International Center for Economic Growth
European Center

WORKING PAPERS
NR. 4.

MACROECONOMIC STUDIES

PETER BACKÉ:

Inflation Developments in Central and Eastern European Accession Countries: Implications for Exchange Rate Policies and Regimes

JANUARY 2002

Peter Backé[1]

Inflation Developments in Central and Eastern European Accession Countries: Implications for Exchange Rate Policies and Regimes

[1] Oesterreichische Nationalbank, Foreign Research Division. The views expressed do not necessarily represent those of the Oesterreichische Nationalbank.

CONTENTS

1. INTRODUCTION

Exchange rate policies and regimes have been among the most contested and controversial issues in Central and Eastern Europe since the very beginning of transition twelve years ago. The purpose of this paper is to analyze the implications of inflation developments in Central and Eastern European accession countries for exchange rate policies and regimes.

Accession countries are in a process of completing transition and, at the same time, preparing for EU accession. Their economies have embarked or are about to embark on a catching-up process to the income levels of Western European countries. These processes have a distinct bearing on price dynamics in accession countries. Understanding these price and price level developments is key to designing and implementing appropriate exchange rate policies and adopt proper exchange rate regimes.

This paper consists of three main parts. Section 2 comprises some basic facts about exchange rate regimes, inflation developments and price level convergence during the course of the transition process so far. Section 3 deals with selected driving forces of price dynamics; it takes a forward-looking perspective. Building on this background, section 4 explores policy implications in general and for monetary policy in particular.

2. SOME BASIC FACTS

2.1. Exchange Rate Regimes of Accession Countries: Recent Changes

It would go far beyond the objective and the scope of this paper to revisit and reproduce the debate on fixed versus flexible exchange rate regimes. In order to set the stage for the analysis, it is sufficient to recall that, basically, the choice of the exchange rate regime is dependent on the size and the degree of openness of an economy, the nature and source of shocks it is exposed to, its structural features, the preferences of policymakers, and furthermore also on credibility-related considerations.

The financial crises in Asia, Russia and Brazil between 1997 and 1999 had a marked impact on the debate on exchange rate regimes: There has been growing support for the view that, in a world of integrated capital markets and greatly increased capital mobility, intermediate exchange rate regimes – standard-type pegged regimes and heavily managed floats based on unstated exchange rate rules – are inherently unstable, mainly due to the size and volatility of capital flows. In this perspective, the future belongs exclusively or almost exclusively to corner solutions, i.e. to free (or only very lightly managed) floats and to super-strict regimes (currency boards, the adoption of a foreign currency as sole or parallel legal tender or joining a monetary union).

A different view concedes that the substantial increase in capital mobility over the last decade has clearly made the management of intermediate regimes much more challenging. However, it holds that there are still good reasons for many countries to adopt intermediate regimes. If the overall macroeconomic policy stance is coherent and the financial system is

robust, functions well and is properly supervised, such regimes can be reasonably viable, in particular if they are adopted in the context of a broader economic and political integration process. Capital account liberalization, if carefully timed and sequenced, can support intermediate exchange rate regimes during the transitional period in which these conditions are put in place. Corner solutions, in turn, will tend to constitute the exception rather than the rule for most countries: Currency boards require very demanding preconditions in order to be lastingly viable, while free or only lightly managed floats tend to have significant drawbacks, in particular for the development of the real sectors in small open economies.

Table 1 displays recent exchange rate regime developments, comparing the arrangements of the applicants at the start of the Asian crisis in mid-May 1997 with the regimes that are currently in place. It shows that exchange rate regimes in Central and Eastern Europe have varied widely across countries: One can find all kinds of arrangements, from currency boards to lightly managed floats.

There is no uniform trend which would characterize the evolution of exchange rate regimes in Central and Eastern Europe over the review period of the past four years. Some countries, like Poland, the Czech Republic and Slovakia, have moved or continued to move towards greater exchange rate flexibility – either, as Poland and Hungary, within the framework of a deliberate strategy or as a consequence of a successful attack on "standard" exchange rate pegs, fixed pegs to be more precise (Czech Republic, Slovakia[2]). Among the two former countries, Poland proceeded to more exchange rate flexibility in several small steps while Hungary took one major leap very recently, after having clinged to a regime with limited flexibility for six years.

This move towards more exchange rate flexibility has been combined with or followed by the adoption of direct inflation targeting frameworks (Czech Republic and Poland), or by a more eclectic strategy that has brought together elements of monetary and direct inflation targeting, while gradually strengthening the latter (Slovakia). Hungary moved to an "implicit" inflation targeting shortly after adopting a more flexible exchange rate regime.

Other countries have not advanced towards greater exchange rate flexibility. Latvia has retained a standard-type fixed peg with narrow bands. The number of currency board countries has increased from two to three, with Bulgaria joining Estonia and Lithuania. Also, it should be noted that the two countries that operate crawling peg regimes (Poland and Hungary) have greatly reduced their crawl rates, especially more recently.

In terms of corner solutions versus intermediate exchange rate regimes, the following picture emerges: Two countries have typical intermediate regimes, Latvia and Slovenia (which operates a tightly managed float). Hungary can also be counted into this group, despite its new wide fluctuation band. The number of clear intermediate regimes has thus gone down over the past four years. Three countries, namely the currency board countries, have definite corner solutions. The degree of exchange rate management in the other four countries has been diverse, with little central bank intervention in the foreign exchange market in the Czech Republic and Poland since early 1998. However, even in these two cases,

---

[2] In terms of timing, these two regime collapses are closely linked, in terms of timing, to emerging market crises events (for a short analysis, see Backé 1999).

the authorities appear to have remained genuinely concerned about exchange rate developments.

Table 1
Exchange Rate Regimes of Central and Eastern European Accession Countries at the Outbreak of the Asian Crisis and Today

	mid-May 1997	mid-June 2001
Bulgaria	Managed float	EUR peg under a currency board
Czech Republic	Fixed peg to a DEM-USD basket Fluctuation band: ±7.5%	Managed float
Estonia	DEM peg under a currency board	DEM/EUR peg under a currency board
Hungary	Crawling peg versus DEM-USD basket Fluctuation band: ±2.25% Automatic monthly devaluation: 1.1%	Crawling peg versus EUR Fluctuation band: ±15% Automatic monthly devaluation: 0.2%
Latvia	SDR peg Fluctuation band: ±1%	SDR peg Fluctuation band: ±1%
Lithuania	USD peg under a currency board	USD peg under a currency board
Poland	Crawling peg versus a five-currency basket Fluctuation band: ±7% Automatic monthly devaluation: 1%	Managed float
Romania	Managed float	Managed float
Slovakia	Fixed peg to a DEM-USD basket Fluctuation band: ±7%	Managed float
Slovenia	Managed float	Managed float

During the course of the last four years, four of the ten countries – Bulgaria, the Czech Republic, Poland and Slovakia – have carried out exchange rate regime changes. Hungary, in turn, has a made tangible alteration within a particular (crawling peg) regime. The other five countries, in turn, have undertaken no change or only technical adaptations.

2.2. Inflation Developments during Transition: Stylized Facts

Price developments since the beginning of the transition can be divided into four phases. In the early stages of transition, Central and Eastern European countries experienced a corrective inflation phase associated with sweeping price and trade liberalization coupled with substantial nominal exchange rate depreciation at the beginning of transformation. The size of the initial price level jump was diverse among individual countries. This phase was associated with substantial initial adjustments of relative prices, in particular in the area of tradables.

Table 2

Consumer Price Inflation in the Central and Eastern European Accession Countries (annual average, in %)

	Bulgaria	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Poland	Romania	Slovakia	Slovenia
1990	23.8	9.7		28.9			585.8	5.1	10.4	549.7
1991	338.5	56.6		35.0			70.3	170.2	61.2	117.7
1992	91.2	11.1		23.0	243.3		43.0	210.4	10.0	201.3
1993	72.8	20.8	89.8	22.5	108.8	410.2	35.3	256.1	23.2	32.3
1994	96.0	10.0	47.7	18.8	35.9	72.2	32.2	136.8	13.4	19.8
1995	62.1	9.1	28.8	28.2	25.0	39.7	27.8	32.3	9.9	12.6
1996	123.0	8.8	23.1	23.6	17.6	24.6	19.9	38.8	5.8	9.7
1997	1,082.3	8.5	10.6	18.3	8.4	8.9	14.9	154.8	6.1	9.1
1998	22.3	10.7	8.2	14.3	4.6	5.1	11.8	59.1	6.7	8.6
1999	0.3	2.1	3.3	10.0	2.4	0.8	7.3	45.8	10.6	6.6
2000	9.9	4.1	4.0	9.8	1.8	1.0	10.1	45.7	12.2	8.9

Source: WIIW (collected from national sources).

Remark: Eurostat has recently published a harmonized CPI for the accession countries since 1996 (see http://europa.eu.int/newcronos/exec/extract/de/theme2/price/ihicp_cc/hmind_cc.htm).

The harmonized figures are, in most cases, close or very close to the figures presented above.

As stabilization took hold in most accession countries, annual inflation was substantially reduced to moderate rates (high-single or low-double digits).[3] These inflation rates then proved to be fairly persistent in a number of transition economies. In this phase, relative price adjustments became less turbulent and began to exhibit a typical pattern in which nontradables prices increased faster than tradables prices.

Further headway towards disinflation, though to a different extent, was made after the onset of the Russian crisis in the fall of 1998. This is attributed to a combination of negative demand shocks (lower import demand from Russia and the European Union) and positive supply shocks (very low oil prices which actually started to fall already in the wake of the Asian crisis; constant or falling food prices, as food exports to Russia were redirected to the domestic markets). The Czech Republic and the Baltic countries advanced to fairly low rates of inflation in this period and have retained this edge subsequently.

---

[3] Stabilization policies were much less successful in Bulgaria (until 1997) and in Romania.

The last and most recent phase began in the spring and summer of 1999, when disinflation came to a halt in most, if not all accession countries. Subsequently, a number of applicant countries registered a more or less pronounced pick-up of inflation. These less favorable developments are ascribed to a combination of positive demand shocks (increasing growth dynamics mainly due to additional import demand from the European Union until the second quarter of 2000 and higher import demand from Russia) and probably far more important negative supply shocks (rising import prices due to the surging oil price and to euro/U.S. dollar developments in conjunction with the euro-linked or euro-oriented exchange rate policies of various accession countries; growing food prices mainly due to bad harvests).

While this general pattern of developments applies to most accession countries, the disinflation process in each individual applicant country displays country-specific peculiarities as well. Typically, temporary bouts in inflation reflect the short-term impact of stabilization packages (e.g. Hungary 1995, Slovakia 1999) or major reforms in the indirect tax system (e.g. the introduction of VAT in the Czech Republic and Slovakia in 1993 or in Slovenia in 1999), while disinflation dynamics have been enhanced by recession (Czech Republic 1998/99).[4]

A caveat has to be added here. Inflation data, in particular consumer price inflation data, may be upward-biased. Some argue that there is a bias and that this bias is substantial in the case of Central and Eastern European countries (see e.g. Skreb, 1998, who points out the dramatic increase in the number of new products and the improving quality of existing products in transition economies).

2.3. Price Level Convergence

To put inflation developments into perspective and to relate them more closely to the accession process, it is useful to shed some light on the degree of price level convergence that has been achieved so far.

A convenient way to approach this issue is to look at the development of the comparative price levels which relate (market) exchange rates to purchasing power parities.[5] A comparative price level of 100% means that, at the given (market) exchange rate, price levels are the same in the country under examination and in the reference country. Figures below 100% indicate that the price level in the country under examination is lower than the price level in the reference country. More specifically, they imply that the (market) exchange rate assigns a lower value (in currency units of the reference country) to one local currency unit than the purchasing power parity. Starting from such a position, price level convergence is a process of real appreciation of the local currency against the currency of the reference country. Table 3 reports the development of comparative price levels relative to Germany

---

[4] In order to review the inflation process in a more substantial manner, it is useful to look at other inflation indexes, apart from consumer price inflation, in particular on core inflation measure. For a simple concept of core inflation and some analysis on Central and Eastern European accession countries, see Fidrmuc (2000).

[5] The comparative price level is the ratio of the (market) exchange rate to purchasing power parity, both denominated in currency units of the reference country per one local currency unit.

during the course of the 1990s. It therefore provides information about price level deviations of accession countries and selected EU countries from the German level.

Table 3
Comparative Price Levels (in % of the German Price Level)

|	1991	1992	1994	1998	1999
Bulgaria	15.8	16.3	17.9	26.2	27.0
Czech Republic	21.7	22.3	28.3	36.5	35.7
Estonia	n/a	12.1	31.7	38.8	41.1
Hungary	34.6	35.5	38.2	38.8	39.3
Latvia	n/a	11.5	35.7	36.6	38.5
Lithuania	n/a	7.5	28.0	35.3	39.8
Poland	34.9	33.6	34.6	43.9	43.0
Romania	19.5	13.1	18.6	26.7	23.7
Slovakia	23.3	24.4	27.6	33.2	31.5
Slovenia	50.2	47.3	49.0	58.7	59.8
Austria	96.2	96.2	95.6	96.9	97.5
Greece	70.1	67.5	63.4	70.4	72.4
Ireland	85.4	82.2	75.0	89.7	90.9
Portugal	60.3	64.7	55.8	62.4	63.4
Spain	84.2	84.7	71.0	76.4	77.4

Source: WIIW, World Bank, OECD.

Regarding price level convergence to date, three observations are noteworthy: First, exchange rates in 1992 were strongly undervalued in relation to purchasing power parities. Second, the degree of undervaluation was reduced considerably during the 1990s, but third, (with the exception of Slovenia) these undervaluations are still significantly larger than in the catching-up economies in the Euro-12 area.

Price level convergence will go hand in hand with the convergence of the candidates' levels of economic development with the levels prevailing in the European Union. Integration of candidate countries into the EU and later into the euro area will give additional impetus to price level convergence.

Within the euro area, there is a strong and significant negative correlation between the level of inflation rates and comparative price levels (ECB 1999). Figure 1 appears to suggest that a comparable, albeit somewhat weaker relationship holds true for the Central and Eastern

European accession countries.[6] This figure shows the relation between the comparative price levels of 1999 and the inflation rates (1998 and 1999 average) of all candidate countries (except for Romania which is an outlier in terms of inflation).

Figure 1
Inflation and Comparative price level
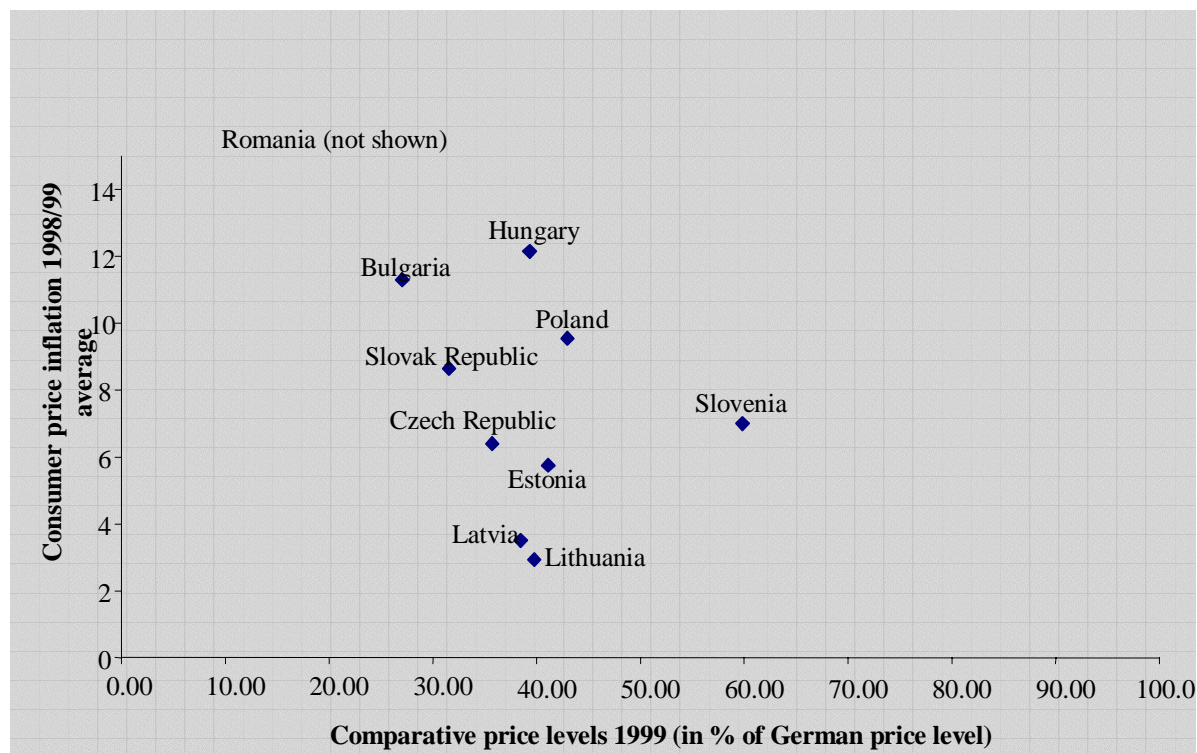
3. PRESENT AND FUTURE DRIVING FORCES OF PRICE DYNAMICS

Inflation in accession countries is driven by a multitude of factors which encompass transition-related, accession-related, catching-up-related sources as well as policy-related determinants of inflation; furthermore, external factors are also important.

A standard approach to analyze inflation developments is to use various econometric tools, e.g. VAR techniques, to identify the main determinants of a past inflationary process. A number of studies of this kind have been written on Central and Eastern European economies in recent years.[7] Such analyses have undoubted merits. However, an approach of this kind

---

[6]   The comparatively low inflation rates recorded by the Baltic countries are partly due to the recession Estonia, Latvia and Lithuania experienced in the aftermath of the Russian crisis. In Slovenia, in turn, inflation developments in the second half of 1999 were specifically affected by the introduction of VAT in the middle of last year.

[7]   Many of these studies have been undertaken by the IMF staff. The IMF homepage contains a useful overview (see http://www.imf.org/external/pubind.htm).

appears to be less (or only partly useful) for the purpose of this paper. This is so because inflation sources in accession countries are undergoing dynamic change. In such a context, past relationships among variables may be misleading.

A basic proposition of this paper is that EU accession and integration is an important anchor and incentive for sound macroeconomic and structural policies. This will mitigate or do away with several factors that currently drive inflation in accession countries, even though accession itself may entail some one-off price adjustments. In particular, any potential inflationary bias of monetary, exchange rate and fiscal policies will be reduced to a large extent under the EU economic policy coordination and surveillance framework. In fact, already now, applicants are exposed to a string of policy dialogue and surveillance instruments.

In a similar vein, transition will still impact on inflation in accession countries, but only for a limited period of time in the most advanced transition economies. Catching-up, in turn, is a long-term process which will impact on inflation developments in accession countries for any foreseeable future.

Against this backdrop, three main sources of current and future price dynamics in accession countries are singled out and dealt with in more detail in this chapter, namely (1) price deregulation and agricultural prices, (2) productivity developments, and (3) potential wage drifts.

3.1. Completing Transition and Acceding to the European Union

This section is about those sources of inflation that relate to the completion of the transition process and the accession of advanced transition economies to the European Union. The two main factors that feature in this twin context are explored in more detail, namely price deregulation and agricultural price adjustments.

The liberalization of administered prices or their adjustment to cost-recovery levels has reached an advanced stage in most accession countries. However, it is not yet complete. Administered prices still have a share of approximately 10% to 25% in the accession countries' consumer baskets. Also, the portion of administered prices that already cover costs varies among individual countries. Thus, the order of magnitude of "repressed" inflation due to price caps appears to vary among individual accession countries.

In any case, the final steps towards price liberalization and adjustment will still have a bearing on the price dynamics in accession countries during the next years. These adjustments are very much "transition-related" dynamics, as they emanate from the legacy of central planning in Central and Eastern Europe.

It should be noted that the liberalization of administered prices or their adjustment to cost-recovery levels should essentially be completed before EU accession. The Copenhagen criteria, as interpreted by the European Commission in its *Agenda 2000* (July 1997), require that "prices... are liberalised" as a precondition for EU accession. Consequently, this issue

should be principally settled when EU accession takes place. Two qualifications have to be added here. First, in some specific areas (like e.g. public transportation in urban areas), a case can be made for keeping prices below cost-recovery levels. Second, in the area of public utilities, capital costs will typically increase over time, as old production and distribution facilities, which have already been depreciated (close to) zero in the books of utility companies, are being replaced. This process will extend beyond EU accession.

Furthermore, if prices remain regulated, transparent and effective price-setting formulas have to be put in place which ensure that administered prices, once adjusted to cost-recovery levels, will be regularly altered in line with ongoing cost changes. The recent surge in energy prices has shown that existing formulas do not always live up to these needs and that political interference in the price-setting process has remained significant.

The adjustment of energy prices for households seems to be the most significant task outstanding in this area of regulated prices. A recent analysis of energy price developments in four Central and Eastern European accession countries yields the following picture:[8]

There has been some convergence between energy prices in four selected Central and Eastern European accession countries and energy prices in the EU during the period 1992/93 to 1998/99. The candidate countries under review have largely reached EU energy price levels in most (but not all) types of energy. However, energy prices charged on households are still low, as compared to those in the European Union, even if they are higher than in the EU when measured relative to GDP per capita. Major adjustments are needed to reach the levels of EU economies.

It follows that the expected adjustments of energy prices will mainly affect the consumer price index, while the direct influence on the industrial producer price index and, hence, on the inflation of tradables will be relatively less important. Thus, price competitiveness should not suffer too much from these energy price adjustments.

However, the upward push on the CPI triggered by the adjustment of energy prices for households will be considerable, as energy constitutes a sizeable share – typically in the rough order of around 15% – of the accession countries' consumer baskets. This, in turn, may lead to higher wage claims, which may result in indirect upward pressure on tradables prices.

The overall upward adjustment of energy prices will probably be mitigated by two factors in the medium term. First, the currently high prices of most sources of energy may come down to more regular levels as a result of a reduction in the USD price and a strengthening of the euro vis-a-vis the U.S. dollar. Furthermore, the process of restructuring and liberalizing energy sectors in Central and Eastern Europe, which is often linked to privatization, may raise their productivity. In particular, the level of energy prices for industry may even decrease relative to the corresponding level in EU countries.

The most obvious case of specific "EU accession-related" price dynamics relates to agricultural and food prices. The entry into the European Union will, in all likelihood, involve

---

[8] For more details, see Reininger (2000). Due to data availability constraints, the analysis of Reininger (2000) had to be restricted to the Czech Republic, Hungary, Poland and the Slovak Republic.

upward pressures on the level of agricultural prices, which are, on the whole, considerably lower in the accession countries than in the EU. Agricultural prices are particularly low compared to EU prices for livestock products and some selected crop products like sugarbeet or apples. However, it should be noted that there is some variation of agricultural price levels among accession countries, but also among EU Member States. Among the former, agricultural producer price level convergence has progressed farthest in Slovenia, followed by the Czech Republic, Slovakia, Poland and Hungary.[9]

Changes in agricultural prices have an impact on food prices, which constitute a sizeable share of accession countries' consumer baskets (typically around 30% or more, as compared to 16% in the European Union), while being on average in the order of one third to one half of food prices in the European Union. The size and phasing of this potential source of inflation will crucially depend on the integration concepts in the agricultural sector. If the newly acceding countries are integrated into the common agricultural policy (CAP) and its price system upon their accession to the EU, this adjustment will take place faster than if there is a phasing-in period with two different price systems for the incumbent Member States and the newly acceding countries.

As in the case of energy prices, the adjustment of food prices as a consequence of EU accession and CAP integration holds the risk of second-round inflation effects and a weakening of external competitiveness, if it spills over to wage developments.

Clearly, EU accession will have additional impacts on price formation. On the fiscal side, bringing VAT regulation in line with EU requirements may lead to price rises for certain categories of goods and services. On the monetary side, reducing mandatory reserve rates which are high in most accession countries (in preparation for prospective euro area accession) will constitute a challenge for monetary policy;[10] in particular in the currency board countries, where other monetary policy instruments are not available, such a move may lead to additional inflationary pressures.[11] Furthermore, rising capital (in)flows in the context of the full liberalization of capital flows, a precondition for EU entry, will probably complicate monetary management and may well have an impact on inflation performance (depending on policy frameworks and responses to such flows).

Conversely, EU accession will also have dampening effects on inflation. In particular, added competition in the Single Market and the effects resulting from the adoption of the EU tariff system have to mentioned in this context.[12]

---

[9]   Own calculations based on WIIW and Eurostat figures. Data for the other accession have not been available.

[10] Apart from the high mandatory reserve rates, most accession countries have brought their monetary instruments already largely in line with those of the euro area. An obvious exception to this are the currency board countries (which basically dispose of the mandatory reserve instrument only).

[11] One possible way to tackle this issue under a currency board arrangement would be the sale of central bank certificates of deposit in order to absorb the additional liquidity that is created through the reduction of mandatory reserve requirements.

[12] The inflation outlook for the first few years of the post-EU-accession period is further blurred by the uncertainties about the short-term impact of EU membership on aggregate demand developments in the accession countries and also about the room of maneuver of macroeconomic policies to deal with internal and external imbalances in this period.

3.2. Productivity Developments and Price Dynamics[13]

The restructuring and catching-up process of the applicants is associated with inflation differentials between nontradables and tradables. Most of the analytical work on this issue so far has focused on supply-side effects and, more specifically, on the Balassa-Samuelson effect. Under this effect, the price ratio (P_r) between nontradables (P_n) and tradables (P_t) develops, in formal terms, as follows (all variables are in logs)[14]:

$$P_r = P_n - P_t = \frac{\delta}{\gamma} a_t - a_n \tag{1}$$

where γ and δ represent labor elasticities of production in the tradables and nontradables sectors, respectively, while a_t and a_n stand for the respective sectoral productivities. In other words, this effect results from differential productivity developments between tradables and nontradables, while wages are assumed to develop uniformly across sectors, with wage increases being driven by productivity increases in the tradables sector. Consequently, nontradables inflation is higher than tradables inflation, leading to a trend appreciation of the real exchange rate and to a convergence of comparative price levels.

In order to investigate this issue in somewhat more detail, it is useful to start by taking a look at inflation and productivity growth differentials between tradables and nontradables in selected accession countries. Before doing so, three points have to be clarified. A first delicate issue which arises in this context is the definition of tradability. In the following analysis, manufacturing is taken as a rough but often used proxy for tradables. Secondly, the investigation is based on gross value added figures. The nominal values of these data series are used as weightings for the tradables and the nontradables sectors, and the implicit deflators of gross value added capture sectoral (tradables and nontradables) inflation. Further insights and evidence about the magnitude of the Balassa-Samuelson effect may be obtained from extending the examination by using gross output data. Thirdly, labor productivity developments are taken as a proxy for total factor productivity developments which are not on hand either.

Inflation and productivity growth differentials between tradables and nontradables in four selected accession countries (the Czech Republic, Hungary, Poland, Slovenia) are depicted in figure 2 and figure 3. In the course of the 1990s, the share of manufacturing in GDP ranged between one fifth and one third in these four countries.

---

[13] This and the next section are based on joint work with Franz Schardax and Thomas Reininger (see also Fidrmuc and Schardax, 2000).
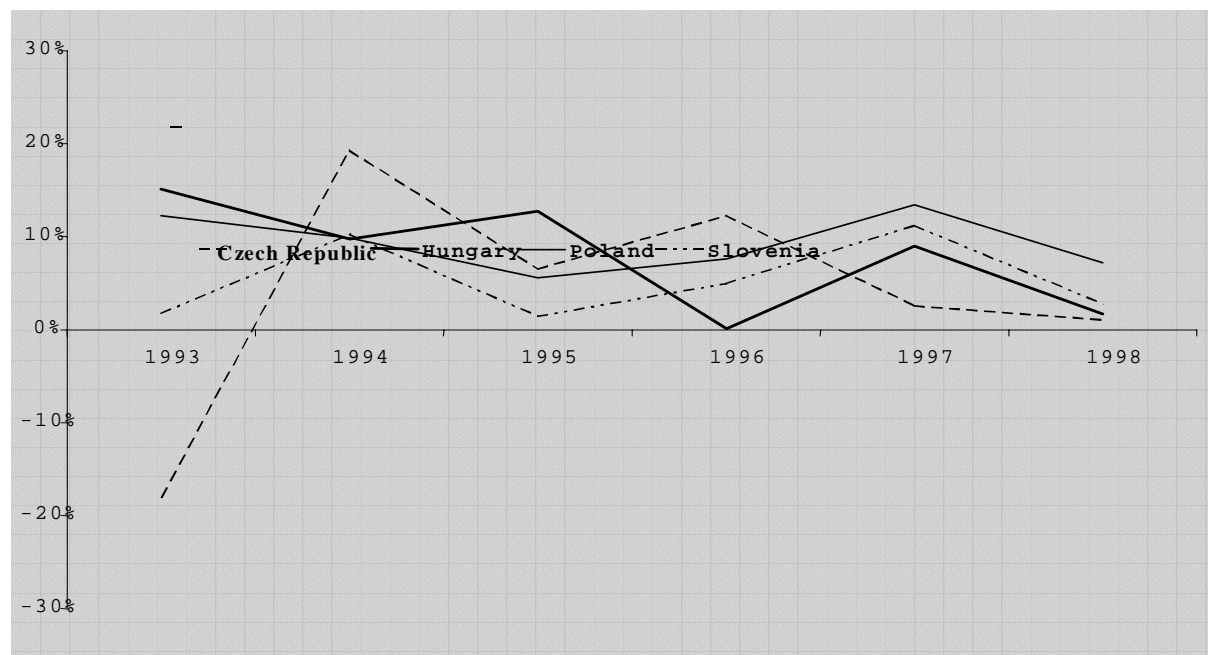
[14] For a derivation of this formula, see IMF (2000).

Figure 2
Inflation Differential: Nontradables/Tradables, 1993-1998
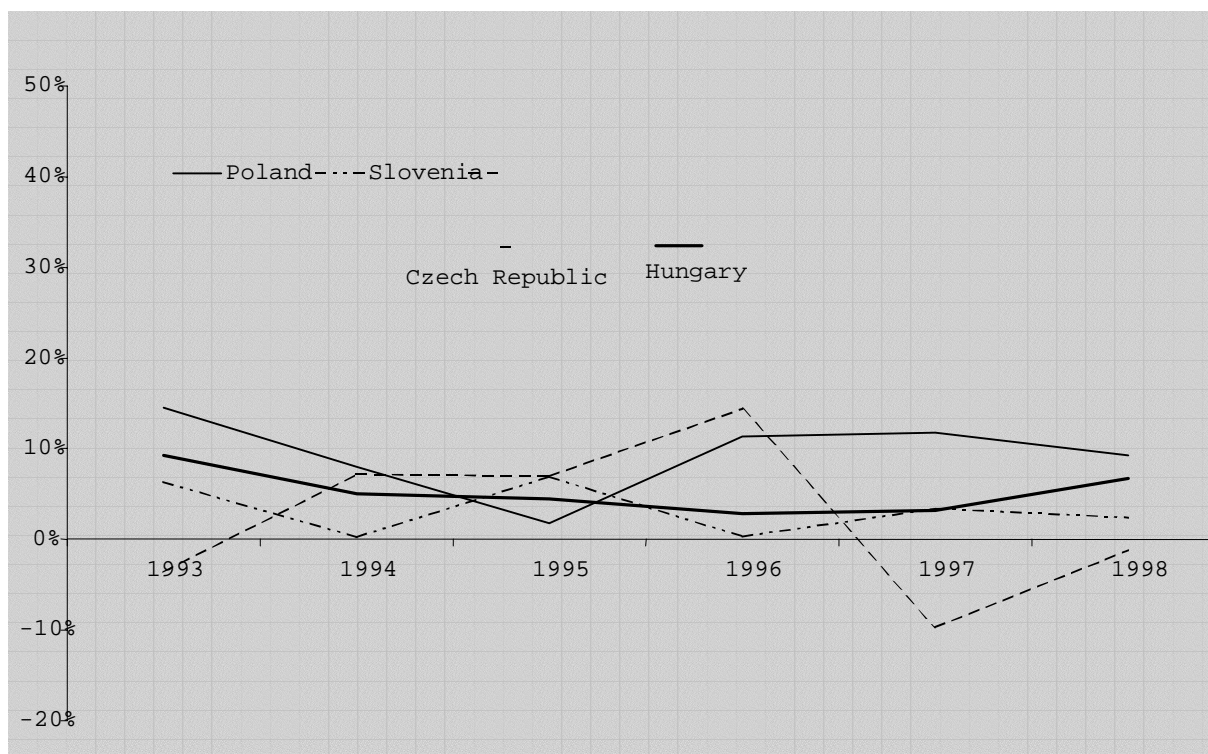
Note: Figure 2 is based on implicit sectoral deflators of gross value added.

Figure 3
Productivity Differentials Tradables/Nontradables, 1993-1998


Note: Figure 3 is based on sectoral labor productivity growth figures.

How do these inflation differentials fit with the Balassa-Samuelson hypothesis?

Although the lack of appropriate data does not permit rigorous empirical tests of the Balassa-Samuelson hypothesis for Central and Eastern European economies, the magnitude of relative price changes seems to be broadly in line with what the Balassa-Samuelson effect would predict.[15] Figure 4, which is based on the approach chosen in IMF (2000), compares the predicted relative price ratio of tradables and nontradables which is implied by sectoral productivity developments according to equation (1) with actual outcomes. In general, predicted and observed price ratios move closely together. Except for Slovenia (until 1995) and the Czech Republic (until 1996), the outcomes are somewhat below predictions.[16]

Figure 4
Relative Prices: Nontradables/Tradables (Price Ratio), 1992=1
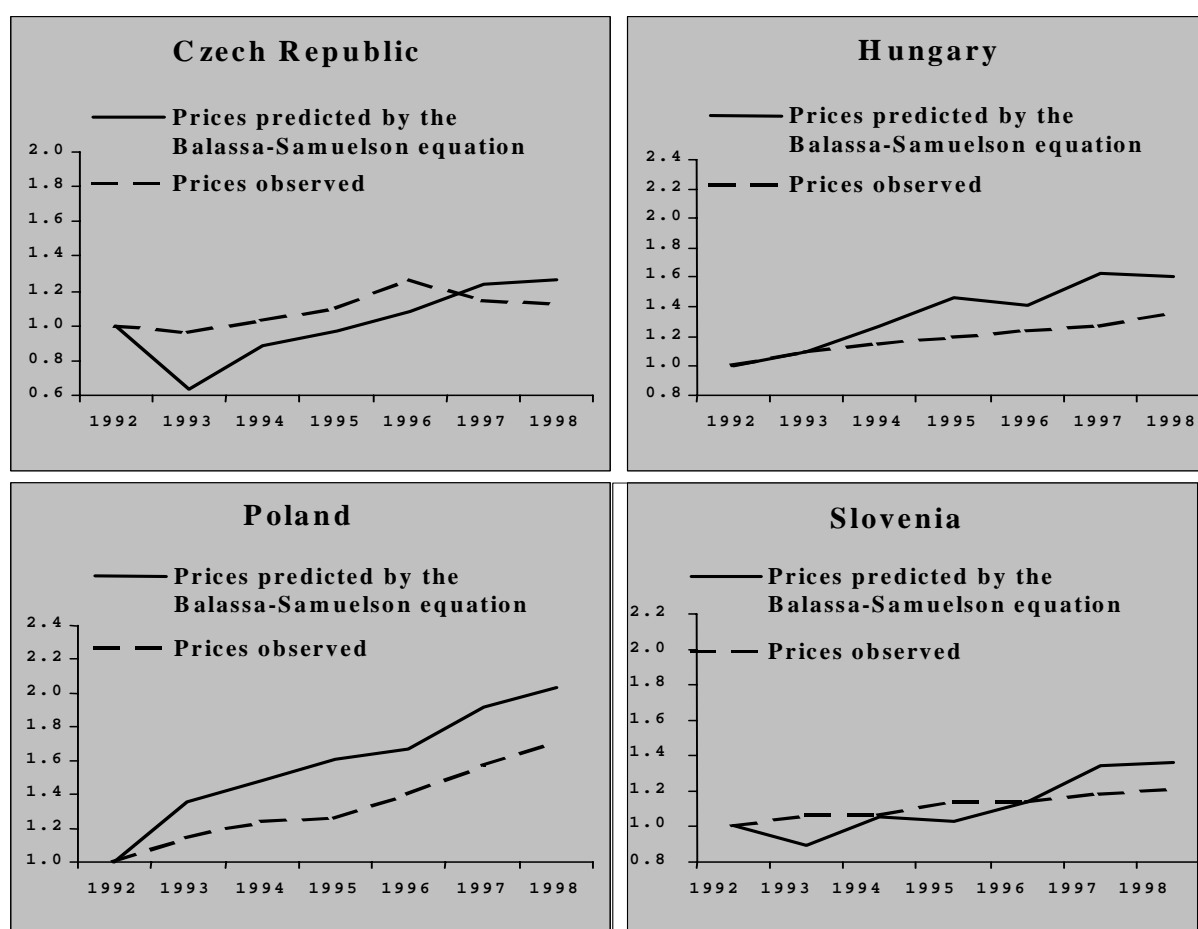
Source: WIIW, own calculations.
Note: Labor productivities were used instead of total productivities (for sectoral productivities).

---

[15]   However, as argued in more detail below, this strong correlation does not necessarily mean that the Balassa-Samuelson effect is the only important force that determines inflation differentials between tradables and nontradables.

[16]   This undershooting is in accordance with other studies that examined different country samples (see e.g. Canzoneri, Diba and Eudey, 1996).

The question of how the inflation differentials between nontradables and tradables affect overall inflation developments can be answered by weighing sectoral inflation rates (implicit deflators of gross value added) with their shares in total gross value added. This simple calculation yields the results displayed in Figure 5.

Figure 5
The contribution of tradables inflation and nontradables inflation to overall inflation (implicit deflators of gross value added)
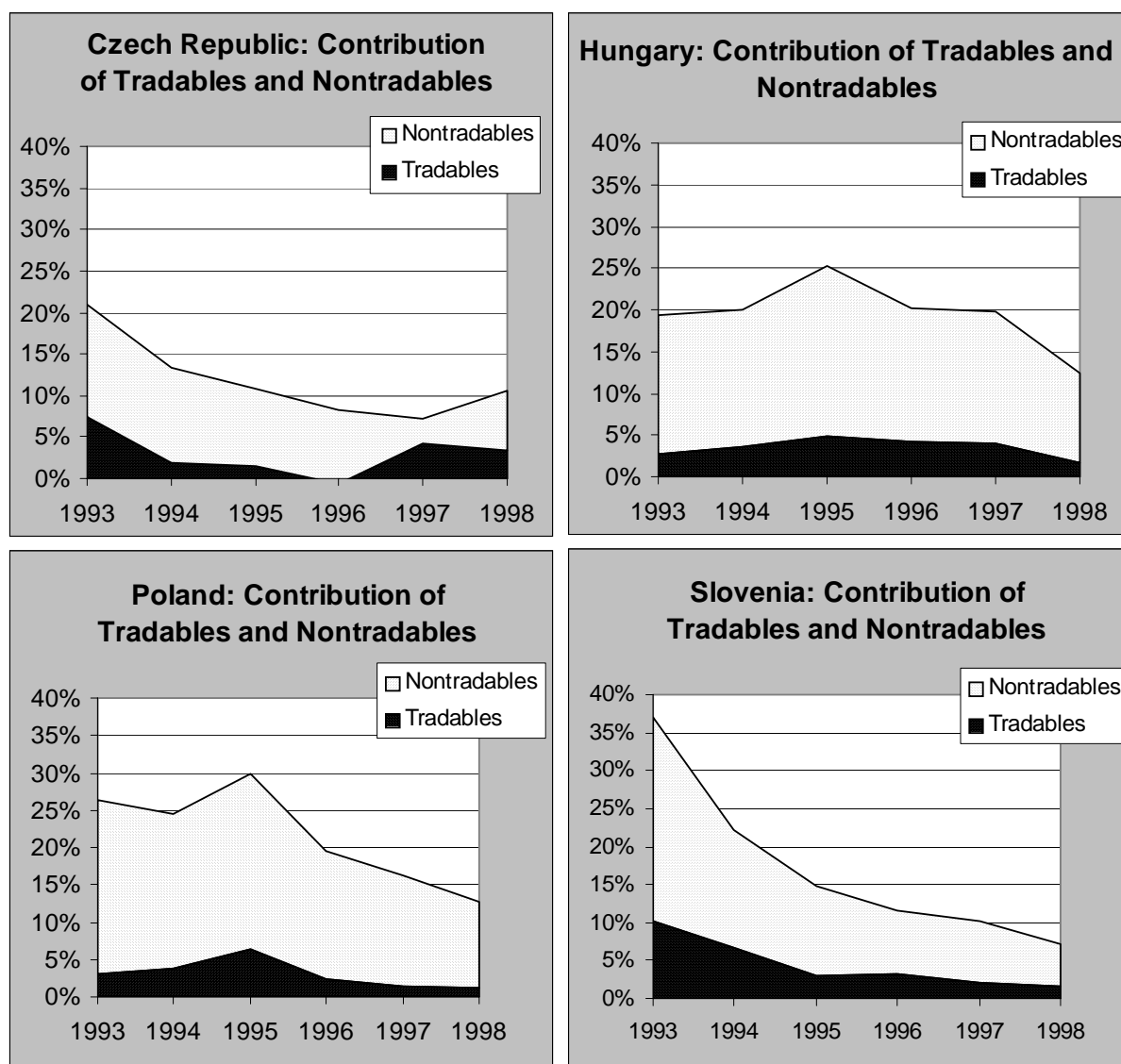
Note: The upper lines show implicit overall annual deflators of gross value added between 1993 and 1998. The contribution of tradables inflation and nontradables inflation to overall inflation is given in percentage points.

The central message of these figures is that inflation differentials between nontradables and tradables were of major importance for overall inflation performance in the four accession

countries under review in the period 1993 to 1998. Typically, nontradables inflation accounted for about four fifths of overall inflation in this period.

In order to gauge future sectoral inflation differentials between tradables and nontradables, it is important to understand the underlying forces that drive these changes. In the long run, these forces will primarily (if not exclusively) be supply-side effects. Apart from the Balassa-Samuelson effect, these forces are not fully understood yet.

The Balassa-Samuelson effect and the potential orders of magnitude it may take in the future requires a closer examination of several issues. First, to what extent does the basic assumption of the Balassa-Samuelson effect – wage growth equalization – hold in practice? One would have to examine sectoral wage and productivity data to address this question. Second, to what extent do the high productivity and inflation differentials of the past between tradables and nontradables reflect non-recurring factors rather than a long-term process? (Are the relatively low productivity differentials in 1998 a first sign of that one-time factors are petering out?) Third, the literature on conditional convergence (see e.g. Barro, 1991) suggests that productivity increases will tend to decelerate as differences in productivity levels narrow. How will this prediction affect productivity differentials in accession countries in the longer run?

Apart from supply-side factors, demand-side factors may also be important for determining differentials between tradables and nontradables inflation in the short to medium run. (In fact, in the case of the catching-up economies of Central and Eastern Europe, deep structural change and substantial rises in income may set off a cascade of important demand changes, so that demand-side effects may prove to be rather persistent.) The relevance of demand-side factors is also supported by the rising share of nontradables in total output in a number of accession countries (the Czech Republic, Poland and Slovenia in the period 1992 to 1998; not however Hungary, which has recorded a small increase in the share of tradables in GDP in the period), while the Balassa-Samuelson effect should produce falling shares of nontradables in total output.[17] Rising shares of nontradables, in turn, may be due to the initially low share of services in aggregate supply and demand and to higher income elasticities for these goods (in particular for services) than for tradables. The resulting increase of demand for labor in that sector will spur wage growth in the nontradables sector. Normally, these pressures will contribute to elevating wage growth in this sector towards wage growth in the tradables sector, thus supporting wage growth equalization, as postulated by the Balassa-Samuelson effect. However, there may be periods of comparatively low productivity advances in the tradables sector coupled with high wage growth in the nontradables sector, which may then propel wage growth in the tradables sector beyond productivity improvements.[18]

In the long run, accession countries will presumably experience far-reaching (but not necessarily fully complete) price level convergence with the EU/euro area. This is the flipside of the catching-up process and the trend real appreciation it entails. For the intermediate period, this implies either higher inflation rates or nominal appreciation. As argued above, it is very difficult to gauge future inflation differentials between tradables and nontradables.

---

[17] Higher factor productivity in the tradable sector should induce labor and capital to move out of the nontradables sector, reducing the supply of nontradables and increasing the supply of tradables (IMF, 2000).
[18] Compare Cincibuch and Vavra (2000).

Past differentials are probably inadequate yardsticks, but it is still instructive to take a short look at the hypothetical implications of these past differentials.

To this end, table 4 displays weighted inflation differentials between nontradable and tradable inflation in percentage points: The average inflation differential for the years 1992 to 1998 is weighted by the share of nontradables in GDP. (The calculations are based on implicit sectoral deflators of gross value added.)

Table 4
Impact of Relative Price Changes on the Implicit Deflator of Total Gross Value Added (per year, average 1992 to 1998, percentage points)

Inflation differentials between nontradables and tradables (weighted by the share of nontradables in the implicit deflator of total gross value added)	Poland	Slovenia	Czech Republic	Hungary
Inflation differentials observed	7.26	2.27	1.46	4.01
Inflation differentials predicted by productivity differentials	9.73	3.70	2.84	6.29

Source: WIIW, OECD, own calculations.

These differentials indicate the size of the overall annual inflation differential that would have prevailed between the accession countries and their main trading partners in the period 1992 to 1998 as a consequence of nontradable/tradable inflation or productivity differentials, if two further conditions had been fulfilled, namely (1) uniform tradables inflation between accession countries and their main trading partners and (2) no productivity/inflation differentials between tradables and nontradables in the accession countries' main trading partners.[19]

The former does not necessarily have to hold true, given the sizeable deviations between tradables prices of accession countries from international levels. The latter is a simplification, which largely holds true for the reference country (Germany) during the period under consideration,[20] but is not fully correct for the broader European Union, where the Balassa-Samuelson effect has had a certain upward impact on annual inflation.[21] If taken into account, this would reduce the sectoral inflation differentials displayed in table 4 correspondingly.

If the exchange rates had been nominally stable in the period under consideration, these inflation differentials would have been equal to the size of annual convergence of comparative price levels between the accession countries and their main trading partners.

---

[19]   As regards the latter, it should be mentioned that relative price changes and productivity growth differentials of nontradables/tradables were small in Germany in the period 1992 to 1998.

[20]   Relative price changes and productivity growth differentials of nontradables/tradables were small in Germany in the period 1992 to 1998.

[21]   According to IMF (2000), a rough (annual) estimate of the Balassa-Samuelson effect for the "core European countries" is around 0.8 percentage points.

Alternatively, these measures can also be taken to indicate the magnitude of the annual nominal appreciation of the exchange rate that the accession countries would have had to accomplish to achieve an inflation rate as low as that prevailing in their main trading partner countries. To be precise, a further condition must be fulfilled for this to hold true, namely swift and full adjustment of tradables prices *and* wages to that nominal appreciation (implying a possible need for downward nominal flexibility). In particular, this condition implies that the productivity differential between tradables and nontradables must not increase in reaction to that nominal appreciation.[22]

Such a magnitude of annual nominal appreciation combined with an inflation rate as low as that prevailing in the main trading partner countries would have rendered the same size of annual convergence of comparative price levels in the period under consideration as under the fixed exchange rate scenario discussed above.

To round this discussion off, it should be stressed again that it is an open question to what extent the presented figures, which are derived from past developments, are predictive of future developments.

Except for the case of Poland, the results reported in table 4 are broadly similar with those of other studies that aim at quantifying the Balassa-Samuelson effect.[23] Table 4 seems to indicate that productivity-predicted inflation differentials tend to exceed observed differentials, which is not an unusual result.[24] The IMF's investigation (IMF, 2000) of the Balassa-Samuelson effect in Slovenia, which uses a very similar methodology but different data, arrives at somewhat lower estimates for productivity-implied inflation differences between Slovenia and the EU (1.5 to 2 percentage points).[25] The results of Simon and Kovacs (1998) for Hungary are based on a slightly different classification of sectors. Presenting results for different assumptions about developments in agriculture, their main scenario assumes a sectoral productivity-induced appreciation of the real exchange rate (based on the GDP deflator) of 2.9% per year. Pelkmans, Gros and Ferrer (2000), who use relative price level data and do not investigate the relationship between sectoral productivity developments and inflation directly, estimate an average inflation differential of 3.8% between the ten applicant countries and the euro zone.

---

[22] Otherwise, if price and/or wages do not adjust fully, the magnitude of the nominal appreciation would need to be higher. In particular, if tradable prices adjust, but the adjustment of wages in the tradables sector is incomplete, the productivity differential between tradables and nontradables would probably increase and the size of nominal appreciation would have to be higher to achieve an inflation rate as low as that prevailing in the main trade partner countries.

[23] In the case of Poland, alternative calculations based on implicit sectoral deflators of gross output (instead of gross value added) render results which are more in line with those for the other countries, putting the observed sectoral inflation differential at 4.19% p.a. and the sectoral inflation differential predicted by the productivity differential at 5.30% p.a. in the period 1992 to 1998.

[24] See for example Canzoneri, Diba and Eudey (1996).

[25] This result is based on an estimated annual magnitude of the Balassa-Samuelson effect on the order of 2.6 percentage points in Slovenia minus the the size of the same effect in "core European countries" indicated above.

3.3. Wage Developments in the Tradables Sector

Another source of inflation may arise from wage developments in the tradables sector. There will be an inflationary bias if wage-setting mechanisms do not work well. If wage increases in the tradables sector tend to systematically exceed productivity increases, they may be accommodated by a reduction in profit margins for a certain time. However, eventually such a development will have to lead to higher prices of tradables. If prices of tradables are already uniform across countries (i.e. conform to the "law of one price"), a nominal depreciation of the domestic currency will be needed to maintain the competitive position.[26] However, such a depreciation will not cure the underlying imperfections in wage-setting by itself. Moreover, it will have broader implications if it sets in motion a wage-price spiral in the respective economy.

It goes beyond the scope of this paper to examine the wage-setting mechanisms that are in place in the accession countries and to assess their future operation. An alternative way of exploring this issue further is to look unit labor cost (ULC) developments and to relate them to the development of the real exchange rate (deflated by the prices of tradables). Such an exercise, done for the period 1992 to 1998, yields the following results.

Cost factors may have contributed to real appreciation in the Czech Republic and to some extent in Slovenia, because these countries experienced a rise in exchange rate-corrected unit labor costs in the period under review (see table 5). In contrast to Poland, the Czech Republic and Slovenia not only recorded a rise in unit labor costs (expressed in Deutsche mark), but at the same time an appreciation of the real exchange rate. This seems to indicate that producers in the Czech Republic and in Slovenia were more successful in passing on rising wage costs to customers than their counterparts in Poland. The extent of real appreciation in the tradables sector in the Czech Republic can probably be explained in part by the very low level of the real exchange rate in 1992. Nevertheless, it should also be noted that profitability in the tradables sectors must have declined not only in Poland but also in the Czech Republic in the period under observation, as the rise in real unit labor costs exceeded the change in the real exchange rate. Although one should be aware of the importance of the choice of the base year, the development of wages in the Czech Republic and in Poland between 1992 and 1998 thus negatively affected the tradables sectors of the two economies. A continuation of these developments into the future would increase upward pressures on tradables prices and may ultimately lead to a nominal depreciation of the exchange rate. Unlike in Poland and the Czech Republic, wage developments did not cause a decline in competitiveness in Slovenia and Hungary, as the rise in unit labor cost in Deutsche mark terms was smaller than real appreciation in terms of tradables prices in Slovenia, and Hungary recorded a ULC decline which was more pronounced than real depreciation.

---

[26] It should be noted that tradables prices of Central and Eastern European countries actually are often considerably below international levels. It is difficult to assess whether the observed deviations in tradables prices really constitute empirical evidence against the "law of one price." Part of the price gaps may be due to differences in quality which statisticians have been unable to capture.

Table 5
**Unit Labor Cost in the Tradables Sector and Real Appreciation
(from 1992 to 1998, cumulated)**

	Poland[27]	Slovenia	Czech Republic	Hungary
Unit labor cost, DEM	8.4%	6.4%	84.1%	-28.3%
Real exchange rate against the DEM **(based on the implicit deflator for gross value added of the tradables sector)**	-7.4%	15.8%	65.7%	-9.5%

Source: WIIW, own calculations.

What does this imply? Obviously, one cannot conclude that wage developments of the past – whether they were in line with productivity developments or not – will show a steady pattern in the future. Therefore, historical patterns may be poor guides for judging prospective developments. Nevertheless, this analysis is still interesting because it provides some information about how far wage setting in the tradables sector will have to be adjusted to shake off any potential inflationary bias in the future.

4. POLICY IMPLICATIONS[28]

4.1. The Overall Policy Mix

Economic policymakers in the accession countries face the challenge of reducing inflation at the lowest possible cost (in terms of lower real growth), while avoiding excessive current account imbalances and financial instability (and, in particular, sudden reversals of capital flows). In this perspective, with a view to preserving external competitiveness, it is more important to achieve disinflation in tradables than in nontradables.

In view of the manifold potential sources of inflation, it becomes very clear that responses are needed in a number of policy fields, not least to achieve fully adequate policy reactions to particular factors driving inflation. Moreover, a balanced approach that relies on measures in several policy fields helps to avoid the excessive use of a particular instrument, with potentially decreasing marginal rates of return or growing negative side effects.

---

[27]   In the case of Poland, alternative calculations based on the implicit deflator of gross output (instead of gross value added) in the tradables sector render somewhat different results, with an increase of ULC in Deutsche mark by 9.3% and an appreciation (instead of depreciation) of the real exchange rate against the Deutsche mark by 8.5%.

[28]   This section is mostly based on joint work with Thomas Reininger.

The concrete design of the overall policy mix is case- and time-dependent. Nevertheless, one can make a few general observations that pertain to most or all Central and Eastern European accession countries at the current stage.

In the area of fiscal policy, a careful handling of changes in indirect taxes and charges seems to be important. Moreover, a prudent conduct of fiscal policy will support the avoidance of excessive aggregate domestic demand and thus external imbalances and/or (additional) inflationary pressures, hence leaving monetary policy more room to maneuver.

In countries which have experienced wage inflation, the question arises whether incomes policies can and should play a role in containing wage growth in line with productivity developments. This also poses the question of institution building, for instance, the development of a (better) functioning tripartite mechanism.

In the realm of structural policy, ambitious efforts to speed up restructuring and privatization in sectors whose product prices are (partly) still administered could turn out to be an important contribution to disinflation. The resulting boost in productivity could dampen the size of the necessary adjustments of administered prices. Moreover, this would facilitate earlier full liberalization of these sectors, including an unlimited opening to imports, which should further support the disinflation trend. Finally, decisive measures in these sectors and the phasing out of administered prices would probably dampen expectations of future inflation.

In the field of agricultural policy, a timely and comprehensive substitution of shortfalls in domestic production by imports in the case of adverse weather conditions (perhaps combined with schemes of direct income compensation payments to farmers) may contribute to limiting the associated inflationary pressures. In a medium-term perspective, there is a need, in a number of accession countries, to design and pursue a reliable and transparent policy of restructuring the agricultural sector and of developing rural regions, not least in order to clamp down on calls for price policy measures whenever adverse weather conditions affect crops.

The speed of disinflation and of prospective adjustment paths to future inflationary shocks are, to a great extent, conditioned and predetermined by the design and the consistency of the overall policy mix.

4.2. The Role of Monetary and Exchange Rate Policy

The main task of the accession countries' central banks is to contribute to the process of disinflation while maintaining a reasonable degree of external balance. A key precondition for successful disinflation is to reduce inflation expectations and anchor them at low levels.

In practice, most Central and Eastern European accession countries are currently following two alternative basic monetary strategies to achieve these goals, namely either exchange rate-based strategies or direct inflation targeting strategies. Monetary targeting, in turn, is the

policy of choice only for Slovenia (which, however, at the same time places considerable de facto weight on exchange rate developments).

The selection of the most appropriate strategy is both country-specific and time-dependent. There is no single strategy that is a priori optimal for all countries at all times. Moreover, one has to distinguish between the pros and cons per se of a certain monetary policy strategy and the potential costs involved in a regime change. The potential credibility losses of a switch in regimes and the resulting repercussions in the financial markets have to be assessed carefully. Any regime shift certainly needs a very active communication policy.

The basic advantages and disadvantages of both principal strategies are well known and do not have to be recapitulated here at length. In a nutshell, a fixed exchange rate regime is conducive to cross-border trade and investment, but it carries the risk of exchange rate misalignments, which may be difficult and costly to correct without nominal exchange rate changes. Furthermore, such a regime tends to be more exposed to major and sometimes sudden swings in capital flows that are unrelated to changes in fundamentals. Direct inflation targeting in accession countries, in turn, is fraught with the difficulty of forecasting inflation, and a lack of knowledge about the relationship between the instruments and the target. Moreover, it carries the risk of large exchange rate swings and exchange rate overshooting (due to potentially sizeable capital inflows).

Monetary policymaking in accession countries is made even more challenging by the uneven functioning of monetary transmission channels.[29] Two recent empirical studies find that central bank stabilization efforts in Central and Eastern Europe still have to rely mainly on the exchange rate channel, while the interest rate channel is not well developed yet. Certainly, the situation differs from country to country, depending, for instance, on the level of domestic credit relative to GDP. In any case, it follows that one important task for monetary policy consists in strengthening the interest rate channel via structural reforms within the financial sector and measures to deepen domestic fixed-income markets. The growing share of foreign strategic interests in the domestic banking sector may change the functioning of the interest rate channel relatively quickly. As the Central and Eastern European accession countries are generally small and open economies and do not yet have fully functioning interest rate channels for transmission, the exchange rate still has a major impact on inflation performance in these countries, irrespective of the monetary strategy chosen.

From the preceding analysis of price dynamics in accession countries, two major points emerge that have a direct bearing on the prospective monetary policy courses of accession countries.

First, as long as there is tangible inertial inflation (in particular wage inflation in the tradables sector) or if other – mainly transition-related – cost-push factors create inflationary pressures or if the fiscal position is not consolidated, it may be risky to move on to a rigid

---

[29] See e.g. Christofferson and Wescott (1999) or Fidrmuc and Schardax (1999). For a different view, see Orlowski (2000), who argues that monetary transmission tends to be a function of the monetary policy strategy adopted. Compare also Rybinski (2000), who finds that the interest channel works in Poland but with long lags.

(nonadjustable) fixed peg. In such a situation, some downward nominal exchange rate flexibility may still be needed to preserve price competitiveness. Under these conditions, a case for a fixed peg could only be made, if such a regime change altered wage formation and enhanced fiscal prudence. However, such changes cannot be taken for granted, and even if they do occur, the change in behavior may not be sufficient to make a fully fixed rate sustainable in the longer run. In a similar vein, any monetary strategy that would allow for nominal appreciation in an inflationary environment likewise carries major risks.

Second, if and when the inflation bias resulting from transition and imperfect wage formation is basically overcome and price dynamics are mainly driven by catching up-related factors, in particular differential productivity developments, the transition countries have (in pure conceptual terms) two basic options: either a nominal-appreciation/low-inflation strategy or, alternatively, a strategy of maintaining a stable nominal exchange rate with somewhat higher inflation. It should be noted that both of these strategies can be followed under different exchange rate regimes. While the nominal appreciation strategy can be implemented both in a flexible exchange rate context (in the case of the Central and Eastern European accession countries, typically under direct inflation targeting) and under a tighter exchange rate regime (e.g. a tightly managed float or a fixed but adjustable peg), a stable nominal exchange rate can be achieved both under a fixed regime or under a managed float.

Whether a nominal-appreciation/low-inflation strategy or a stable nominal exchange rate with somewhat higher inflation is the more appropriate option, depends on a whole range of issues, like a possible unsettling of expectations as a consequence of nominal appreciation (e.g. if this would imply a major exchange rate regime shift), the potential for exchange rate overshooting or the existence of price and/or wage rigidities in the tradables sector. Moreover, even if such rigidities do not exist, the more restrictive monetary policy stance to move to nominal appreciation/low inflation may (at least) temporarily affect real growth.

From an integration viewpoint,[30] both strategies seem to be equally viable for EU accession. The same appears to be true for subsequent participation in the ERM II. Joining the exchange rate mechanism can take place from any preceding monetary and exchange rate regime, while participating in ERM II presupposes a fixed (but adjustable) peg to the euro or a tightly managed float with the euro as the reference currency.

To eventually join the euro area, inflation has to be reduced to low levels in the year that is relevant for the convergence examination. Whether the Maastricht convergence criterion on inflation would, as it is sometimes claimed, unduly constrain growth dynamics in a catching-up economy that intends to qualify for participation in the euro area without being willing to allow a nominal appreciation of the exchange rate remains to be seen. From today's perspective, it is just too early to assess with any degree of certainty how dynamic the catching-up process will be in the accession countries then and to what extent differential productivity advances will drive price developments in the euro area. Furthermore, it has to be seen that actual inflation oscillates around the medium-term trend implied by the Balassa-

---

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

Samuelson effect and that overall inflation performance also hinges upon a number of other factors and developments which can hardly be anticipated either from today's viewpoint.

Will differential productivity developments complicate monetary policymaking in a future enlarged euro area? The relative economic weight of the accession countries is tiny and clearly smaller than the weight of the Southern European catching-up economies in today's euro area.[31] Even if all accession countries accede to the EU in the medium run and if they join the euro area a few years after their accession to the EU and if all of them catch up quickly, this would not make the meeting of the Eurosystem's price stability objective tangibly more difficult, as euro area-wide inflation would only rise very slightly on account of the working of the Balassa-Samuelson effect in the new euro area participants.[32] Moreover, the Southern European catching-up economies of today's euro area should have largely matured by the time when the first Central and Eastern European countries accede to this single currency area. While the economies of today's euro area will have become more homogeneous by that time, the inclusion of the frontrunners among the Central and Eastern European countries into the euro area will presumably not make it significantly more heterogeneous than it is today. Even in the very long run, when the per-capita GDP of the Central and Eastern European countries approaches the EU average, difficulties for monetary policymaking will presumably be contained, as most of these economies will, at that stage, grow at a much more moderate pace than during the earlier stages of the catching-up.

While gaps in the levels of economic development may have a certain relevance for monetary policymaking, other factors seem to be more important for the functioning and the effectiveness of monetary policy after accession countries will have joined the euro area. These factors can mainly be related to the issue of convergence of economic structures. They include differences or similarities in the monetary transmission mechanism, in money demand and in the structure of the financial sector as well as the degree of integration of financial markets.

---

[31] In 1999, the nominal GDP in USD at current exchange rates of all accession countries was at 6% of the nominal GDP in USD of the Euro area (including Greece). In comparison, the combined nominal GDP of Greece, Portugal and Spain amounted to 12% of the Euro area (including Greece).

[32] Furthermore, the higher potential growth path of the accession countries will be taken into account when establishing the weighted average growth rate of the monetary aggregate M3 for the whole euro area as reference value for monetary policy decisions.

REFERENCES

Backé, Peter. 1999. Exchange Rate Regimes in Central and Eastern Europe: A Brief Review of Recent Changes, Current Issues and Future Challenges, in: Focus on Transition (Oesterreichische Nationalbank), 4 (2), pp. 47-67.

Barro, Robert. 1991. Economic Growth in a Cross-Section of Countries, in: Quarterly Journal of Economics, 106, May , pp. 407-444.

Canzoneri Matthew B., Behzad Diba and Gwen Eudey. 1996. Trends in European Productivity and Real Exchange Rates: Implications for the Maastricht Convergence Criteria and for Inflation Targets after EMU, Discussion Paper No. 1417, CEPR London.

Christoffersen, Peter F. and Robert F. Wescott. 1999. Is Poland Ready for Inflation Targeting? IMF Working Paper WP/99/41, International Monetary Fund, Washington D.C.

Cincibuch, Martin and David Vavra. 2000. Towards the EMU: A Need for Exchange Rate Flexibility, mimeo, Czech National Bank, Prague.

European Central Bank. 1999. Inflation Differentials in a Monetary Union, in: ECB Monthly Bulletin, October, pp.35-44.

Fidrmuc, Jarko. 2000. Short-run and long-run price dynamics in selected Central and Eastern European accession countries, mimeo, Oesterreichische Nationalbank, Vienna.

Fidrmuc, Jarko and Franz Schardax. 2000. The Pre-Ins Ante Portas? Euro Area Enlargement, Optimum Currency Area and Nominal Convergence, in: Focus on Transition (Oesterreichische Nationalbank), 5 (2), pp. 28-47.

International Monetary Fund. 2000. Republic of Slovenia: Staff Report for the 1999 Article IV Consultation and Selected Issues, Selected Issues, Washington D.C., pp. 26-38.

Landesmann, Michael. 2000. Structural change in the transition economies. WIIW Research Reports, No. 269, September.

Micossi, Stefano and Gian Maria Milesi-Ferretti. 1996. Real Exchange Rates and the Prices of Non-Tradable Goods, in: De Grauwe P., S. Micossi and G. Tullio (eds.) *Inflation and Wage Behaviour in Europe, Claredon Press Oxford.*

Orlowski, Lucjan. 2000. Monetary policy regimes and real exchange rates in Central Europe's transition economies, in: Economic Systems, Vol. 24, No. 2, pp. 145-166.

Radzyner, Olga and Sandra Riesinger. 1996. Exchange Rate Policy in Transition – Developments and Challenges in Central and Eastern Europe, in: Focus on Transition (Oesterreichische Nationalbank), 1 (1), pp. 20-38.

Reininger, Thomas. 2000. An International Comparison of Energy Prices in Selected Accession Countries, mimeo, Oesterreichische Nationalbank, Vienna.

Rybinski, Krzysztof. 2000., Monetary policy impact upon disinflation process in Poland (in Polish, English summary), in: Bank i Kredyt, Vol. 31, No. 7-8, pp. 56-77 and 162.

Skreb, Marko. 1998. A note on inflation, in: Cottarelli, Carlo and György Szapáry (eds.) Moderate Inflation: The Experience of Transition Economies, International Monetary Fund and National Bank of Hungary, Washington D.C.

Wójcik, Cezary. 2000. Inflationary sources and the disinflation process in the transition economies: A literature review (draft), mimeo, Oesterreichische Nationalbank, Vienna.