3] See empirical evidence later in this Section.

[4] This instability stems from the persistent differences between populist, nationalist and somewhat autocratic political forces and those who oppose them. However this instability may be cured in the medium run, and there are already some signs of it.

wants real political autonomy, it cannot count on someone else' money. The weight of these arguments weakened all around the world – mostly due to globalization pressures – and Slovakia seems to be no exception.

It seems that from the political economy arguments for keeping own currency only the argument that currency is a national political symbol has some weight in the Slovak context.

The Slovak policy makers inherited from the former Czechoslovakia an attitude to stable monetary policy. Stable currency was typical for the period of the existence of the Czechoslovak state as it is documented in Tables 1 and 2. These tables show that when large exogenous shocks affected the Visegrad region, the Czech and Slovak policy makers typically were able to keep stable value of their currency, while Hungarian and Polish currency on some occasions underwent periods of heavy depreciation.

Table 1

Exchange Rates of Visegrad Countries, 1913-1939

	Unit-a	1913	1920	1922	1924	1926	1932	1934	1939
Czecho-Slovakia	Koruna	20.26	1.60	2.41	2.95	2.96	2.96	4.25	3.42
Hungary	Koruna, Pengő	20.26	0.201	0.0043	0.0017	17.56	17.45	28.99	29.41
Poland	Mark,Zloty	20.26	0.18	0.006	19.23	11.18	11.19	18.84	18.84

Exchange rates as US cents of contemporary gold content per unit of currency.
a – Hungary korona (1913-1925), Pengo (from 1925 on); Poland mark (1920-1924), zloty (from 1924 on); Czechoslovakia koruna. Note in the pre-1934 parity a fine ounce of gold was $20.67, and after 1934 onwards $35.00. Note that increasing number means appreciation of the domestic currency. Source: M.C. Kaser ed. The Economic History of Eastern Europe 1919-1975, Clarendon Press, Oxford, 1985, p. xii.

The stylized fact that the Czechs and Slovaks preferred stable currency may be seen most clearly at the period 1920-25. The Czechoslovak koruna slightly appreciated towards US dollar, while the Hungarian korona and the Polish mark heavily depreciated. Similarly to the early 1920s, after the Second World War, and also in the period 1989-1992 the Czechoslovak currency remained to a large extent more stable than the currencies of the remaining Visegrad countries. From 1993 till now Slovak koruna had lost some value compared to the Czech currency, but this loss was still smaller than losses of Forint and Zloty.

Table 2

Exchange Rates of Visegrad Countries, 1980, 1988-2000

	Unit-a	1980	1989	1990	1992	1994	1996	1998	2000
Czecho-Slovakia	Koruna	5.36	14.37	18.56	28.30				
Czech Republic	Koruna					28.79	27.14	32.29	38.60
Slovakia	Koruna					31.93	30.68	35.23	46.33
Hungary	Forint	32.64	59.04	63.21	78.98	105.1	152.65	214.40	282.18
Poland	Zloty	3.05	1439	9500	13627	22723	2.70	3.49	4.35

Source: United Nations, Economic Commission for Europe; annual averages are unweighted arithmetic averages of monthly values. [c] The zloty was redenominated at 1:10,000 from 1 January 1995. Exchange rates calculated as aannual averages, national currency units per dollar.

This little historical excursion document that population of Slovakia did not experience heavy weakening of its currency during a relatively long period of time.[5] This may be an additional political economy argument, which may work against giving up the Slovak koruna.

III. Some Theoretical Considerations

In this Section I turn for advice to a theoretical literature on choosing proper (optimal) exchange rate regime. This literature may be divided into five basic streams.

The first approach stems from the pure international macroeconomic theory. This literature typically evaluates the response of economy to disturbances under different exchange rate regimes. Thus, for example, country exposed to external nominal shocks should use flexible rates to insulate the domestic economy. On the other hand, fixed regime can be useful when dealing with domestic nominal shocks, while domestic real shocks are best handled under flexible regime. These theoretical results have relatively low practical application since most of the economies face various combinations of shocks.

[5] Also Balino et al. (1999) provide evidence which shows that Slovakia to a lower extent unofficially dollarized than Poland and Hungary during the 1990s.

As Helpman (1981) shows in an environment where markets are complete, money is neutral, and there are no rigidities, there is no welfare impact of exchange rate regime. Under such conditions the exchange rate regime does not really matter. If one leaves this frictionless world – in which all exchange rate regimes are equally efficient – then the question becomes which regime is preferable under different type of friction. Helpman (1981) argues that how to choose between different exchange rate regime depends on the given rigidities and imperfections. Thus the message from the pure theory is that the issue is empirical.

The second approach considers the problem of optimum exchange rate regime in the context of stabilization.[6] This consideration played an important role in the forming of exchange rate policy of the former Czechoslovakia in the aftermath of price liberalization in 1991.[7]

The third approach discusses the importance of different exchange rate regimes under the so-called Unholy Trinity conditions. If the high capital mobility is given, then domestic country needs to choose from two options. Either a country opts for a float with possible consequent volatility, but keeps the possibility of independent monetary policy, or it opts for the fixed exchange rate regime, and gives up its independent domestic monetary policy.

In the last decade or so the problem of choosing a proper exchange rate regime is discussed also in the light of the recent currency crisis experiences. Any small economy with almost zero restraint on capital flows should be aware of the implications of the financial and currency crisis of the 1990s. Countries are more and more vulnerable to adverse shifts in market sentiments. Such shifts though generally related to concerns about economic fundamentals can often be sudden, and destabilizing. In this respect one may tentatively argue that in the world of free capital mobility the exchange rate regime should be chosen to prevent future pervasive currency crisis.[8]

[6] Bruno (1991) presents an excellent treatment of this subject.

[7] See Horvath and Jonas (1998) for discussion of this subject.

[8] As a result of such considerations Eichengreen (1994) puts forward the hypothesis about vanishing intermediate regimes, i.e. that countries are being pushed to choose between extremes of fixed (currency board, dollarization, membership in monetary union) and truly floating rate.

Traditionally, however the typical framework for the discussion concerning the proper exchange rate regime is provided by the considerations of the optimum currency area theory. I shortly review its main message.

A currency area is an area in which exchange rates are fixed or in which common currency exists. Since in the modern world the concept of "one country, one currency" prevails, typically almost every country is a currency area. Currency area then corresponds to optimum currency area to the extent as the political considerations for creation of the country correspond to the economic consideration of currency optimality. This brings up the Mundellian question what is the appropriate domain of a currency area, i.e. how large should be a territory where one currency is used.

This Mundellian question may be asked in two different ways. First, one may ask whether an existing country, say x, is an optimum currency area. In other words, does this country has such characteristics, which allow her to use optimally hers currency, or rather each separate part (region) of x would be better off with own regional currency. Second, whether "area x as a whole would be better off in a larger currency area and without a separate currency."[9]

Mundell (1961) represents the beginning of the search for the criterion defining optimum currency area. He suggests labor mobility and the subsequent research puts forward additional criteria. McKinnon (1963) considers the openness of economy as the crucial criterion of the optimality of currency areas. McKinnon's argument is that the more open is an economy, the more it should be inclined to use fixed exchange rates, in other words flexible exchange rates are more advantageous for fairly closed economies. Kenen (1969) suggests production diversification as a characteristic for optimum currency areas. He writes that a well-diversified economy will not often confront a change in demand for its export products. In well-diversified economies the importance of asymmetric shocks would be of lesser significance than in less-diversified economies. Thus, fixed rates are the most appropriate to well-diversified economies. There are some other criteria of optimal currency areas as similarity of rates of inflation, the degree of policy integration, the degree of price and wage flexibility, and real exchange rate variability.[10]

[9] Melitz (1995, p.496).

[10] See Ishiyama (1975), Tavlas (1993) and Horvath (2001) for reviews.

Some authors as Mintz (1970), or Machlup (1977) raise the point that for choosing the exchange rate arrangements the economic considerations are not of foremost importance. Machlup (1977, p. 71) for example argues: "what ultimately counts however, is that all members are willing to give up their independence in matters of money, credit, and interest. Pragmatically, therefore, an optimum currency area is a region no part of which insists on creating money and having a monetary policy of its own." Frankel and Rose (1997) argue that optimum currency area criteria are endogenous, i.e. that the international trade patterns and international business cycle correlations are endogenous, i.e. countries with closer trade links tend to have more tightly correlated business cycles. In their opinion then joining the currency union will move countries closer to meet the optimum currency area criteria, since it will increase the symmetry in business cycle of the prospective member-country.

This short review of different streams in the literature which address the issue of the proper exchange rate regimes seems to suggest that there is no general answer to the question. The exchange rate regime for any country depends on the particular situation and on the country's characteristics.

Optimal currency area theory seems to suggest that a small open diversified economy – as Slovakia – should opt for fix exchange rate regime unless is exposed to highly asymmetric shocks. The modern theory of currency crisis would probably suggest a movement towards a highly credible exchange rate regime to avoid possible speculative attacks against the domestic currency or towards a float discouraging these attacks.

Based on this background I now move to the empirical part of the paper in which I measure symmetry and/or asymmetry of shocks in the example of Slovakia.

IV. Implications for the Slovak Exchange Rate Regime

The optimum currency area literature emphasizes the importance of retaining exchange rate flexibility in countries facing asymmetric shocks, particularly if these countries are unable to adjust otherwise due to wage and price rigidity, non-existent fiscal transfers and limited labor mobility. In this respect the

evaluation of the costs of joining a currency union is connected with the identification of the character of shocks affecting a given area. Mundell's argument sends the following warning: if shocks affecting countries are symmetric then joining a currency union will not constrain, since for symmetric shocks an overall union response will suffice. If, on the other hand, the shocks are mainly asymmetric then an over-all response can do more harm than good, implying that the joining of a currency union could be costly.

There is no unique way of identifying different shocks affecting a given economy. I follow a strategy suggested by Bayoumi and Eichengreen (1992), where the identification strategy is based on a simple aggregate supply/aggregate demand model with a positively sloped short run, and a vertical long run aggregate supply curve. In this framework, the demand shocks only have transitory effects on output.

Consider two types of orthogonal shocks that are the sources of variation in domestic output, y_t, and the price level, p_t: a supply shock, ε_{1t}, and a demand shock, ε_{2t}.

Assuming that the vector

$$\Delta X_t = [\Delta y_t \; \Delta p_t]$$

is stationary and can be written as an infinite moving average process:

$$\Delta x_t = \sum_{i=0}^{\infty} A_i \varepsilon_{t-i} = A(L)\varepsilon_t$$

or

$$\begin{pmatrix} \Delta y_t \\ \Delta p_t \end{pmatrix} = \begin{pmatrix} a_{11}(L) a_{12}(L) \\ a_{21}(L) a_{22}(L) \end{pmatrix} \begin{pmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \end{pmatrix} \quad (1)$$

where $a_{ij}(L)$ are polynomials and A_i are matrices in the lag operator L. The time paths of the effects of various shocks on the growth rate of output and prices are given by the coefficients of the polynomials $a_{ij}(L)$. Furthermore, coefficient $a_{ij}(k)$ in the $a_{ij}(L)$ polynomial is the response of variable i to a unit shock in ε_{it} after k periods. We also adopt the notation such that $a_{ij}(1)$ is the sum

of all the moving average coefficients and gives the cumulative effect of ε_{jt} on variable i over time. The shocks have the following properties: the variance is normalized to equal unity, $E(\varepsilon_t,\varepsilon_{t+j}) = I$, $E(\varepsilon_t,\varepsilon_{t+j}) = 0$, and $\forall j \neq 0$.

In order to identify this model, one can estimate a finite order bivariate VAR

$$\Delta x_t = b_1 \Delta x_{t-1} + b_2 \Delta x_{t-2} + \ldots b_k \Delta x_{t-k} + e_t \tag{2}$$

where the maximum lag length k is chosen such that residuals e_{it}, approximate white noise and

$$E(e_t e_t') = \Sigma = \begin{pmatrix} \sigma_{11}\sigma_{12} \\ \sigma_{21}\sigma_{22} \end{pmatrix} \tag{3}$$

Since the elements of ΔX_t are stationary, the system can be inverted to obtain the moving average representation:

$$\Delta x_t = e_t + c_1 e_{t-1} + c_2 e_{t-2} + \ldots = \sum_{i=0}^{\infty} c_i e_{t-i} = C(L) e_t \tag{4}$$

The contemporaneous relationship between the orthogonal (pure) innovations ε_t and the composite innovations e_t is

$$e_t = A_0 \varepsilon_t \tag{5}$$

Thus the following relationship exists between the variance-covariance matrices:

$$E(e_t e_t') = A_0 E(\varepsilon_t \varepsilon_t') A_0' \text{ and} \tag{6}$$

(7) $$\Sigma = A_0 A_0^{'}.$$

Σ is a symmetric matrix with known elements, which imposes one restriction on the matrix of contemporaneous effects, A_0, which has four elements. Additional restrictions are needed to identify A_0, so that the orthogonal shocks $\square_{it}$ can be recovered using equation (5). Blanchard and Quah (1989) concentrate on the relationship between the matrices of long term effects. If we evaluate the polynomials embedded in equations (1) and (4) at L = 1, and note the relationship in equation (5), then

(8) $$A(1) = C(1) A_0$$

where C(1) contains known elements. In order to identify the shocks, we impose the following restriction on the long run matrix A(1): the aggregate supply curve is vertical in the long run. This corresponds to the restriction that $a_{12}(1) = 0$ in equation (1). After A_0 is identified, one can recover the orthogonal shocks using equation (5).

As a final result of estimation we will obtain for each country two series of exogenous shocks: supply shock, $\varepsilon_{1,t,p}$, and demand shock, $\varepsilon_{2,t,p}$, where p is the number of countries. Then correlation of these shocks is computed between countries.

I collected quarterly data on real and nominal GDP for Visegrad countries (Hungary, Poland, Czech Republic, Slovak Republic) and Germany. These data cover the period 1993:1-2000:3. Data were obtained from the IFS CD-ROM, however for some countries data were obtained directly from the national statistical offices. Hungarian data are obtainable only for the period 1995:1-2000:3.

To identify exogenous supply and demand shocks I estimate the bivariate vector autoregressive model. It is important to establish the number of lags to work with in equation (2). While it is possible to allow for different lag lengths for each variable in each equation, Enders (1995) advises that "in order to preserve the symmetry of the system (and to be able to use OLS efficiently) it is

common to use the same lag length for all equations."[11] Since I use quarterly data for relatively short period of time, long lag lengths may consume degrees of freedom. Thus I consider to use at maximum four lag length assuming that one year is sufficiently long to capture the dynamics of the system. For testing the number of lags then I use the likelihood ratio test based on Sims (1980).[12] In all cases the number of lags was set to two.[13] Unit root tests reveal that in all cases the log of the real GDP contains an autoregressive root, and thus the hypothesis of a unit root cannot be rejected at conventional significance levels. Consequently, for each country growth and inflation were calculated as the first difference of the natural logarithm of real GDP and the GDP deflator.

Table 3 presents correlation coefficients measuring the correlation of supply shocks of Slovakia with the Visegrad countries and the anchor, Germany.

Table 3

Correlation of Supply and Demand Shocks; Slovak Republic

	Supply Shocks	Demand Shocks
Germany	-0.04	0.04
Czech Republic	**0.47**	0.21
Poland	0.23	0.18
Hungary	-0.13	-0.09

For the period 1993:1-2000:3. Hungary 1995:1-2000:3. Bold indicates statistical significance at 5% significance level.

Results in Table 3 provide tentative argument for some form of flexibility for the Slovak exchange rate. Slovakia seems to be exposed to asymmetric demand and supply shocks compared to Germany, the possible currency anchor.

The evidence from the structural vector autoregressive model concerning the correlation of supply and demand shocks affecting Slovakia and Germany

[11] As long as there are identical regressors in each equation, the ordinary least square estimates are consistent and asymptotically efficient, see Enders (1995, chapter 5).

[12] For example when testing two lags against four lags Sims (1980) recommends using the statistics $(T-c)(\log|\Sigma_2|-\log|\Sigma_4|)$. Where T is the number of usable observations, c is the number of parameters estimated in each equation of the unrestricted system and $log|\Sigma_4|$ is the natural logarithm of the determinant of Σ_4. This statistics has the asymptotic χ^2 distribution with degrees of freedom equal to the number of restrictions in the system.

[13] The Likelihood Ratio tests indicate in most cases the optimal lag length of 2 (in some cases 3 or 4), however following Enders (1995) advice I have chosen a uniform lag of 2 in order to preserve the symmetry of specification across the countries.

shows that this correlation is rather low. But the two economies could still be in similar stage of the cycle and thus probably not require divergent monetary policies or exchange rate adjustment. Indeed, the simple correlation of the difference of logarithm of the real output and the price level between Slovakia and Germany for the same period gives us results of 0.24 and 0.21, thus to a certain extent higher than the correlation of shocks.

Thus, the tentative conclusion of this exercise is the following. Some optimum currency area consideration as the smallness of the economy, and the diversification of the production would suggest that Slovakia should opt for the fixed exchange rate regime. The possibility of speculative attack suggests that Slovakia should opt for the floating exchange rate or introduce a form of truly fixed exchange rate regime. The empirical investigation of the symmetry and asymmetry of shocks affecting Slovakia and Germany (anchor country) suggest that Slovakia should opt for a more flexible exchange rate regime.

V. Conclusion

In this paper I present some selective empirical and theoretical discussion about possibilities of the proper exchange rate regime for small transition economy, the Slovak Republic.

I discuss – from the political economy perspective – the issue of why a politically independent, sovereign country needs its own currency. This discussion shows that political symbolism of the national currency may play some role in the future. Historical data suggest that Slovakia typically had a stable currency policy and that tendency seems to continue also through the 1990s.

I discuss also the question of the proper exchange rate regime for Slovakia from the optimum currency area perspective. I present results of the structural vector auto-regressive model based on quarterly data for the period 1993:1-2000:3. The results suggest that compared to the possible currency anchor, Germany, Slovakia was exposed to asymmetric shocks. While some optimum currency area consideration as the smallness of the economy, and the diversification of the production suggest that Slovakia should opt for the fixed exchange

rate regime, the asymmetry of shocks affecting Slovakia and Germany suggest that this solution may be costly.

VI. Bas van Aarle: Comment

Aim of this interesting paper is to analyze the optimum currency area dimensions of the current monetary and exchange rate arrangements in Slovakia. In addition to political economy considerations – the use of money as a symbol of sovereignty and source of seigniorage revenues to the government – optimum currency area considerations could motivate the implementation of an independent domestic monetary and exchange rate policy. If countries face asymmetric shocks and/or asymmetric business cycle conditions, the flexibility provided by independent exchange rate may be indispensable, in particular if other stabilizing mechanism are slow and/or costly operate.

The author studies in detail the optimum currency area question for the case of Slovakia, a small open economy in a rapid process of transition, structural change and integration with the EU, to which it at some point in time will accede. The methodology used is the one proposed in the seminal contribution of Bayoumi and Eichengreen (1992), who propose a structural VAR (SVAR) model to determine the aggregate demand and supply shocks hitting an economy. The correlation of macroeconomic shocks with a reference country or area (say Germany or the EU) is then a useful measure of the degree of (a)symmetry of the macroeconomic shocks of both, and consequently a measure of the extent to which countries are an optimum currency area. The case of permanent supply shocks is an exception, as adjustment to permanent shocks is to be brought about by structural adjustments and nominal exchange rate adjustment can not be considered as an appropriate adjustment tool to permanent supply shocks. The paper extends in a nice way, some earlier results of Dibooglu and Horvath (1997). In that paper the optimum currency area aspect is analyzed for the current EU countries (plus five other countries) using the same methodology.

Evidence is found that the correlation of macroeconomic shocks between Slovakia and Germany (the EU) is relatively low. From an optimum currency area perspective one needs to conclude therefore that exchange rate adjustment

remains a useful adjustment mechanism, in particular also if compared with the effects and costs of the alternative adjustment mechanisms, wage and price flexibility, fiscal adjustment and labor mobility. It should be stressed that during the accession phase to EU and EMU, exchange rate flexibility may well be a useful tool of macroeconomic management, in particular if conducted in an orderly form like an ERM-II framework. It may combine benefits of exchange rate adjustment if needed/warranted together with a framework of monetary stability and credibility. In particular, it can prevent a situation where accession countries are adhering to exchange rate strategies that induce increasing over- or under-valuation, with strong negative consequences in the long run. In that perspective it is instructive to note that the current EMU countries participated for good reasons during a period of nearly twenty years (1979-1998) in the EMS/ERM-I framework before finally putting aside exchange rate adjustment altogether.

The empirical results and the conclusions from it are also in line with studies by Fidrmuc and Korhonen (2001) and Korhonen (2001). The latter uses alternative methodology of business cycle correlation to assess the optimum currency area criterion and finds relatively low correlation in the case of Slovakia.

Frankel and Rose (1997) proposed that higher trade integration is likely to increase the symmetry of business cycles and/or macroeconomic shocks, making the optimum currency area endogenous to integration. On the other hand, integration fosters specialization making cyclical fluctuations and shocks typically more asymmetric. Fidrmuc (2001) analyses the possible endogeneity of the optimum currency area criterion in the case of the Accession Countries. It is shown that Slovakia did not experience such an endogenous optimum currency area effect and that country-specific shocks remained significant, thus providing also indirect support to the conclusion reached by the author.

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