Orlowski, Lucjan T.

Working Paper
Monetary convergence of the EU candidates to the Euro: A theoretical framework and policy implications


Provided in Cooperation with:
ZEI - Center for European Integration Studies, University of Bonn


This Version is available at:
http://hdl.handle.net/10419/39534

Standard-Nutzungsbedingungen:
Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden. Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen. Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:
Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.
Lucjan T. Orlowski

Monetary Convergence of the EU Candidates to the Euro: A Theoretical Framework and Policy Implications
“Monetary Convergence of the EU Candidates to the Euro: A Theoretical Framework and Policy Implications”

by Lucjan T. Orlowski

(Professor of Economics, Sacred Heart University, 5151 Park Avenue, Fairfield, Connecticut 06432. Tel. +1 203 371 7858. E-mail: OrlowskiL@sacredheart.edu)

Abstract: A flexible approach to direct inflation targeting is a viable monetary policy choice for transition economies that is believed to facilitate both the economic transition and the monetary convergence to the euro. Following this assumption, an analytical model investigating the link between the inflation process and monetary variables in transition economies is advanced in this study. The empirical testing is conducted for Poland, the Czech Republic and Hungary. The analysis recommends that the monetary convergence begins with inflation targeting and concludes with a full-fledged euroization. It further advocates the application of flexible benchmarks of monetary convergence that would accommodate various non-monetary factors affecting inflation in transition economies.

JEL classification: E32, E52, P33

This version: September 2001

I am grateful to the University of Bonn – Center for European Integration Studies (ZEI) for sponsoring this research. I am particularly indebted to Jürgen von Hagen and Birgit Uhlenbrock for their useful comments and suggestions.
I. Introduction

During the first decade of economic transition, monetary policies in Central European countries relied on fixed exchange rates for building monetary stability and credibility. Commitment to stable exchange rates, along with prudent fiscal policies, helped these countries lower inflation to single digit levels. But in order to bring it down further to the levels comparable with those in the European Union, monetary authorities in these countries face a challenge of designing appropriate policy strategies and tactics. Fixed exchange rates were intrinsically built into the program of comprehensive economic reform and were the only feasible option at the beginning of transition. They served as a crucial policy anchor for launching the process of disinflation. As the transition has advanced, the transition countries have abandoned currency pegs. Their exit strategies have been made possible by the ongoing institutional development of financial markets and banking systems that enabled the application of indirect instruments of monetary policy. Consequently, central banks in transition economies of Central Europe have begun searching for appropriate autonomous monetary policies that could underpin their commitment to pursuing price stability.

The underlying assumption of my analysis is that the Central European transition countries who are now the candidates for the EU accession will be well advised to strengthen the monetary policy framework of direct inflation targeting (DIT) at their present stage of transition. A flexible approach to DIT will likely facilitate a successful monetary convergence to the EU of the candidate countries. I refrain from engaging in the ongoing discussion on the viability and feasibility of a ‘leap to euroization’ (in the sense of an early unilateral adoption of the euro as a legal tender). The debate on this subject has been extensive and inspiring (Begg, et.al, 2001; Bratkowski and Rostowski, 2001). In my opinion, euroization is an ultimate and beneficial policy option for these countries. However, before its possible adoption, the EU candidates need to establish ‘foundational credibility’ through autonomous monetary policy resulting in a sustained period of price stability (Orlowski, 2000 and 2001).

While advocating an autonomous monetary policy based on DIT, I propose an analytical model examining the link between the inflation process in transition economies and a set of monetary variables. The model is empirically tested for Poland, the Czech Republic and Hungary - all of them have officially enacted various forms of DIT. The empirical analysis provides useful information about the monetary policy transmission channels. It is aimed at identifying effective tools of disinflation in these economies. The empirical findings provide guidance for improving the existing inflation targeting systems. The focal point of my investigation is the assessment of whether monetary policies in these countries are backward or forward-looking, and the evaluation of the exchange rate, the aggregate demand and the rational expectations channels of monetary policy transmission. The analysis centers further on feasibility of a flexible, rather than a strict approach to inflation targeting. Flexible inflation targeting not only preserves commitment to disinflation, but also allows for controlling other policy objectives, such as income growth or exchange rate stability. The latter is particularly important for achieving a successful monetary convergence to the euro.
The study begins from an overview of the current monetary policy regimes in Poland, the Czech Republic and Hungary, by presenting the foundations of their present DIT in Section II. The institutional framework of these policies is useful for designing the model reflecting the link between inflation and monetary policy variables in transition economies, which is presented in Section III. The empirical tests of the model are analyzed in Section IV, and the concluding Section V summarizes key findings and presents several recommendations for advancing autonomous monetary policies in these relatively advanced transition economies.

II. Inflation Targeting Regimes of the Czech Republic, Poland and Hungary

Stabilization programs in Central European transition economies that were initiated in the early 1990s played a pivotal role in bringing inflation down to single digit levels over the course of several years. This was accomplished by a set of measures including currency pegs, followed later by implicit target zones for exchange rates. Such policies served as nominal anchors for macroeconomic discipline. Other policy measures that assisted the process of disinflation included privatization and de-monopolization of state companies, trade liberalization, deregulation of financial systems and tight fiscal policies. As the transition advanced, Central European countries have decided to depart from exchange rate targeting and seek alternative measures that would provide sufficient policy discipline allowing further reduction in inflation to more sustainable levels. Currency pegs brought about problems of real appreciation of domestic currencies and the subsequent troubles with current account deficits and capital inflows that precipitated inflation. In response, governments of Central European countries have decided to depart from exchange rate targeting and to look for a more credible nominal anchor for monetary policy. They did so at different times and with dissimilar determination.

Poland abandoned a rigid peg of the zloty (PLN) to the dollar already in May 1991, although it maintained implicit target zones for the exchange rate accompanied by crawling devaluation until April 2000. During the period 1996-1998, the National Bank of Poland (NBP) experimented with targeting interest rate (1996), monetary base (1997) and M2 money growth (1998). None of these alternative regimes were suitable for a country in transition that experienced deep structural changes, strong relative price adjustments and a fast growing monetization (as reflected by the growth of M2-to-GDP ratio from 15 percent in 1991 to 45 percent in 2000). Under such circumstances, the actual money growth exceeded significantly any reasonable targets that were set at levels comparable to those in Western economies. Interest rate targeting has proven to be erroneous as well, because Poland and other small open transition economies are subject to sizeable changes in capital inflows that induce large, temporary shocks to interest rates. This vulnerability to external capital shocks was particularly evident at the time of the Asian financial crisis of 1997-1998 that brought about strong contagion effects to their financial markets (Linne, 1999; Gelos and Sahay, 2000). In search for an explicit nominal anchor for monetary policy, the NBP decided to adopt a system of DIT as of January 1999.

The Czech National Bank (CNB) introduced a similar policy framework a year earlier. It did so in response to a struggle with the rigid currency peg that was maintained...
until 1997, and that brought about significant real appreciation of the Czech Koruna (CKR) and a deep current account deficit (Brada and Kutan, 1999). These macroeconomic imbalances, along with the institutional deficiencies in the financial sector precipitated a deep crisis of the Czech financial system in the summer of 1997 (Linne, 1999). A monetary policy framework of DIT was a viable and prudent response to the vacuum in the policy discipline created by abandoning the currency peg.

Pursuing a distinctly different approach to monetary policy, the National Bank of Hungary (NBH) maintained a crawling peg system of the Hungarian Forint (HUF) to the Euro (EUR) accompanied by a narrow tolerance band of 2.25 percent on either side of the parity until May 2001. In spite of the prolonged currency peg, Hungary was able to mitigate real appreciation of the HUF, thus to alleviate large balance of payments disequilibria thanks to maintaining wage discipline, productivity gains and large inflows of foreign direct investments. Recently however, the NBH faced increasing problems with manageability of large short-term capital inflows and with inflation levels stubbornly exceeding those of Poland and the Czech Republic. Needless to say, crawling devaluation has exacerbated inflationary pressures on the Hungarian economy. Responding to these mounting problems, the NBH has decided to launch a DIT system as of June 2001.

As of mid-2001, monetary authorities of all three countries officially follow policies of DIT. In my opinion, these policies are particularly useful and viable at the present stage of economic transition and also at the time of a global economic slowdown coupled with increasing political and financial risk. In the presence of slower economic growth, fiscal discipline is seriously jeopardized by lower than expected budget revenues and by political reluctance to cut government expenditures. This aggravates the risk of a lax fiscal discipline as the growing budget deficits are already projected to exceed 5 percent of GDP in all three countries in 2000 and 2001 fiscal years. Consequently, monetary policy will have to assume a stronger responsibility for pursuing disinflation, thereby also for facilitating monetary convergence to the euro. Policies based on a currency peg would require a high degree of fiscal tightness since they would eradicate monetary autonomy, which is simply not feasible at the present time. For this reason, a premature return to a euro-peg would indubitably fail to facilitate reaching the goals of monetary convergence to the EU/EMU. Without doubt, autonomous monetary policies based on DIT seem to provide a sufficient framework for achieving ambitious goals of disinflation.

Thus the countries in transition will be well advised to resist recent calls for income targeting monetary policies that are becoming popular in the United States, Japan, or even in the European Union. Income targeting is consistent with monetary easing that is unsuitable for countries that are struggling with fiscal discipline. Similar strategies applied by the economies in transition could hinder monetary discipline, reinvent the spiral of nominal indexation, and jeopardize disinflation. Income targeting might be viable for averting recession in highly developed industrial countries, but it would be too costly for transition countries and, in principle, for other emerging market economies.

The approaches to inflation targeting and the degree of its advancement are not uniform among the three examined countries. Specific features of these policies are presented in Table 1.
Table 1: Inflation Targeting Regimes: the Czech Republic, Poland and Hungary

<table>
<thead>
<tr>
<th></th>
<th>Czech Republic</th>
<th>Poland</th>
<th>Hungary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of DIT regime</strong></td>
<td>Headline CPI inflation targeting (with net inflation as a supporting target); relatively strict net inflation targeting prior to 2001</td>
<td>CPI inflation targeting, strict</td>
<td>CPI and core inflation targeting, flexible (implicit) with some attention to exchange rate stability</td>
</tr>
<tr>
<td><strong>Corresponding exchange rate regime</strong></td>
<td>Managed float</td>
<td>Float</td>
<td>Implicit target zone of +/- 15% against EUR, 0.2% monthly rate of crawling devaluation</td>
</tr>
<tr>
<td><strong>Policy inception date</strong></td>
<td>January 1998</td>
<td>January 1999</td>
<td>June 2001 (announced June 12, 2001)</td>
</tr>
<tr>
<td><strong>Long-term inflation target</strong></td>
<td>2.0 % net inflation with a +/- 1% tolerance band for the end of 2005, prior to EMU accession in Jan. 2006</td>
<td>CPI inflation of 4.0% for the end of 2003</td>
<td>CPI inflation of 2.0% reached by March 2004, prior to the targeted EMU accession in Jan. 2006</td>
</tr>
<tr>
<td><strong>Recent operating targets:</strong></td>
<td>a. 2.0-4.0% net and 4.3-5.8% CPI inflation b. dynamic range descending evenly from 3.0-5.0% CPI and 2.0-4.0% net inflation in Jan.2001 to the long-term target</td>
<td>a. 6.0-8.0% CPI inflation b. 4.0-6.0% CPI inflation</td>
<td>a. 6.0-8.0% CPI inflation b. 3.5-5.5% CPI inflation</td>
</tr>
<tr>
<td><strong>Recent CPI y-o-y inflation (August 2001)</strong></td>
<td>5.5%</td>
<td>5.1%</td>
<td>8.7%</td>
</tr>
<tr>
<td><strong>Inflation Risk Premium</strong></td>
<td>a. 4.73% b. 1.18%</td>
<td>a. 8.48% b. 8.60%</td>
<td>a. 4.10% b. 0.92%</td>
</tr>
<tr>
<td><strong>Forward-looking mechanism</strong></td>
<td>Inflation forecasts, monthly revised, incorporate a survey of inflation expectations of ten banks</td>
<td>Inflation forecasts, unspecified time, active use of policy bias for two quarters ahead</td>
<td>Rolling inflation forecasts for 6 quarters ahead, revised monthly</td>
</tr>
<tr>
<td><strong>Inflation reports</strong></td>
<td>Quarterly, annual</td>
<td>Quarterly, annual</td>
<td>Quarterly (as of Aug. 2001), annual</td>
</tr>
<tr>
<td><strong>Target announcements</strong></td>
<td>CNB Board in consultations with MF</td>
<td>NBP Monetary Policy Council</td>
<td>NBH Council, transparent methodology</td>
</tr>
</tbody>
</table>

Notes: * Inflation Risk Premium is computed as a difference between average monthly interest rates on three-months Treasury bills and the average CPI year-on-year inflation rates.

Source: The author’s own compilation, based on CNB, NBP, and NBH data and reports.

A pioneer among inflation targeting banks in Central Europe, the CNB introduced net inflation targeting in January 1998, as a follow up to abandoning the fixed exchange rate in May 1997. During the period 1998-2000, CNB targeted net inflation that was based on changes in the index of retail prices but excluded administratively regulated prices and fees. The CNB intention was to distance itself from shocks in CPI inflation induced by sharp increases in governmentally regulated prices and fees that were
routinely conducted at the beginning of each year until January 1998. Specifically, the annual increases in administrative prices reached 22.7 percent in 1997, 20.4 percent in 1998 and only 4.2 percent in 1999. The recent smaller increases in regulated prices certainly have helped shift the CNB policy focus from net inflation to CPI-based inflation targeting. The operating targets for December 2001 and December 2002 are based on CPI rather than net inflation levels, as shown in Table 1.

The long-term inflation target has been set by the CNB at 2.0 percent net inflation with the tolerance band of one percent on either side of the midpoint level for the end of 2005. Adherence to the long-term target and the dynamic trajectory of disinflation that is fully consistent with this target is a dominant measure of efficiency of the Czech DIT system. The achievement of interim targets is monitored on a monthly basis in terms of deviations of actual inflation from the target trend. This is a prudent approach that increases transparency and discloses a long reaching path of operating targets. It also underpins the CNB commitment to reaching the predetermined inflation targets. Because of its higher transparency and predictability, the dynamic trajectory approach is superior to the end-of-year specification of operating targets that does not convey adequate information about long-term inflation forecasts. It is because possible revisions of year-end targets downplay the importance of the long-term goal and question feasibility of pursuing the trajectory leading to this goal. Such revisions might also cast doubt on commitment of central banks to reach the long-term goal. Therefore, recent decisions of the CNB to emphasize the long-term goal and the dynamic inflation trajectory make the Czech DIT system highly transparent and purposeful. Furthermore, the dynamic approach alleviates unnecessary and unproductive struggle with fiscal authorities about operating inflation targets. In a common policy practice, governments willing to run larger budget deficits often exert pressures on central banks to raise short-term inflation goals. Such pressures become irrelevant if a central bank’s policy is bound by adherence to the dynamic trajectory of disinflation. ¹ Undoubtedly, the dynamic trajectory approach enacted by the CNB gives it more leverage in the disputes about the necessity to maintain monetary policy discipline. For this reason, the Czech DIT system is clearly superior to the Polish regime, which emphasizes adherence to year-end targets that in turn instigates routine criticism of the central bank for its excessively restrictive policy and overly ambitious inflation targets.

The CNB has developed a fairly advanced system of inflation forecasting in spite of a number of technical deficiencies that are prevalent at the present stage of economic transition. These obstacles include high instability of monetary variables in the small, open economies that are susceptible to contagion effects of external financial crises. They also include short time series of data, the time consistency of which is further distorted by frequent systemic changes in monetary regimes. The CNB has been able to alleviate these deficiencies at least partially by conducting surveys of inflation forecasts of ten leading institutions in the Czech financial system. By doing so, it is able to detect inflation expectations of the financial sector and relate them to the official inflation forecast in order to devise appropriate policy responses.

The Czech DIT regime began from a relatively strict version of inflation targeting. The tolerance band during the first two years was set at 0.5 percent around the

¹ The advantages of targeting a trend-consistent inflation trajectory over the emphasis on year-end operating targets are convincingly explained by King (1996).
midpoint targets (the year-end net inflation targets were 5.5-6.5 percent in 1998, and 4.0-5.0 percent in 1999). As the system evolved and inflation become considerably lower, the bands of operating targets were increased to one percent in 2000 and 2001. Consistently, the year-end target setting was replaced by a dynamic inflation trajectory. These modifications certainly improved transparency of the DIT regime and made monetary policy more predictable for financial institutions. The ongoing development of the Czech DIT system has enabled the CNB to relax restrictiveness of monetary policy and improve credibility, as implied by declining inflation risk premiums in Table 1.

A similar advancement of the DIT system is not apparent in Poland. The NBP launched inflation targeting in January 1999. Initially, it applied a strict version of CPI-based targeting with a narrow tolerance band of 6.6-7.8 percent for the end of 1999, and 5.4-6.8 percent for the end of 2000. The target band has been eventually increased and broadened to 6.0-8.0 percent for 2001, since the target was missed during the first two years of the new policy regime. Consistently, Poland’s financial authorities applied a floating exchange rate system as of April 2000, replacing the previous broad target zone of exchange rate of plus-minus 15 percent. In spite of its failure to reach the 1999 and 2000 operating targets, the NBP has demonstrated a strong determination to pursue the long-term CPI inflation goal that has been set at 4.0 percent for the end of 2003. It has done so by maintaining interest rates at very high levels, as reflected by high inflation risk premiums shown in Table 1. Such a restrictive monetary policy has resulted in the lowest level of actual inflation among the three examined countries (Table1). The CPI inflation is likely to fall well below the operating target set for December 2001.

The Polish DIT system has yet to prove visible gains in monetary credibility. The decreasing trend of CPI inflation has been accomplished by very restrictive monetary policy, as proven by high inflation risk premiums reported in Table 1. A slow progress of the Polish DIT system may be at least partially attributed to the vagueness of the official pronouncement of its strategies, objectives and guiding rules. While the Polish system overemphasizes the importance of accomplishing year-end operating target, its determination is not fully supported by the disclosure of official inflation forecasts. Although the NBP Monetary Policy Council frequently refers to the future ‘policy bias’ in its official announcements and reports, the actual policy changes seem to rely heavily on backward-looking, rather than forward-looking expectations (Orlowski, 2001).

Hungary is the newest member of the ‘inflation targeting club’ in Central Europe. The NBH has officially begun pursuing DIT in June 2001, after realizing that the previous strict exchange rate targeting system did not help accomplish goals of price stability. At the time of the new policy announcement in May 2001, Hungary’s CPI annualized inflation was running at 10.8 percent, well above the levels in the Czech Republic and in Poland. The NBH has set a long-term target at 2.0 percent to be reached by March 2004, or two years prior to the anticipated entry to the eurozone in 2006. Consistently, the operating target has been set for the next two years at the levels reported in Table 1. Accomplishing these targets will be a challenge; it will require a better coordination of fiscal and monetary policies than the one prevailing in Hungary for the past several years. The previous monetary system was based on the HUF peg to the euro with a narrow band of 2.25 percent on either side of parity and accompanied by crawling devaluation (recently at 0.2 percent monthly rate). The currency peg was not very successful in lowering inflation to sustained single digit levels, because it failed to
provide sufficient policy discipline that would facilitate a successful monetary convergence to the euro. Monetary policy in Hungary will have to be more restrictive than that implied by low inflation risk premiums shown in Table 1. However, the degree of restrictiveness can be relaxed if the government is able to demonstrate stronger commitment to fiscal discipline.

Although it is too early to detect any meaningful results of the new policy, the Hungarian DIT system seems to be well drafted and exhaustively explained. Its rules are transparent, reinforced by a comprehensive articulation of the forward-looking mechanism that relies on monthly revised rolling inflation forecasts for six quarters ahead.

In sum, it is not a coincidence that the monetary authorities in the three advanced Central European transition countries have chosen to apply DIT regimes at the present stage of transition and monetary convergence to the euro. They need to demonstrate clear commitment to disinflation, particularly at the present time of high fiscal policy uncertainty. They need to prove ability to reach price stability by applying modern, forward-looking monetary regimes. Similar complex policies could not had been enacted in these countries at earlier stages of economic transition in the absence of the necessary institutional framework (developed financial markets) and analytical tools (methods of inflation forecasting) to support such policies. Nevertheless, the technical advancement of these countries’ DIT regimes is far from being perfect. There is a room for improving techniques of forecasting inflation and modeling monetary policies. Following this belief, I attempt to design an analytical model prescribing the inflation process in the economies in transition. Its empirical tests might be useful for designing appropriate venues of monetary convergence to the euro.

III. A Dynamic Inflation Process in Transition Economies

Recognizing the experience of Central European monetary authorities with gradual departure from fixed exchange rate regimes, I advocate the relevance of DIT at the present stage of transition. This type of monetary policy allows focusing on disinflation as a primary goal of monetary policy, which makes it a viable starting point of monetary convergence to the euro. The policy long-term target, which is consistent with a predetermined trajectory of disinflation, will help facilitate transition to a stable currency regime. Therefore, I propose a dynamic policy sequence that begins with a strict form of DIT, followed by a more flexible approach that is based on combination of well-specified inflation targets and supporting targets for the (floating) exchange rate. At its final stage, the monetary convergence will conclude with a full-fledged euroization, not necessarily preceded by a peg to the euro. The convergence process may take several years and one may argue that the proposed sequence entails too many and too costly changes in monetary regimes. However, I believe that the process is based essentially on two regimes: inflation targeting, and full euroization. The latter may be accomplished through a one-time, radical change, or a ‘leap to the eurosystem’, when the candidate
countries reach a satisfactory level of price stability comparable with that in the eurozone. In search for optimal policy for the transition economies that are targeting inflation, I make several assumptions that are derived from the prominent analysts of DIT regimes, particularly Svensson (1999, 2000 and 2001), Eichengreen (2001) and, specifically for transition countries, Siklos and Abel (2001). These assumptions are essential for designing an analytical model that represents the inflation process in transition economies.

1. I advocate a forward-looking character of DIT regimes in transition economies. Accordingly, central banks will be well advised to adjust policy instruments in response to changes in inflation forecasts. A forward-looking approach provides a comfort of keeping interest rates at considerably lower levels than those prevailing under backward-looking policies. While responding to inflation forecasts, central banks may use a future policy (tightening) bias that will help them refrain from applying exorbitantly high interest rates.

2. DIT systems ought to be transparent. Policy goals, strategies and tactics need to be thoroughly explained to the public at large and, in some instances, fully consulted with qualified institutions and specialists. Full communication of policy rules and actions, particularly in the environment of transition economies, becomes indispensable for breaking a cycle of inflation inertia that stems from nominal, backward-looking indexation of wages and prices.

3. Central banks need to have good knowledge about the prevailing channels of monetary policy transmission. There is a common belief that the exchange rate channel is predominant in transition economies, particularly in Hungary (Golinelli and Rovelli, 2001), although in Orlowski (1999) I suggest to downplay its dominance in the cases of Poland and the Czech Republic. However, in order to further disinflation, central banks may want to find methods leading to a more active role of the rational expectations channel. This can be accomplished through more transparent and forward-looking policy rules and actions.

4. Perhaps most importantly, central banks must be free of government dominance and of constraints imposed on them by lax fiscal policies. DIT is successfully implemented when fiscal discipline is maintained and when the entire government shares responsibility for pursuing goals of price stability.

Taking these assumptions into consideration, I devise a model aimed at explaining the inflation process applicable to specific conditions of countries in transition. It begins from a simple, open economy Phillips curve in the form proposed by Svensson (2000):

\[
\pi_t = \alpha_\pi \pi_{t-1} + \alpha_y y_t - \alpha_\epsilon (e_t - e_{t-1}) + \xi_t
\]

where

\footnotesize
\cite{2} There is an exhaustive literature supporting the bi-polar view of exchange rate regimes and proving that interim solutions, such as implicit target zones for exchange rate, are too costly (see for instance, Masson, 1999; Fischer, 2001; Eichengreen, 2001)
with \( y^d_t \) being a log of aggregate demand and \( y^n_t \) the natural level of output that is assumed to be exogenous.

The log of real exchange rate \( e_t \) is the sum of the log of nominal rate \( s_t \) and the inflation differential of the log of domestic price \( p^d_t \) and the foreign price level \( p^f_t \):

\[
e_t = s_t + p^d_t - p^f_t
\]

In this form, the nominal exchange rate \( s_t \) is expressed as a foreign currency value of a unit of domestic currency, thus an increase in \( s_t \) means nominal appreciation and an increase in \( e_t \) real appreciation of domestic currency.

The open economy inflation process can be extended by the introduction of forward-looking expectations:

\[
\pi_t = \alpha_{x} \pi_{t-1} + (1-\alpha_{x}) \pi_{t+\tau/t} + \alpha_y [y_t - \eta (y_{t-1} - y_{t+\tau/t})] - \alpha_{x1} (e_t - e_{t-1}) + \alpha_{x2} (e_{t+\tau/t} - e_t) + \xi_t
\]

This is an open-economy Phillips curve with forward-looking expectations. The function reacts to the lagged effect of real exchange rate movement \( (e_t - e_{t-1}) \), as well as to the direction of the real exchange rate forecast for \( \tau \) -periods ahead, formulated at time \( t \), which is \( (e_{t+\tau/t} - e_t) \). The inflation response to the real exchange rate forecast is assumed to be strongly affected by interest rate differentials and by shocks to capital inflows. The role of the exchange rate channel of monetary policy transmission is reflected by \( \alpha_{x1} \) and it is more pronounced if the coefficient has a higher absolute value. The shift parameter \( \alpha_y \) varies between 0 and 1 and it reflects the relative importance of backward (when it is close to 1) or forward (close to 0) looking expectations. The forward expectations are geared to the inflation forecast \( \pi_{t+\tau/t} \) for \( \tau \)-periods ahead, formulated at the present time \( t \). The shift parameter \( \alpha_{x2} \) is assumed to be diminishing as the policy becomes more credible and, at the same time, more responsive to forward-looking expectations.

The expected variation in the real exchange rate \( (e_{t+\tau/t} - e_t) \) is assumed to be dependent on the international Fischer effect:

\[
e_{t+\tau/t} - e_t = r^d_t - r^f_t + r_t^M + \nu_t
\]

where \( r^d_t \) is the domestic and \( r^f_t \) is the corresponding foreign short-term interest rate. The interest rate differential is augmented with \( r_t^M \), which is the interest rate risk reflecting the credibility gap between domestic and foreign monetary systems, and with \( \nu_t \), which represents the asset price shock (the Calvo-type shock, as prescribed by Eichengreen, 2001).
By assumption, the interest rate risk premium fully corresponds to the currency risk premium $\theta_i$ in these small open economies whose monetary policies closely follow those of their larger foreign partners. Thereby,

$$\rho_i^M = -\theta_i$$

(6)

The currency risk premium can be introduced in (5) and the augmented international Fischer effect will assume:

$$\lambda(r_i^d - r_i^f) - \theta_i + \nu_i = (1 - \lambda)(e_{i+\tau} - e_i)$$

(7)

In this relationship, $\lambda$ is introduced as the policy bias parameter. High $\lambda$ implies reliance on interest rate adjustments in response to changes in foreign rates, as a key tool of policy operations. Adversely, a low value of $\lambda$ suggests active management of expected real exchange rates, as a predominant policy devise. Moreover, high $\lambda$ is consistent with a floating exchange rate system within which the nominal exchange rate closely follows inflation differentials thus causing a steady expected path of real exchange rate. Under such circumstances, changes in the domestic interest rate $r_i^d$ relative to foreign rate $r_i^f$ directly respond to changes in $\theta_i$ and under more discretionary policy also to $\nu_i$. If $\lambda$ is close to zero, monetary policy strongly relies on the exchange rate channel of the policy transmission. Then, a central bank responds to the observed changes in $\theta_i$ with currency devaluation or revaluation. A medium level $\lambda$ indicates application of implicit target zones for the exchange rate.

The currency risk premium $\theta_i$ is exogenous. It depends on long-term gains in macroeconomic stability of the country relative to its foreign partners. External shocks are also exogenous, although they have normally a short-term impact on the economy and do not require corrective adjustments in interest rates.

It can be further noted that $\lambda = 1 - \alpha_{\sigma_2} = \alpha_r$ within the framework of (4). Thereby, the augmented international effect prescribed by (7) inserted into the inflationary process (4) results in:

$$\pi_i = \alpha_\sigma \pi_{i-1} + (1 - \alpha_\sigma)\pi_{i+\tau/1} + \alpha_\eta [y_i - \eta(y_{i-1} - y_{i+\tau/1})] - \alpha_\lambda (e_i - e_{i-1}) + \alpha_\phi (r_i^d - r_i^f + \gamma_i) + \alpha_\phi \phi_i + \xi_i$$

(8)

The actual experience of the economic transition calls for an assumption that the parameter $\alpha_\sigma$ is slowly diminishing as the currency risk premium improves. However, it remains to be nearly constant in the short-run. In addition, $\gamma_i$ is believed to be rather negligible. Possible shocks to $\gamma_i$ can be either permanent or transitory. If they are permanent and large, it may be plausible for a central bank to target monetary conditions index (MCI), thus to respond to currency depreciation by raising interest rates (Hunt, 1999). If they are transitory, these shocks do not require active policy responses. It can be noted that pass-through effects of currency depreciation are shown in (8) separately,
following their treatment in the model advanced by Ball (1999). In principle, pass-
through effects have a transitory nature since rising import prices normally affect
inflation only temporary and active policy responses to them with higher interest rates
would only amplify the volatility of output and inflation (Eichengreen, 2001). In his
seminal study, Ball (1999) suggests that the MCI ought to be adjusted not only to
movements in the CPI-based inflation, but also to fluctuations in inflation that are
adjusted for the real exchange rate movement. Then, a central bank will target not only
CPI inflation alone, but also the overall domestic inflation that takes into consideration
exchange rate and/or income variables. Consequently, the system will follow a flexible
inflation-targeting framework, such as the one suggested by (8). Among other
considerations, a central bank that applies a flexible inflation target needs to monitor the
values of $\alpha$ parameters. They ought to have a finite sum in order to avoid large
destabilizing effects of monetary policy on income or on exchange rates.

It can be further assumed that interest rate differentials in a small open economy
with liberalized capital account are likely to react to shocks to capital inflows, thus $\gamma_i$
may have a non-zero value.

The inflationary process (8) can rearranged to display the instrument rule:

$$\alpha_i (r^d_t - r^f_t + \gamma_t) = \pi_t - \alpha_d \pi_{t+1} - (1-\alpha_x) \pi_{t+1} - \alpha_y \phi [y_t - \eta(y_{t+1} - y_{t+1})] + \alpha_c (e_t - e_{t+1}) - \alpha_d \phi_t - \xi_t$$

(9)

It can be further rearranged into a feedback rule for monetary policy that incorporates
backward and forward-looking variables and open economy parameters:

$$r^d_t = \frac{1}{\alpha_i} \{ \pi_t - \alpha_d \pi_{t+1} - (1-\alpha_x) \pi_{t+1} - \alpha_y \phi [y_t - \eta(y_{t+1} - y_{t+1})] + \alpha_c (e_t - e_{t+1}) - \alpha_d \phi_t + r^f_t - \gamma_t + \xi_t \}$$

(10)

In order to make the general process (10) more applicable to monetary regimes that are
based on inflation targeting, it is necessary to formulate an appropriate feedback (or
reaction) function of a central bank. The Reserve Bank of New Zealand, which has
pioneered DIT, has developed a reaction function that offers useful guidance for inflation
targeting in small, open economies (Nadal de Simone, 1998):

$$s_t - s_{t-1} = \pi_{t+1} - ((\pi^f_{t+1} - \pi^d_{t+1}) - \delta[\pi^f_{t+1} - \pi^d_{t+1}])$$

(11)

where $\pi_{t+1}$ is the domestic inflation target, or more specifically, the trajectory-consistent
level of inflation set for $\tau$ -periods ahead, $s_t$ is the nominal exchange rate, and $\pi^f_{t+1}$
denotes forecasts of foreign (f) and domestic (d) inflation for $\tau$ -periods ahead. The
function can be reset for domestic inflation:

$$\pi^d_t = \pi^d_{t+1} - (1-\alpha_x) \pi^d_{t+1} + \alpha_x (\pi^f_{t+1} - \pi^d_{t+1} + s_t - s_{t-1})$$

(12)

---

3 A useful analysis of the role of exchange rate stability in the inflation-targeting framework is presented by Haldane (1997).
This model seems to be suitable for transition economies that are becoming increasingly dependent on foreign monetary conditions since it emphasizes the impact of external shocks to the exchange rate on domestic inflation, as reflected by a stronger role of $\alpha_s$.

Under perfectly flexible exchange rates, rising foreign inflation leads to appreciation of domestic currency, thereby it has no effect on domestic inflation.

Inserting (12) into (8) allows for modification of the domestic inflation process that becomes:

$$\pi_{t+\tau/t}^d = (1-\alpha_s)\pi_{t+\tau/t}^f + \alpha_s(\pi_{t+\tau/t}^f - \pi_t^f + s_t - s_{t-1}) =$$

$$= \alpha_s^d \pi_{t-1}^d + (1-\alpha_s)\pi_{t+\tau/t}^d + \alpha_s^d [y_t - \eta(y_{t-1} - y_{t+\tau/t})] - \alpha_{i1}(e_t - e_{t-1}) + \alpha(r_t - r_{t-1}^f + \gamma u_t) + \alpha \phi_t + \xi_t$$

(13)

Based on (13), the domestic inflation forecast for $\tau$-periods ahead can be stated as:

$$\pi_{t+\tau/t}^d = \pi_{t-1}^d + (1-\beta_s)\pi_{t+\tau/t}^f - \beta_s(\pi_{t+\tau/t}^f - \pi_t^f + s_t - s_{t-1}) + \beta_y^d [y_t - \eta(y_{t-1} - y_{t+\tau/t})] -$$

$$- \beta_y(e_t - e_{t-1}) - \beta_e(r_t - r_{t-1}^f + \gamma u_t) + \beta_{t0} \phi_t + \xi_t^d$$

(14)

where $\beta_y = \alpha_y^d / \alpha_y$; $\beta_e = \alpha_e^d / \alpha_e$; $\beta_r = \alpha_r^d / \alpha_r$; and $\beta_{t0} = \alpha_{t0} / \alpha_x$.

In the dynamic inflation forecast function, the values of $\beta$ coefficients provide monetary authorities with information about the nature of the inflation process and policy transmission channels. This knowledge is essential for determining appropriate policy feedback rules. Specifically, a low value of $\beta_s$ suggests pursuing an independent forward-looking inflation targeting, and its value being close to unity implies a non-autonomous policy that strongly depends on the external inflationary environment. If the remaining $\beta$ coefficients are zero, the process follows strict inflation targeting, while their non-zero values, particularly those of $\beta_y$ and $\beta_e$, imply a flexible approach to inflation targeting.

Dynamic changes in $\beta$ coefficients can be applied to the environment of transition economies. Specifically, monetary policies in these economies might have started from relatively high values of $\beta_s$ and $\beta_e$ upon inception of pegged exchange rates. With the advancement of economic transition, these two coefficients might have played a diminishing role and the projected inflation might have been increasingly sensitive to the remaining $\beta$ coefficients. However, these general statements may not always reflect the experiences of individual countries, because systemic foundations of their monetary policies have changed at different directions, timing and pace.

IV. Empirical Evidence
A straightforward application of (14) aimed at assessing monetary policy conditions in Poland, Hungary and the Czech Republic is not plausible for several technical reasons that can be summarized as follows:

1. These countries have not pursued full-fledged forward-looking monetary policies yet. Thus the empirical testing of the future expected inflation $\pi_{t+\tau}$ based on the recent available data could not be conclusive. Therefore, I have chosen the current inflation level $\pi_t$ as a dependent variable in the tested model.

2. Policy makers in these countries have not officially conducted estimations of the output gap and the GDP data are certainly reported on the quarterly basis. For these reasons, I have chosen the index of industrial production as a proxy for each country’s output and the data have been seasonally adjusted in order to eliminate large, transitory shocks.

3. The connection between interest rates and inflation has been refocused onto the impact of short-term interest rate differentials (three months Treasury bills) as well as bank lending rates differentials between individual transition countries and Germany. The differences in bank lending rates are believed to have impact on inflation through international flows of bank credit. If domestic lending rates are too high relative to foreign rates, businesses and individuals may borrow large amounts of credit from abroad thus accelerating capital inflows. Moreover, the underdeveloped bond markets and the lack of adequate data on long-term Treasury bond rates have hindered a proper assessment of risk premiums, which are incorporated in domestic nominal interest rates and not extracted separately.

4. The empirical analysis is based on monthly data series in the period January 1995–June 2001. Although earlier data are available for these countries, their inclusion would distort the empirical findings due to serious systemic inconsistencies. Earlier monetary policies were based on currency pegs and were implemented with less complex, direct instruments. Prices were less flexible - they were subject to vast administrative interference, financial markets were less developed and capital flows were constrained. Thereby conclusions based on the past foundations are likely to be invalid for explaining the current environment of monetary policies.

5. Inflation targets have been specified only very recently, upon the adoption of DIT systems and the dynamic target trajectories have not been officially designed (with the exception of the Czech Republic). Therefore, I have estimated smoothed series of inflation trajectories with Hodrick-Prescott filters.

Taking these obstacles into consideration, the empirically tested model has been designed as:

$$\pi_t^d = \beta_0 + \beta_1 \pi_t^d + \beta_2 \pi_t^{d-1} + \beta_3 (\pi_t^G - \pi_t^G + s_t - s_{t-1}) + \beta_4 IP_t^{m} + \beta_5 (e_t - e_{t-1}) + \beta_6 (r_t^{ad} - r_t^{ad}) + \beta_7 (r_t^{gd} - r_t^{gd}) + \xi_t.$$  

(15)
where nominal exchange rates $s_t$ reflect domestic currency values of the euro (based on DEM/1.95583 before 1999), $IP_{t}^{au}$ is a seasonally adjusted (with Census X11 additive) index of industrial production, superscripts $G$ denote German variables, $r_t^T$ are three months Treasury bill rates, and $r_t^L$ are prevailing bank lending rates.

The empirical assessment of $\beta$ sensitivity coefficients provides useful information about the monetary determinants of inflation and about the features of the existing monetary system. The systemic characteristics can be summarized as follows:

1. If the estimated value of $\beta_1$ is high and the values of $\beta_2$, $\beta_3$, $\beta_4$ and $\beta_5$ are low, the monetary system follows a strict, backward-looking DIT policy.
2. High estimated values of $\beta_2$ and low $\beta_1$, $\beta_3$, $\beta_4$ and $\beta_5$ imply a strict, forward-looking DIT.
3. Low $\beta_1$, $\beta_2$ and $\beta_4$, combined with high $\beta_3$ and $\beta_5$ suggest a successful policy of strict exchange rate targeting.
4. Medium levels of $\beta_1$ and $\beta_2$ accompanied by higher absolute values of $\beta_3$, $\beta_4$ and $\beta_5$ indicate flexible inflation targeting (certainly, if these levels are consistent with deliberately set targets). A stronger influence of $\beta_3$ and $\beta_5$ relative to $\beta_4$ suggests a dominant role of exchange rate stability rather than income growth within a wider band of tolerance around the inflation target. In addition, the advantage of $\beta_5$ over $\beta_1$ implies a stronger role of forward-looking expectations.
5. A high value of $\beta_3$ indicates effective functioning of the exchange rate channel of monetary policy transmission, while high $\beta_2$ means reliance on the rational expectations channel. By contrast, high value of $\beta_1$ means a stronger role of the credit channel. Simultaneously, a higher value of $\beta_4$ means effective influence of short-term interest rate differentials, thus a strong impact of speculative capital inflows on inflation.

In the above form (15), the model emphasizes the monetary and income variables that can be influenced by monetary authorities, at least to some degree. In other words, it incorporates variables that might be considered in the determination of monetary policy goals and appropriate instruments. There are, however, important determinants of inflation that play a crucial role in transition economies, which are not included in the model. Among them are administrative price adjustments, taxes and wage indexation. Because of their exogenous relation to monetary policy, or the inability of central banks to influence them, these variables have not been included in the tested model. Consequently, the deterministic value of the model is lower because of this exclusion. Nevertheless, the model is specifically designed to provide guidance for determining monetary policy goals, tactics and instruments based on the variables that are more directly related to it.

Direct estimation of (15) is limited by non-stationarity of almost all variables included in the model for all four countries (Poland, the Czech Republic, Hungary, and
This problem is reflected by the results of the Augmented Dickey Fuller (ADF) stationarity test shown in Table 2.

Table 2: ADF Unit Root Test for Stationarity

<table>
<thead>
<tr>
<th></th>
<th>(\tau)</th>
<th>(\tau')</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Poland:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPI inflation (year-on-year)</td>
<td>-3.3212</td>
<td>-4.3796</td>
</tr>
<tr>
<td>PLN value of EUR</td>
<td>-1.4962</td>
<td>-6.4004</td>
</tr>
<tr>
<td>Real Effective Exchange Rate</td>
<td>-3.8139</td>
<td>-6.1710</td>
</tr>
<tr>
<td>3-Months T-bill Rate</td>
<td>-2.1475</td>
<td>-5.3124</td>
</tr>
<tr>
<td>Bank Lending Interest Rate</td>
<td>-2.0012</td>
<td>-9.0308</td>
</tr>
<tr>
<td>Industrial Production (s.a.)</td>
<td>-2.9208</td>
<td>-10.7855</td>
</tr>
<tr>
<td>CPI Inflation Trend (HP Filter)</td>
<td>-14.0890</td>
<td>-6.6438</td>
</tr>
<tr>
<td><strong>Czech Republic:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPI inflation (year-on-year)</td>
<td>-1.7435</td>
<td>-4.3005</td>
</tr>
<tr>
<td>Net Inflation (year-on-year)</td>
<td>-1.3547</td>
<td>-3.2033</td>
</tr>
<tr>
<td>CTKR value of EUR</td>
<td>-2.6602</td>
<td>-5.4235</td>
</tr>
<tr>
<td>Real Effective Exchange Rate</td>
<td>-3.1242</td>
<td>-5.9715</td>
</tr>
<tr>
<td>3-Months T-bill Rate</td>
<td>-1.4417</td>
<td>-5.2822</td>
</tr>
<tr>
<td>Bank Lending Interest Rate</td>
<td>-1.7408</td>
<td>-6.2429</td>
</tr>
<tr>
<td>Industrial Production (s.a.)</td>
<td>-2.5330</td>
<td>-11.1618</td>
</tr>
<tr>
<td>CPI Inflation Trend (HP Filter)</td>
<td>-14.7370</td>
<td>-12.6049</td>
</tr>
<tr>
<td>Net Inflation Trend (HP Filter)</td>
<td>-8.0890</td>
<td>-10.3223</td>
</tr>
<tr>
<td><strong>Hungary:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPI inflation (year-on-year)</td>
<td>-2.2860</td>
<td>-6.0356</td>
</tr>
<tr>
<td>HUF value of EUR</td>
<td>-2.2026</td>
<td>-7.3226</td>
</tr>
<tr>
<td>Real Effective Exchange Rate</td>
<td>-3.3117</td>
<td>-7.4129</td>
</tr>
<tr>
<td>3-Months T-bill Rate</td>
<td>-2.7323</td>
<td>-6.3964</td>
</tr>
<tr>
<td>Bank Lending Interest Rate</td>
<td>-0.9714</td>
<td>-4.0292</td>
</tr>
<tr>
<td>Industrial Production (s.a.)</td>
<td>-2.0466</td>
<td>-11.8208</td>
</tr>
<tr>
<td>CPI Inflation Trend (HP Filter)</td>
<td>-22.7070</td>
<td>-15.1321</td>
</tr>
<tr>
<td><strong>Germany:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPI inflation (year-on-year)</td>
<td>-1.0786</td>
<td>-7.7034</td>
</tr>
<tr>
<td>3-Months T-bill Rate</td>
<td>-2.7494</td>
<td>-5.7991</td>
</tr>
<tr>
<td>Bank Lending Interest Rate</td>
<td>-0.7249</td>
<td>-5.7819</td>
</tr>
<tr>
<td>CPI Inflation Trend (HP Filter)</td>
<td>-10.3429</td>
<td>-11.1949</td>
</tr>
</tbody>
</table>

Notes: \(\tau\) is based on the ADF test for unit root in the level of the variable, including trend and intercept, with one lagged difference and \(\tau'\) is for the first difference of the variable, including trend and intercept, with one lagged difference. These \(\tau\) indicators are certainly different from the \(\tau\) time horizon operators in the model used for forecast variables. McKinnon critical \(\tau\)-values are: –4.0803 at one percent, -3.4681 at five percent, and –3.1606 at ten percent probability. The \(\tau\)-value of the Czech net inflation in the second difference of the variable is –7.4156. Trend inflation variables are based on Hodrick Prescott filter estimation. They are reported only for the purpose of completing
the list of all variables included in estimation of (15). Industrial production indexes are seasonally adjusted with Census X11 Additive.

Source: Own calculations based on data from the International Monetary Fund, the Czech National Bank, the Czech Statistical Office, the National Bank of Poland, the National Bank of Hungary, and PlanEcon (real effective exchange rates).

As evidenced in Table 2, all examined variables (with the exception of the Polish real exchange rate) are non-stationary at their levels. All of them become stationary in the series representing their first differences. Therefore, the empirical estimation of (15) is based on the function representing first differences of all dependent and independent variables. The results of these regressions are shown in Table 3.

Table 3: Estimation Representations of (15)

<table>
<thead>
<tr>
<th></th>
<th>Poland’s CPI Inflation</th>
<th>Czech CPI Inflation</th>
<th>Czech Net Inflation</th>
<th>Hungary’s CPI Inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\hat{\beta}_0$</td>
<td>0.098 (0.127)</td>
<td>0.070 (0.139)</td>
<td>0.056 (0.070)</td>
<td>0.151 (0.167)</td>
</tr>
<tr>
<td>$\hat{\beta}_1$</td>
<td>0.462 (0.107)</td>
<td>0.246 (0.119)</td>
<td>0.467 (0.093)</td>
<td>0.439 (0.097)</td>
</tr>
<tr>
<td>$\hat{\beta}_2$</td>
<td>1.063 (2.580)</td>
<td>1.347 (1.332)</td>
<td>1.156 (1.978)</td>
<td>0.534 (0.971)</td>
</tr>
<tr>
<td>$\hat{\beta}_3$</td>
<td>-0.013 (-0.052)</td>
<td>-0.155 (-1.205)</td>
<td>-0.210 (-3.312)</td>
<td>0.050 (2.237)</td>
</tr>
<tr>
<td>$\hat{\beta}_4$</td>
<td>0.033 (0.013)</td>
<td>0.021 (0.015)</td>
<td>0.028 (0.008)</td>
<td>0.025 (0.013)</td>
</tr>
<tr>
<td>$\hat{\beta}_5$</td>
<td>0.007 (0.035)</td>
<td>0.013 (0.068)</td>
<td>-0.002 (-0.209)</td>
<td>-0.003 (-0.146)</td>
</tr>
<tr>
<td>$\hat{\beta}_6$</td>
<td>0.003 (0.090)</td>
<td>0.305 (0.119)</td>
<td>0.022 (0.065)</td>
<td>0.148 (0.109)</td>
</tr>
<tr>
<td>$\hat{\beta}_7$</td>
<td>0.077 (0.035)</td>
<td>0.086 (0.163)</td>
<td>0.165 (0.346)</td>
<td>0.424 (1.358)</td>
</tr>
<tr>
<td>$R^2$ adjusted $R^2$</td>
<td>0.44 (0.38)</td>
<td>0.26 (0.18)</td>
<td>0.51 (0.45)</td>
<td>0.47 (0.41)</td>
</tr>
<tr>
<td>Durbin Watson</td>
<td>1.80 (2.03)</td>
<td>2.24 (2.203)</td>
<td>2.39 (1.929)</td>
<td>2.19 (2.689)</td>
</tr>
<tr>
<td>Akaike info.</td>
<td>1.86 (0.528)</td>
<td>2.33 (0.163)</td>
<td>1.00 (0.086)</td>
<td>2.05 (0.158)</td>
</tr>
</tbody>
</table>
Notes: $\hat{\beta}$ are estimated values of the corresponding $\beta$ coefficients in (15). Standard errors are reported in upper and t-statistics in lower parentheses. The time horizon $\tau$ is two quarters (six months) ahead, thus $\pi_{t+\tau/1}$ is regressed as a 6 months ahead forecast of inflation, based on the trend estimated with the Hodrick Prescott filter.

Source: Own calculations based on data as in Table 2.

The empirical testing of (15) shows that the factors that determine the inflation process vary quite significantly for all three economies. The examined series do not suffer from mean reversion (or ‘random walk’) since the estimated values of $\beta_0$ are all close to zero and the Durbin Watson statistics are within the tolerance range (around 2). The absence of mean reversion means that the last realization of the change in $\pi$ is a good forecast for its next realization.

The model is fairly explanatory in the cases of the Czech net inflation and Hungarian and Polish CPI inflation, but less for the Czech CPI inflation. These findings support the statement that the Czech CPI inflation was strongly influenced in the investigated period of time by the factors unrelated to monetary policy, such as adjustments in administrative prices, VAT rates and import duties (Brada and Kutan, 1999). Within this context, the recent switch by the CNB into CPI inflation targeting may be correct as long as the Czech Government will refrain from large increases in regulated prices that were last conducted in 1998. Moreover, the investigated function does not take into consideration significant changes in relative prices induced by Balassa-Samuelson effects (BSE). The BSE phenomenon is based on the notion that a faster productivity growth in the traded goods sector tends to drive up wages in all sectors, thus relative prices of non-traded goods to those of the traded goods will rise. BSE is pronounced in catching-up economies, since their productivity growth is normally faster than that in industrial countries. These effects are quite strong in the candidate countries for the EU accession and they contribute to the persistence of inflation (Szapáry, 2000). Consequently, they tend to disconnect a link between the inflation process and changes in monetary variables.

As shown in Table 3, both backward and forward looking expectations do affect current inflation rates, however, at various degrees. While in Hungary backward-looking expectations and indexation play a strong role, a sensitivity of inflation to its forecast is statistically insignificant. This confirms the statement that the inflationary process in this country has not been strongly sensitive to future expectations, which is perhaps consistent with the pegged exchange rate regime. The new framework for the NBH monetary policy is likely to change this situation since it emphasizes the importance of inflation forecast and other forward looking variables for policy decisions. Current inflation is certainly sensitive to its most recent trend in all three countries. It is highly sensitive to the first order autoregressive process, thus it is certainly supported by strong, backward-looking indexation. Although the future inflation forecast is less significant, it is an important explanatory factor of inflation, primarily in Poland. As argued before, this stems directly from systemic foundations that decide how forward-looking expectations are transmitted into the inflation process. Polish firms and markets may be sensitive to
the expected inflation trend since the NBP widely applies a policy bias in monetary policy communication. It can be expected that inflation forecasts and rational expectations will play a more significant role in the future, as monetary policies become more transparent and, generally speaking, more credible.

The relationship between seasonally adjusted industrial production and the inflation process seems to be quite apparent, as also confirmed for Hungary by Siklos and Abel (2001). This suggests that a Phillips-curve-type relationship may be evident in these economies, at least in the short-run. Monetary easing (or tightening) seems to correspond with an increase (or slowdown) in industrial activity. For instance, in the Czech Republic, a significant and prolonged monetary tightening, particularly during the period between the third quarter of 1997 and the first quarter of 1999, had a strong, negative impact on the country’s industrial output. A similar slowdown in output growth is observed in Poland in 2000 and 2001, in part because of the extremely tight monetary policy (which is evidenced by the high inflation risk premiums shown in Table 1). Interestingly, the data seem to indicate that the Phillips curve process is somewhat more pronounced under conditions of more flexible exchange rates in Poland and in the Czech Republic, than in Hungary.

Intriguing results are provided by the $\beta_3$ estimates. These coefficients show to what extent the expected trend in foreign (German) inflation is transmitted via variation in the current exchange rate onto domestic inflation. Evidently, the reactions of current inflation to the expected German inflation and to the exchange rate trend are quite different in these economies. The coefficient is statistically significant and has a positive sign for Hungary, meaning that increases in the EU, or more precisely, in German inflation expectations are transmitted to domestic inflation, particularly under the fixed exchange rate regime. In contrast, the coefficient is statistically significant; yet, it has a negative sign in the case of the Czech net inflation. This suggests frequent pre-emptive policy responses of the CNB to the expected external inflationary pressures.

It is rather perplexing that the real exchange rate movement in the preceding period has little impact on the inflationary process in all three countries. This suggests weaker pass-through effects of exchange rates into inflation than that claimed by both policy-makers and independent researchers (Szapáry and Jakab, 1998; Golinelli and Rovelli, 2001).

Short-term interest rate differentials do not appear to be seemingly related to the inflation process, with the exception of the Czech CPI inflation (as confirmed also by Matoušek, 2001). Their impact on inflation in Poland and in Hungary might be overrated in the official policy statements and central bank reports. Both countries are fairly well cushioned from large external speculative attacks, as proven by relative stability of their financial markets in the aftermath of the Asian and the Russian financial crises (Gelos and Sahay, 2000). But the weak connection between short-term market interest rates, suggests that calls for monetary policies that are based on interest rate targeting might be unsubstantiated; such policies are not likely to be effective in lowering inflation.

By comparison, differentials in bank lending rates in the preceding period do matter in the tested model. This is clearly the case in Hungary and, to a lesser degree, in Poland. They have also a somewhat pronounced impact on the Czech net inflation. The obtained results indicate that if domestic lending rates in the previous period are higher than the German lending rates, borrowers are likely to bring large amounts of credit from
German and other EU banks. Large inflows of foreign bank credit are likely to add to the ongoing inflation process in the examined transition economies. This factor deserves strong attention of central banks in these countries in their decisions about interest rate target levels.

The presented tests indicate that inflation in all three countries is strongly influenced by the autoregressive process. Current inflation is affected by the most recently observed trend and it might be also influenced by its dynamic trajectory, or the overall trend.

In order to detect a precise pattern of inflation, the estimates of which would be robust to heteroscedasticity and autocorrelation, a simplified inflation function can be estimated with a generalized method of moments (GMM). The specified estimated equation can be designed as a vector autoregressive function that includes the stochastic time trend:

\[ \hat{\pi}_t = c_1 + c_2 \pi_{t-1} + c_3 \pi_{t-2} + c_4 \pi_{\text{TREND}} \] (16)

The GMM methodology allows for choosing a list of instrument variables the changes of which do not become autocorrelated with the residuals in the estimated inflation function (16). Therefore, in order to alleviate the problem of autocorrelation between these residuals and the changes in the key instrument variables of monetary policy, I have conducted the GMM estimation of (16) while selecting the nominal exchange rate, the short-term interest rate differential (with Germany) and the constant term as GMM instrument variables. In other words, the choice of exchange rates and interest rates as instrument variables allows for insulating inflation as the monetary policy goal from autocorrelation with the policy instruments. As before, the inflation trend is based on the Hodrick Prescott filter estimation.

The GMM results are shown in Table 4. The empirical estimation shows no significant revelations comparing to the previously obtained results. As proven before, the strongest accelerator (or decelerator) of inflation is its most recently observed tendency, or, in technical terms, the first order autoregressive process. The second order process has a somewhat reversed, corrective impact in current inflation, and the overall dynamic trend seems to play a less significant role. The different results between a forward looking (6 months ahead) trend in Table 3 and the GMM estimated dynamic trend in Table 4 seem to indicate autocorrelation between the trend inflation, and interest rate differentials and exchange rates.

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Poland's CPI Inflation</th>
<th>Czech CPI Inflation</th>
<th>Czech Net Inflation</th>
<th>Hungary's CPI Inflation</th>
<th>Hungary's CPI Infl. no trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>( C_1 )</td>
<td>-0.014</td>
<td>-1.399</td>
<td>-0.383</td>
<td>-0.104</td>
<td>0.021</td>
</tr>
<tr>
<td></td>
<td>(0.280)</td>
<td>(2.246)</td>
<td>(1.317)</td>
<td>(0.869)</td>
<td>(0.121)</td>
</tr>
<tr>
<td></td>
<td>(-0.049)</td>
<td>(-0.623)</td>
<td>(-0.291)</td>
<td>(-0.119)</td>
<td>(0.175)</td>
</tr>
</tbody>
</table>
The fairly robust statistical results of the autoregressive process with the trend for Poland and the Czech Republic are not confirmed for Hungary. However, a de-trended function reaffirms a strong role of the autoregressive process, which is taking place there as well. Thereby, the Hungarian inflation appears to be less connected with its dynamic path, which may be at least partially related to the NBH’s highly discretionary monetary policy based on exchange rate targeting that prevailed in the investigated period of time between January 1995 and June 2001. As proven by Golinelli and Rovelli (2001), the stubbornly high Hungarian inflation is susceptible to systemic factors, such as the rate of crawling devaluation and the fiscal policy stance.

In general terms, the presented empirical analysis shows that inflation in the EU candidate countries does not very strongly depend on changes in financial variables, at least in the short-run. However, with the advancement of their inflation targeting regimes, such variables are likely to be increasingly inter-related with the inflation process.

V. Concluding Remarks

Optimal sequencing of changes in monetary policies among the candidate countries that is aimed at facilitating the process of the EU/EMU accession is a perennial topic of concern and discussion. In seeking to refine the presented theoretical framework and empirical analysis, I conclude that monetary convergence process is best served with policies based on flexible inflation targeting and it should end, perhaps a bit abruptly, with a leap to euroization. Policies to this end are entirely possible and can help reinforce commitment to disinflation and ensure achieving the goal of price stability over time.
They are likely to eradicate systemic problems with lowering inflation, including nominal indexation of wages and prices that still plays a strong role in these economies. As the above empirical evidence suggests, inflation in Central European transition economies is strongly influenced by the autoregressive process, or predominantly by backward-looking expectations that directly affect the scope of nominal indexation. It is also hardly a surprise that central banks in transition economies are concerned with defying fiscal dominance that at the present time seems to be threatening a further pursuit of disinflation.

In response to these problems, flexible inflation targeting seems to offer a viable policy framework that preserves autonomy of central banks and their full commitment to price stability. It is also likely to strengthen connection between inflation and key monetary policy variables, namely interest rates and exchange rate, thus to diminish the interference of exogenous factors such as fiscal dominance, political risk, administrative price adjustments, etc.

The factors disconnecting inflation from the monetary variables can have either a transitory or a more dynamic impact. Changes in administratively regulated prices or VAT adjustments are likely to have a transitory influence on inflation. They do not have to be considered by central banks in setting monetary policy goals and determining its tactics. A more permanent impact on the perseverance of inflation is linked to structural changes in the economy that cause changes in relative prices and add to inflation through the Balassa-Samuelson process. These factors cannot be directly influenced by central banks and they have to be incorporated into the policy goals and targets. If short-term, operating targets are too ambitious and ignore these factors, monetary policy may become too tight; it will lead inadvertently to large instability of output and exchange rates. For this reason, a framework of flexible inflation targeting that takes stable exchange rate into consideration is certainly more appropriate for the economies in transition.

Since the catching up and the BSE phenomena are likely to continue in the foreseeable future, it would be imprudent for transition countries to rush to the eurozone prematurely. They need to establish foundations of price stability and gain a sustainable degree of monetary credibility by ‘internal means’ or with autonomous monetary policies instead. Moreover, because of the persistence of structural and BSE factors in the EU candidate countries, the formal criteria of their accession to the EU and later to the EMU need to deviate from the rigor of the Maastricht Treaty. If the accession is to be completed within the next several years, the inflation convergence might be redesigned to accommodate these dynamic processes, for instance, set at a maximum of 1.5 percent above the overall HICP inflation in the eurozone, rather than above that of the three lowest inflation states.

REFERENCES


Matoušek, Roman (2001) ‘Transparency and Credibility of Monetary Policy in Transition Countries: the Case of the Czech Republic’ Paper to the conference of the PhareACE Project P98-1065, Erasmus University – Tinbergen Institute, Rotterdam, the Netherlands, May 11-12.


<table>
<thead>
<tr>
<th>Year</th>
<th>Paper Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>Euro-Diplomatie durch gemeinsame „Wirtschaftsregierung“</td>
<td>Martin Seidel</td>
</tr>
<tr>
<td>2007</td>
<td>Löhne und Steuern im Systemwettbewerb der Mitgliedstaaten der Europäischen Union</td>
<td>Martin Seidel</td>
</tr>
<tr>
<td></td>
<td>Konsolidierung und Reform der Europäischen Union</td>
<td>Martin Seidel</td>
</tr>
<tr>
<td></td>
<td>The Ratification of European Treaties - Legal and Constitutional Basis of a European Referendum</td>
<td>Martin Seidel</td>
</tr>
<tr>
<td>2006</td>
<td>Financial Frictions, Capital Reallocation, and Aggregate Fluctuations</td>
<td>Jürgen von Hagen, Haiping Zhang</td>
</tr>
<tr>
<td></td>
<td>Financial Openness and Macroeconomic Volatility</td>
<td>Jürgen von Hagen, Haiping Zhang</td>
</tr>
<tr>
<td></td>
<td>A Welfare Analysis of Capital Account Liberalization</td>
<td>Jürgen von Hagen, Haiping Zhang</td>
</tr>
<tr>
<td>2005</td>
<td>Das Kompetenz- und Entscheidungssystem des Vertrages von Rom im Wandel seiner Funktion und Verfassung</td>
<td>Martin Seidel</td>
</tr>
<tr>
<td></td>
<td>Die Schutzklauseln der Beitrittsverträge</td>
<td>Martin Seidel</td>
</tr>
<tr>
<td></td>
<td>Measuring Tax Burdens in Europe</td>
<td>Guntram B. Wolff</td>
</tr>
<tr>
<td></td>
<td>Remittances as Investment in the Absence of Altruism</td>
<td>Gabriel González-König</td>
</tr>
<tr>
<td></td>
<td>Economic Integration in a Multicone World?</td>
<td>Christian Volpe Martincus, Jennifer Pédussel Wu</td>
</tr>
<tr>
<td></td>
<td>Banking Sector (Under?)Development in Central and Eastern Europe</td>
<td>Jürgen von Hagen, Valeriya Dinger</td>
</tr>
<tr>
<td></td>
<td>Regulatory Standards Can Lead to Predation</td>
<td>Stefan Lutz</td>
</tr>
<tr>
<td></td>
<td>Währungspolitik als Sozialpolitik</td>
<td>Martin Seidel</td>
</tr>
<tr>
<td></td>
<td>Public Education in an Integrated Europe: Studying to Migrate and Teaching to Stay?</td>
<td>Panu Poutvaara</td>
</tr>
<tr>
<td>2004</td>
<td>The Effects of Transition and Political Instability On Foreign Direct Investment Inflows: Central Europe and the Balkans</td>
<td>Josef C. Brada, Ali M. Kutan, Tamer M. Yigit</td>
</tr>
<tr>
<td></td>
<td>The Choice of Exchange Rate Regimes in Developing Countries: A Multinominal Panel Analysis</td>
<td>Jürgen von Hagen, Jizhong Zhou</td>
</tr>
<tr>
<td></td>
<td>Fear of Floating and Fear of Pegging: An Empirical Analysis of De Facto Exchange Rate Regimes in Developing Countries</td>
<td>Jürgen von Hagen, Jizhong Zhou</td>
</tr>
<tr>
<td></td>
<td>Der Vollzug von Gemeinschaftsrecht über die Mitgliedstaaten und seine Rolle für die EU und den Beitrittsprozess</td>
<td>Martin Seidel</td>
</tr>
<tr>
<td></td>
<td>Deutschlands Wirtschaft, seine Schulden und die Unzulänglichkeiten der einheitlichen Geldpolitik im Eurosystem</td>
<td>Dieter Spethmann, Otto Steiger</td>
</tr>
<tr>
<td></td>
<td>Fiscal Crises in U.S. Cities: Structural and Non-structural Causes</td>
<td>Guntram B. Wolff</td>
</tr>
<tr>
<td></td>
<td>Firm Performance and Privatization in Ukraine</td>
<td>Galyna Grygorenko, Stefan Lutz</td>
</tr>
<tr>
<td></td>
<td>Analyzing Trade Opening in Ukraine: Effects of a Customs Union with the EU</td>
<td>Oksana Harbuzyuk, Stefan Lutz</td>
</tr>
<tr>
<td></td>
<td>Exchange Rate Risk and Convergence to the Euro</td>
<td>Lucjan T. Orlowski</td>
</tr>
<tr>
<td></td>
<td>The Endogeneity of Money and the Eurosystem</td>
<td>Otto Steiger</td>
</tr>
<tr>
<td></td>
<td>Which Lender of Last Resort for the Eurosystem?</td>
<td>Otto Steiger</td>
</tr>
<tr>
<td></td>
<td>The Effectiveness of Subsidies Revisited: Accounting for Wage and Employment Effects in Business R+D</td>
<td>Volker Reinthaler, Guntram B. Wolff</td>
</tr>
<tr>
<td></td>
<td>Money Market Pressure and the Determinants of Banking Crises</td>
<td>Jürgen von Hagen, Tai-kuang Ho</td>
</tr>
<tr>
<td></td>
<td>Die Stellung der Europäischen Zentralbank nach dem Verfassungsvertrag</td>
<td>Martin Seidel</td>
</tr>
</tbody>
</table>
Transmission Channels of Business Cycles Synchronization in an Enlarged EMU  
Iulia Traistaru

Foreign Exchange Regime, the Real Exchange Rate and Current Account Sustainability: The Case of Turkey  
Sübidey Togan, Hasan Ersel

Harry P. Bowen, Jennifer Pédussel Wu

Do Economic Integration and Fiscal Competition Help to Explain Local Patterns?  
Christian Volpe Martincus

Euro Adoption and Maastricht Criteria: Rules or Discretion?  
Sami Yläoutinen

The Role of Electoral and Party Systems in the Development of Fiscal Institutions in the Central and Eastern European Countries  
Jennifer Pédussel Wu

Harry P. Bowen, Jennifer Pédussel Wu

Economic Integration and Location of Manufacturing Activities: Evidence from MERCOSUR  
Pablo Sanguinetti, Iulia Traistaru, Christian Volpe Martincus

Economic Integration and Industry Location in Transition Countries  
Laura Resmini

Testing Creditor Moral Hazard in Sovereign Bond Markets: A Unified Theoretical Approach and Empirical Evidence  
Ayse Y. Evrensel, Ali M. Kutan

European Integration, Productivity Growth and Real Convergence  
Taner M. Yigit, Ali M. Kutan

The Contribution of Income, Social Capital, and Institutions to Human Well-being in Africa  
Mina Baliamoune-Lutz, Stefan H. Lutz

Rural Urban Inequality in Africa: A Panel Study of the Effects of Trade Liberalization and Financial Deepening  
Mina Baliamoune-Lutz, Stefan H. Lutz

Money Rules for the Eurozone Candidate Countries  
Lucjan T. Orlowski

Who is in Favor of Enlargement? Determinants of Support for EU Membership in the Candidate Countries’ Referenda  
Orla Doyle, Jan Fidrmuc

Over- and Underbidding in Central Bank Open Market Operations Conducted as Fixed Rate Tender  
Ulrich Bindseil

Total Factor Productivity and Economic Freedom Implications for EU Enlargement  
Ronald L. Moomaw, Euy Seok Yang

Die neuen Schutzklauseln der Artikel 38 und 39 des Beitrittvertrages: Schutz der alten Mitgliedstaaten vor Störungen durch die neuen Mitgliedstaaten  
Martin Seidel

Macroeconomic Implications of Low Inflation in the Euro Area  
Jürgen von Hagen, Boris Hofmann

The Effects of Transition and Political Instability on Foreign Direct Investment: Central Europe and the Balkans  
Josef C. Brada, Ali M. Kutan, Taner M. Yigit

The Performance of the Euribor Futures Market: Efficiency and the Impact of ECB Policy Announcements (Electronic Version of International Finance)  
Kerstin Bernoth, Juergen von Hagen

Sovereign Risk Premia in the European Government Bond Market (überarbeitete Version zum Herunterladen)  
Kerstin Bernoth, Juergen von Hagen, Ludger Schultechnicht

How Flexible are Wages in EU Accession Countries?  
Anna Lara, Iulia Traistaru

Monetary Policy Reaction Functions: ECB versus Bundesbank  
Bernd Hayo, Boris Hofmann

Economic Integration and Manufacturing Concentration Patterns: Evidence from Mercosur  
Iulia Traistaru, Christian Volpe Martincus

Reformzwänge innerhalb der EU angesichts der Osterweiterung  
Martin Seidel

Reputation Flows: Contractual Disputes and the Channels for Inter-Firm Communication  
William Pyle

Urban Primacy, Gigantism, and International Trade: Evidence from Asia and the Americas  
Ronald L. Moomaw, Mohammed A. Alwosabi

An Empirical Analysis of Competing Explanations of Urban Primacy Evidence from Asia and the Americas  
Ronald L. Moomaw, Mohammed A. Alwosabi
The Effects of Regional and Industry-Wide FDI Spillovers on Export of Ukrainian Firms
Stefan H. Lutz, Oleksandr Talavera, Sang-Min Park

Determinants of Inter-Regional Migration in the Baltic States
Mihails Hazans

South-East Europe: Economic Performance, Perspectives, and Policy Challenges
Iulia Traistaru, Jürgen von Hagen

Employed and Unemployed Search: The Marginal Willingness to Pay for Attributes in Lithuania, the US and the Netherlands
Jos van Ommeren, Mihails Hazans

FCIs and Economic Activity: Some International Evidence
Charles Goodhart, Boris Hofmann

The IS Curve and the Transmission of Monetary Policy: Is there a Puzzle?
Charles Goodhart, Boris Hofmann

What Makes Regions in Eastern Europe Catching Up? The Role of Foreign Investment, Human Resources, and Geography
Gabriele Tondl, Goran Vuksic

Die Weisungs- und Herrschaftsmacht der Europäischen Zentralbank im europäischen System der Zentralbanken - eine rechtliche Analyse
Martin Seidel

Foreign Direct Investment and Perceptions of Vulnerability to Foreign Exchange Crises: Evidence from Transition Economies
Josef C. Brada, Vladimír Tomsík

The European Central Bank and the Eurosystem: An Analysis of the Missing Central Monetary Institution in European Monetary Union
Gunnar Heinsohn, Otto Steiger

The Determination of Capital Controls: Which Role Do Exchange Rate Regimes Play?
Jürgen von Hagen, Jizhong Zhou

Nach Nizza und Stockholm: Stand des Binnenmarktes und Prioritäten für die Zukunft
Martin Seidel

Fiscal Discipline and Growth in Euroland. Experiences with the Stability and Growth Pact
Jürgen von Hagen

Reconsidering the Evidence: Are Eurozone Business Cycles Converging?
Michael Massmann, James Mitchell

Do Ukrainian Firms Benefit from FDI?
Stefan H. Lutz, Oleksandr Talavera

Europäische Steuerkoordination und die Schweiz
Stefan H. Lutz

Commuting in the Baltic States: Patterns, Determinants, and Gains
Mihails Hazans

Die Wirtschafts- und Währungsunion im rechtlichen und politischen Gefüge der Europäischen Union
Martin Seidel

2002

An Adverse Selection Model of Optimal Unemployment Assurance
Marcus Hagedorn, Ashok Kaul, Tim Mennel

Trade Agreements as Self-protection
Jennifer Pédussel Wu

Growth and Business Cycles with Imperfect Credit Markets
Debajyoti Chakrabarty

Inequality, Politics and Economic Growth
Debajyoti Chakrabarty

Poverty Traps and Growth in a Model of Endogenous Time Preference
Debajyoti Chakrabarty

Monetary Convergence and Risk Premiums in the EU Candidate Countries
Lucjan T. Orlowski

Trade Policy: Institutional Vs. Economic Factors
Stefan Lutz

The Effects of Quotas on Vertical Intra-industry Trade
Stefan Lutz

Legal Aspects of European Economic and Monetary Union
Martin Seidel

Der Staat als Lender of Last Resort - oder: Die Achillesverse des Eurosystems
Otto Steiger

Nominal and Real Stochastic Convergence Within the Transition Economies and to the European Union: Evidence from Panel Data
Ali M. Kutan, Taner M. Yigit

The Impact of News, Oil Prices, and International Spillovers on Russian Financial Markets
Bernd Hayo, Ali M. Kutan
B19-02 East Germany: Transition with Unification, Experiments and Experiences
Jürgen von Hagen, Rolf R. Strauch, Guntram B. Wolff

B18-02 Regional Specialization and Employment Dynamics in Transition Countries
Iulia Traistaru, Guntram B. Wolff

B17-02 Specialization and Growth Patterns in Border Regions of Accession Countries
Laura Resmini

B16-02 Regional Specialization and Concentration of Industrial Activity in Accession Countries
Iulia Traistaru, Peter Nijkamp, Simonetta Longhi

B15-02 Does Broad Money Matter for Interest Rate Policy?
Matthias Brückner, Andreas Schaber

B14-02 The Long and Short of It: Global Liberalization, Poverty and Inequality
Christian E. Weller, Adam Hersch

B13-02 De Facto and Official Exchange Rate Regimes in Transition Economies
Jürgen von Hagen, Jizhong Zhou

B12-02 Argentina: The Anatomy of A Crisis
Jiri Jonas

B11-02 The Eurosystem and the Art of Central Banking
Gunnar Heinsohn, Otto Steiger

Martin Seidel

B09-02 Monetary Policy in the Euro Area - Lessons from the First Years
Volker Clausen, Bernd Hayo

B08-02 Has the Link Between the Spot and Forward Exchange Rates Broken Down? Evidence From Rolling Cointegration Tests
Ali M. Kutan, Su Zhou

B07-02 Perspektiven der Erweiterung der Europäischen Union
Martin Seidel

B06-02 Is There Asymmetry in Forward Exchange Rate Bias? Multi-Country Evidence
Su Zhou, Ali M. Kutan

B05-02 Real and Monetary Convergence Within the European Union and Between the European Union and Candidate Countries: A Rolling Cointegration Approach
Josef C. Brada, Ali M. Kutan, Su Zhou

B04-02 Asymmetric Monetary Policy Effects in EMU
Volker Clausen, Bernd Hayo

B03-02 The Choice of Exchange Rate Regimes: An Empirical Analysis for Transition Economies
Jürgen von Hagen, Jizhong Zhou

B02-02 The Euro System and the Federal Reserve System Compared: Facts and Challenges
Karlheinz Ruckriegel, Franz Seitz

B01-02 Does Inflation Targeting Matter?
Manfred J. M. Neumann, Jürgen von Hagen

2001

B29-01 Is Kazakhstan Vulnerable to the Dutch Disease?
Karlygash Kuralbayeva, Ali M. Kutan, Michael L. Wyzan

B28-01 Political Economy of the Nice Treaty: Rebalancing the EU Council. The Future of European Agricultural Policies
Deutsch-Französisches Wirtschaftspolitisches Forum

B27-01 Investor Panic, IMF Actions, and Emerging Stock Market Returns and Volatility: A Panel Investigation
Bernd Hayo, Ali M. Kutan

B26-01 Regional Effects of Terrorism on Tourism: Evidence from Three Mediterranean Countries
Konstantinos Dracos, Ali M. Kutan

B25-01 Monetary Convergence of the EU Candidates to the Euro: A Theoretical Framework and Policy Implications
Lucjan T. Orlowski

B24-01 Disintegration and Trade
Jarko and Jan Fidrmuc

B23-01 Migration and Adjustment to Shocks in Transition Economies
Jan Fidrmuc

B22-01 Strategic Delegation and International Capital Taxation
Matthias Brückner

B21-01 Balkan and Mediterranean Candidates for European Union Membership: The Convergence of Their Monetary Policy With That of the European Central Bank
Josef C. Brada, Ali M. Kutan

B20-01 An Empirical Inquiry of the Efficiency of Intergovernmental Transfers for Water Projects Based on the WRDA Data
Anna Rubinichik-Pessach

B19-01 Detrending and the Money-Output Link: International Evidence
R.W. Hafer, Ali M. Kutan
B18-01  Monetary Policy in Unknown Territory. The European Central Bank in the Early Years
       Jürgen von Hagen, Matthias Brückner
B17-01  Executive Authority, the Personal Vote, and Budget Discipline in Latin American and Carribean Countries
       Mark Hallerberg, Patrick Marier
B16-01  Sources of Inflation and Output Fluctuations in Poland and Hungary: Implications for Full Membership in the European Union
       Selahattin Dibooglu, Ali M. Kutan
B15-01  Programs Without Alternative: Public Pensions in the OECD
       Christian E. Weller
B14-01  Formal Fiscal Restraints and Budget Processes As Solutions to a Deficit and Spending Bias in Public Finances - U.S. Experience and Possible Lessons for EMU
       Rolf R. Strauch, Jürgen von Hagen
B13-01  German Public Finances: Recent Experiences and Future Challenges
       Jürgen von Hagen, Rolf R. Strauch
B12-01  The Impact of Eastern Enlargement On EU-Labour Markets. Pensions Reform Between Economic and Political Problems
       Deutsch-Französisches Wirtschaftspolitisches Forum
B11-01  Inflationary Performance in a Monetary Union With Large Wage Setters
       Lilia Cavallar
B10-01  Integration of the Baltic States into the EU and Institutions of Fiscal Convergence: A Critical Evaluation of Key Issues and Empirical Evidence
       Ali M. Kutan, Niina Pautola-Mol
B09-01  Democracy in Transition Economies: Grease or Sand in the Wheels of Growth?
       Jan Fidrmuc
B08-01  The Functioning of Economic Policy Coordination
       Jürgen von Hagen, Susanne Mundschien
B07-01  The Convergence of Monetary Policy Between Candidate Countries and the European Union
       Josef C. Brada, Ali M. Kutan
B06-01  Opposites Attract: The Case of Greek and Turkish Financial Markets
       Konstantinos Drakos, Ali M. Kutan
B05-01  Trade Rules and Global Governance: A Long Term Agenda. The Future of Banking.
       Deutsch-Französisches Wirtschaftspolitisches Forum
B04-01  The Determination of Unemployment Benefits
       Rafael di Tella, Robert J. MacCulloch
B03-01  Preferences Over Inflation and Unemployment: Evidence from Surveys of Happiness
       Michele Fratianni, Jürgen von Hagen
B02-01  The Konstanz Seminar on Monetary Theory and Policy at Thirty
       Etienne Farvaque, Gael Lagadec
B01-01  Divided Boards: Partisanship Through Delegated Monetary Policy

2000
B20-00  Breakin-up a Nation, From the Inside
       Etienne Farvaque
B19-00  Income Dynamics and Stability in the Transition Process, general Reflections applied to the Czech Republic
       Jens Hölscher
B18-00  Budget Processes: Theory and Experimental Evidence
       Karl-Martin Ehrhart, Roy Gardner, Jürgen von Hagen, Claudia Keser Martin Seidel
B17-00  Rückführung der Landwirtschaftspolitik in die Verantwortung der Mitgliedsstaaten? - Rechts- und Verfassungsfragen des Gemeinschaftsrechts
B16-00  The European Central Bank: Independence and Accountability
       Christa Randzio-Plath, Tomasso Padoa-Schioppa
B15-00  Regional Risk Sharing and Redistribution in the German Federation
       Jürgen von Hagen, Ralf Hepp
B14-00  Sources of Real Exchange Rate Fluctuations in Transition Economies: The Case of Poland and Hungary
       Selahattin Dibooglu, Ali M. Kutan
B13-00  Back to the Future: The Growth Prospects of Transition Economies Reconsidered
       Nauro F. Campos
B12-00 Rechtsetzung und Rechtsangleichung als Folge der Einheitlichen Europäischen Währung

Martin Seidel

B11-00 A Dynamic Approach to Inflation Targeting in Transition Economies

Lucjan T. Orlowski

B10-00 The Importance of Domestic Political Institutions: Why and How Belgium Qualified for EMU

Marc Hallerberg

B09-00 Rational Institutions Yield Hysteresis

Rafael Di Tella, Robert MacCulloch

B08-00 The Effectiveness of Self-Protection Policies for Safeguarding Emerging Market Economies from Crises

Kenneth Kletzer

B07-00 Financial Supervision and Policy Coordination in The EMU

Deutsch-Französisches Wirtschaftspolitisches Forum

B06-00 The Demand for Money in Austria

Jan Fidrmuc

B05-00 Liberalization, Democracy and Economic Performance during Transition

Chris Stypinski

B04-00 A New Political Culture in The EU - Democratic Accountability of the ECB

Christa Randzio-Plath

B03-00 Integration, Disintegration and Trade in Europe: Evolution of Trade Relations during the 1990's

Jarko Fidrmuc, Jan Fidrmuc

B02-00 Inflation Bias and Productivity Shocks in Transition Economies: The Case of the Czech Republic

Josef C. Brada, Arthur E. King, Ali M. Kutan

B01-00 Monetary Union and Fiscal Federalism

Kenneth Kletzer, Jürgen von Hagen

1999


Stefan Lutz, Alessandro Turrini

B25-99 Micro and Macro Determinants of Public Support for Market Reforms in Eastern Europe

Bernd Hayo

B24-99 What Makes a Revolution?

Rafael Di Tella, Robert MacCulloch

B23-99 Informal Family Insurance and the Design of the Welfare State

Rafael Di Tella, Robert MacCulloch

B22-99 Partisan Social Happiness

Rafael Di Tella, Robert MacCulloch

B21-99 The End of Moderate Inflation in Three Transition Economies?

Josef C. Brada, Ali M. Kutan

B20-99 Subnational Government Bailouts in Germany

Helmut Seitz

B19-99 The Evolution of Monetary Policy in Transition Economies

Ali M. Kutan, Josef C. Brada

B18-99 Why are Eastern Europe’s Banks not failing when everybody else’s are?

Christian E. Weller, Bernard Morzuch

B17-99 Stability of Monetary Unions: Lessons from the Break-Up of Czechoslovakia

Jan Fidrmuc, Julius Horvath and Jarko Fidrmuc

B16-99 Multinational Banks and Development Finance

Christian E. Weller and Mark J. Scher

B15-99 Financial Crises after Financial Liberalization: Exceptional Circumstances or Structural Weakness?

Christian E. Weller

B14-99 Industry Effects of Monetary Policy in Germany

Bernd Hayo and Birgit Uhlenbrock

B13-99 Financial Fragility or What Went Right and What Could Go Wrong in Central European Banking?

Christian E. Weller and Jürgen von Hagen

B12-99 Size Distortions of Tests of the Null Hypothesis of Stationarity: Evidence and Implications for Applied Work

Mehmet Caner and Lutz Kilian

B11-99 Financial Supervision and Policy Coordination in the EMU

Deutsch-Französisches Wirtschaftspolitisches Forum

B10-99 Financial Liberalization, Multinational Banks and Credit Supply: The Case of Poland

Christian Weller

B09-99 Monetary Policy, Parameter Uncertainty and Optimal Learning

Volker Wieland

B08-99 The Connection between more Multinational Banks and less Real Credit in Transition Economies

Christian Weller
B07-99  Comovement and Catch-up in Productivity across Sectors: Evidence from the OECD
Christopher M. Cornwell and Jens-Uwe Wächter

B06-99  Productivity Convergence and Economic Growth: A Frontier Production Function Approach
Christopher M. Cornwell and Jens-Uwe Wächter

B05-99  Tumbling Giant: Germany's Experience with the Maastricht Fiscal Criteria
Jürgen von Hagen and Rolf Strauch

B04-99  The Finance-Investment Link in a Transition Economy: Evidence for Poland from Panel Data
Christian Weller

B03-99  The Macroeconomics of Happiness

B02-99  The Consequences of Labour Market Flexibility: Panel Evidence Based on Survey Data
Rafael Di Tella, Robert MacCulloch and Andrew J. Oswald

B01-99  The Excess Volatility of Foreign Exchange Rates: Statistical Puzzle or Theoretical Artifact?
Robert B.H. Hauswald