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«Foreign Exchange Rate Policies in Transition : Lessons, Challenges and Policy Options»

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FOREIGN EXCHANGE RATE POLICIES IN TRANSITION: LESSONS, CHALLENGES AND POLICY OPTIONS

1. Introduction

Foreign exchange rate policies have been an important component of the reform programmes implemented in Central and East European transition countries (CEEC)². These policies have been decisive in improving relative prices, restoring price stability and opening up the previously closed domestic markets to international economy. However, specific policies have varied widely across the region, with individual transition countries adopting different exchange rate regimes and following different policy courses. Given the very uneven economic performance of transition countries, a number of obvious questions arise. How have the different foreign exchange rate policies contributed to this divergent performance? To what extent were they consistent with other macroeconomic policies? Is it possible to speak about an sequence of foreign exchange policies which would ensure successful transition and integration with Europe?

While references are made in the paper to many transition countries, the case of Poland is discussed most extensively. This is not only because the country was one of the pioneers of market transformation in Europe, having started its reforms with a “big bang” already in end-1989, but also because Poland seems to be the most successful transition countries to date. After ten years of transition, Poland’s GDP in 1999 is 23% higher than it was in 1989, by far the best performance among all transition countries. Equally important, Poland has so far avoided policy reversals and financial crises that were observed in most other countries.

The paper is organized in three main parts. The evolution of foreign exchange rate regimes and policies in transition countries between 1989 and 1999 is briefly discussed in the first part. Countries that started with a fixed exchange rate regime and later moved to some form of a flexible rate regime performed generally better than those that floated their currencies from the very beginning, or those that have not switched to more flexible regimes later. By contrast to current account convertibility, early capital account liberalization does not seem to have had a positive impact on economic performance of transition countries. Foreign exchange rate policies in Poland are discussed extensively in the second part of the paper. Against the background of a chronology of main policy decisions, a simple analytical framework is applied to show that a policy of a crawling peg has becoming more costly and inefficient under increasing capital mobility. The third part discusses policy options for transition countries faced by new challenges, including greater capital mobility, increased risks of financial and currency crises and prospects of integration with the European Union.

2. Foreign exchange policies in transition countries: experiences and lessons

2.1. Initial dilemmas and further adjustments.

¹ Warsaw School of Economics and National Bank of Poland.

² The CEECs include 12 central and east European transition countries, 3 Baltic republics and 12 CIS states.

At the beginning of transition from central planning to market CEECs were confronted with three important dilemmas in the area of foreign exchange policy. They comprised the choice of an exchange rate regime, scope of currency convertibility and size of the initial adjustment of the exchange rate (Rosati, 1996).

As regards the choice of the exchange rate regime, fixed exchange rates were generally recommended for stabilization reasons as they provided the “nominal anchors” badly needed in inflationary environment of post-communist economies. However, only Poland and (then) Czechoslovakia introduced a fixed exchange rate system, with other countries opting for – or rather being forced into - some form of a flexible rate regime. None of the countries was initially ready for a fully independent float and frequent interventions were used to limit the exchange rate fluctuations and to control the pace of nominal depreciation. With the passing of time, the initially adopted foreign exchange regimes were adjusted and changed, either within longer-term reform programmes or more spontaneously in response to accumulating balance of payments pressures. The pattern was slightly different for some of the newly independent states of the former Soviet Union; e.g. when the Baltic republics introduced their national currencies, they immediately pegged them within quite rigid regimes, trying to build up monetary credibility.

With respect to the second dilemma, all CEECs moved to some form of convertibility, typically restricted to current account transactions on trade in goods and services, sometimes extended (selectively) to factor incomes flows and other transfers. Broadly, most of CEECs accepted initially the obligations of Article XIV of the IMF’s Articles of Agreement, which permits for some limited exceptions to full current account convertibility³. Liberalization of capital account transactions was not on the immediate agenda, although inward flows of foreign direct investment (FDI) and some portfolio investment were generally permitted. The extent of external payments liberalization differed across the countries, but as a general pattern, central European CEECs and the Baltics opened up their foreign exchange markets more than the CIS countries.

The third dilemma concerned the foreign exchange rate adjustment. The jump from non-convertible and largely overvalued currencies into some form of currency convertibility required an initial devaluation which was effected either through a deliberate policy decision (under a fixed exchange rate regime) or through a spontaneous market adjustment following liberalization of the exchange market (under a flexible rate regime). The scope of the initial depreciation varied from country to country, but everywhere it was done by a rather substantial margin and – in some cases – excessively. Under the fixed rate regimes further step devaluations followed after some time, while in other cases national currencies fluctuated widely, with a tendency to depreciate further in the medium term.

As a result of different initial decisions and different subsequent reform strategies, the foreign exchange rate systems in CEECs represent now a wide range of arrangements. As far as convertibility is concerned, most countries moved from IMF’s Article XIV to Article VIII, eliminating most of the remaining restrictions on current account transactions. At present, out of all twenty seven CEECs, nineteen of them have assumed the obligations of Article VIII, Sections 2, 3, and 4 of the IMF’s Articles of Agreement⁴. Some of them, like Estonia, Latvia or Kyrgyzstan, have also fully liberalized capital account transactions. The Czech Republic, Hungary and Poland are prepared to introduce soon capital account liberalization as part of their obligations as OECD members and prospective members of the EU. Other CEECs have advanced at a much slower pace. In some countries (Belarus, Turkmenistan, Uzbekistan), this lack of progress

³ Specifically, Article XIV, Section 2, permits the member countries for maintaining the restrictions on payments and transfers for current international transactions that were in effect on their date of membership in the Fund.

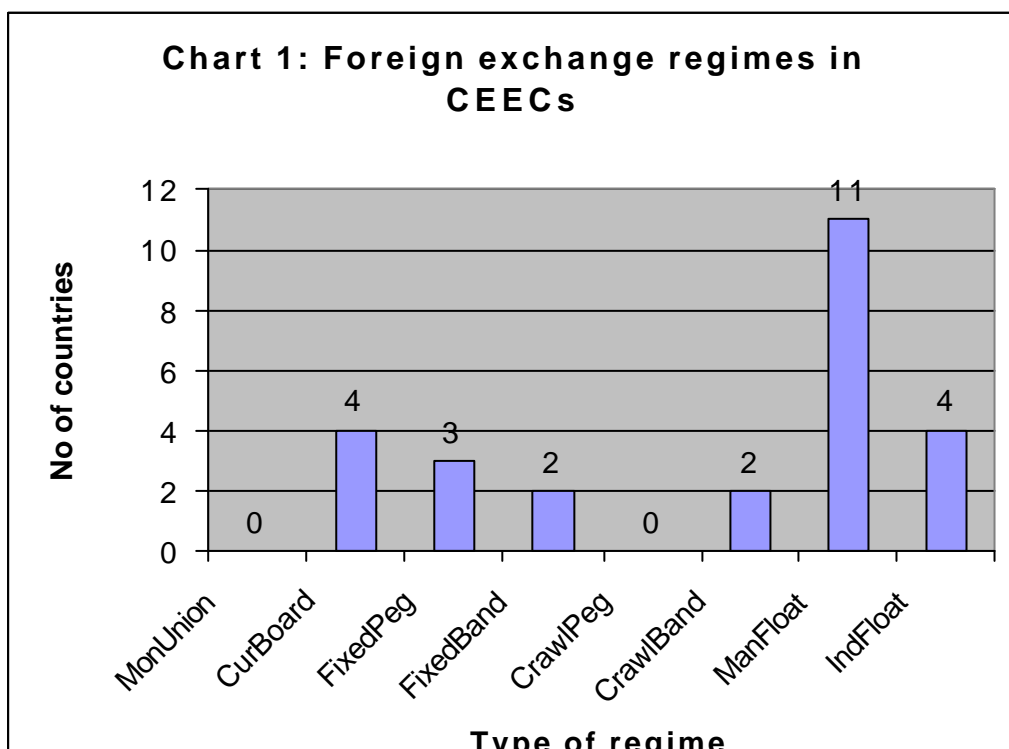
⁴ Armenia (1997), Bulgaria (1998), Croatia (1995), Czech Republic (1995), Estonia (1994), Georgia (1996), Hungary (1996), Kazakhstan (1996), Kyrgyzstan (1995), Latvia (1994), Lithuania (1994), Macedonia (1998), Moldova (1995), Poland (1995), Romania (1998), Russia (1996), Slovakia (1995), Slovenia (1995), Ukraine (1996).

reflects a much more reserved attitude to market reforms in general and to external liberalization in particular, whereas in other cases the delays in introducing broader-based convertibility have been caused by reversals in the reform process and/or protracted domestic political instability (Albania, Bosnia-Herzegovina, Ukraine, Tajikistan).

Foreign exchange rate regimes present an even more diversified picture. The arrangements vary from very rigid forms of fixed exchange rate regime, such as the currency board adopted in Bulgaria or Lithuania, through a range of adjustable pegs and bands with varying flexibility, and to an independent floating rate regime, as in Albania or Moldova. Moreover, the progress in general reforms and transformation does not seem to be correlated with the choice of a particular regime, as demonstrated by various arrangements now in force in the most advanced transition countries. For instance, the Czech Republic prefers to apply a managed float, while Estonia has opted for a currency board. Hungary operates a crawling peg regime with a relatively rapid pace of pre-announced depreciations and within a narrow band, whereas Poland applies a very wide band and the rate of monthly devaluation is much slower.

Such diversity is somewhat surprising: even though CEECs have never been a homogenous group, they nevertheless still display quite a lot of structural similarities and some degree of uniformity in exchange rate arrangements could be expected. Indeed, the wide diversity of the initially applied policies could have been justified by differences in the initial conditions: for instance, high inflation and widespread dollarisation in Poland called for a strong nominal anchor. But while Poland was able to fix the exchange rate because the zloty was supported by an externally provided stabilization fund, such an option was not available for Bulgaria or Romania, and was not seriously considered in Russia.

Another interesting regularity is that with the passing of time the exchange rate regimes in CEECs do not converge; in fact, they tend to diverge towards one of the two extremes: a currency board or a float. Chart 1 shows that there is a falling demand for intermediate solutions. This tendency seems to mirror the trend observed also in other emerging markets, in particular during and after the east Asian financial crisis. Many observers are inclined to believe that the real choice for emerging economies is only between some form of a very credible fixed rate arrangement like a monetary union or a currency board, and a floating rate with or without occasional interventions (see, e.g. Eichengreen, Rose and Wyplosz, 1997).



Probably the most serious test to date for viability and robustness of CEECs' exchange rate regimes came with the series of financial crises in 1997-1998. The Czech Republic was first to suffer from excessive rigidity of the exchange rate regime, and more broadly, from serious mistakes in domestic structural policies. The aftershocks from the east Asian crisis felt throughout Europe and the Russian crisis threw nearly many of the economies in the region into recession. Again, the countries with more flexible exchange rate arrangements fared generally better than others: Poland and Hungary seem to be fastest growing transition countries in 1999 – most of other countries are likely to register negative growth rates.

2.2. Main lessons

The experience of Poland and of other transition countries to date offers a number of important policy lessons. Some of them confirm the “mainstream orthodoxy” in economic policies as developed and recommended by the IMF within the so-called “Washington consensus”.⁵ Some other lessons, however, highlight serious flaws in the traditional policy approaches.

One early lesson is that a fixed exchange rate regime is *caeteris paribus* more effective in eliminating inflation and securing price and monetary stabilization than a flexible rate regime. Thus, the decision to fix the exchange rate to stabilize prices and reverse expectations was correct at the beginning of transition. This conclusion has clearly emerged from the stabilization results obtained in Poland, the Czech Republic or the Baltic states *vis-à-vis* countries like Bulgaria, Romania or Russia. Of course, this result comes as no surprise; as mentioned earlier, the CEECs that opted for a float did so not because of an alleged superiority of such a policy but because they did not have enough foreign exchange reserves to fix the exchange rate and to defend it effectively.

Another lesson is that the fixed rate cannot be maintained for too long in a post-high-inflation environment because of inevitable real appreciation of the domestic currency, deteriorating current account and mounting dangers of speculation. All transition countries that pegged their exchange rates at the outset of transition had sooner or later to abandon the initial level of the peg and make downward adjustments in the exchange rates. By contrast to the first lesson, this one has not been so evident: almost in all cases the “exit” from the fixed exchange rate regime was done in a rather disorderly way and in rush, and not as part of a broader strategy. The only exception to this pattern is Estonia where the fixed exchange rate has been kept unchanged within the currency board arrangement since the introduction of the national currency in 1992 (the Estonian kroon was then pegged to the Deutsche mark at 8 kroon/DM). However, since inflation continued, the extent of subsequent real appreciation has been very substantial – by almost 400% between 1992 and 1999⁶. A similar policy has been pursued by the two other Baltic states: Latvia pegged its currency to the SDR in 1993, while Lithuania, after a period of unsuccessful attempts to stabilize the national currency within a system of managed float, introduced a currency board in 1994. Both countries have not changed their arrangements so far.

⁵ For a discussion of the “Washington consensus”, see Williamson (1997).

⁶ The case of Estonia is indeed puzzling. Massive real appreciation took place under rapidly increasing real wages and only moderate lay-offs (employment in 1998 was down by less than 20% from 1992). One explanation to this phenomenon should probably be sought in fundamental, FDI-based, restructuring of the tradable sectors, as well as rapid development of trade and financial intermediation services – which contributed to very rapid productivity increases in the whole economy.

The case of the three Baltic states is instructing, especially against the experience of other post-Soviet states. First, it demonstrates that it is possible for a newly independent state to successfully stabilize its national currency, provided there is a very strong and credible commitment by the authorities. Second, the fixed rate policy course has turned out to be a costly endeavour in terms of output and incomes losses: all three countries went through a long and deep recession after gaining independence, even though the initial exchange rates were as a rule undervalued. An immediate question in this context is whether output loss in the range of 10-20% of GDP is a justified price to be paid for exchange rate stability. At the same time, gains on the inflation front were not very impressive; in fact, the progress in disinflation in the Baltic states was similar or only marginally better than in countries that adopted more flexible exchange rate arrangements (Poland, Hungary). The main reason for this high output cost of fixed exchange rate policies is that the Baltic states pegged their currencies to western currencies, but a large proportion of their foreign trade was still with the post-Soviet area where national currencies depreciated rapidly. For small open economies, such a mismatch was bound to result in large export losses and deep recession.

As a general rule, therefore, it can be claimed that with the passing of time, as they move from stabilization to recovery and growth, the transition countries ought to switch towards more flexible exchange rate arrangements, allowing for more frequent step or crawling adjustments of the exchange rate level and for wider fluctuations. A crawl at a pre-announced rate is a preferable solution in a post-stabilization phase, as it reduces shocks and uncertainties, while maintaining competitiveness of tradable sectors. However, under increased capital mobility it becomes too rigid and unsustainable, and a smooth shift to a float is recommended.

The third lesson is that once economic growth is resumed and market reforms successfully implemented, a long-term tendency emerges for the national currency to appreciate in real terms. This tendency is a combined result of two mechanisms. The first one is the well-known Balassa-Samuelson effect: faster productivity growth in tradable sectors induces higher growth of wages across all sectors in the economy, including non-tradables, which results in persistently higher inflation levels in transition economies as compared with developed economies. With nominal exchange rates determined by relative prices in the tradable sector at home and abroad, higher inflation rates result in real appreciation. The second mechanism is the impact of capital inflows on the exchange rate. Real interest rates in transition countries are generally much higher than in industrialized countries both because of relative scarcity of capital and because of the need to fight inflation. High rates of return on investment attract more FDI, while high interest rates attract portfolio flows. The appreciation tendency may be difficult to fend off: under a fixed rate regime it involves costly sterilization, while under a flexible rate regime it may undermine the competitiveness of the export sector and lead to high current account deficits.

The fourth lesson is that there is no clear relationship between the extent of liberalization and economic performance. Among countries with most liberalized foreign exchange regimes Estonia managed to quickly overcome the transitional recession and moved to rapid growth, while Kyrgyzstan or Moldova have been among the least successful transition countries. At the same time, Hungary - one of the most successful reformers - has been relatively slow with liberalization. It seems that opening up on current account transactions is indeed essential for sustained growth but extending liberalization to capital transactions gives more ambiguous results that depend much on other policies and specific circumstances.

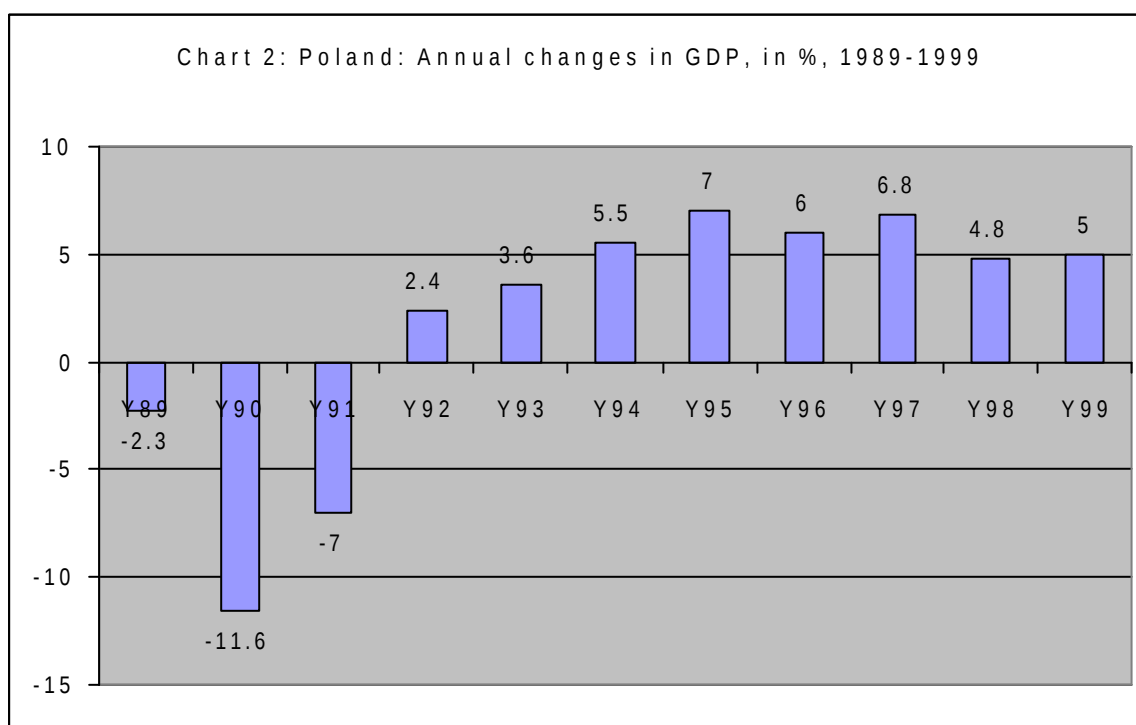
An important conclusion is that no one single model of foreign exchange rate policy should be applied in the course of transition and that the policy has to change over time in response to the progress of reforms and to changing circumstances. The crucial factors determining the performance of particular foreign exchange regimes include the speed of

implementation of other institutional reforms, the degree of openness and the magnitude and composition of capital movements.

3. Exchange rate policies in Poland in 1990-1999

3.1. An overview

Poland started its reform programme under very difficult economic conditions: in late 1989 inflation was running at 20-50% per month, output was falling, domestic market was plagued by massive shortages, the currency was worthless, foreign debt was not serviced. In 1990 a comprehensive and radical programme was launched with the aim to restore stability and to build a market economy. Since that time much ground has been covered and now Poland is one of the leaders in transformation: GDP level in 1999 is 22% higher than in 1989, inflation is down to single digits, international reserves increased from barely USD 2 bn in 1989 to more than 25 bn in 1999, and the country has become member of OECD and is on its way to join the European Union within few years. Chart 2 shows the evolution of output in 1989-1999. An important role in achieving macroeconomic stability and putting the economy on a sustained growth path has been played by foreign exchange rate policies.



On 1 January 1990, Poland devalued the zloty from 6650 zl/\$ to 9500 zl/\$ (i.e. by 43%) and introduced “internal” convertibility on most of current account transactions. That date is commonly invoked as the beginning of transition in Poland. But many important reforms had been carried out prior to that date. Already in 1982 foreign currency auctions with competitive bidding for importers were introduced, with their share in total import financing gradually

increasing. On a parallel track, trading in convertible currencies at market equilibrium rates was allowed after 1984. In result, in 1989 more than 40% of foreign exchange allocation for current account transactions were effected through market mechanism rather than via administrative decisions. The Polish “big bang” programme was not such a “big-bang” after all, as it was applied in an economy, which had been already partially reformed and where a number of important market institutions had already been in place⁷.

The deep initial devaluation helped to raise exports and reduce imports, and led to a wide trade surplus in 1990. But it had also a strong inflationary and contractionary impact. During 1990, domestic consumer prices increased by 250% and output fell by nearly 12%. In light of those quite unexpected developments, a revaluation of the zloty was even contemplated in the spring of 1990. But the idea was quickly overtaken by events. Strong real appreciation under still high inflation and the fixed dollar rate led quickly to erosion of competitiveness of exports. Rapidly growing current account deficit forced the government to devalue the zloty by 17% in May 1991, and then to abandon the fixed rate regime and to introduce a crawling peg in October 1991. Another step devaluation was effected in February 1992 (by 12%). With hindsight, the exit from the fixed exchange rate regime was late but ultimately without major turbulences, as it was not accompanied by capital outflows because of administrative restrictions on capital mobility.

Table 1: Chronology of changes in the exchange rate regime in Poland, 1990-1999.

| Period (as of) | Regime changes | Pegging currency | Fluctuations permitted |
|-------------------|------------------------|---------------------|---------------------------|
| 1.10.1990 | Devaluation by 42% | | |
| 1.01.1990 | Fixed rate | US dollar | No |
| 20.05.1991 | Devaluation by 17% | | |
| | Basket established | 5 currencies | |
| 14.10.1991 | Crawl, 1.8% per month | | |
| 26.02.1992 | Devaluation by 12% | | |
| 1.10.1992 | Band established | | +/- 1% |
| 27.08.1993 | Devaluation by 8% | | |
| | Crawl, 1.6% per month | | |
| 13.09.1994 | Crawl, 1.5% per month | | |
| 30.11.1994 | Crawl, 1.4% per month | | |
| 16.02.1995 | Crawl, 1.2% per month | | |
| 6.03.1995 | Band widened | | +/- 2% |
| 16.05.1995 | Band widened | | +/- 7% |
| 22.12.1995 | Revaluation by 6% | | |
| 8.01.1996 | Crawl, 1.0% per month | | |
| 26.02.1998 | Crawl, 0.8% per month | | |
| | Band widened | | +/-10% |
| 17.07.1998 | Crawl, 0.65% per month | | |
| 10.09.1998 | Crawl, 0.5% per month | | |
| 29.10.1998 | Band widened | | +/-12.5% |
| 1.01.1999 | Basket changed | 2 currencies | |
| 25.03.1999 | Crawl, 0.3% per month | | |

⁷ This is certainly one of the key reasons that Poland's transformation has been so much more successful than in many other CEECs. The same observation applies also to other more advanced transition countries, like Hungary, Slovenia and the Czech Republic. The role of initial conditions and institutions in transition has long been understated in professional literature dominated in the last two decades by the “Washington consensus”. Few exceptions included e.g. Murrell (1995), UN ECE (1991), Rosati (1994). More recently, the role of initial conditions in transformation has been discussed in de Melo et al. (1997), Havrylyshyn et al. (1999), Berg et al. (1999). For a critique of the “Washington consensus”, see Kolodko (1999).

Band widened

+/-15%

Source: National Bank of Poland

Since 14 October 1991 Poland has operated first a crawling peg (until May 1995), and then a crawling band with a pre-announced and gradually diminishing rate of monthly devaluation. The exchange rate continued to serve as a “nominal anchor with a drift”, and at the same time the central bank has been trying to target a real exchange rate which would be consistent with medium-term balance of payments equilibrium. Until end-1998, the peg was tied to a basket of five major currencies, and after 1 January 1999, to a basket of two currencies⁸. The evolution of the exchange rate policy in Poland is summarized in Table 1.

Chart 3 shows the changes in the nominal exchange rates in Poland in 1990-1999. Three broad phases can be distinguished: the period of the fixed rate between January 1990 and May 1991, a crawl within a narrow band between May 1991 and the end of 1997, and a period of increased volatility afterwards. The changes over the entire period are approximated almost ideally by a linear trend⁹. This suggests that the actual rate of devaluation has been systematically diminishing over time – from 2.5% per month in 1991 to 0.7% per month in 1999.

The system worked reasonably well in terms of achieving its two key objectives – price stabilisation and current account balance. Inflation has been gradually forced down, though at a slower pace than in most of other transition countries. Clearly, the crawling peg worked as an important indexation mechanism, adding to inflation through direct price effects and inflationary expectations. But the fall in the inflation rate was nevertheless consistent and generally without reversals. Chart 4 illustrates the gradual fall of inflation in Poland over the analyzed period.

As far as current account balance is concerned, it varied between a deficit of 2% of GDP and a surplus of 4% of GDP in 1990-1996. Only in 1997 and 1998 did it increase to 3.1% and 4.2% of GDP, respectively¹⁰. The crawling peg slowed down real appreciation of the zloty and helped to broadly maintain external balance throughout the period. The evolution of real exchange rates with respect to the US dollar and to the basket of main currencies is shown on Charts 5 and 6. As can be seen, the zloty appreciated in real terms (PPI-deflated) by about 60% between January 1990 and May 1991 - such a massive appreciation must obviously have entailed a heavy loss of competitiveness of Polish exports and the decision to devalue the zloty was inevitable¹¹. But this rapid appreciation also reflected the extent of the initial devaluation – which turned out to be much too excessive¹².

⁸ Between May 1991 and December 1998 the basket consisted of five currencies that dominated in Poland's foreign trade: US dollar (45%), Deutsche mark (35%), British pound (10%), French franc (5%) and Swiss franc (5%). Since 1 January 1999, the basket consists of the euro (55%) and the US dollar (45%).

⁹ The trend equation for the nominal exchange rate index with respect to the basket is as follows:

$$\text{NER}(t) = 68.96 + 2.8741t, \quad R^2 = 0.9878$$

(33.8) (96.9)

¹⁰ In 1999, current account deficit has widened sharply due to falling exports and is likely to reach 7% of GDP.

¹¹ The extent of real appreciation was in fact even greater because producer prices between December 1989 and January 1990 went up by more than 100%, while the official exchange rate increased only by some 75%.

¹² The initial overshooting ignored the radical shift in the demand schedule for foreign currency in Poland in early 1990. The implementation of a credible stabilization programme changed consumers' and investors' behaviour, reducing speculative demand for foreign currency and restoring transaction demand for domestic currency. That policy mistake was a classic case of time-inconsistency problem and a practical confirmation of the famous “Lucas critique”.

Chart 3: Poland: Nominal exchange rates, 1990-1999,
(January 1990 = 100)

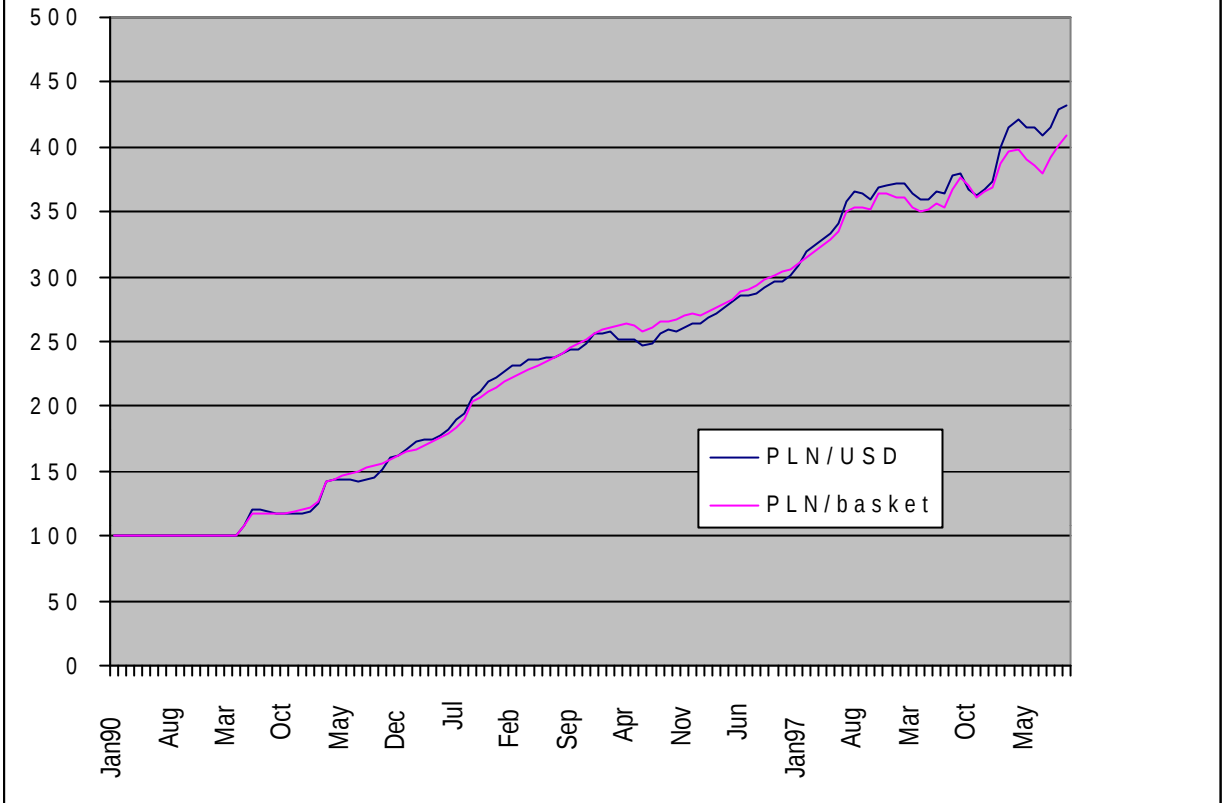


Chart 4: Inflation in Poland (PPI, CPI), 12-month rates, 1991-1999

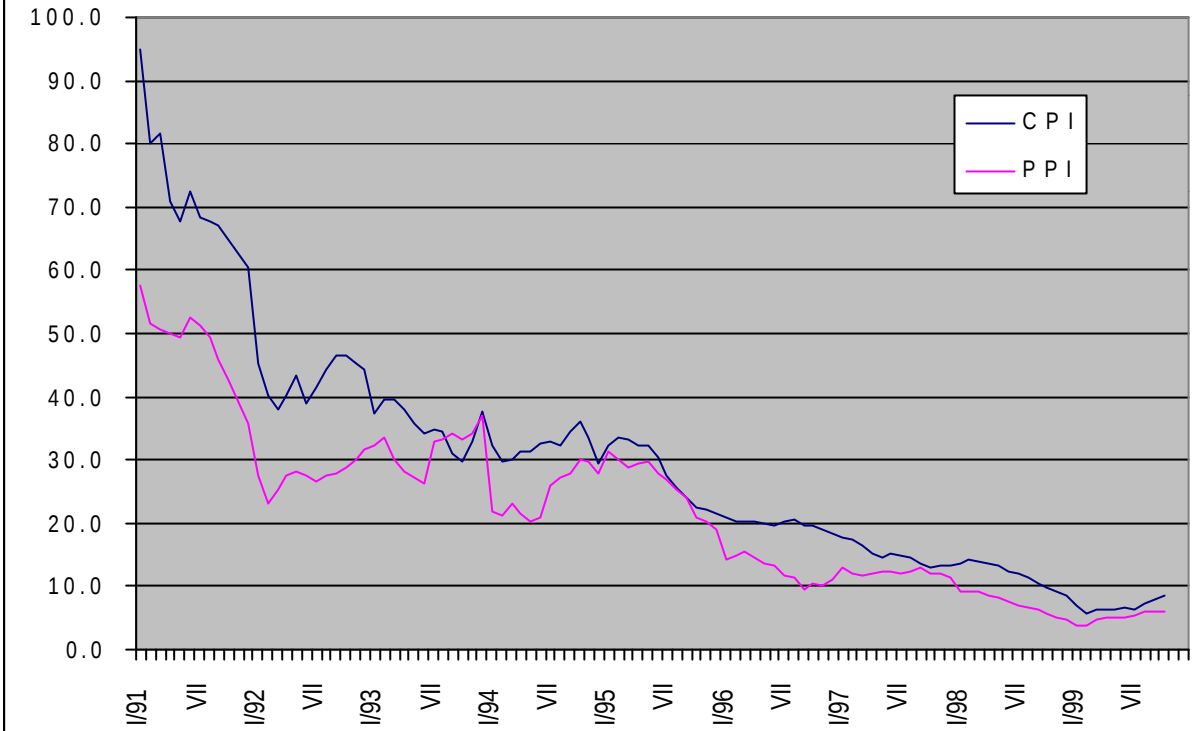


Chart 5: Poland: Real exchange rate, PLN/USD, 1990-1999
(January 1990 = 100, a decrease means appreciation)

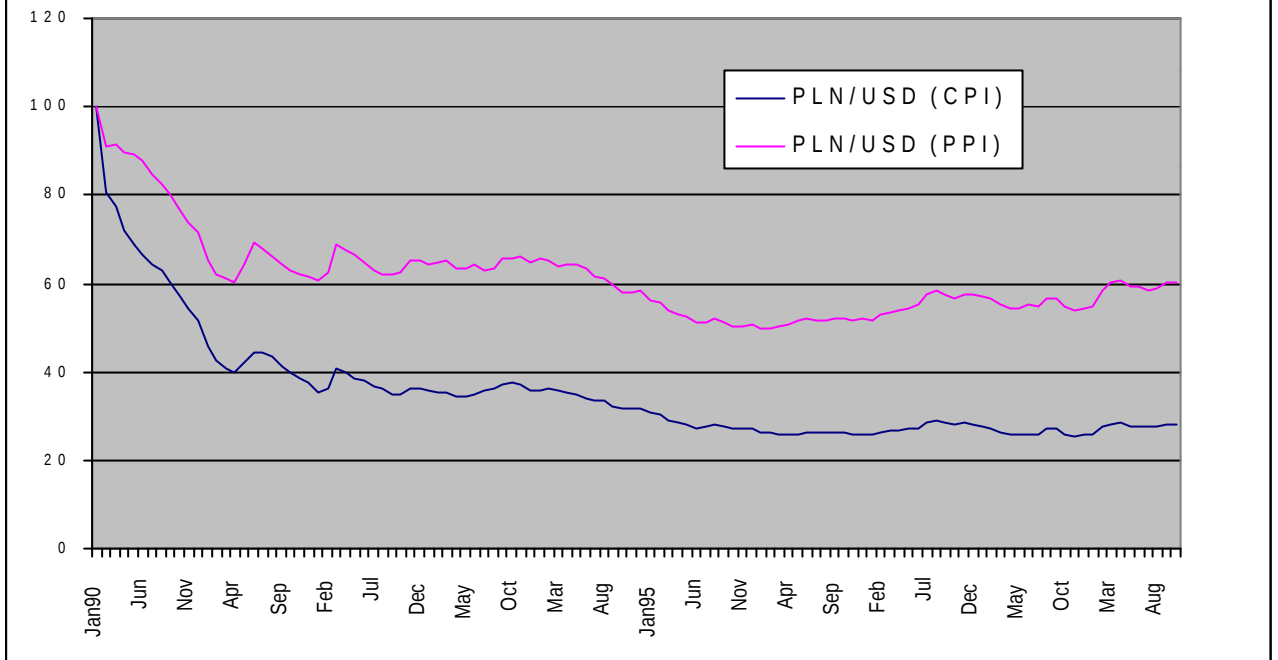
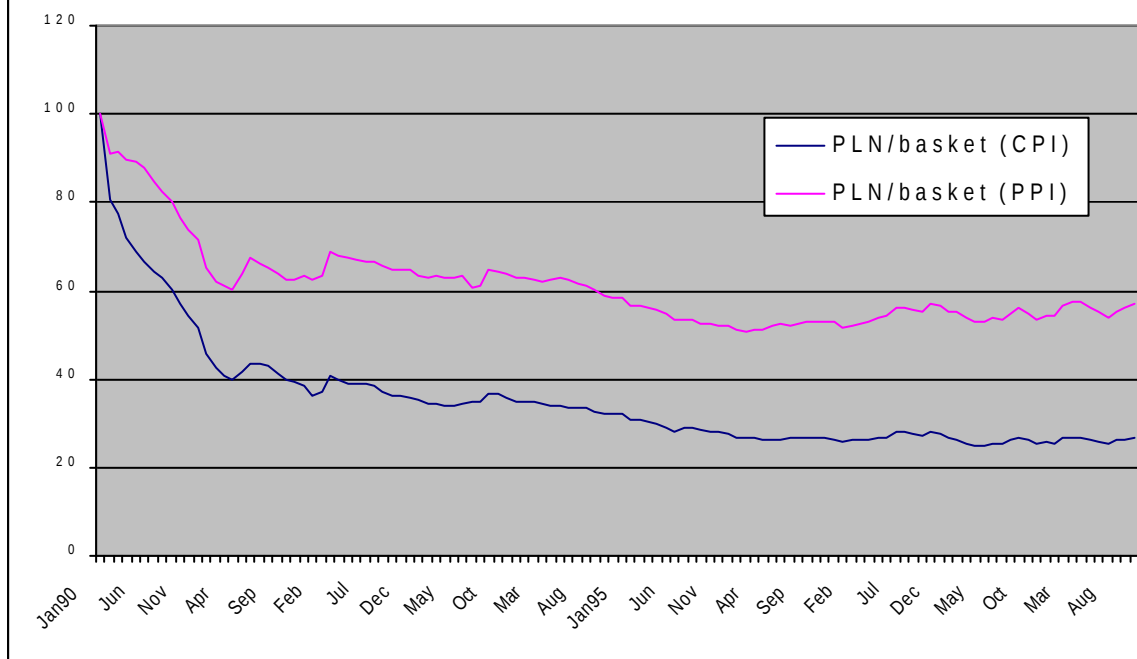


Chart 6: Poland: Real exchange rate, PLN/basket, 1990-1999
(January 1990 = 100, a decrease means appreciation)



Between May 1991 and the first quarter 1994 the real rate remained broadly unchanged, before entering again a phase of slow appreciation in 1994 and 1995. Strong upward pressure on

the currency appeared in the last months of 1994 and continued until 1996, resulting in a renewed period of real appreciation – by about 20% in two years. In fact, the central bank had to revalue the zloty against the basket by 6% in December 1995 in order to stem off the pressure on the currency and realign the central parity with the market rate. That trend was reversed at the beginning of 1996 and replaced with a tendency to moderate real depreciation, by about 2-3% a year.

Even though the crawling peg regime throughout of the most of the analyzed period clearly helped to maintain broad external balance, the actual relationship between the changes in the real exchange rate and the changes in the current account does not seem to be very straightforward. Clearly, the initial real depreciation helped to switch the current account balance from a deficit in 1989 to a surplus in 1990, but in 1991 and 1992 the external balance again deteriorated sharply as a result of the collapse of CMEA and the fall of exports to ex-Soviet markets. In 1993 and until mid-1994 the current account strengthened significantly while the zloty remained broadly stable. This tendency continued into mid-1995, even though the zloty began to strengthen. After 1996, the zloty weakened but the current account turned into deficit. It seems that – at least in the short term – throughout the whole period external shocks played a more decisive role in shaping the current account position than did the changes in the zloty exchange rate.

It may be assumed that after 1995, i.e. in the period of increased flexibility of the exchange rate regime, the fluctuations of the zloty rate within the band have been mostly affected by developments in the balance of payments, including in particular changes in the current account and inflows of capital. This hypothesis has been tested with statistical data. Regressing the changes in the real exchange rate with respect to changes in the current account and capital inflows data has shown stronger relationship between the the exchange rate and capital inflows, while the relationship between the changes in the exchange rate and the current account data has been statistically insignificant, at least in the short run. In the medium run, however, when lags extend to between one and three years, the relationship becomes quite strong and statistically significant, and structural coefficients have correct signs. Testing for Granger causality confirms this hypothesis with respect to short-term changes (see Annex A for details).

3.2. The impact of capital mobility

Under the fixed exchange rate regime in 1990-1991 and the rigid crawling peg regime during 1991-1994, the Polish national bank intervened routinely in the foreign exchange market, buying and selling foreign currency at predetermined rates and sterilizing the monetary impact of the changes in international reserves. Those operations involved rather limited amounts of foreign currency, as outward capital mobility remained restricted while capital inflows were relatively insignificant. As shown in Table 2, in four years between December 1990 and December 1994 international reserves increased only by 25% from USD 4.7 bn to 5.8 bn, which shows that the magnitude of sterilization operations was limited.

Table 2: International reserves in Poland, 1989-1999 (USD mln, end of period)

| Year | Gross Official Reserves | Net Foreign Assets, a) |
|------|-------------------------|------------------------|
| 1989 | 2503 | 3628 |
| 1990 | 4680 | 7822 |
| 1991 | 3614 | 6505 |
| 1992 | 4287 | 8552 |
| 1993 | 4281 | 8755 |

| | | |
|---------|-------|-------|
| 1994 | 5839 | 11289 |
| 1995 | 14963 | 20436 |
| 1996 | 18033 | 21667 |
| 1997 | 20670 | 24443 |
| 1998 | 27382 | 27484 |
| 1999,b) | 25793 | 26328 |

a) consolidated banking system

b) as of end-October 1999

Source: National Bank of Poland

However, the situation changed quite radically in the beginning of 1995. After long negotiations Poland signed in 1994 debt-restructuring agreements with the Paris Club and London Club creditors. The agreements provided for a 50% reduction of foreign debt and for substantial restructuring of the remaining debt, including extension of the bulk of debt service payments beyond 2006 and until 2024, and a conversion of some of the obligations to commercial banks into Brady-type bonds. This allowed Poland to regularize its relations with international financial community. The country received an investment grade from international rating agencies and returned – after fifteen years - to international financial markets. Reduced investment risk combined with strengthened economic and political stability and rapid growth has made the Polish economy an attractive market for international investors. At the same time, restrictions on capital mobility were relaxed and foreign investors were invited to participate in privatization programmes.

In result, capital inflows to Poland accelerated rapidly. Under the then existing arrangements, the central bank was forced to absorb the inflows, accumulate international reserves and substantially increase sterilization operations. But capital inflows were so massive and the pressure on the zloty got so intense, that after spending most of its resources the central bank had no choice but first to widen the fluctuation band for the zloty from +/-2% to +/-7 percent in May 1995, and then to revalue the zloty by 6% in December 1995. In the course of one year only gross official reserves of the central bank increased from USD 5.8 bn to almost 15 bn, partly in result of the defense of the exchange rate against upward pressure (see Table 2).

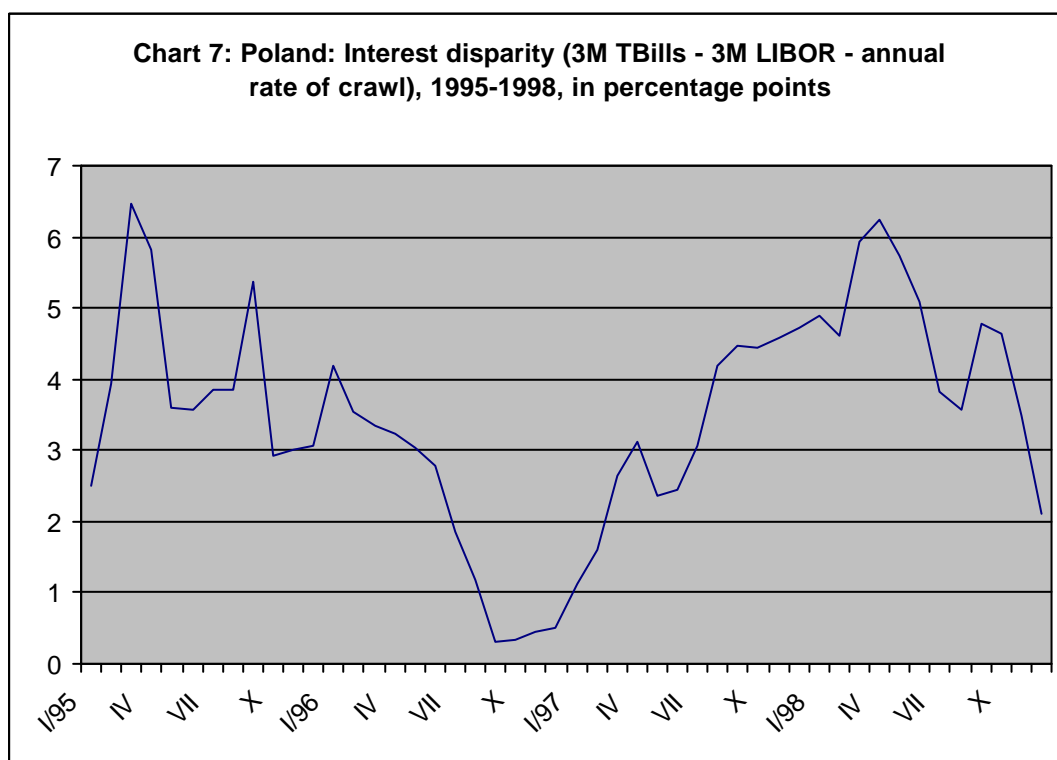
The 1995 episode provided a first test for the ability of macroeconomic policies in a successful transition country to effectively respond to a sudden surge of capital inflows. The test has been passed with difficulties. Capital inflows to Poland were primarily attracted by high rates of return on government securities: in the last quarter of 1994 yields on 3-months Treasury Bills hovered around 27-28% and the expected rate of annual devaluation was about 18% (1.4% per month compounded), yielding an expected return on foreign currency investment of about 10%, well above the 3-month LIBOR (6.2-6.3%). The actual rate of return was even higher because the zloty tended to appreciate. Faced with rapid growth of reserve money in result of capital inflows and concerned with its potentially inflationary impact, the central bank first reduced the rate of crawl in February 1995 to 1.2% per month, and two weeks later raised interest rates by 2-3 percentage points. As a result, the (uncovered) interest disparity widened and capital inflows further intensified.

In the first four months of 1995 international reserves increased by half to USD 9 bn, while net foreign assets of the banking sector jumped from USD 11.2 bn to 14.5 bn. In April alone net inflows reached USD 1.5 bn. It became clear that if sterilization operations would continue at this rate, the central bank would simply run into losses within few months. Faced by this challenge, in mid-May the bank decided to allow for a moderate adjustment of the exchange rate, widening the currency band to +/-7%; in June it also lowered interest rates by 4 percentage points in an attempt to reduce the upward pressure on the currency. The relief, however, was

only temporary: foreign investors, encouraged by good growth prospects, continued to buy Polish securities. Moreover, since the central bank was reluctant to let the zloty move across the whole larger band and tried to limit the fluctuations to a much narrower inner band, investors immediately began to speculate on the appreciation of the zloty. The central bank had to cut interest rates again in September, and in December it also decided to revalue the zloty. Thus, the defense of the peg was not only unsuccessful, but also rather costly, as the sterilization operations costed the central bank almost USD 1 bn, or 0.8% of GDP.

The key error was obviously that the central bank attempted to simultaneously control three different variables: the exchange rate, the interest rate and the level of reserve money. However, under capital mobility, at least one of these variables cannot be controlled. If the level of the exchange rate is inconsistent with the level of interest rates, producing a large disparity and a tendency for capital inflows (or outflows), either the exchange rate, or the interest rate, or the level of reserve money has to adjust.

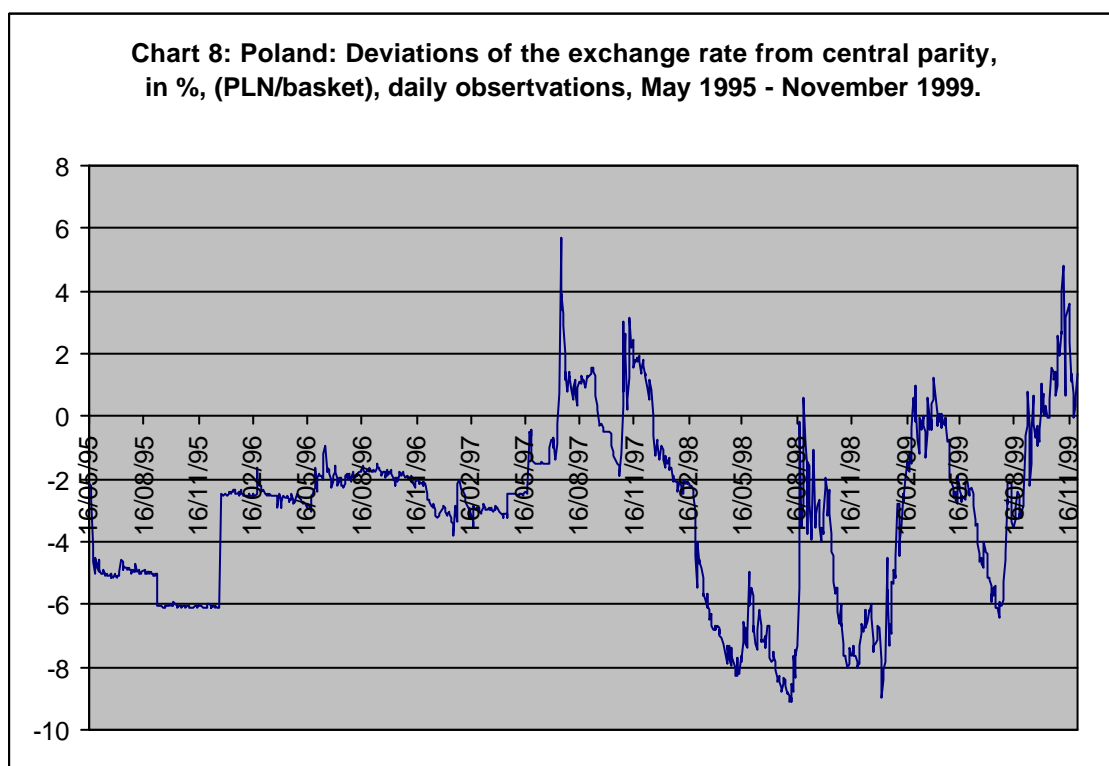
Large capital inflows continued in 1996-1999, contributing to a steep increase of international reserves up to USD 27 bn in the end-1998. In fact, actual inflows were even higher than the figures in Table 2 would suggest, because in 1996-1999 current account balance switched from surplus to growing deficit. An important component of those inflows was financial and speculative capital attracted by high rates of return on government securities. The interest disparity between the Polish and international financial markets has consistently been positive – see Chart 6. Only in the second half of 1996 did the disparity go down to below 1 percentage point, but then it rebounded again to 4-6 percentage points in 1997-1998. The capital inflows more than covered growing current account deficit and kept the zloty consistently on the strong side of the central parity, frequently very close to the lower limit of the band.



Only in 1998 was the band for fluctuations substantially widened and the scope of interventions significantly reduced. With the adoption of the direct inflation targeting framework

in monetary policy since the beginning of 1999, the central bank announced also its intention to discontinue the crawling peg system altogether and to free float the national currency. The final decision has not been taken yet (as it requires a joint consent of the central bank and the government), but as a matter of fact the zloty is practically free as the central bank has refrained from intervening in the foreign exchange market since July 1998, i.e. already for 17 months.

The changes in the exchange rate policy in Poland after May 1995 are illustrated on Chart 8 which shows the deviations of the exchange rate (zloty per basket of currencies) from central parity in percent (daily observations). Even though the zloty could formally fluctuate within the +/-7% band since May 1995, the central bank maintained the rate strictly stable throughout 1995 at 5% and next at 6% from parity through daily interventions and fixing mechanism. More variability was introduced after revaluation in December 1995: for about eighteen months the exchange rate was allowed to fluctuate within a narrow band of +/-2%. The spikes in July and November 1997 were caused, respectively, by the disastrous flood in the summer and uncertainties on the economic programme of the new government after parliamentary elections in September. The appreciation of the zloty in the first half of 1998 reflects the change of policy (widening of the band to 12.5%) under large capital inflows while the depreciation in August 1998 shows the impact of the Russian crisis. A shift from the stronger side to the weaker side of the parity in 1999 reflects deteriorating sentiments about the Polish market because of growing current account deficit, higher inflation and political conflicts in the ruling coalition¹³.



¹³ As a result, the deviations of the exchange rate from central parity have not followed a random walk, but they have displayed strong non-stationarity. The results of the ADF test for stationarity of daily deviations are given in Annex B.

3.3. Monetary and exchange rate policies under capital mobility: statistical analysis of the Polish case

Pursuing its policy of exchange rate-based stabilization in 1990-1998, the Polish central bank favoured keeping the zloty within a relatively narrow band. As already mentioned, such a rigid regime may be inconsistent with established monetary and inflation targets under capital mobility. Two dilemmas immediately emerge. First, sterilization of growing capital inflows raises domestic interest rates that attract even more capital, rendering central bank's efforts to reduce growth of money supply largely ineffective. Second, slowing down the rate crawl reduces the inflationary impact of devaluation but at the same time raises expected rates of return on zloty-denominated assets. This attracts more capital and may work pro-inflationary. The two dilemmas will be illustrated with Polish data.

The fundamental identity of the consolidated balance sheet of the banking system links broad money supply (M2) with three main sources of money creation – domestic credit (DC), credit to government (BC), and net foreign assets (NFA):

$$M2 = DC + BC + NFA + \text{resid} \quad (1)$$

Taking changes and assuming resid = const., one obtains:

$$\Delta M2 = a(\Delta DC) + b(\Delta BC) + c(\Delta NFA) \quad (2)$$

With some simplification, changes in DC can be expressed as a function of the level of domestic interest rates i , and the level of income Y :

$$\begin{aligned} \Delta DC &= f(i, Y) \\ \delta f / \delta i &< 0, \delta f / \delta Y > 0 \end{aligned} \quad (3)$$

Changes in NFA can be presented as a function of foreign capital inflows, including foreign direct investment (FDI) and portfolio investment and other capital inflows (PIOC), and the current account balance (CA):

$$\Delta NFA = k(\Delta FDI) + m(\Delta PIOC) + nCA + \varepsilon \quad (4)$$

FDI inflows can be assumed exogenous as they do not directly depend on monetary variables, but rather on overall investment climate and growth prospects of the economy. By contrast, other inflows depend on the expected rate of return and the risk level. Defining the expected rate of return as (uncovered) interest disparity and approximating the risk level with the level of gross official reserves (GOR), PIOC can be expressed as follows:

$$\begin{aligned} \Delta PIOC &= g[(i - i^* - \phi(e)), \text{GOR}], \\ \delta g / \delta (i - i^* - \phi(e)) &> 0, \delta g / \delta (\text{GOR}) > 0 \end{aligned} \quad (5)$$

Where i^* is foreign interest rate and $\phi(e)$ is the expected annual rate of devaluation of the zloty. To close the model, it is necessary to link inflation (CPI) with money supply and expected devaluation:

$$\begin{aligned} \text{CPI} &= p[M2, \phi(e)], \\ \delta \text{CPI} / \delta M2 &> 0, \delta \text{CPI} / \delta \phi(e) > 0 \end{aligned} \quad (6)$$

Equations (2) – (6) have been estimated from monthly data for the period January 1995 – March 1998¹⁴. Equation (2) has been estimated in two variants: in the first variant (equation 7) net foreign assets are expressed in zloties (PLN) and in the second variant (equation 8) NFA is in dollars (USD) and the exchange rate (FER) is added as additional variable.

As all variables representing monetary aggregates (M2, NFA, DC, BC) are expressed in terms of cumulative amounts, this involves non-stationarity of those variables. Testing for stationarity with the Augmented Dickey-Fuller test – ADF – has shown that in the two equations all variables (except NFA(USD)) are non-stationary at 5% level. To check whether the OLS estimation procedure is allowed under the circumstances, the Johansen test for cointegration was performed for both equations. The test gave a negative result for the first equation and a positive result for the second equation. First equation has therefore been transformed into first-differences (for which the ADF test showed stationarity), while the second equation has been left unchanged. The results of estimation are as follows (t-statistics in brackets):

$$\begin{aligned} \Delta M2 &= 832.5 + 0.485 \Delta DC + 0.87 \Delta BC + 0.498 \Delta NFA(PLN) & (7) \\ & (1.72) \quad (2.45) \quad (7.38) \quad (4.63) \\ R^2 &= 0.636 & F(\text{stat}) = 19.80 \\ \text{Adj. } R^2 &= 0.604 & DW = 2.61 \end{aligned}$$

$$\begin{aligned} M2 &= -27030 + 0.895 DC + 0.571 BC + 1.797 NFA(USD) + 8197 FER & (8) \\ & (-4.75) \quad (15.82) \quad (5.10) \quad (17.45) \quad (2.95) \\ R^2 &= 0.999 & F(\text{stat}) = 8404.5 \\ \text{Adj. } R^2 &= 0.999 & DW = 1.24 \end{aligned}$$

In estimating other equations the following assumptions have been made with respect to the relevant variables:

- the domestic interest rate is represented by the rate of return on three-month Treasury Bills (on primary auctions);
- the foreign interest rate is represented by three-month LIBOR;
- expected devaluation is measured by the current rate of crawl compounded for 12 months;
- monthly income levels are measured by monthly changes in the index of industrial production (IND), as monthly GDP figures are not available;

It was also assumed that both the domestic credit (DC) and capital inflows (PIOC) react to the changes in the interest rate with a three month lag, while CPI reacts to the changes in M2 with a six month lag. Equation (3), first estimated in a simple general form:

$$r(\text{DC}) = a + b \text{IND} + c i(-3)$$

showed very high autocorrelation (DW = 0.31). An autoregressive correction has been applied to transform the equation into the following¹⁵:

$$\begin{aligned} r(\text{DC}) &= 55.99 - 0.03 \text{IND}^* - 0.784 i(-3)^* + 0.925 r(\text{DC}, -1) & (9) \\ & (5.17) \quad (-0.56) \quad (-1.67) \quad (13.97) \\ R^2 &= 0.918 & F(\text{stat}) = 115.1 \\ \text{Adj. } R^2 &= 0.910 & DW = 1.29 \end{aligned}$$

¹⁴ In February 1998 the central bank changed its foreign exchange policy allowing for much wider fluctuations of the exchange rate and reducing the size of intervention.

¹⁵ Autoregressive correction allows for eliminating most of autocorrelation of the error term from the original equation and thereby increases efficiency of structural parameters. The original regression equation:

$$Y(t) = a + b X(t) + u(t)$$

with autocorrelation process of a general form:

$$u(t) = \rho u(t-1) + \epsilon(t), \text{ and: } \rho \neq 0$$

is transformed into an autoregressive equation:

$$Y(t) = \rho Y(t-1) + b X^*(t) + \epsilon(t),$$

where: $X^*(t) = X(t) - \rho X(t-1)$. Note that the correction does not change the interpretation of structural parameters.

The results for the three remaining equations are as follows (Δ s omitted for simplicity):

$$\text{NFA} = -186.1 + 1.78 \text{ FDI} + 0.694 \text{ PIOC} + 1.24 \text{ CA} \quad (10)$$

(-1.99) (4.91) (7.70) (10.44)

$$\begin{aligned} R^2 &= 0.790 & F(\text{stat}) &= 43.9 \\ \text{Adj. } R^2 &= 0.772 & \text{DW} &= 1.77 \end{aligned}$$

$$\text{PIOC} = -5638 + 855.4 \text{ DISP} + 0.614 \text{ GOR}(-3) \quad (11)$$

(-6.81) (6.32) (12.82)

$$\begin{aligned} R^2 &= 0.876 & F(\text{stat}) &= 117.0 \\ \text{Adj. } R^2 &= 0.869 & \text{DW} &= 0.64 \end{aligned}$$

$$\text{CPI} = -23.67 + 0.552 \text{ rM2}(-6) + 1.784 \phi(e) \quad (12)$$

(-6.57) (6.33) (6.02)

$$\begin{aligned} R^2 &= 0.833 & F(\text{stat}) &= 74.6 \\ \text{Adj. } R^2 &= 0.821 & \text{DW} &= 0.62 \end{aligned}$$

where $\text{DISP} = i - i^* - \phi(e)$ and rM2 is the rate of growth of broad money. Equation (11) has two important shortcomings: non-stationarity of PIOC and GOR , and high autocorrelation of the error term. Johansen cointegration test confirms the existence of at least one co-integrating equation which allows to use (11) in its present form. As far as autocorrelation is concerned, autoregressive correction could not be performed neither for (11) nor for (12) as it yields non-convergence of parameters. Therefore, equations (11) and (12) have to be interpreted with great caution.

The results obtained allow for assessing – in a comparative statics framework - the impact of changes in the control variables, i.e. domestic interest rate and the rate of crawling devaluation, on money supply and inflation. Table 3 provides a summary of this exercise. As can be seen, under the assumption of a fixed exchange rate (or a fixed crawling rate) and in the absence of sterilization, capital inflows may lead to a “perverse” effect of interest rates changes: an increase of the interest rate by one percentage point may actually lead to an increase, rather than a decrease, of the inflation rate by 0.22-0.23 percentage point. Obviously, this is a short term and comparative static result. By contrast, a reduction of the rate of crawl unambiguously reduces inflation.

Table 3: Poland: Impact of changes interest rates and expected devaluation on money supply and inflation under capital mobility.

| Equation(s) | Control variables | | Endogenous variables | | | | Impact on inflation | |
|------------------------------|-----------------------------|------------------|-----------------------------------|---------------------|---------------------------------|--------------------|-------------------------------|---------------------|
| | Δi (percent. p.) | $\Delta \phi(e)$ | $\Delta(\text{PIOC})$ (\$ mln) | ΔNFA | ΔDC (PLN mln) | ΔM2 | rM2 (percent. p.) | ΔCPI |
| ----- | | | | | | | | |
| Changes in the interest rate | | | | | | | | |
| 7,10,11,12 | +1 | - | 855 | 594 | - | 844 | 0.66 | 0.36 |
| 8,10,11,12 | +1 | - | 855 | 594 | - | 1067 | 0.83 | 0.46 |
| 7,9,12 | +1 | - | - | - | -615 | -298 | -0.23 | -0.13 |
| 8,9,12 | +1 | - | - | - | -615 | -550 | -0.43 | -0.24 |
| Net effect | +1 | | | | | | | 0.22 ÷ 0.23 |
| Changes in the rate of crawl | | | | | | | | |
| 15,13,10,16 | - | -1 | 835 | 594 | - | 844 | 0.66 | 0.36 |

| | | | | | | | | |
|-------------------|---|----|-----|-----|---|-----|------|---------------------|
| 15,13,11,16 | - | -1 | 835 | 594 | - | 844 | 0.83 | 0.46 |
| 16 | - | -1 | - | - | - | - | - | -1.78 |
| Net effect | - | -1 | | | | | | -(1.32÷1.42) |

Source: Own calculations

3.4. The impact of sterilization

Of course, central banks do not sit idle in the face of large capital inflows. They typically resort to sterilization operations, trying to reduce the monetary impact of capital inflows. But the efficiency of those operations may be very limited. Consider a simple model of capital flows introduced first by Kouri and Porter (1974).

$$CI = \alpha \Delta NDA + b \Delta i^* + c CA + d \Delta Y + \varepsilon \quad (13)$$

Where NDA – net domestic assets of the central bank, and α is the offset coefficient which measures the reaction of capital inflows on the changes in the level of sterilization operations. A fall in NDA means that the central bank sells securities to the banking sector, thereby reducing the supply of reserve money. As sterilization induces capital inflows, α should have a negative sign. A high (absolute) value of α means that sterilization is largely ineffective.

Model (13) assumes that the exchange rate is constant. In order to apply the model to the conditions of the Polish economy, CI needs to be decomposed into two variables – one measuring changes in the exchange rate (CIFEX) and another measuring “pure” changes in capital inflows (CIN) under a fixed rate (of course, $CI = CIFEX + CIN$). Defining CI as a cumulative increase in gross official reserves, Y as an index of industrial output (average monthly in 1994 = 100), and i^* as three month LIBOR, equation (13) has been estimated for the period from January 1995 to March 1998. The results, after allowing for autoregressive correction, are shown in (14):

$$\begin{aligned}
CIN = & 8416 - 0.561 NDA^* - 0.215 CIFEX^* - 540.5 i^* + 1.131 CA^* + 46.95 Y^* + \\
& (1.15) \quad (-6.08) \quad (-1.03) \quad (-0.49) \quad (2.72) \quad (2.40) \\
& + 0.896 AR(1) \quad (14) \\
& (23.18) \\
R^2 = & 0.995 \quad F(stat) = 983.9 \\
Adj. R^2 = & 0.994 \quad DW = 2.05
\end{aligned}$$

The offset coefficient ($\alpha = -0.561$) suggests that an increase in the level of sterilization operations by, say, PLN 1 billion entails a “secondary” inflow of capital of about PLN 0.56 billion. Adding to that the effects of systematic devaluation, the monetary implications expressed in terms of zloties are even larger. Since the sum of coefficients in NDA and CIFEX is about 0.78, this suggests that sterilization operations were in fact neutralized in 75-80% by additional capital inflows.

The magnitude of sterilization operations depends on a number of policy factors that typically can be jointly represented in the form of a certain reaction function of the central bank (15):

$$NDA = -\beta CI + \varepsilon \quad (15)$$

where β is the reaction coefficient (Δ s are omitted). If $\beta = 0$, the central bank refrains from sterilization; if $\beta = 1$, each unit of incoming capital is fully sterilized with a corresponding decrease in net domestic assets of the central bank. Decomposing CI into CIFEX and CIN, estimating for the same time period as for the previous model, and allowing for autoregressive correction, one obtains:

$$\begin{aligned} \text{NDA} &= 4267 - 0.855 \text{ CIN}^* - 0.968 \text{ CIFEX}^* + 0.324 \text{ AR}(1) & (16) \\ & \quad (5.39) \quad (-21.68) \quad (-15.86) \quad (1.99) \\ \text{R}^2 &= 0.996 & \text{F(stat)} = 2853 \\ \text{Adj. R}^2 &= 0.995 & \text{DW} = 2.01 \end{aligned}$$

The reaction coefficient ($\beta = -0.855$) shows that out of each PLN billion of capital inflows the central bank sterilized on average PLN 855 million. Substituting (16) into (15), one obtains a measure of full impact of sterilization on capital inflows (see, e.g. Bond, 1998).

$$\text{CIN} = [1/(1-\alpha\beta)] (a G) \quad (17)$$

or

$$\text{CIN} = 1.922 (a G) \quad (18)$$

Where G is the sum of other variables (CIFEX, i^* and Y). Equation (18) shows that sterilization by the Polish central bank of autonomous capital inflows induced by a change in the components of G increased these inflows through a cumulative process by a factor of 1.9.

4. New challenges and suggested policy responses

Having stabilized their economies and having implemented essential elements of markets mechanism, CEECs have to now decide on the preferred foreign exchange regime to assure sustained growth and external balance. Many of them want also to join the European Union, which requires rapid institutional and incomes convergence to the EU levels and standards. Their choice is again between some form of a fixed exchange rate and a floating rate regime.

Pegging the national currency to a currency of the main trading partner seems to be an reasonable solution because it offers stability, but it involves a number of risks that may even be fatal. First, if a transition country trades with and borrows from different partners with different currencies, changes in nominal cross-rates may provoke wide changes in real values, undermining the financial position of exporters. More importantly, massive swings of international capital put enormous pressures on the fixed exchange rate and may overwhelm the currency. A pegged rate regime requires a higher level of international reserves; but this is costly and - by itself - does not provide a guarantee of stability.

The series of recent financial crises provides a clear and valuable lesson on the inherent risks involved with fixed exchange rate regimes. Virtually all crises - from Mexico and the Czech Republic to east Asia and Russia - took place in countries with pegged foreign exchange rates. True, there were different underlying reasons including weak fundamentals in the first place, but the fixed exchange rate deprived the countries concerned necessary flexibility to make appropriate adjustments. Even a currency board is not a solution, as demonstrated by turbulences in Argentina in 1998-1999, where the currency board did not prevent the national currency from coming under intensive speculative pressure and the authorities contemplated even the switch to the US dollar. After all, the currency board - though legally more binding than a regular fixed rate - is still a unilateral peg that can be revoked by a unilateral decision.

The key problem in ensuring the stability of the pegged regime is that of credibility. In the first place, credibility of commitment to maintain the fixed rate depends on the overall policy stance by the national authorities. Generally, if the macroeconomic policies are considered by market players as imprudent and unsustainable in the longer run, the market will increasingly expect depreciation of the national currency. This in turn will trigger speculative behaviour by investors and, unless the policies are corrected, the exchange rate regime will collapse. This mechanism has been described by Krugman (1979).

But even if the macroeconomic policies are correct, the market may still consider that government's commitment to defend the exchange rate as not credible enough. If the government is politically weak, or its policies are likely to lead to increased unemployment and may provoke massive social protests, the ability of the government to defend the exchange rate will necessarily be reduced. In that case, market players expect a policy shift leading to an eventual devaluation, and will behave accordingly, increasing a downward pressure on the pegged currency (Ozkan, Sutherland, 1994; Drazen, Masson, 1994; Obstfeld, 1994). This case is relevant for transition countries where expectations are still high and political stability relatively low. The very prospect of devaluation gives an obvious incentive for market players to anticipate events and to attack the currency. One important and rather pessimistic implication of this model is that speculative attacks can be self-fulfilling. Another is that a financial crisis may strike even the countries with sound economic policies, either through a „contagion effect” (if a devaluation in one country threatens the competitiveness of its neighbours), or through a sudden shift in market sentiments. Thus, virtuous behaviour is not a guarantee against crises.

Many observers argue that an appropriate remedy to all these deficiencies is a move toward an arrangement in which the national currency is allowed to fluctuate more or less freely (Eichengreen, 1999). A floating exchange rate regime allows for a flexible adjustment to changing environment, including a change in the fundamentals and in relevant policies. Currency flexibility may work as a buffer against shocks.

These are obvious advantages. After the east Asian crisis many emerging economies abandoned their pegs and moved to a floating rate regimes, though almost always with active interventions. But the float does also involve some problems that cannot be dealt away easily.

Under a flexible rate regime the burden of adjustment to external or policy-induced shocks rests almost entirely on the exchange rate level. The most important deficiency of such an arrangement is that the necessary adjustment may be very large, leading to very wide swings in the nominal exchange rate level. Under downward sticky prices this may lead to wide changes in real wages and profits, as well as to higher inflation (in case of downward adjustments). This potential for wide fluctuations of the nominal exchange rate is basically the result of high capital mobility and increases with the level of capital flows.

It should be noted that the share of foreign exchange transactions related to flows of goods and services in total transactions involving foreign exchange in more advanced transition countries has been diminishing in line with the growth of the size of the foreign exchange market. For instance in Poland, the average amount of all transactions on the foreign exchange market is now between \$ 1.5 and 2 bn per day, but transactions related to exports and imports of goods and services account only for \$ 120-170 mln, i.e. less than 10% of total flows. And the Polish market is still rather underdeveloped. Moreover, a large amount of other capital transactions are conducted abroad, mainly in London, in form of swaps, futures and options, such as Non-Deliverable-Forward transactions (NDFs). Only a small part of those transactions are linked to foreign direct investment, either as privatization deals or in form of green-field investment. In sum, the developments on the foreign exchange market are to a large and still growing extent determined by financial capital flows.

Table 4 shows some measures of variability and volatility of the foreign exchange rate in Poland. Variability is measured by the standard deviation of differences between the daily fixing and the central parity, while volatility is measured by the difference between the maximum and minimum deviation of the fixing from central parity. As can be seen, both measures have increased broadly in line with the width of the band and with the size of capital inflows.

Table 4: Poland: Deviations of the exchange rate from central parity, 1995-1999, in %.

| Year | Mean deviation | Standard deviation | Volatility a) | Capital inflows USD mln |
|----------|----------------|--------------------|---------------|-------------------------|
| 1995 | -5.33 | 0.881 | 3.967 | 4980 |
| 1996 | -2.22 | 0.413 | 2.267 | 4422 |
| 1997 | -0.96 | 1.888 | 9.508 | 7842 |
| 1998 | -5.59 | 2.418 | 9.713 | 12565 |
| 1999, b) | -1.98 | 2.636 | 13.760 | 8318 |

a) $|e(\max) - e(\min)|$

b) January-October

Capital mobility under a flexible rate regime implies a large potential for massive swings in the exchange rate level. The result is higher uncertainty, more instability, lower investment and less trade. These effects will generally be more pronounced in small open economies, because in those economies the exchange rate determines directly a higher proportion of goods and services produced.

There is, however, an effective way to reduce the negative impact of the increased volatility of the exchange rate through universal including currency risk clauses in commercial contracts and providing simple currency risk insurance schemes. They would marginally increase transaction costs but the price is worth paying given potential disruption produced by wild swings in exchange rates.

These observations suggest that the choice of a flexible regime should be weighted against its potential negative implications. In fact, policy makers in transition economies are left with rather limited choices. According to Eichengreen, Rose and Wyplosz (1997) they can, in practice, contemplate only three possible foreign exchange regimes: a monetary union, a „dirty” float, and a „Tobin-tax” type of arrangement. They find the first choice unrealistic, at least for a majority of countries, as it requires political consensus and can be practically implemented only for countries with similar structural and institutional characteristics. Indeed, joining the European Monetary union (EMU) is not yet on the agenda, not least because the euro-zone EU member countries are not prepared to extend the single currency to the prospective EU members any time soon. At least theoretically, it would be possible for some CEECs to adopt the euro unilaterally, but the cost of such a unilateral decision seems to outweigh benefits (see Bratkowski and Rostowski, 1999, for such a proposal, and Rosati, 1999, for a critical assessment).

Eichengreen et al. also reject the „Tobin tax” on international transactions, as it would require an international agreement in order to work effectively, and such an international agreement is nowhere in sight. In result, they seem to be in favour of the opinion that a „dirty” float is the only practical solution.

Most probably, the „dirty float” is a preferable solution to either the fixed rate or an independent float. However, as discussed earlier, the „dirty” float may also pose enormous problems. Wide devastating fluctuations of the nominal (and real) exchange rate can possibly be avoided only through very frequent and sometimes very substantial interventions. But this requires large international reserves and an independent anchor for monetary policy. Moreover, this does not eliminate the main risk of a fixed exchange rate regime, i.e. a potential for speculative attack.

Probably a more practical and safer solution would be for transition countries to simply reduce the scope of capital mobility. Empirical evidence suggests that what is most important for ensuring rapid growth is current account convertibility and opening up to FDI inflows. But liberalization of other capital transactions, and especially of short-term financial flows may produce more harm than good. Two options can be considered in this context. First, to suspend further liberalization of capital transactions in countries that have not yet opened up their capital accounts - or to reintroduce some restrictions in more liberalized countries - until their structural characteristics become more substantially similar to those in industrialized countries (the EU). Second, to introduce temporary tax-based capital controls in form of mandatory reserves with the national bank on all short term capital movements. Both options involve some costs but they definitely can be quite efficient in preventing financial crises, provided other domestic policies are correct.

Once the transition countries are ready to join the EMU, they will be able to dismantle the remaining capital controls and adopt a single currency. At the same time it may be unwise for them to remain for too long in any transitional arrangement involving a rigid exchange rate regime. From this perspective, the mandatory participation in the ERM II for at least two years before joining the EMU - as it is now envisaged - may actually be the most risky and dangerous period, for their currencies will then present rather easy targets for speculation. It could thus be preferable to remain in a flexible rate regime (e.g. the „dirty float”) with an appropriate measure of capital controls on short-term flows (administrative or tax-based) for some time, and pass from that regime directly to the monetary union.

Table 5 shows the preferred evolution of foreign exchange arrangements corresponding to the progress of transition. The pattern shown is very general. To apply it in the context of an individual transition country would require taking into account many other considerations, such the macroeconomic policy stance, progress in integration with the EU, and the degree of openness.

Table 5: Transition phases and foreign exchange rate arrangements.

| Transition phase | Foreign exchange rate arrangement |
|--|---|
| 1. Initial stabilization: (6-12 months) | Fixed exchange rate regime Current account convertibility |
| 2. Post-stabilization recovery (1-3 years) | Adjustable (crawling) exchange rate regime, Article VIII convertibility |
| 3. Economic growth – “emerging market” phase (10-15 years) | Managed float within a wide band, or independent float Capital controls |

4. Integration with EU –
“post-emerging market” phase

ERM-2 (?)
EMU

Source: Author

ANNEX A:

The relationship between the real exchange rate, current account balance in Poland, and capital inflows, 1995-1999.

The following simple regressions have been tested for two measures of the exchange rate with respect to current account balance and inflows of non-FDI capital:

$$\text{RER} = a + b \text{ CA} + c \text{ PIOC} \quad (\text{A1})$$

$$\text{DEV} = d + e \text{ CA} + f \text{ PIOC} \quad (\text{A2})$$

where RER is the index of real exchange rate (PPI-deflated, January 1991=100), and DEV is the average monthly deviation of the nominal exchange rate from central parity. As time series for RER, DEV and CA show high non-stationarity of order one and the Johansen test for cointegration has yielded ambiguous results, it was decided to use first differences for non-stationary variables. The estimation has been done for two periods: January 1996 – October 1999, and January 1997 – October 1999. The results obtained are shown in Table A1:

Table A1: Regression results on the relationship between exchange rate changes, current account balance and inflows of non-FDI capital.

| Period | Exchange rate variable | Constant | D(CA) | PIOC | R ² | F(stat) | DW | No obs |
|-------------|------------------------|-----------------|---------------------|---------------------|----------------|---------|------|--------|
| 01/96-10/99 | ΔRER | 0.433 (2.92) | 0.00013 (0.44) | -0.00078 (-3.48) | 0.225 | 6.11 | 1.76 | 45 |
| 01/97-10/99 | ΔRER | 0.536 (2.62) | 0.00014 (0.38) | -0.00088 (-3.01) | 0.232 | 4.54 | 1.81 | 33 |
| 01/96-10/99 | ΔDEV | 0.569 (2.14) | -2.4E-06 (-0.05) | -0.00128 (-3.21) | 0.196 | 5.13 | 1.67 | 45 |
| 01/97-10/99 | ΔDEV | 0.843 (2.32) | 6.8E-05 (0.11) | -0.00168 (-3.23) | 0.258 | 5.22 | 1.78 | 33 |

Source: Own calculations

The results for different specifications are quite similar. First, the tested relationship is statistically very weak and does not allow for any robust conclusion. Second, changes in the current account balance seem to have no impact on (contemporaneous) changes in the exchange rate, real or nominal. Third, non-FDI capital inflows seem to be of some importance, as suggested by t-statistics and coefficient signs.

Equations (A1) and (A2) have been tested for causality between the two measures of the exchange rate, current account balance and non-FDI capital inflows. Table A2 shows only the positive results of Granger causality test for various lags and various pairs of variables – i.e. only the pairwise cases for which the null hypothesis of no causality can be rejected at 10%

confidence level. As can be seen, no clear causality can be detected between the exchange rate changes and the exogenous variables. In sum, neither current account balance nor capital inflows seem to be primary responsible for the variations of the exchange rate in Poland in 1996-1999.

Table A2: Selected results for Granger causality test for RER, DEV, CA and PIOC.

| Lags (months) | Null hypothesis | No. of observations | F(statistics) | Probability |
|---------------|------------------------|---------------------|---------------|-------------|
| 2 | RER does not cause CA | 44 | 3.294 | 0.048 |
| | CA does not cause RER | | 1.665 | 0.202 |
| 6 | PIOC does not cause CA | 40 | 2.405 | 0.054 |
| | CA does not cause PIOC | | 1.215 | 0.329 |
| 9 | PIOC does not cause CA | 37 | 3.253 | 0.016 |
| | CA does not cause PIOC | | 0.739 | 0.670 |
| 12 | DEV does not cause CA | 34 | 2.633 | 0.077 |
| | CA does not cause DEV | | 1.760 | 0.201 |

Source: Own calculations.

ANNEX B

Stationarity of the deviations of the exchange rate from central parity.

Daily observations of deviations of the “fixing” (central bank) exchange rate from central parity have been tested for stationarity with the Augmented Dickey-Fuller test. The results in Table B1 show that while for all years deviation levels are not stationary, first differences are unambiguously stationary. This suggests a strong presence of systematic structural factors behind foreign exchange rate movements. It can also be seen that the role of the random walk factor gradually increases with time.

Table B1: ADF test results for stationarity of deviations of the “fixing” exchange rate from central parity, May 1995 – November 1999.

| Year | No of observ. Levels | ADF test values | | Critical values | |
|------|-------------------------|-----------------|-----------------------------|-----------------|--|
| | | Levels | 1 st differences | | |
| 1995 | 153 | -1.833 | -4.378 | 1%: -3.474 | |
| | | | | 5%: -2.880 | |
| | | | | 10%: -2.577 | |
| 1996 | 245 | -1.449 | -7.899 | 1%: -3.459 | |
| | | | | 5%: -2.873 | |
| | | | | 10%: -2.573 | |
| 1997 | 246 | -2.038 | -8.407 | 1%: -3.459 | |
| | | | | 5%: -2.873 | |
| | | | | 10%: -2.573 | |
| 1998 | 250 | -2.125 | -6.693 | 1%: -3.458 | |
| | | | | 5%: -2.873 | |
| | | | | 10%: -2.573 | |
| 1999 | 225 | -2.338 | -7.382 | 1%: -3.462 | |
| | | | | 5%: -2.874 | |
| | | | | 10%: -2.574 | |

Source: Own calculations

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