

# Exchange Rate Developments and Fundamentals in Four EU Accession and Candidate Countries: Bulgaria, Croatia, Romania and Turkey

*This paper deals with exchange rate challenges in the four potential EU Member States Bulgaria, Croatia, Romania and Turkey. For the two countries with freely floating currencies, Romania and Turkey, we evaluate possible exchange rate misalignments based on a monetary model of exchange rate determination. In the case of Bulgaria and Croatia, two countries with currency board and narrow-band peg arrangements against the euro, we discuss possible exit strategies. We argue that a continuation of their current exchange rate regimes is likely to represent an optimal strategy for these countries in the run-up to both EU membership and the eventual adoption of the euro.*

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## 1 Introduction

On May 1, 2004, ten countries became new Member States of the European Union, thus raising the EU's population by 20%. After this successful enlargement, a major objective of European integration policies will be the further enlargement of the EU. In principle, there is a relatively wide range of countries that may potentially have a chance of joining the EU in the remote future, but there are four countries that are already one step ahead, as they have already submitted their membership applications: Bulgaria, Croatia, Romania and Turkey. Bulgaria and Romania have already started accession negotiations with 2007 being a prospective entry date, and therefore have the status of accession countries. Negotiations with Bulgaria were preliminarily closed on June 15, 2004. Croatia and Turkey by contrast have so far only submitted their application for EU membership, and they will start accession negotiations in March and October 2005, respectively.

In this paper we will focus on exchange rate issues in these four accession and candidate countries. In addition to the monetary and fiscal policy challenges on the way to EU membership, exchange rate policies and the driving forces of exchange rate movements are of special interest for these countries. They all have to decide on the optimal exchange rate strategy in the run-up to EU membership with the aim of paving the way toward a later adoption of the euro.

Countries preparing for EU membership may in principle choose any exchange rate regime suitable for their current economic policy mix. There are, however, several good reasons why such countries should already adopt an exchange rate policy which is oriented toward the euro during the process of EU accession. First, exchange rate stability supports economic relations with the EU (see Rose, 2000), which is the most important trading partner of and foreign investor in all potential EU Member States. Second, a fixed exchange rate system represents a direct commitment to stabilizing the economy and establishes closer links with the EU.

Finally, all new Member States are supposed to treat exchange rate policies as a matter of common interest from the first day of EU membership on and to eventually adopt the euro after the fulfillment of the Maastricht convergence criteria.

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We would like to thank Stephan Barisitz, Vivek Dehejia, Balázs Égert and Doris Ritzberger-Grünwald for helpful comments and discussions. Our special thanks go to Andreas Nader for assisting in our data search and to Jennifer Gredler and Susanne Steinacher for their linguistic support.

This paper aims at assessing the suitability of exchange rate strategies and identifying possible currency misalignments since the beginning of the 1990s. An exchange rate is regarded as misaligned if its realized values continually deviate from its equilibrium trend. Strong and persistent exchange rate misalignment may be a hindering factor in the period prior to and during exchange rate mechanism II (ERM II) participation and bears the risk of speculative attacks. Because of the substantial differences in the economic and historical backgrounds of selected countries, we will follow two different approaches when assessing the appropriateness of exchange rate policies. For the countries with more or less freely floating currencies (Romania and Turkey), we will follow the monetary model of the exchange rate to estimate the long-run elasticity of the exchange rate with respect to changes in the fundamentals. Based on these parameter estimates, we will calculate the implied equilibrium exchange rate (defined as the long-run relationship found in the data between the nominal exchange rate and macroeconomic fundamentals) and the corresponding exchange rate misalignments.<sup>4</sup>

For the countries which had fixed or narrow-band exchange rate pegs (currency boards<sup>5</sup>) during most of the 1990s (Bulgaria and Croatia), the monetary model of the exchange rate is inappropriate. However, the countries in this group may consider whether they should introduce a higher flexibility of exchange rates for the following reasons. First, relatively flexible exchange rate regimes may be more appropriate for these countries after financial stabilization has been achieved. Second, early (voluntary) exits from fully fixed exchange rates are generally recommended. Ghosh et al. (2002) and Frankel (2003) argue that fixed exchange rate regimes have been subject to increased vulnerability under the increased capital mobility since the beginning of the 1990s. As a result, a relaxation of exchange rate policies may be part of capital account liberalization or a reaction to an increased integration of these two countries into international financial markets. Finally, voluntary exits from currency boards or comparable fixed exchange rates may prevent possible exchange rate misalignments and their adverse effects on competitiveness.

Therefore, we will follow an indirect approach in order to evaluate whether the currency board in Bulgaria and the unofficial narrow-band peg in Croatia are appropriate monetary policy arrangements. Using a panel including six Central and Eastern European countries (the Czech Republic, Hungary, Poland, Romania, Slovenia, and Slovakia; CEECs) and Turkey, we will estimate the monetary model of the exchange rate. These panel parameter estimates will then be used to study the dynamics of “hypothetical” equilibrium exchange rates against the euro as derived from the macroeconomic fundamentals in Bulgaria and Croatia for the peg period. Under the assumption that the exchange rate was in equilibrium when the peg was introduced, we will be able to assess the relative undervaluation or overvaluation that has taken place since the exchange rate regime changed.

<sup>4</sup> For a literature survey on equilibrium exchange rate estimation with a focus on the new EU Member States, see e.g. Égert (2003).

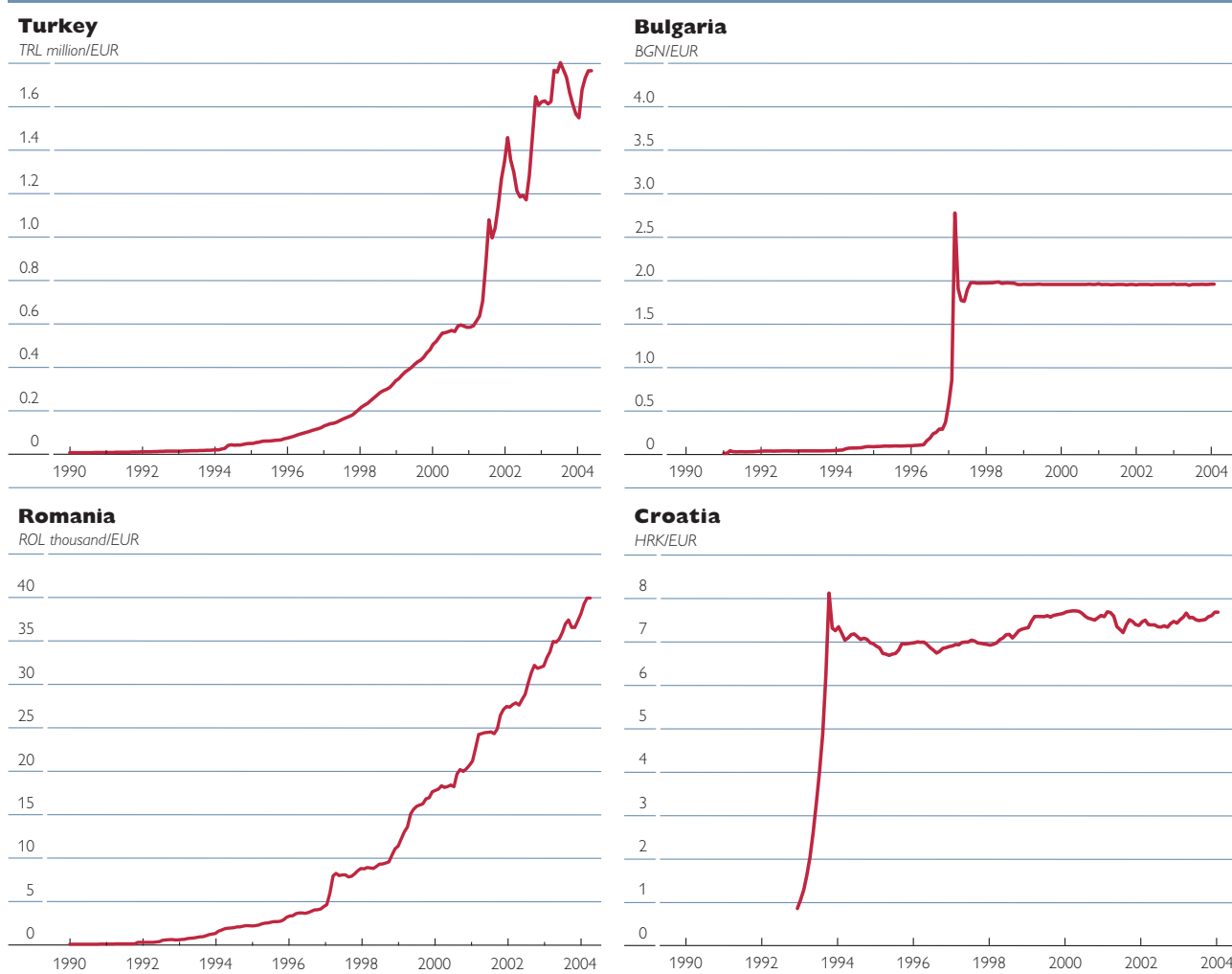
<sup>5</sup> Under a currency board, a fixed conversion rate is set between the local and a foreign currency, and the domestic monetary base is fully backed by low-risk assets denominated in the foreign currency. The currency board has no right to issue central bank money against any domestic assets.

## 2 Bulgaria, Croatia, Romania and Turkey: Economic Policy and Exchange Rate Strategies

The following section reviews the major economic and exchange rate developments of the four countries discussed. While the focus is on exchange rate developments, we also provide a short summary of integration policy steps to give a comprehensive overview of the overall situation. Chart 1 shows exchange rate developments of the national currencies against the euro since 1990. The order of the discussed countries is chronological according to their EU membership application dates.

Chart 1

### Exchange Rate Developments in Turkey, Bulgaria, Romania and Croatia, 1990 to 2003



Source: IMF.

### 2.1 Turkey

Turkey's efforts to move closer to the European Union have a long history. In 1963, Turkey and the European Economic Community (EEC) signed an Association Agreement with the prospect of future full membership. Following the military putsch in Turkey in 1980, relations were broken off and only reestablished after the Turkish army had retreated. In 1987, Turkey submitted its

application for European Community membership, which was rejected temporarily in 1990. Nevertheless, Turkey continued its rapprochement policy. In 1996, Turkey and the EU formed a customs union and at the 1999 European Council meeting in Helsinki, Turkey was officially recognized as a candidate for EU membership. The country has made serious progress with the fulfillment of the political criteria of Copenhagen, but the sustainability of the process remains a challenge. On December 17, 2004, the European Council decided that the EU will start the so-called “open-end” negotiations with Turkey in October 2005.

Turkey has a tradition in exchange rate pegs. Since the 1930s, it has experienced pegs to the pound sterling, the French franc, the U.S. dollar, the Deutsche mark and the euro. During most of the 1980s and 1990s, the Turkish exchange rate system was a managed float. Turkey introduced convertibility of the lira in early 1990. In retrospect, this step can be regarded as premature, as it was not preceded by the necessary structural reforms and adjustments in the macrofundamentals. The following years saw a rapid increase in public debt and an extreme short-term orientation of debt management, widening trade deficits, high real interest rates and high inflation. The increased degree of dollarization was accompanied by real exchange rate appreciation. This unsustainable policy mix led to a foreign exchange crisis in early 1994, which entailed a sharp exchange rate correction. Inflation subsequently reached levels of more than 120%.

A first stabilization program in 1994, which included fiscal adjustment, monetary tightening and structural reforms, brought limited success. A second disinflation program adopted at end-1999 aimed at reducing inflation to below 10% by end-2002. It relied on monetary control and a depreciation of the currency according to a preannounced schedule (exchange rate basket: USD 1 + EUR 0.77). This formal crawling peg regime initially had no fluctuation margins, although the introduction of bands was originally intended to take effect as of February 2001. Against the background of unsustainable short-term indebtedness, widening current account deficits and serious weaknesses in the banking sector, the program proved to be unsustainable, as it pushed the economy into recession and led to the abandonment of the pegged exchange rate system in February 2001. The following months brought a sharp depreciation of the currency, with the real effective exchange rate dropping by 20%.

Since then, macroeconomic stabilization and fiscal tightening in Turkey have progressed steadily. The country has experienced stronger growth than before the crisis, with growth rates close to or above potential (5%). In May 2004, Turkey saw single-digit inflation rates for the first time since 1972, which makes it appear realistic that the country could reach its goal of an annual inflation rate of 12% in 2004. Macroeconomic progress and political stability have led to a substantial reduction of currency substitution by the U.S. dollar and the euro, which has brought about a gradual appreciation of the lira. The success of this last stabilization program stems from the broader base of Turkey’s structural reforms, which included a reform of the banking sector. Despite this remarkable progress, the serious imbalances in the economy still discourage foreign direct investment (FDI).

## 2.2 Bulgaria and Romania

In Bulgaria and Romania the main steps toward European integration ran in parallel. Romania was the first country of Central and Eastern Europe to have official relations with the European Community, having already entered into first agreements in the 1970s. The Europe Agreement<sup>6</sup> with Romania entered into force in February 1995. Romania submitted its application for EU membership on June 22, 1995. Bulgaria presented its application for EU membership on December 14, 1995. Accession negotiations with both countries started on February 15, 2000. On June 15, 2004, the accession negotiations with Bulgaria were preliminarily closed. The year 2007 has been set as the prospective entry date. At the same time the EU has left open the option of a one-year delay in case Bulgaria fails to fulfill its commitments.

More than other transition economies, Bulgaria and Romania have been affected by the decade-long Yugoslav crisis, which obstructed transport links and trade and impeded FDI inflows. In both countries the particularly difficult initial conditions for transition were reinforced by inconsistent macroeconomic policies, political instability and sluggish structural reforms. This accumulation of problems led to banking crises in both countries in the second half of the 1990s.<sup>7</sup>

Bulgaria suffered at least three financial crises during the 1990s. In 1996 the strong depreciation of the lev led prices to explode and was followed by mass bank runs. The Bulgarian economy dropped into a downturn. Initial measures failed to restore confidence, the exchange rate collapsed and led to full-fledged hyperinflation in the first two months of 1997. GDP dropped by almost 10% in 1996 and by more than 5% in 1997. The large-scale depreciation of the exchange rate led to an irreversible process of currency substitution, which further limited the Bulgarian central bank's ability to control inflation.

In 1997 a new government was formed that committed to structural reform and responsible fiscal planning. On July 1, 1997, Bulgaria moved from a free- or managed-float system to a currency board arrangement (first based on the Deutsche mark, then on the euro). Confidence was immediately restored after the announcement of the regime shift, even before its implementation. Inflation quickly fell and reached single-digit levels by mid-1997. Since this major restructuring, Bulgaria has experienced macroeconomic stability and strong growth despite adverse external shocks (Russian crisis, global financial crisis, Kosovo conflict). Average growth rates since 2000 have reached almost 5%. Despite the currency board arrangement, inflation remained high, with average inflation coming to more than 6% since 2000. This appears to be related to external factors such as oil prices, the U.S. dollar exchange rate or the adjustment of administered prices and does not seem to signal a serious competitiveness problem, given that unit labor cost developments have remained moderate. The most pressing problem is the continuously high unemployment rate of around 15%, which is largely attributable to restructuring-related labor shedding.

<sup>6</sup> During the 1990s, the European Community and its Member States progressively concluded Association Agreements, the so-called "Europe Agreements," with ten countries of Central and Eastern Europe. The Europe Agreements provided the legal basis for bilateral relations between these countries and the EU.

<sup>7</sup> For a more detailed analysis of the banking crises in Bulgaria and Romania, see Barisitz, 2001.

Romania's banking crisis lasted longer than Bulgaria's, but was less severe. The new government that came to power in 1996 launched a structural reform program, which included the tightening of monetary policy, the liberalization of the official exchange rate and the acceleration of privatizations. These measures actually revealed problems that had previously been alleviated by an accommodating monetary policy. Real GDP fell by around 5% in 1996 and 1997, and inflation reached 150% in 1997. In mid-1999, Romania faced major difficulties with the repayment of foreign debt. A partial default could be avoided, however, and the country's financial situation improved. After three years of deep recession, Romania recovered in 2000, mainly because of the strong demand in EU export markets. Since 2001, GDP growth has amounted to around 5%, primarily driven by domestic demand. Inflation remains at high two-digit levels, which is attributable to several special factors, but also to the depreciation of the domestic currency and to strong wage growth, which in turn is partly related to poor fiscal discipline. The annual inflation targets have mostly been missed in recent years. For the coming years, the Romanian government has announced ambitious privatization and restructuring plans as well as a continuation of fiscal consolidation and disinflation. Romania's major weaknesses are still widespread corruption and red tape, which discourage foreign direct investment.

Although a foreign exchange market was already created in 1992, administrative controls over the official exchange rate were maintained until the end of 1996. In January 1997, the three main exchange rates were unified. Since then Romania's leu has officially remained a freely floating currency, although central bank interventions exceed what is considered normal in a managed-float regime. The exchange rate regime since early 2001 has consequently been classified as a *de facto* crawling bandwith a bandwidth of  $\pm 5\%$  in Reinhart and Rogoff (2004).<sup>8</sup>

### 2.3 Croatia

Croatia declared its independence from Yugoslavia in 1991, but it took four years before the majority of the occupying Serb troops had left the country. Croatia signed a Stabilisation and Association Agreement with the European Union in October 2001. On February 21, 2003, Croatia applied for EU membership. On June 18, 2004, the European Council officially granted Croatia candidate status, thereby opening the way for accession negotiations in March 2005. Croatia hopes to catch up with Bulgaria and Romania and to enter the European Union in 2007, but this may prove difficult to achieve.

The situation in Croatia is usually cited as a classical example of the fear of floating.<sup>9</sup>

The Croatian economy is highly euroized with widespread asset substitution and an indexation of prices to the exchange rate. The high degree of euroization had its origin in the war period of the early 1990s, when foreign currencies were

<sup>8</sup> The new classification of exchange rate arrangements in Reinhart and Rogoff (2004, extended working paper version with country-specific information 2002) makes considerable adjustments to the IMF's official classification by focusing on *de facto* exchange rate policies instead of official announcements.

<sup>9</sup> The term "fear of floating" was coined by Calvo and Reinhart (2002) for economies that are confronted with a restricted choice set of exchange rate strategies because of their high degree of economic integration.

also used as a means of payment. While Croatia's economy is considered an intermediate case in terms of openness, the average ratio of imports to GDP reached no more than 53% between 1991 and 2000, and 73% of Croatia's trade in 2003 was carried out in euro.

This high degree of euroization implies that Croatia's economic policy strongly focuses on exchange rate stability. When exchange rate movements directly feed into the domestic price level and the exchange rate therefore does not function as a shock absorber, the benefits of a freely floating currency are severely limited. Since the end of the war of the early 1990s, monetary policy has thus been characterized by a very low tolerance of exchange rate movements (from October 1994 to January 1, 1999, vis-à-vis the Deutsche mark, since then vis-à-vis the euro) and a pronounced activism of the Croatian central bank on foreign currency markets. This strategy initially proved very successful in ending hyperinflation and in stabilizing the economy in the aftermath of the Croatian war, but the exchange rate anchor remained in place even after successful stabilization in the mid-1990s. The new classification presented in Reinhart and Rogoff (2004) characterizes Croatia's exchange rate policy as a de facto band of the kuna around the Deutsche mark and the euro with a bandwidth of only  $\pm 2\%$ , respectively. This de facto fixed peg stands in contrast to the official managed-float classification.

### **3 Fundamentals and the Exchange Rate: A Simple Monetary Model of Exchange Rate Determination**

The institutional settings of the exchange rate market (with a view to exchange rate regimes) differ strongly for the countries under observation. In order to empirically assess the importance of fundamentals in exchange rate developments and consequently to evaluate possible exchange rate misalignments, we will apply two different methodologies, depending on whether or not the country enjoyed sufficient flexibility in the exchange rate regime to be modeled using a classical flexible-price monetary model.

For Romania and Turkey we will use a fully specified monetary model with purchasing power parity (PPP) in tradable prices in order to assess the exchange rate's long-run elasticity vis-à-vis the fundamentals. This will allow us to evaluate possible exchange rate misalignments in these countries. The low exchange rate volatility in the fixed-peg or narrow-band settings in Bulgaria and Croatia, however, does not allow for an explicit estimation of the long-run elasticities of the exchange rate vis-à-vis the fundamentals. We will therefore assume that the parameter estimates drawn from a panel of seven former and future accession countries based on a similar monetary model also hold for Bulgaria and Croatia. This indirect approach will allow us to simulate exchange rate movements in the absence of fixed exchange rate regimes and to evaluate possible misalignments of the currencies.

We have to keep in mind that our indirect method relies on strong assumptions concerning the homogeneity of the panel's parameter estimates for Bulgaria and Croatia. There is no doubt that projections with estimates obtained from economies under a flexible exchange rate regime, and thus with exchange rate policies that differ from those being studied, may not be directly applicable to countries with a fixed exchange rate regime. It should be noted, however,

that we do not aim at interpreting the projected trajectories in a purely quantitative manner. The “hypothetical” exchange rate developments obtained from the panel estimates when using Bulgarian and Croatian data will be interpreted as overall over- or undervaluation pressures and potential competitiveness problems, and not directly as quantifications of misalignments. However, this approach may become more relevant if currency board countries decide to adopt more flexible exchange rate regimes. In this sense we can use our estimations to evaluate the risks associated with a regime shift. Actually, several CEECs included in our panel moved from relatively fixed exchange rate regimes toward managed or free-floating regimes during economic transition. This feature of our panel as well as similar long-run targets of current monetary policies (that is, preparing for the future adoption of the euro) provide some economic rationale for this method.

The general model used in all four cases is a simple monetary model of exchange rate determination, where PPP holds exclusively in tradable prices. This assumption, proposed by Clements and Frenkel (1980), implies that the Balassa-Samuelson effect may play a role in the determination of nominal exchange rates. It has recently been used for analyzing exchange rates in transition countries by Crespo-Cuaresma et al. (2004). We apply this model to the countries under review (denoted as domestic economies) and the euro area (representing the foreign economy). Following the literature, we assume log-linear money demand functions in the domestic and foreign economy, with similar income and interest rate elasticities,

$$m_t - p_t = \alpha y_t - \beta i_t, \quad (1)$$

$$m_t^* - p_t^* = \alpha y_t^* - \beta i_t^*, \quad (2)$$

where  $m_t$  denotes money demand,  $p_t$  denotes the price level,  $y_t$  denotes output (all in logs) and  $i_t$  is the interest rate in the domestic economy. Variables with asterisks refer to the foreign economy. Assume that PPP in tradable goods approximately holds, so that

$$e_t = (p_t^T - p_t^{T*}) + \varepsilon_t, \quad (3)$$

where  $e_t$  is the nominal exchange rate (in logs),  $p_t^T$  is the (log) price of tradable goods and  $\varepsilon_t$  is an *iid* error. Assume further that the overall price levels,  $p_t$  and  $p_t^*$ , are weighted averages of the price of traded ( $p_t^T$ ) and nontraded goods ( $p_t^{NT}$ ) with equal weights ( $\theta$  and  $1-\theta$ ) across countries,

$$p_t = \theta p_t^T + (1-\theta)p_t^{NT}, \quad (4)$$

$$p_t^* = \theta p_t^{T*} + (1-\theta)p_t^{NT*}. \quad (5)$$

Using (1), (2), (3), (4) and (5), we arrive at the following expression for the nominal exchange rate,

$$e_t = \frac{1}{\theta}(m_t - m_t^*) - \frac{\alpha}{\theta}(y_t - y_t^*) + \frac{\beta}{\theta}(i_t - i_t^*) - \frac{(1-\theta)}{\theta}(p_t^{NT} - p_t^{NT*}) + \varepsilon_t. \quad (6)$$

If the uncovered interest rate parity (UIP) is assumed to hold, then

$$i_t - i_t^* = \mathbf{E}_t(e_{t+1}) - e_t, \quad (7)$$

where  $\mathbf{E}_t(\cdot)$  refers to the conditional expectation operator using information up to period  $t$ . Using (7) in (6) and assuming rational expectations, recursive

forward substitution results in

$$e_t = \frac{1}{\theta}(m_t - m_t^*) - \frac{\alpha}{\theta}(y_t - y_t^*) - \frac{(1 - \theta)}{\theta}(p_t^{NT} - p_t^{NT*}) + \frac{1}{1 + \beta/\theta} \varepsilon_t, \quad (8)$$

which will be our baseline specification for the estimation of the long-run relationship between the exchange rate and the fundamentals implied by the monetary model. In the empirical implementation we will not impose the parameter restrictions implied by (8) explicitly, but instead estimate the unconstrained model

$$e_t = \gamma_0 + \gamma_1(m_t - m_t^*) + \gamma_2(y_t - y_t^*) + \gamma_3(p_t^{NT} - p_t^{NT*}) + \varepsilon_t. \quad (9)$$

This parametrization allows for point estimates of the structural parameter, which corresponds to the weight of tradable goods in the consumer price index (CPI). In such a case PPP in tradable prices does not hold continuously, but the adjustment to PPP is slow and partial. The parameter estimates will then be used to estimate the exchange rate that corresponds to the development of money supply, real growth of industrial production and price developments. This estimated exchange rate trend can then be confronted with realized movements to detect periods of under- or overvaluation of the currency. Longer intervals of sustained deviations could indicate serious external imbalances and a potential loss of international competitiveness.

#### 4 Estimation of the Monetary Model: The Case of Romania and Turkey

The data used to estimate the model described above for the Romanian leu and the Turkish lira against the euro stem from the IMF's International Financial Statistics, the Vienna Institute for International Economic Studies' Database on Eastern Europe, and Eurostat.<sup>10</sup> The production variable used is the industrial production index, the monetary aggregate is M2 and the variable reflecting the price of non-tradables will be proxied by the ratio of the CPI to the producer price index (PPI).<sup>11</sup> The variables used in model (9) present nonstationary features, thus (9) can be interpreted as the long-run equilibrium acting as an attractor in the  $(e_t, (m_t - m_t^*), (y_t - y_t^*), (p_t^{NT} - p_t^{NT*}))$  plane. This implies that cointegration methods will be used to estimate the underlying parameters in the specification proposed. The first two columns of table 1 present the parameter estimates for Romania and Turkey. As a standard least squares estimator does not correct for the potential serial correlation of the error term and endogeneity of the regressors, Stock and Watson (1993) propose to correct the estimates of the long-run parameters by applying dynamic OLS (DOLS). This approach augments the OLS specification by adding leads and lags of the first differences of the regressors.

The estimates of the long-run elasticities have the correct signs and are highly significant for both countries. The estimated parameters corresponding to money supply differentials are in line with those reported in the empirical literature on the monetary model of exchange rate determination for both cases. While the estimate of  $\gamma_1$  for Turkey is not significantly different from

<sup>10</sup> The close trade links of these countries with the euro area suggest that exchange rate movements against the euro are of higher relevance for exchange rate considerations than the fluctuations against other currencies, in particular the U.S. dollar.

<sup>11</sup> See Égert and Lommatzsch (2004) and Crespo-Cuaresma et al. (2004) for a discussion on the use of the CPI-to-PPI ratio as a proxy of the Balassa-Samuelson effect in Central and Eastern European economies.

Table 1

<b>Generalized Monetary Model Estimates</b>			
<b>of Local Currencies against the Euro</b>			
	Romania	Turkey	CEE Panel
$\gamma_1$	0.854 * (0.011)	0.996 * (0.014)	0.887 * (0.010)
$\gamma_2$	-1.299 * (0.125)	-0.88 * (0.189)	-0.352 * (0.043)
$\gamma_3$	-0.980 * (0.191) -4.919 *	-2.033 * (0.309) -4.488 *	-1.598 * (0.093) -12.249 * a)

Source: Authors' calculations.

Notes: Standard errors in parentheses. The CEE panel includes the Czech Republic, Hungary, Poland, Romania, Slovakia, Slovenia and Turkey.

\* indicates significance at the 1% level, a) indicates panel ADF test.

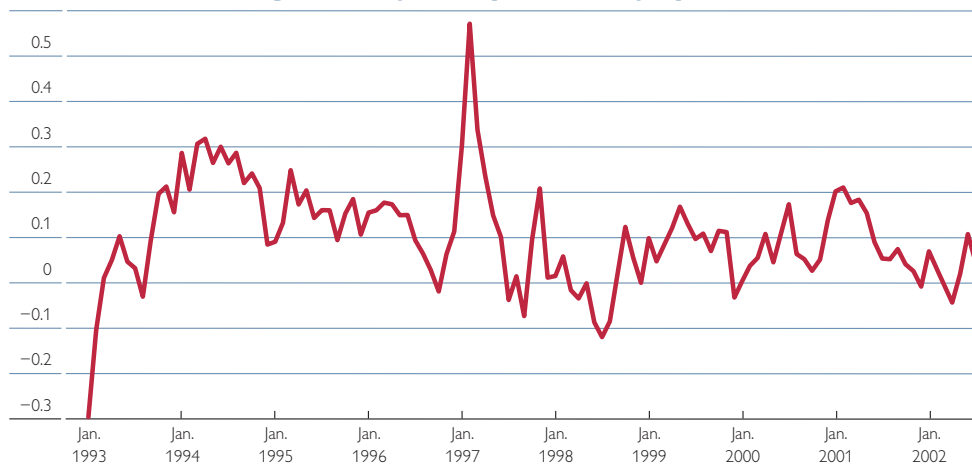
one, the estimate for Romania is relatively lower, indicating some degree of sluggishness in the adjustment to PPP. The estimates of the long-run income elasticities implied by the exchange rate model for the ROL/EUR exchange rate are in the range of values obtained using pooled estimates reported in Crespo-Cuaresma et al. (2004) for a panel of six CEECs including Romania, with a relatively high elasticity for industrial production and a relatively low elasticity to price developments as compared to the panel results and to the results for Turkey. The point estimate of the output elasticity,  $\gamma_2$ , is lower in absolute value for Turkey than for Romania. In turn, the estimate of  $\gamma_3$  for Turkey is higher in absolute value than that obtained for Romania and the estimates reported in Crespo-Cuaresma et al. (2004) for the CEECs, indicating a higher sensitivity of the exchange rate to relative price developments in Turkey.

Using the cointegration relationships implied by the estimates in table 1, we constructed deviations from the exchange rate against the euro implied by fundamentals for Romania and Turkey. The log deviations are plotted in charts 2 and 3. For both currencies, the volatility of the deviations around the exchange rate implied by fundamentals is visibly higher in the first part of the sample. For Romania, less volatile deviations are observable as of 1999, while in Turkey, deviations stabilize already around the beginning of 1998. The deviations from the estimated equilibrium in Romania tend to show an overall undervaluation of the currency for the period reviewed, except for the second half of 1998. The Turkish lira was mostly undervalued until the beginning of 1998. Since 1998 the lira has remained closer to equilibrium than in previous periods, with clear undervaluation pressures at the beginning of 1998 (reflecting the negative effects of the Russian crisis) and in the aftermath of the currency crisis and the abandonment of the disinflation program in 2001. The most recent estimates do not seem to indicate persistent exchange rate over- or undervaluations.<sup>12</sup>

<sup>12</sup> For a recent assessment of exchange rate misalignments of the Turkish lira against the U.S. dollar, see e.g. Ozlale and Yeldan (2004).

Chart 2

**Romania: Deviations of the Actual Exchange Rate from the Estimated Exchange Rate, January 1993 to July 2002**



Source: Authors' calculations.

Chart 3

**Turkey: Deviations of the Actual Exchange Rate from the Estimated Exchange Rate, January 1993 to October 2003**



Source: Authors' calculations.

Notes: The area between the vertical lines indicates the period which a crawling peg regime was applied.

## 5 Fundamentals and Fixed Exchange Rates: The Case of Bulgaria and Croatia

Under the policy of fully fixed exchange rates (currency boards or comparably credible fixed exchange rate regimes), money supply is endogenous. In the benchmark case of a currency board, the monetary base is fully covered by foreign exchange reserves. Furthermore, the change in money supply is determined by international transactions (trade and capital flows). This ensures the sustainability of currency boards (Ghosh et al., 2000), because capital flights automatically reduce the monetary base, which strengthens the exchange rate.

Under currency boards and comparably fixed exchange rate regimes (de facto currency boards), demand for domestic money directly determines money supply, while the exchange rate remains exogenous. Correspondingly, the monetary approach to the exchange rate is not appropriate in this case. However, fundamentals still have a crucial importance for those countries. On the one hand, exchange rate-based stabilization may trigger rapid consumption growth

as a result of lower interest rates and banking sector improvement. This economic environment makes it more difficult for a country that implements a currency board to reach the levels of inflation prevailing in the anchor economy (i.e. the euro area in the case of Bulgaria and Croatia). As a result, the exchange rate may deviate increasingly from its hypothetical fundamental levels prevailing under a free-floating regime. Thus, these countries may face growing competitiveness problems, even though output growth and capital inflows ensure the sustainability of policies. Possibly, the deterioration of competitiveness is reversed in later stages of reform after structural reform comes fully into effect.

On the other hand, fixed exchange rate regimes (but less so credible currency boards) are generally seen as more vulnerable to capital flights or sudden stops of capital inflows (see Milesi-Ferretti and Razin, 1999). Ghosh et al. (2002) recommend voluntary early exits from fixed exchange rate regimes after having achieved the aims of financial stabilization, sufficient disinflation and credible national monetary policy. However, optimal timing is crucial for the success of this strategy. A country has to preannounce its monetary strategy and prove the credibility of its monetary policy during this process. In general, this means that exchange rate policy should avoid exchange rate misalignments before exchange rate liberalization.

Bulgaria and, to a lesser degree, also Croatia face specific monetary policy challenges. Both countries have the prospect of becoming EU Member States relatively fast and of eventually adopting the euro. Therefore, they may circumvent the problem of how to choose the optimal timing for their exit from fixed exchange rate regimes by defining a long-term strategy toward euro adoption. As part of this policy, countries can avoid exchange rate flexibilization. For example, Estonia and Lithuania have opted for continuing their policy of fixed exchange rates with zero fluctuation bands in ERM II.<sup>13</sup> Insofar as the macroeconomic policy mix ensures financial sustainability, possible exchange rate misalignments (overvaluation) are to some degree less important in this very specific case, because the Balassa-Samuelson effect results in a continuous appreciation of the exchange rate.

In addition to the previous arguments, we have to keep in mind that both Bulgaria and Croatia show a history of low (zero or nearly zero) exchange rate volatility. In the case of Croatia, the de facto peg of the Croatian kuna to the euro with a bandwidth of about  $\pm 2\%$  is motivated by the high degree of dollarization of the Croatian economy. Bulgaria, by contrast, was unsuccessful with inflation stabilization until 1997, so that the implementation of a currency board arrangement was basically the only way to quickly stabilize inflation and inflation expectations. In both cases, exchange rate movements are not flexible enough to directly estimate a monetary model.

Our approach is therefore to estimate the monetary model derived in section 3 for a panel of seven former and current candidate countries (the Czech Republic, Hungary, Poland, Romania, Slovakia, Slovenia and Turkey).<sup>14</sup> The

<sup>13</sup> After a careful assessment of appropriateness and sustainability of the currency boards in Estonia and Lithuania, both countries joined ERM II on June 27, 2004, with their existing currency board arrangements based on the euro in place. This move imposes unilateral commitments on these countries, while entailing no obligations for the ECB.

<sup>14</sup> Alternatively, Égert (2004) estimates various models of the real exchange rates in Bulgaria and Romania, which are not directly comparable to our approach.

panel specification is similar to equation (9),

$$e_{it} = \gamma_0 + \gamma_1(m_{it} - m_t^*) + \gamma_2(y_{it} - y_t^*) + \gamma_3(p_{it}^{NT} - p_t^{NT*}) + \varepsilon_{it}, \quad (10)$$

where the variables have the same notation as above, but the error term  $\varepsilon_{it}$  is assumed to be composed of a fixed country effect and a white noise error. Panel unit root tests carried out for the variables of the model provide evidence that the specification given by (10) should be estimated using panel cointegration methods. We then use the estimated coefficient to simulate a relative “hypothetical” path of the equilibrium exchange rate against the euro (driven by relative developments in macroeconomic fundamentals in these countries as compared to the euro area) for Bulgaria and Croatia during the peg period.

The last column of table 1 presents the estimates for a balanced panel between January 1994 and May 2003. Similarly to the previous section, we estimate the monetary model of exchange rates by DOLS, which is also recommended by Kao and Chiang (2000). We also report the test statistics for the ADF test for panel cointegration proposed by Kao (1999). The results of panel estimations are comparable to the previous results for Romania and Turkey. The panel estimates, especially the estimated coefficient for the industrial production differential, are relatively close to generally reported results (see Groen 1998 and 2002).

In order to create the “hypothetical” path of the fundamentals-driven exchange rate, we will use the parameter estimates obtained by DOLS for the CEE panel and the corresponding fundamentals for Bulgaria and Croatia.<sup>15</sup> Given that the parameter estimates are obtained using a panel with fixed effects, in which the countries of interest were not included, a decision has to be taken as to how to normalize the level of the implied equilibrium exchange rate. In the case of Bulgaria this normalization is set by assuming that the exchange rate level corresponded to the value implied by the fundamentals, on average, in the second half of 1998. For Croatia we will assume that the exchange rate corresponded to the one implied by the fundamentals in October 1994, when the peg was introduced. Charts 4 and 5 present the evolution of the actual exchange rate and the “hypothetical” fundamentals-driven exchange rate for the two economies. Fixed effects implied by this procedure are of appropriate size according to the criteria proposed by Maeso-Fernandez et al. (2004). In particular, fixed effects derived for Bulgaria are slightly higher than fixed effects estimated in the original sample, while they are much more similar to those in other CEECs in the case of Croatia. This observation corresponds broadly to the similarities between the analyzed countries. Thus, the fixed effects used here for Bulgaria and Croatia effectively adjust for the structural characteristics of the individual countries.

<sup>15</sup> When interpreting the results, we should keep in mind that exchange rate misalignments estimated on the basis of panel data tend to show greater volatility than those directly based on the individual time series (see e.g. Égert and Halpern, 2004).

Chart 4

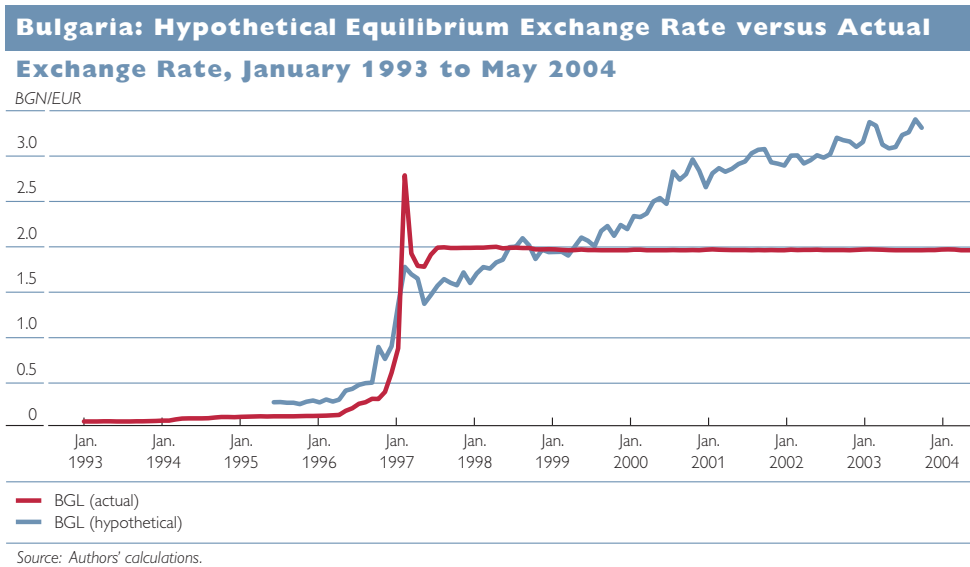
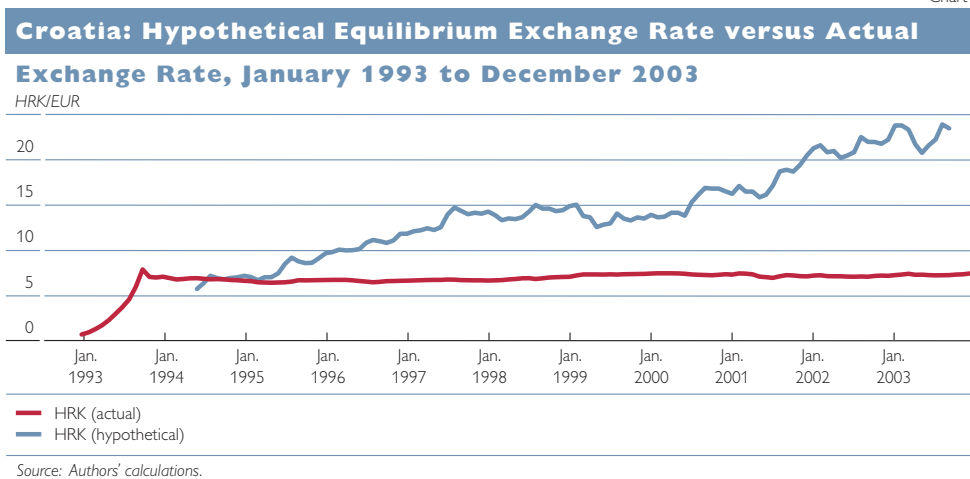


Chart 5



### 5.1 Bulgaria

Some interesting features can be observed in the case of Bulgaria. Prior to the 1997 crisis, the exchange rate was significantly overvalued<sup>16</sup> as compared to the exchange rate implied by macroeconomic fundamentals. Furthermore, the degree of depreciation during hyperinflation roughly corresponds to that implied by the fundamentals-driven exchange rate. We can see a dampened overshooting behavior of the implied monetary exchange rate, which is mainly attributable to the movements of the interest rate differential. Since the introduction of the currency board, the “hypothetical” exchange rate has followed a depreciating path. On the one hand, this development may imply that the Bulgarian currency is overvalued again in the last part of the sample. This behavior pattern follows the so-called exchange rate-based stabilization syndrome

<sup>16</sup> This conclusion is, however, sensitive to the specification of the constant term in the simulation, which was discussed above. By contrast, alternative derivations of the constant term would result in a confusing behavior of the exchange rate especially during the currency crisis in 1997.

(see Ghosh et al., 2002). On the other hand, we can see that the “hypothetical” exchange rate stabilized in 2001, which indicates that the Bulgarian economy adjusted to a new exchange rate regime under the currency board. Actually, the deviations between the “hypothetical” and the actual exchange rates are more difficult to interpret in this case because of statistical changes and a currency revaluation after the 1997 currency crisis.

Inflation remained relatively high in Bulgaria (above 5% at the end of 2003). Under fixed exchange rates, a persistent inflation differential with respect to the anchor country may lead to an overvaluation of the real exchange rate and, accordingly, to a fall in the competitive position of the economy. One way to assess this risk is to analyze the current account position. The Bulgarian current account deficit widened sharply from 0.5% of GDP in 1998 to 8.3% in 2003. This was the result of strong growth in consumer goods imports, but mainly also of the increase in imports of investment goods. The gap is, however, largely covered by FDI inflows and official financing. While initially most of this financing came through privatization revenues, Bulgaria also managed to draw substantial funds from nonprivatization direct investment after the privatization process slowed down. The fiscal account, by contrast, was close to balance in recent years and did therefore not increase the current account deficit further. Overall, this picture suggests that the overvaluation does not pose a substantial risk to the Bulgarian economy.

To evaluate the evolution of competitiveness in the Bulgarian economy in view of a possible exchange rate overvaluation, it is useful to examine unit labor cost developments. From 2000 to 2002, the annual change of unit labor costs was only around 2.5%, despite an average inflation rate of almost 8% in these three years. The reason was a rapid productivity increase. The Bulgarian economy is in a comparatively early stage of development, and thus still provides sufficient margins for productivity gains. These favorable labor cost developments helped sustain the favorable competitive position of the economy in spite of a possible overvaluation of the currency. The IMF shares the view that price and wage indicators do not indicate a loss in competitiveness, suggesting that the real exchange rate appreciation since mid-1997 has to a large extent been attributable to the Balassa-Samuelson effect and to price liberalization (see e.g. IMF, 2000). The most recent data for the year 2003 may, however, point to potential risks, with unit labor costs increasing by more than 7%.

## 5.2 Croatia

Chart 5 shows the dynamics of the simulated equilibrium exchange rate against the actual exchange rate for Croatia. In the light of the developments of the fundamentals-driven exchange rate, the level of the peg appears extremely (and increasingly) overvalued. To assess whether a sustained and widening overvaluation of the currency poses a risk to competitiveness, we again examine balance of payment developments. Since 1998, the current account deficit has been at around 6% of GDP on average. Behind this figure stands a huge trade deficit of around 20% of GDP, resulting from the failure to adjust the export structure to new demand. This high trade deficit is counterbalanced by a positive service balance as a result of income from tourism as well as by the inflows of funds from expatriates. From 1998 to 2003, the current account deficit was entirely

financed by FDI inflows, which have also amounted to 6% of GDP on average since 1998. This suggests that the high current account deficit is nevertheless sustainable. But the most recent developments may point to a certain risk. The current account deficit has widened in recent years, from 2.5% of GDP in 2000 to almost 7% in 2003, while FDI inflows have remained relatively stable.<sup>17</sup> If the current account deficit continues to widen and this development is not matched by increasing FDI inflows, this may point to increasing difficulties with the overvaluation of the Croatian currency.

A second factor to keep in mind, especially when evaluating the competitive position of the Croatian economy, is the development of unit labor costs. These do not seem to indicate an unsustainable situation, as both inflation and the increase in unit labor costs showed rates of below 2% in 2003.

A highly relevant aspect for the feasibility of exchange rate relaxation is the cost associated with such a policy shift. One argument put forward by the supporters of the current regime is the high degree of euroization in the economy. If asset and commodity prices as well as wages are set in euro, a devaluation of the exchange rate directly feeds into the domestic price level, leading to higher inflation and a redistribution within the economy. Billmeier and Bonato (2002) argue that euroization is mostly limited to financial assets (asset substitution, savings in foreign currency and foreign currency-denominated or indexed loans), while retail prices are hardly affected by exchange rate movements. Strict exchange rate targeting may therefore not be necessary. The authors suggest a gradual shift away from the past policy of exchange rate targeting.

Furthermore, chart 5 may overestimate the actual degree of overvaluation because the use of foreign currencies in the Croatian economy lost importance during the period analyzed. Stix (2003) reports that the share of Croatian respondents holding foreign currencies declined from almost 60% in 1997 to about 20% in 2001. Even though these figures cannot be translated directly into standard monetary aggregates, they show that a significant part of M2 growth has actually been offset by corresponding declines of unreported foreign currency holdings (see also Barisitz, 2004).

While these results seem to downgrade the cost of a change in the exchange rate regime on the grounds of inflation considerations, they ignore the potentially high costs of financial stability. If an important part of liabilities is denominated in foreign currency, exchange rate movements have direct consequences on the level and sustainability of debt and the stability of the banking system. Exchange rate fluctuations may therefore entail severe costs for the economy and may in extreme cases lead to a banking crisis. The confidence of the economy highly depends on financial sector stability. Certainly, these considerations significantly limit the set of options for future exchange rate policies.

<sup>17</sup> It should be noted that the current account deficit in 2003 is biased to a certain extent by a one-off event in the same year. The patent transfer of the Croatian pharmaceutical company PLIVA d.d. to a branch in Hungary was not accompanied by a financial counterflow, and thus caused the current account deficit to deteriorate. According to the 2003 Annual Report of Hrvatska narodna banka, the current account deficit amounts to 6% of GDP when this factor is excluded.

## 6 Policy Implications and Conclusions

This paper focuses on the exchange rate challenges in the four countries that currently have declared their interest in becoming a member of the European Union in the near future: Bulgaria, Croatia, Romania and Turkey. While Romania is already in the midst of accession negotiations and Bulgaria preliminarily closed them on June 15, 2004, Croatia and Turkey will start negotiations in 2005. All of these countries share the challenge of choosing the appropriate exchange rate strategy in the run-up to EU membership and to an eventual adoption of the euro.

Given the substantial differences in past exchange rate policies, we adopt different approaches in assessing the appropriateness of exchange rate strategies and in studying the connections between exchange rates and other economic variables. For the countries with currently freely floating currencies, i.e. Romania and Turkey, we follow the monetary model in evaluating the importance of fundamentals for exchange rate fluctuations. A comparison of realized exchange rates with the equilibrium exchange rate (as derived from the estimated elasticities and the macroeconomic fundamentals) reveals no substantial over- or undervaluations of the currencies at the end of the sample. In both countries, deviations around the equilibrium exchange rate became less volatile over time.

Bulgaria and Croatia, by contrast, follow a fixed-peg or narrow-band exchange rate policy. In these cases, we use estimates of the monetary model of exchange rate determination obtained from a panel including six CEECs and Turkey. We address possible exit strategies from the current fixed exchange rate regimes which are presently discussed in the literature. In particular, we present the dynamics of “hypothetical” equilibrium exchange rates against the euro computed on the basis of macroeconomic fundamentals in Bulgaria and Croatia.

We find some deviation of this “hypothetical” exchange rate level, which can be explained partially by factors specific to these countries (the previously high degree of informal dollarization, structural changes, etc.). Furthermore, major economic variables in these economies confirm the sustainability of financial developments. Nevertheless, our results indicate possible depreciation trends if these countries exit the current currency board or narrow-peg strategy, respectively. From this perspective, a continuation of the current exchange rate regimes and a long-term preparation for euro adoption appears to be an optimal exchange rate strategy for Bulgaria and Croatia.

Cutoff date for data: December 31, 2004.

## References

- Barisitz, S. 2001.** The Development of the Romanian and Bulgarian Banking Sectors since 1990. In: Focus on Transition 1. Vienna: Oesterreichische Nationalbank. 79–118.
- Barisitz, S. 2004.** Stylized Facts on Exchange Rate Arrangements and Monetary Policy in Southeastern Europe and Turkey. In: Focus on European Economic Integration 2. Vienna: Oesterreichische Nationalbank.
- Billmeier, A. and L. Bonato. 2002.** Exchange Rate Pass-Through and Monetary Policy in Croatia. IMF Working Paper 109.
- Calvo, G. A. and C. M. Reinhart. 2002.** Fear of Floating. In: The Quarterly Journal of Economics CXVII(2). 379–408.
- Clements, K. W. and J. A. Frenkel. 1980.** Exchange Rates, Money, and Relative Prices: The Dollar-Pound in the 1920s. In: Journal of International Economics 10(2). 249–262.
- Crespo-Cuaresma, J., J. Fidrmuc and R. MacDonald. 2003.** The Monetary Approach to Exchange Rates: Panel Data Evidence for Selected CEECs. In: Focus on Transition 2. Vienna: Oesterreichische Nationalbank. 138–151.
- Égert, B. 2003.** Assessing Equilibrium Exchange Rates in CEE Acceding Countries: Can We Have DEER with BEER without FEER? A Critical Survey of the Literature. In: Focus on Transition 2. Vienna: Oesterreichische Nationalbank. 38–106.
- Égert, B. 2004.** Equilibrium Exchange Rates in Southeastern Europe, Russia, Ukraine and Turkey: Healthy or (Dutch) Diseased? In: Focus on European Economic Integration 2. Vienna: Oesterreichische Nationalbank.
- Égert, B. and L. Halpern. 2004.** Equilibrium Exchange Rates in Central and Eastern Europe on the Eve of the Euro: New Insights from Meta-Analysis. Paper presented at the 10<sup>th</sup> Dubrovnik Economic Conference 2004.
- Égert, B. and K. Lommatzsch. 2003.** Equilibrium Real Exchange Rates in Acceding Countries: How Large is our Confidence (Interval)? In: Focus on Transition 2. Vienna: Oesterreichische Nationalbank. 107–137.
- Frankel, J. A. 2003.** Experience of and Lessons from Exchange Rate Regime in Emerging Economies. NBER Working Paper 10032. October.
- Ghosh, A. R., A.-M. Gulde and H. C. Wolf. 2000.** Currency Boards, More than a Quick Fix? In: Economic Policy 31. 269–335.
- Ghosh, A. R., A.-M. Gulde and H. C. Wolf. 2002.** Exchange Rate Regimes, Choices and Consequences. Cambridge: MIT Press.
- Groen, J. J. 1998.** The Monetary Exchange Rate Model as a Long-Run Phenomenon. Tinbergen Institute Discussion Papers 98-082/2.
- Groen, J. J. 2002.** Cointegration and the Monetary Exchange Rate Model Revisited. In: Oxford Bulletin of Economics and Statistics 64(4). 361–380.
- International Monetary Fund. 2000.** Bulgaria: Selected Issues and Statistical Appendix. IMF Staff Country Report 00/54.
- Kao, C. 1999.** Spurious Regressions and Residual-Based Tests for Cointegration in Panel Data. In: Journal of Econometrics 90(1). 1–44.
- Kao, C. and M.-H. Chiang. 2000.** On the Estimation and Inference of Cointegrated Regression in Panel Data. Advances in Econometrics 15. 179–222.
- Maeso-Fernandez, F., C. Osbat and B. Schnatz. 2004.** Towards the Estimation of Equilibrium Exchange Rates for CEE Acceding Countries: Methodological Issues and a Panel Cointegration Perspective. European Central Bank Working Paper 353.
- Milesi-Ferretti, G. M. and A. Razin. 1998.** Current Account Reversals and Currency Crisis: Empirical Regularities. NBER Working Paper Series 6620.

- Ozlale, U. and E. Yeldan. 2004.** Measuring Exchange Rate Misalignment in Turkey. In: Applied Economics (forthcoming).
- Reinhart, C. M. and K. S. Rogoff. 2002.** The Modern History of Exchange Rate Arrangements: A Reinterpretation. NBER Working Paper Series 8963.
- Reinhart, C. M. and K. S. Rogoff. 2004.** The Modern History of Exchange Rate Arrangements: A Reinterpretation. In: The Quarterly Journal of Economics CXIX(1). 1–48.
- Rose, A. K. 2000.** One Money, One Market: Estimating the Effect of Common Currencies on Trade. Economic Policy: A European Forum. April. 7–45.
- Stix, H. 2003.** Survey Result about Foreign Currency Holdings in Five Central and Eastern European Countries. CESifo Forum 3. 41–48.
- Stock, J. H. and M. W. Watson. 1993.** A Simple Estimator of Cointegrating Vectors in Higher-Order Integrated Systems. In: Econometrica 61(4). 783–820.