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Observations on disinflation in transition economies

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Paul Wachtel * and Iikka Korhonen **

Observations on disinflation in transition economies

Abstract

The transition economies were remarkably successful in curbing the inflation that took place after the initial transition and shocks and, more recently, most of the countries have brought inflation down to the levels found in major developed countries. In this paper we review the experiences and show how fiscal discipline, monetary policy and exchange rate policy contributed to the outcome. In addition, we note that the influence of EU accession on institutions and policy may have played an important role. The paper also surveys the literature on the quality of the inflation data, the extent to which necessary relative price adjustments have occurred and the size of the Balassa-Samuelson effect. Case studies of disinflation in four countries are presented: Poland, Romania, Estonia and Russia.

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Paul Wachtel and Iikka Korhonen

Observations on disinflation in transition economies

Tiivistelmä

Siirtymätaloudet ovat olleet hyvin menestyksekkäitä inflaation vaimentamisessa. Yleensä inflaatio kiihtyi hyvin nopeaksi transition alkuvaiheessa, mutta tällä hetkellä useimpien siirtymätalouksien inflaatio on samalla tasolla kuin kehittyneissä teollisuusmaissa. Tässä tutkimuksessa käsitellään keinoja, joilla inflaatio on saatu aisoihin. Finanssi- ja rahapolitiikka sekä valuuttakurssijärjestelmä ovat kaikki olleet osallisina inflaation vaimentamisessa. Lisäksi EU-jäsenyyden mahdollisuus lienee vaikuttanut instituutioiden ja talouspolitiikan muotoutumiseen useissa maissa. Tutkimuksessa käsitellään lisäksi inflaatiodatan laatua, suhteellisten hintojen muutoksia sekä Balassan-Samuelsonin efektiä. Lähemmin tarkastellaan inflaation hidastumista neljässä siirtymätalousmaassa eli Puolassa, Romaniassa, Venäjällä ja Virossa.

Asiasanat: siirtymätaloudet, inflaatio, rahapolitiikka, valuuttakurssipolitiikka, suhteelliset hinnat

1 Introduction

The transition to market based economies began just a little more than a decade ago in twenty seven countries of Central Europe and the Former Soviet Union. Most observers in the early 1990s thought that the transition process would be long and tedious. Early transition experiences seemed to support that expectation. Most of the transition countries experienced sharp initial declines in output, periods of rapid inflation, including many hyperinflations, and enormous political obstacles to reform. There was ample reason to believe that transition would be a specific area of concern to economists for many years to come. However, the unique transition experiences are largely past in most countries and the term transition economics might even be disappearing from view. At the very least, the term is barely relevant in much of Central Europe although it is still applicable in the republics of the former Soviet Union, and possibly China. That is not to say that these countries are trouble free but that they share the problems that are common to other emerging market economies. However, some of the advanced transition countries are quickly leaving that status. Nothing symbolizes this more than the spring 2004 accession to the European Union of eight formerly planned economies from the Baltics, through Central Europe and in the Balkans.

The rapidity of the transition experience is well illustrated by the path of inflation in these countries. Not surprisingly, one of the first manifestations of transition was high inflation. The causes of these inflationary outbursts were classical. First, the removal of price controls and quantity allocations, which repressed demand, led to rapid adjustments to free market prices. Second, fiscal and financial crises resulted in periods of rapid monetary expansion as governments relied on seignorage to support budgets as well as state owned enterprises. In the early 1990s more than half of the transition countries experienced at least one year with annual inflation rates in excess of 1000 per cent or close to it. However, stabilization policies were in place in virtually every transition country by 1995 and the policies were remarkably successful. Since 1997 only three countries have experienced annual inflation rates in excess of 100 percent. By 2002, annual inflation rates were below 15 percent in all but five countries and below 5 percent in just half.[1] The transition experience with inflation is nothing short of remarkable.

[1] EBRD data for the annual average consumer price level, see Table 1.

Why did the transition economies do so well so quickly in bringing inflation under control? One answer is that the consensus view of stabilization policy had just come into its own in the policy world by the 1990s. Approaches to macroeconomics and policy making which were not self-evident to the leaders and intellectuals of the less developed world in the 1960s, 70s and 80s, were learned quickly in the transition world in the 1990s. Thus, the Latin American experiences of generations that repeatedly fought inflation without a political consensus that accepted macroeconomic realities were not repeated in Central Europe.

Another answer, based on the political economy of transition, was suggested early on by Havrylyshyn (1997). Policymakers were able to introduce disinflation policies when they coincided with the interests of powerful oligarchs. At the start of transition, the elite took advantage of inflation, low interest rates and a poor institutional structure to transfer capital from the state to private interests. Once established as capitalists, the elite had an interest in disinflation. There are countries where disinflation did not take hold so quickly. Russia seemed to follow Latin American experience for much of the 90s; high and persistent fiscal deficits ultimately lead to a financial crisis and reemergence of high inflation in 1998. However, this might be explained by continued tension between the interests of the oligarchs and the government in Russia.

The experience with disinflation does not imply that transition economics is a complete success. Although, the lessons of stabilization policy were largely learned, there are other areas economic issues where transition problems are still extant. In particular, health, education and pension systems are largely unchanged and subsides to government owned enterprises are still common. Important institutional reforms are still needed so, for example, property right are clearly defined and fairly enforced. Confidence in the rule of law is far from perfect and corporate governance needs to be improved. Moreover, liberalization of the economies and support for a competitive environment might face opposition from private sector monopolist interests.

The influence of Western investors and institutions in the transition economies may be another important reason why the transition economies were able to adopt stabilization policies rapidly. Relatively large flows of FDI and portfolio investment into the fast track transition economies of Europe (Poland, Hungary and the Czech Republic) started immediately after the transition. Pressures for institutional reform accompanied these flows. In addition, reform elements in these countries found an environment with an

institutional memory of market institutions and the human capital to jump-start the process. Furthermore, some countries, Hungary in particular, started tentative market reforms already in the 80s, which made the subsequent transition process easier. As a result, policy and regulatory abuses in these countries were rather short lived. And by the mid-1990s, the fast track transition economies had reformed the financial sector and established sound institutional structures for monetary policy. With these accomplishments, it is not surprising that stabilization policy fell into place.

Another important answer is the pull of Europe. For a variety of political and social reasons, the nations of central Europe have an overwhelming desire to be part of Europe and the institutions of the European community. So, a consensus commitment to join Europe led to a willingness to adopt stringent economic policies and structural reforms in the countries chosen for accession. This has also influenced policy in the other Balkan countries that do not want to be left out of the second wave and also some of the other countries (e.g. the Ukraine) that do not want to appear un-European.

We begin the discussion with an overview of the inflation experience in transition. Only a brief overview is needed because this is far from the first essay to take note of the remarkable inflation history in the region. Koen and De Masi (1997) surveyed the initial experiences in transition and Dabrowski (1999) and Cottarelli and Doyle (1999) looked at phenomenon as of the late 1990s. Table 1 shows annual CPI inflation rates for the transition countries separated into three regional groups. In all groups the median inflation rates have declined steadily. For the CEE countries the median dipped below 50% per year in 1993 while in the CIS, that milestone was passed in 1996. The 10% threshold for the median was passed in 1997 in CEE; the median FSU inflation rate almost reached that level in 1998 and again in 2001 but did not fall below 10% until 2002. The strongest efforts to bring inflation down to European levels were in the countries selected for accession to the EU. The reference rate for inflation using the Maastricht convergence criteria was between 3 and 3.5 percent in the three years 2000-02.[2] The median accession country inflation rate reached this threshold in 2002. The median inflation rate in the 8 countries that enter the EU in 2004 was 2.6% in 2002, not much more than the Euro area inflation rate of 2.3%.

[2] The Maastricht Treaty set the reference rate for inflation convergence as the average of the three lowest inflation rates in the EU plus 1.5%. If this rule is applied to the countries in the Euro area, the reference rates are 3.2, 3.5 and 3.0 in 2000-02.

A good measure of the success of disinflation is a sustained low inflation for which we use the average inflation rates for the 5 year period 1998-2002. The five year average was below 5% in the Baltics, Croatia, the Czech Republic and three additional countries (Macedonia, Armenia and Azerbaijan) where an observer might question the quality of the data. The five year average was above 10% in Romania, Serbia and the larger FSU countries (Russia, Belarus and the Ukraine), as well as most of Central Asia (except Kazakhstan) and a few other smaller FSU republics.

There is of course some variation in inflation experience among the 26 countries for which data are reported in Table 1. A few countries, which started some economic reforms in advance of the political transition, were able to avoid hyperinflation (Hungary, Czech Republic and the Slovak Republic). In some countries the disinflation was dramatic. Croatia went from over 1000 per cent inflation to almost none in two years. In others, the process was more gradual. The inflation rate in Hungary declined from 35 percent to 10 percent over the course of a decade.[3] In still others, reforms were not immediately successful. In Bulgaria initial efforts at reform were unsuccessful and inflation returned with vengeance in 1997. However, the introduction of a currency board and the accompanying fiscal adjustment brought inflation down fairly quickly.

Aggregating the data across the transition countries many of which are very small obscures the fact that inflation remains a problem in several large and important countries where fiscal discipline, financial reforms, extensive restructuring and genuine privatization have lagged. Specifically, the 2002 inflation rate was 16% in Russia, 22% in Romania, 28% in Uzbekistan and 43% in Belarus and with only modest amounts of disinflation anticipated for 2003.

Another useful way to examine the disinflation is to look at the experiences that followed stabilization policies. Cottarelli and Doyle (1999) use the dating of transition stabilizations prepared by Fischer, Sahay and Vegh (1998) and show how long it took to reach disinflation mileposts. Table 2 provides an update of the table with EBRD data on monthly inflation rates. There are two broad terms observations from the table. First, stabilization programs usually take hold very quickly. Second, after an initial burst the pace of disinflation slows down. A stabilization program brings inflation below 60% in about a year (the median for successful stabilizations is 13 months). The median time for

inflation to fall from 60% to 30% is about 4 months. However, further progress in inflation reduction takes more time. The median time for inflation to fall from 30% to 15% is 8 months, and from 15% to 7.5%, one year. The initial disinflation experiences are almost all rapid. Stabilization programs always bring inflation below 60% in about two years or less. Further progress is sometimes delayed. In Belarus, Bulgaria, Romania and Russia stabilization programs failed and in Poland it took almost four years to bring inflation under 30%. In Hungary as well, an early successful stabilization program was followed by a slow disinflation, it took 8 years for inflation to reach 15%. Inflation less than 7.5% was not reached until developed country inflation levels consistently dropped below that level. So, the length of time to this final milestone depends largely on date when the 15% milestone was passed.

The inflation experiences in transition countries have been extensively summarized in the IMF Working paper by Cottarelli and Doyle (1999) and the CASE (Warsaw) report by Dabrowski (1999). Both of these papers reflect the amazement with which the successful disinflation programs were received. With a perspective of several more years, we both echo the amazement and note that the success of disinflation programs around the world are taken for granted. In addition to bringing some of the relevant observations up to date, it will be useful to evaluate the disinflation experience and comment on some relevant issues including whether low inflation is sustainable.

In the following sections we describe how the transition countries achieved disinflation. Next, we argue that inflation may have contributed positively to the necessary changes in relative prices. The third section argues that the recorded inflation may overstate the true inflation, and this problem was probably quite severe in the early years of transition. The fourth section has country studies for a small country with a rapid disinflation, Estonia, a rapidly growing transition country that disinflated gradually, Poland, a less successful disinflation story, Romania, and the largest transition country, Russia. Disinflation stories emphasize the choice of exchange rate regime and fiscal policy. We conclude that successful disinflation can occur with different approaches to the exchange rate but that fiscal discipline is a necessary condition for success. In the fifth section we examine the evidence on the Balassa-Samuelson effect in the transition countries. Empirical studies suggest that the transition countries will be likely to

[3] There is much debate concerning the speed of disinflation in Hungary; see Olivier Blanchard (pro

experience real exchange rate appreciation as their income levels increase. However, the resulting inflation differentials with the rest of the world will not be very large. The sixth section offers concluding remarks.

2 How did the transition countries disinflate?

A discussion of disinflation in transition countries has to be divided into two parts, the end of high inflation and the end of moderate inflation. As noted already, there are several studies of the former. Not surprisingly, control of the fiscal deficit is given the strongest credit in econometric studies and case analyses of high inflation episodes. There has been less analysis of the more recent experience with disinflation with the notable exception of Brada and Kutan (2002).

The initial stages of transition were accompanied by large fiscal deficits. Peak deficits in the general government balance were typically over 5% of GDP in the advanced transition countries and often much more in the FSU countries.[4] For example, the balance was over –10% in Bulgaria in 1993 and 1996, –7.5% in Hungary in 1994, -11.9% in Slovak Republic in 1992. In the FSU countries were the collapse of output was larger and tax collections broke down, the deficits were even larger, almost 20% of GDP in Russia in 1992 and more in the Ukraine. There were some exceptions; the peak deficit reported for the Czech Republic was -3.1% of GDP in 1992 and Slovenia maintained a budget surplus in the early transition years. All of these figures understate the true burden because quasi-fiscal deficits in the form of government support to enterprises through central bank credit were large as well. Nevertheless a hallmark of the disinflation era was that the deficits were reduced significantly. In most countries, the deficits were less than 3% of GDP for several years running by 1997 with the exception of Hungary. Improved fiscal balances in the mid 1990s reduced the expectation that deficits would be monetized and helped lower inflationary expectations. The data on deficits understates the extent of progress on fiscal

faster disinflation) and Kornai (con) in Cottarelli and Szapary (1998).

[4] Measurement of the deficit is often imprecise, particularly in the early transition years as accounting standards changed. For example the government balance in Poland was reported as -6.7% of GDP in 1991 and 1992 until recently when government figures were revised to -2.1% and -4.9% respectively.

reform because quasi-fiscal deficits are not measured. Subsidies through directed credits and distorted prices (importantly the price of energy) disappeared as well. Perhaps equally important was the development of a capacity for government deficit financing other than monetization. Treasury bills were introduced in the advanced transition countries in the early 1990s and in the former Soviet Union in the mid- 1990s. In addition, several countries were able to introduce government bonds with longer maturities by the end of the decade. Revenue from privatization has also been a relatively large source of financing. Even though large-scale privatization was completed in many transition countries by the mid-90s, sales of large infrastructure companies and banks continued after that.

Although the capacity to absorb deficits without monetization has increased, the deficits have begun to increase as well. By the end of the 1990s most of the countries of central Europe were running fiscal deficits in excess of 5% of GDP. In 2003 the deficit reached -6.7% of GDP in both Poland and the Czech Republic and -9.2% in Hungary. Although there is no apparent inflationary impact, it may well emerge suddenly and powerfully. Large deficits have not reemerged in the countries of the FSU. Russia has a fiscal surplus, which is due as much to improving world commodity and energy prices as to policy changes.

The other pillar of disinflation is monetary policy itself. Of course, fiscal and monetary policies are related and an early review of disinflation in transition (Begg 1997) notes that monetary policy rarely succeeds if sound fiscal policy had not been established. A money supply based disinflation to stop hyperinflation works because it is also a fiscal based disinflation when seignorage is the most important source of government revenue.

Needless to say, disinflation was accompanied by reduced money expansion. The interesting issue is how money expansion was kept under control. Macro conditions were far too chaotic in the pre stabilization period to adopt either money aggregates targets or interest rate targets. Large overhangs of forced saving meant that the initial money stocks were large. Although early high inflation eroded the value of these stocks, support of both enterprises and the government through money creation led to rapid growth of money. Furthermore, successful disinflation led to a rebound in real money demand and increased intermediary activity. Thus, money multipliers are variable and difficult to predict. It would have been impossible to target money aggregates in this environment. Any attempt to do so would not be credible. Similarly, high and variable inflation made interest rate

targets equally impractical. Moreover, money markets institutions and instruments for the application of interest rate targets did not exist at first.

So, the exchange rate is the most obvious choice as a target for monetary policy. Although policy makers kept a careful watch on the exchange rate as the only reliable indicator of the success of efforts to disinflate, only a few countries adopted formal exchange rate targets. For example Poland adopted a crawling peg exchange rate target in order to influence both policy and expectations. Russia used a crawling peg from 1996 to 1998 while it tried, ultimately unsuccessfully, to maintain an overvalued currency. Estonia is exceptional; it adopted a hard peg early (June 1992) and was followed by the other two Baltic countries, Latvia and Lithuania, in 1994. Many countries avoided a formal peg and many have moved towards floating exchange rates.

This is surprising because formal exchange rate targets that are highly visible and effect prices directly through inflation pass through, can be very helpful in implementing a credible disinflation policy. There are difficulties in choosing an appropriate exchange rate path that complicate the use of formal exchange rate targets. First, capital flows can influence the nominal exchange rates and second, transition structural adjustments lead to changes in real exchange rates. Thus, an explicit target might have as many advantages as disadvantages. The number of transition countries with floating exchange rates increased over the 1990s.

Monetary policy management of the inflation rate in many of the transition countries was complicated by the role of capital inflows. Central banks usually absorb capital inflows in order to avoid currency appreciation and then sterilize the impact on the domestic monetary base. However, there are limits on the ability of a central bank to sterilize. First, sterilization is costly to a central bank that holds low interest earning foreign assets. Second, it constrains the central bank balance sheet and might make it difficult to react to domestic financial sector shocks.

The comparison of Hungary, Poland and the Czech Republic through the mid 1990s is instructive (see Roubini and Wachtel, 1999). The commitment to a pegged exchange rate was strongest in the Czech Republic (the Koruna was pegged from 1991 to 1997), weakest in Hungary that had repeated devaluations and somewhat stronger in Poland where the crawling peg was carefully managed. Inflation was highest in Hungary and lowest in the Czech Republic. The Czech Republic had used a fixed exchange rate as a nominal anchor and cornerstone for its initial stabilization program. However, real appreciation and

problems financing the external imbalance were factors inhibiting Czech growth towards the end of the decade, and the exchange rate peg had to be abandoned in 1997 after a speculative attack.

Thus, the surprising conclusion is that disinflation in transition economies took place while the predominant form of monetary targeting was policy judgment. At the same time, a new approach to policy targeting was taking hold among the developed countries. In the course of the 1990s, inflation targeting became all the rage and was picked up in the transition world as well. At first the use of inflation targets was informal but by the end of the decade several transition countries formally adopted inflation targets. This was only possible once inflation rates had subsided so that inflation forecasts over a medium term horizon could be taken seriously. Jones and Mishkin (2003) describe the use of inflation targets in the Hungary, Poland and the Czech Republic. The Czech Republic dropped its nominal anchor for a floating exchange rate in 1997. This left monetary policy without any target to help reduce the inflation rate and at the end of the year, the central bank formally adopted inflation targets.

Inflation targets have the distinct advantage in that they avoid the pitfalls of the traditional monetary targets – interest rates, exchange rates or monetary aggregates. Moreover, the few years of experience with inflation targets around the world are promising. In addition, adopting inflation targets can lead to more transparent and more consistent communication from the central bank about policy, which helps establish credibility. However, there are two observations to bear in mind. First, missed inflation targets can lead to either abrupt, and perhaps, ill advised changes in policy.[5] Although everyone agrees that inflation targets should not be a straight jacket, there might be a loss of credibility to a transition country central bank that ignores overshooting that goes on beyond its stipulated policy horizon. Second, the apparent success of inflation targeting by transition countries cannot easily be distinguished from the influence of EU accession since all of the transition inflation targeters are also accession countries. Transition central bankers, particularly in Poland, may soon encounter the pitfalls that result from rigid targets that are missed. Poland adopted inflation targets in 1998 and continued to utilize a crawling band exchange rate target for policy operations until April 2000 when a floating regime was announced. The original short term inflation targets were 2 percentage

[5] This is basically the reason why the Greenspan Fed resists the formal use of inflation targets.

points wide but in 2002 the bank specified a target of 5% with a permissible fluctuation band of 1 percentage point. According to the OECD (2002, p.41): "The Bank hopes that by emphasizing its desire to achieve a specific level of inflation as opposed to an outcome within a range, its communications will be better able to affect expectations." This seems to be a dangerous strategy for a transition economy where non-market structural forces continue to effect inflation and for a small open economy where external shocks have large effects (although Poland is clearly the largest and least open of the accession countries). The bank does say that in event of a missed target, policy will be aimed at moving towards the medium term rather than the short term target.

As noted already, all of the transition countries that have adopted inflation targets are accession candidates and the influence of expectations about accession is probably more important than the use of a particular policy approach over the last few years. It is too early to disentangle these simultaneous developments. Success in seeking EU membership is also probably correlated with a further prerequisite for inflation targeting, i.e. institutional capability. For inflation targeting to be effective, the central bank must be able to forecast inflation and gauge the effects of its own actions. This requires an adequate number of highly skilled staff, which simply was not available in the earlier years of transition but EU accession has led to rapid development of institutional capabilities with support from international institutions and without domestic political resistance.

For many years it has been fashionable to attribute successful macroeconomic outcomes to central bank independence. Although the original econometric evidence has been criticized, it is still an interesting indicator. Cukierman, Miller and Neyapti (2002) look at the characteristics of central banks in transition economies. The central banks established in the transition economies score very well on various indexes of institutional, policy and legal independence when compared to other developing countries and even when compared to developed country central banks in the 1980s. Moreover, the central banks established later are institutionally stronger. Some early studies (Dabrowski, 1999) concluded that central bank independence is associated with lower inflation rates but Cukierman et. al. indicates that the relationship is weak in the initial stages of transition when price decontrol dominates. However, in later stages when liberalization is sustained, there is somewhat less inflation with a more independent central bank. Improvements in institutional structure and disinflation took place simultaneously. In the transition countries and probably elsewhere as well, central bank independence is endogenous.

Since 1999, inflation rates in a majority of transition countries have been at developed country levels. One explanation is that monetary and fiscal discipline and improvements in institutional structure (e.g. inflation targets, independent central banks) have convincingly established the disinflation bona fides of transition policy makers. An alternative explanation might attribute this to positive external shocks that are specific to this episode. Brada and Kutan (2002) conclude that the most recent disinflation was due to positive shocks rather than the development of sound monetary and fiscal policy institutions and policies.

In this view, tight monetary policy through the 1990s only served to offset the lack of progress on true fiscal reform. Even if measured fiscal deficits declined, off balance sheet subsidies and unfunded liabilities constitute large longer run fiscal problems. Moreover, monetary policy in the advanced transition economies in the mid and late 1990s was inherently unstable. As noted above the Czech Republic quickly moved from various exchange rate pegs to floating to inflation targeting as it groped for an effective policy tool. As a result, the reduction in inflation in the late 1990s was due to something other than the influence of a credible and stable monetary policy target. Brada and Kutan conclude that an external shock, the decline in import prices, particularly energy, rather than any shift in monetary regime was the source of the later disinflation. Since tradables can account for as much as two-thirds of the components of the CPI, the shock can have a major influence on inflation rates.

This discussion serves to temper our amazement with the extent of disinflation in transition. It might well be premature to declare victory over inflation in the advanced transition countries for several reasons. First, the external shock from import prices is transitory. Second, the fiscal deficits in these countries have been worsening and are in several places as large as they have ever been. Finally, there has not been a long enough period of management with inflation targets to create an environment where inflation expectations are really quiescent.

However, there is one wild card in this discussion. It is the influence of EU accession. In 1993, the EU's Copenhagen declaration stated that CEE transition countries "that so desire shall become members of the EU." This vague commitment to expansion became reality in 1998 when negotiations with the accession countries started and culminated with the announcement in October 2002 of the first round accession countries. Eight transition countries will become part of the EU in May 2004 and two more expect to finish

negotiations and join in 2007. In addition, most of these countries expect to be part of the Euro area as well.[6] Several countries of central Europe that were left out of the first round of accession talks (e.g. Croatia) and some countries of the FSU (e.g. Ukraine) expect to be included in a second round of EU enlargement that follows soon. The consensus, among the countries already in and the transition candidates is that the economic and monetary integration of Europe will go forward rapidly. Monetary integration poses additional problems because price level convergence might generate inflation in some parts of the Euro area.

The anticipation of European integration had a strong influence on inflation, particularly after negotiations commenced in 1998. First, the high and increasing likelihood of accession led to the expectation that inflation would move towards European levels. This effect of European integration may well be the single most important influence on inflation. Second, the enormous emphasis on accession enabled policy makers to maintain a tight monetary policy in order to adjust to standards in the Euro area. Any slowdown in future accession plans or decision to limit the extent of the EU could result in inflation problems for those countries that are affected. Similarly, Russia and the other republics of the FSU which do not expect to become part of the EU and still have double digit inflation rate will have to rely on domestic policies and institutions to reduce inflation expectations. In addition, these countries may not have the same incentive to bring inflation to single digit levels and may choose to emphasize other domestic priorities.

A successful disinflation should not just result in low inflation, it should also be credible and accompanied by long term expectations that inflation will not recur. An indication of long term credibility is a willingness to hold domestic money, liquid assets denominated in the local currency. Monetization ratios are low throughout the region because of weakly developed financial systems (Bonin and Wachtel, 2003) but increases in the ratio are an indicator of confidence in the financial system and the stability of prices. Table 3 shows monetization ratios (M2/GDP) in 1995 and 2001 for transition countries. They are increasing except in countries where successful stabilization had not occurred by 1995 (Bulgaria, Belarus, and Romania). Higher monetization ratios are found in the more advanced transition countries that stabilized earlier on although the increases in the late

[6] For example, Estonia has indicated that it will join the monetary union at the earliest possible date, 2007. The Czech authorities have acknowledged that their membership in the monetary union will be delayed by some years because of the current high fiscal deficit.

1990s varied. The ratio in the Czech Republic declined a bit and in Hungary it went up by about one-tenth while in Estonia and Slovenia the increases were quite large.

3 Did inflation do its job?

Perhaps one of the most important distinguishing characteristics of the formerly planned economies was the extent to which prices were distorted. Restrictions on trade and domestic allocation mechanisms kept the prices of even internationally traded commodities from reaching their world market prices. And the prices of domestically produced goods were set administratively and could venture far from what they would be if allowed to follow market forces. Thus, the removal of controls and price setting arrangements led to a rapid change in prices. The removal of price restraints and the large overhang of liquid balances led to the immediate outbreak of inflation. Generally, the initial outburst of inflation was due to the following causes:

- Removal of price controls, constraints and administered price setting
- Seignorage financing of government
- Credit expansion to support government enterprises
- Spending of forced saving, i.e. monetary overhang.

The initial outbursts of high inflation, often at hyperinflation rates, imposed large economic costs. First, the value of financial savings erodes. Second, the support of inefficient enterprises continues. Third, hyperinflation inhibits the effective operation of the payments system. But there is also one possible way in which inflation, even at relatively high levels can be beneficial. The inflationary environment allows and encourages the adjustment of relative prices. In discussions of moderate inflation in developed countries, the costs and benefits of inflation have been called the ‘sand’ and ‘grease’ effects (Groshen and Schweitzer, 1997). The sand in the wheels of the price system occurs because inflation is associated with forecast errors so that even in a competitive system there are mistakes in price setting and distortions to relative prices.

The grease effect occurs because inflation reduces the costs of making price adjustments and facilitates changes in relative prices when some prices are rigid downwards.

The 'job' of inflation in transition was to provide the grease for price setting and bring about adjustments in relative prices. Is there evidence that relative price adjustments took place and that the structure of prices become less distorted? Did inflation do its job?

There are only a few studies that have looked at this issue indirectly by examining the degree of price variability or the extent of price level convergence. The thrust of the evidence is that a large amount of price level adjustment took place early in the transition process but that the amount of adjustment has slowed down while there are still large differences in the structure of prices between the transition economies and the developed economies. The differences that persist are related to both non-market determinants of prices and productivity differentials between traded and non-traded goods sectors (the Balassa-Samuelson effect that will be discussed later).

Coorey, Mecagni and Offerdal (1998) look at relative price variability measures such as the variance and skewness of inflation rates across price index components. They find that relative price variability is associated with the level of the inflation rates, a finding established for developed countries already. Although, it is difficult to disentangle the direction of causality between inflation rates and relative price variability, there are some inferences that can be drawn for the transition economies. First, the data suggests that the variance among price index components is both particularly high in transition countries relative to developed economies, and also higher early in the transition process. In particular, there are spikes in relative price variability when the initial price liberalizations occur and there is evidence of causality from relative price variability to inflation.[7] Although, the inflation in transition countries was clearly due to standard causes as well (money growth, wage pressures, etc.), price shocks from liberalization seem to play a significant role.

Wozniak (chapter 10 in Dabrowski, 2003) looks at disaggregated price movements in Poland, Hungary and the Czech Republic and reaches very similar conclusions. Relative price changes had an impact on initial inflation rates, particularly in Poland where the initial distortions were greatest. Through, the mid 1990s, the gradual relaxing of administered price adjustments influenced inflation rates in all countries with the biggest

[7] A disaggregated analysis of price changes in Poland (Wozniak, 1998) confirms this.

effects in Hungary. There continues to be considerable debate among policy makers about the optimal speed and magnitude of price liberalizations.

An association between spikes in price changes due to liberalization and the overall inflation rate has an interesting implication. Efforts to disinflate with standard policy tools might be a mistake if low inflation will delay relative price changes, which suggest that there is an added cost to disinflation in transition economies. That is, disinflation might have real costs if it delays relative price adjustments. Recall that most transition economies ended hyperinflation very quickly but then took several years to bring inflation below 10%. At the time this was faulted as the result of an unwillingness to maintain a credibly tight monetary and fiscal policy. However, it may well have been the correct strategy to follow because a moderately high inflation rate allows relative price adjustments to continue. Thus, the long periods of time shown in Table 2 to bring inflation from 60% to 15% per year in many advanced transition countries (e.g. Poland, Hungary, and the Baltics) may have been in retrospect a better policy than the very rapid disinflations in some countries. Of course, this argument assumes that at least some prices are rigid downwards.

There is some indication from Table 4a that the countries with slower disinflations have undergone a greater overall price level adjustment. The price levels relative to OECD averages are higher in Poland and Hungary than in the Czech and Slovak Republics, although the Czech Republic has the highest GDP per capita.[8] The latter two countries did not experience 'enough' inflation to make as much overall price adjustment. However, the extent to which price levels in the transition countries are still very different from the OECD averages is shown in Table 4b. In particular goods prices have adjusted much more than service prices, particularly government services. There are also large country-to-country differences in the adjustments.

Thus, the answer to the question posed – 'did inflation do its job?' - is probably 'somewhat.' Although liberalization of controlled prices contributed to inflation early on, not all prices were liberalized in the initial phases. Many prices are yet to be liberalized. As a result, for the implementation of inflation targeting the Czech National Bank uses a measure called "net inflation" that removes the influence of administered prices until they

[8] In 2002 Czech per capita GDP on a purchasing power parity basis was 62% of the EU-15 average. Corresponding figures for Hungary, Slovak Republic and Poland were 53%, 47% and 41% respectively. Usually relative price levels and per capita income are closely correlated.

are liberalized. Even in this advanced transition economy, about one-fifth of the CPI is netted out. Finally, price levels are still very far away from developed country experience. So, even in the most advanced transition countries, there is still a lot of adjustment to go on.

Disaggregated price movements in transition countries are clearly relevant to understanding the future of moderate inflation in transition countries. Stabilization policies are important but they do not tell the whole story. Some recent research on Albania, where conventional stabilization policy reduced inflation in the mid 1990s, presents a cautionary tale (Rother 2000, Domac and Elbirt, 1998). Monetary restraint, exchange rate pass through and, to a lesser extent, fiscal restraint led to rapid disinflation (Domac and Elbirt, 1998). However, the disinflation path was not smooth and hyperinflation almost returned in 1997 as a result of political pressures for looser policies in 1996 and the affect of the pyramid schemes on the financial sector. There is another part of the inflation story in Albania, the influence of price controls and disaggregated price movements. Although about one-half of prices were liberalized in 1992, many controls still exist. Rother's VAR analysis shows that the skewness of the distribution of price increases influences inflation. Thus, with very low inflation rates, further price liberalizations can introduce significant inflationary shocks. Thus, Albania may find itself in the quandary where it can maintain low inflation (the 1999-2002 average was about 2%) or complete the process of market liberalization but not do both simultaneously. Inflation targets can be too low if they do not allow for the accommodation of inflation shocks from liberalization or other sources. These observations could apply to many of the less advanced transition economies where disinflation may have been too successful. Aggregate policy and external shocks may have brought inflation down to levels that cannot accommodate the price liberalizations that still need to occur.

4 Can we believe the numbers?

Inflation mismeasurement and biases in calculated inflation rates are frequent topic of discussion in developed countries. The 1996 Boskin report in the U.S. provided explicit estimates of the biases in the CPI. Since that time the Bureau of Labor Statistics (BLS) has

improved both the measurement of prices and the calculation of inflation rates. Improvements include obtaining prices from new discount outlets. In addition, the index calculation now allows for regular changes in expenditure weights. In the Euro area there were similar concerns and efforts to improve price measurement with the establishment of the HICP (Harmonized Index of Consumer Prices). However, mismeasurement of prices in the less developed economies is rarely discussed. As long as the focus of interest is on a disinflation that brings inflation from, for example, 1000% to 10%, the quality of the data is not a central concern. But, with inflation rates consistently below 10% and with increased interest in cross country comparisons and small changes in the inflation trend, the quality of the data being examined is worth considering. Moreover, reliable measures of price indexes are essential for determining changes in real income.

Not surprisingly, there are some important reasons why inflation measures in the transition economies might be subject to serious mismeasurement. Filer and Hanousek (2003) summarize their extensive project at CERGE in Prague on inflation bias in the Czech Republic and some other transition countries. In the Czech Republic, the major source of bias is the failure to account for quality improvements in goods sold and the entrance of new goods onto the market. Substitution bias from the use of fixed weight indices and outlet substitution due to new markets also contribute to the measured bias. Their estimates change somewhat over time and with different assumptions but seem fairly robust. At least one-third of the measured average inflation rates in the Czech Republic (about 10% per year) are due to measurement bias.[9] The implications of this are large. Real growth (with GDP deflated by the measured CPI) over the decade was –0.7% per year. With inflation properly measured to correct for the estimated biases, the growth rate was +3.6%. A common way of measuring transition progress is to look at real GDP relative to its pre-transition (1989) level. In 1999, the EBRD data (EBRD, 2000) indicate that only three transition countries had regained the 1989 level – Poland, Slovak Republic and Slovenia. By 2001, the Czech Republic, Hungary, Albania and Uzbekistan were added to the list. With substantial price change compounded over 10 or more years, small errors

[9] The Boskin report for the U.S. provides similar results. The overall bias in the inflation rate is about 1.2% per year with an average inflation rate of 2.8%.

in index measurement can lead to substantially different conclusions. The story might be substantially different with more accurate measurement of price changes.[10]

Filer and Hanousek provide some direct evidence that indicates that economic well being has improved more than the real GDP data suggest because inflation is overstated. They conducted focus groups to determine how consumers would allocate price change to inflation as opposed to quality change. They did this by asking Czech consumers how much they would pay at the current time for a brand new 1990 good. Their results indicate that much more of the observed price change should be attributed to quality change than the official CPI does. For example, clothing prices went up more than two and half times over the decade. The index attributes about 30% of this to quality change so that the CPI for clothing more than doubled. However, when consumer perceptions are used to measure quality improvements, the price increase is only about 50%.

The measurement problems will in all likelihood diminish with time as national authorities follow internationally accepted norms and improve their data collection procedures. In addition, with moderate inflation the biases do not create such large distortions. However, economic historians looking back on the transition decade will be well advised to keep this discussion in mind.

5 Disinflation: Case studies

The experience with disinflation in the two dozen or so transition countries, all in the same decade, provides a useful laboratory to study disinflation policies. Are there particular types of policies that worked better? Which policies seemed to have generated the successful disinflations? Or in other words, how did they do it? A convenient way of addressing these issues is to look at policy history in a few countries. Following de Menil (2003), we will look at Poland and Romania and also examine Estonia and Russia.

Disinflation in Poland. The Polish government introduced a stabilization program, the Balcerowicz Plan, on New Year's Day 1990 in an economy already suffering from high

[10] Of course, the measurement of real GDP is fraught with difficulties as well. In the pre-transition era it was probably overstated and in the early transition years the output declines were very large because activity in the informal sector was overlooked.

inflation (the monthly inflation rate peaked at about 50% in 1989). The Polish zloty was devalued to half its initial exchange rate and pegged to the dollar. Both monetary and fiscal policies were drastically tightened and credit creation stopped immediately. State subsidies were withdrawn, price controls removed, foreign direct investment encouraged and privatization programs started. A large decline in production followed, forcing the National Bank of Poland (NBP) to ease monetary policy later in 1990, only to retighten a few months later. Inflation shot up and the recession intensified. The zloty was devalued again and a crawling peg was adopted. The hyperinflation had abated but inflation was still high. The intention was to gradually reduce the rate of crawl in order to control inflation expectations.

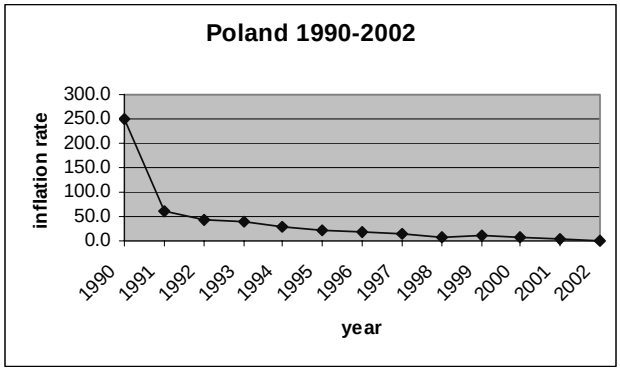
Over the next several years monetary and fiscal policy alternated between expansionary and contractionary episodes as the government tried to cope with unemployment problems, impose hard budget constraints on the government and enterprises and recapitalize the banking system. Although there were fits and starts to the stabilization, the commitment to the crawling peg as a form of inflation target was deliberate and purposeful. From 1991 to 1998 the crawl was reduced from a monthly rate of 1.8% to 0.5%, the bands were widened and inflation came down gradually. The nominal peg decreased in importance due to the widening of fluctuation bands and the NBP adopted inflation targeting in 1998, aiming for around 7 percent inflation. The targets were not met in 1998 and 1999 and the NBP risked losing its hard earned credibility. Monetary policy was eased slightly and the gains from disinflation dissipated as inflation reached double digits again.

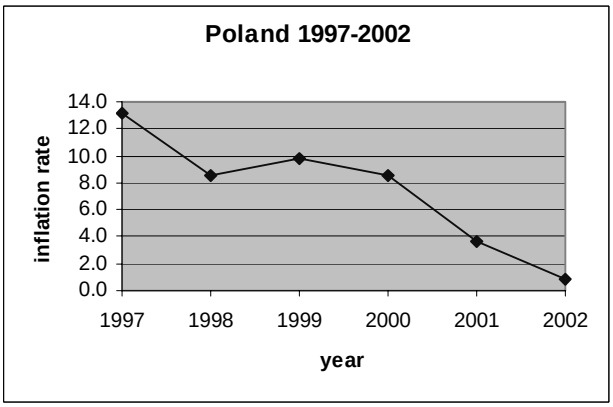
In April 2000, the monetary authorities adopted a floating exchange rate regime, and set out a goal of bringing inflation down to below 4 percent by the end of 2003. During the second half of 2000, real interest rates rose as the zloty appreciated against the euro and the dollar. The September 2001 terrorist attack against the United States further contributed to the appreciation of the zloty. The strong real appreciation of the currency had led the central bank to substantially tighten monetary policy. This environment of tight money and a slowdown in European demand led to a sharp fall in investment activity, causing to an overall slowdown of the economy. It did bring about a reduction in inflation to about 5 percent in 2001.

The story of Polish transition and stabilization can be read in several ways. First, the disinflation was extremely slow; it took a full decade to bring inflation below 5%. Second,

although growth in most recent years has been robust and Poland is often viewed as the most successful transition country, there is still substantial unemployment. Although recent GDP growth is strong, there are persistent problems such as high wages in state owned industries and persistent unemployment. The NBP has had over a decade of experience with nominal anchors. It began with a fixed peg, changed to a credible crawling peg and finally switched to an inflation target as the anchor. The rapid decline inflation at the very end of the 1990s might be due to the credibility of the NBP's inflation targeting program or to the influence of EU accession on inflation expectations.

An evaluation of the experience with inflation targets must be mixed. Inflation overshot the target bands as soon as they were introduced and then undershot them for two year is succession. As the OECD (2002, p.43) notes "the principal advantage of an inflation targeting regime over alternative anchors for monetary policy is its capacity to affect expectations." The NBP backs up its inflation target regime with a regular reporting of inflation developments by the policy council, an admirable degree of transparency.





Inflation expectations may well have come down considerably but recent macroeconomic developments do not support the sustainability of very low inflation rates. In response to a

weak economy, monetary policy was significantly looser in 2002 than earlier. Short-term interest rates went from a peak in early 2001 of 19% to 8% in mid 2002 while the inflation rate went from around 7 % to 2%. Moreover, the fiscal deficit is more almost 7% of GDP and the structural reforms that are needed to change the fiscal stance have slowed down. Finally, the zloty has depreciated against the euro, which will inevitably affect inflation in the future. Although Poland has had access to international financial markets since the mid 1990s, its Standard and Poor's long-term foreign currency credit rating has been BBB+ since 2000. The macroeconomic fundamentals are strong enough to make the future for inflation in Poland uncertain.

Disinflation in Romania. The history of transition in Romania contrasts with that in Poland. As de Menil (2003, p.283) comments "the dominant impression…of the first ten years of transition in Romania…is one of difficulty. The period was marked by a succession of crises…." Romania is the only central European transition country that has not accomplished an effective disinflation program. There are two features of macro policy that have resulted in this outcome. First, although the formal structure of a reformed banking system dates to 1991, Romanian monetary and banking policy made the banks the automatic supplier of financial resources for state owned enterprises. Second, controls over domestic prices and control over foreign exchange transactions continued to be significant influences throughout the decade.

A stabilization program was introduced in 1993 as inflation reached 290 percent and output fell by 30 percent. Although monetary policy was tightened, the currency devalued and price controls substantially reduced, the program was a short lived success because it was not accompanied by further structural reforms. Romania purposefully adopted a gradual approach to reform in order to ensure social support for the transition. From 1994-1996, Romania experienced a volatile economic environment—a period characterized by positive growth but also high inflation (averaging 50 percent during the three year span), in addition to growing macroeconomic imbalances.

The gradualist approach did nothing to reduce subsidies to the unprofitable agriculture and energy sectors. The central bank provided liquidity to the state owned banks that lent heavily to these sectors. Monetary policy was inherently accommodating because of the deterioration of the financial situation, causing persistent inflationary pressures. It was

almost impossible for the Romanian central bank to pursue any effective monetary policy as its actions were constrained by the government's economic policy.

Because of the lack of any meaningful anti-inflation instruments, the government tried to control inflation through price controls and foreign exchange transactions. Although it helped to decrease inflation from 61 percent to 27 percent from 1994 to 1995, postponing the necessary prices adjustments to stem inflation proved unsustainable in the long run. In the absence of any significant enterprise restructuring or change in bank behavior, unsustainable fiscal deficits continued and the country was back in crisis by 1996.

At the end of 1996, a new government came to power, set on implementing a bolder approach to reform. It broke with the gradualist approach and dramatically accelerated the process of structural reforms. Prices and the foreign exchange market were fully liberalized. Tariffs were reduced, and subsidies for loss-making state enterprises were removed. The reforms also gradually reduced directed credits to the agricultural sector. The government sold 60 percent of the companies from the State Ownership Fund in one year to drastically accelerate privatization. The policy of using the central bank as the main provider of credit to the real sector ended immediately.

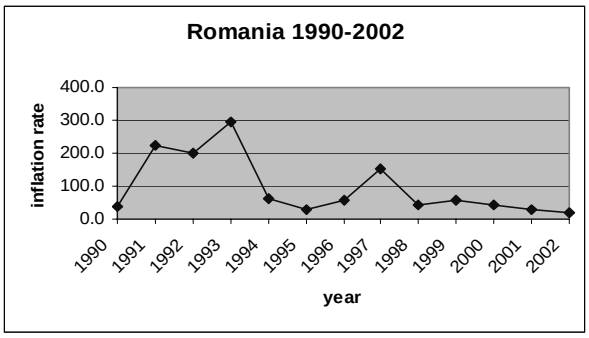
The transition shock in Romania really occurred in early 1997; output fell sharply and inflation soared to 150%. Large state-owned enterprises were among the most affected, as they had previously benefited from easy financing. The government postponed its planned large-scale restructuring of large state-owned enterprises and the NBR relaxed monetary policy.

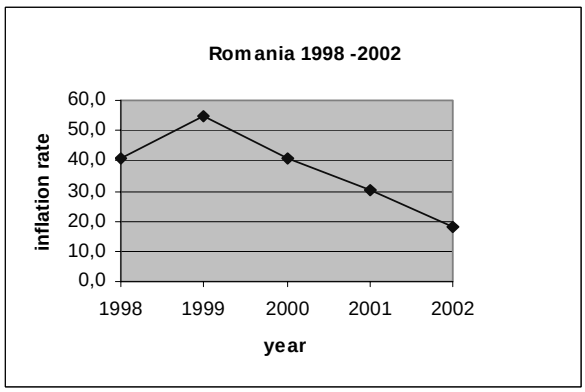
While the 1997 stabilization program failed its primary objectives, it did free up prices and correct the exchange rate. The conduct of monetary policy had been complicated by very high interest rate volatility driven by fluctuations in Treasury bill issuance, the occasional need to act as a lender of last resort to state banks, the country's weak balance of payment position, and the need to build up foreign reserves. The NBR pursued a moderate real exchange rate appreciation to temporarily help disinflation.

By the end of 1998, inflation was down to 41 percent, largely driven by real appreciation of the exchange rate. However, the East Asian and Russian financial crises inhibited further progress. Romania had difficulty financing its external deficit and in early 1999, came close to a payment crisis due to excessively low foreign reserves and an inability to refinance debts. Exchange rate depreciation and fear of sovereign default kept interest rates high.

The NBR continued to focus on exchange rate policy in 2000 because it feared productivity gains would be lost through excessive real exchange rate appreciation. Inflation fell below its 1998 level, yet remained stubbornly high at 40 percent. In July, the central bank, finally free from budget and real sector financing, announced a tighter monetary policy stance. Fiscal reforms have reduced off-budget spending and improved tax collections and so the deficit in 2002 was only 3% of GDP, relatively low for the transition countries. Inflation went down to 17 percent by the end of 2002 and continues to decline slowly. Romania was as a latecomer to transition reforms since two tries at stabilization were needed. As a consequence the fundamentals point to further reduction in inflation rates.

Romanian experience illustrates the pitfalls of half-hearted reforms. Disinflation was extremely slow and uneven because fiscal policy was not brought under control; especially enterprise subsidies continued for a longer time in Romania than elsewhere.





Disinflation in Estonia. Inflation reached 1000 percent soon after Estonia declared its independence from the Soviet Union in October 1991 and began its national existence under very precarious circumstances. The national currency, the kroon, was introduced in June 1992 and a currency board arrangement was put in place. At the same time, an ambitious program of price liberalization began. Further, 80 percent of the country's state-

owned small businesses were sold off in two years, and there were three rounds of large-scale privatization with foreign participation for major enterprises.

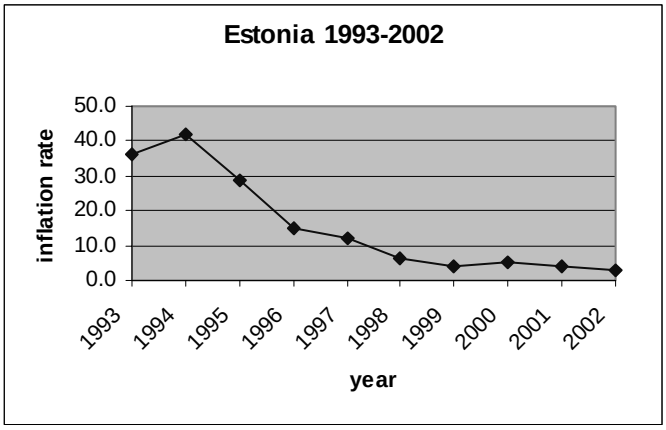
The currency board fixed the kroon exchange to the German mark. The kroon was fully convertible and central bank liabilities were fully backed by foreign exchange reserves. Loans to the government by the Bank of Estonia were prohibited, and the bank was not to be liable for the state's financial obligations. The currency board arrangement was chosen to gain credibility and provide a solid nominal anchor for restructuring.

After the monetary reform, hyperinflation continued for a few months before the first effects of the reform were seen in rapidly declining inflation level. By the end of 1993, inflation had drastically declined from four digits in the past year to 41 percent. Inflation rates continued to decline steadily over the next five years, but it was not until May 1998 that inflation reached single-digit levels. Inflation has averaged less than 4% over the last five years.

The currency board provided a credible nominal anchor and enforced fiscal discipline. As a result it is responsible for the successful disinflation. However, the currency has appreciated in real terms, which can create problems for any fixed exchange rate regime. A very large current account deficit may threaten the stability of the regime although the economy has been able to finance them without difficulty.

Price increases are also somewhat higher in Estonia compared to those in advanced economies due to the Balassa-Samuelson effect. That is higher productivity growth in Estonia due to real convergence yields convergence of the structure and level of prices as well. Thus the Balassa-Samuelson effect is estimated to cause inflation difference of about 2 percentage points compared to inflation in advanced economies (Randveer 2000). Thus, it is unclear whether there has been too much real appreciation. Also, the initial value of the kroon was probably undervalued by design.

The currency board arrangement has been the cornerstone of a successful disinflation in Estonia. Nevertheless, fixed exchange rate regimes inhibit responses to shock and it is well known that the time to exit such a regime is well before any shock occurs. So, far the Estonian economy has proven to be very flexible. For example, the 1998 Russian crises caused only a temporary fall in output.



Disinflation in Russia. As the Soviet Union was disintegrating, the old command structure of the economy deteriorated. This led to disruption of deliveries and distribution and consequently production had started to decline already under Gorbachev. The decline was further exacerbated after the abortive coup of August 1991 and the break up of the Soviet Union. Russia began a stabilization program with a large-scale liberalization of prices, which, it was hoped, would quickly lead to improved incentives for producers. Other reform measures like privatization were slated to follow later.

When the majority of consumer prices were liberalized at the beginning of January 1992,[11] the Russian price level jumped immediately upwards. This was not surprising because many Soviet era consumer prices did not even cover production costs and the Russian consumers were willing spend their large accumulated stock of monetary assets from Soviet era forced savings. Liberalization worked as predicted; consumer goods reappeared, prices increased and the value of the money overhang fell.

Monthly inflation rates in early 1992 oscillated between 10% and 35% and relative prices changed drastically. A stabilization of sorts seemed to be working as monthly inflation rates declined to below 10% in the summer of 1992. However, at the same time production continued its fall, and public finances were in disarray.

Political pressures to halt the decline in production increased. Also, a new central bank management was much more sympathetic towards central bank financing of public deficits and credits both to the government and to enterprises accelerated. This had an almost

[11] Prices for most public goods, e.g. energy, were not liberalized and rents remained administratively set.

immediate effect on inflation, and by the end of 1992 monthly inflation rate was again over 25%.

Monetary policy in Russia was complicated by the existence of the ruble zone. After the Soviet Union disintegrated, the ruble continued to be the currency in most of its successor states for some time and rules concerning the issuance of money were at best unclear. In practice, most former Soviet Union republics expanded the ruble money supply at a rapid pace to cover their budget deficits, which affected inflation in the entire ruble area. The ruble area dissolved mainly during 1993, when most successor states introduced their own national currencies (Odling-Smee and Pastor, 2001).

An effort at restabilization occurred in 1994 when the Russian parliament approved a budget with a clearly smaller deficit and Russia was able to restart its program with the IMF. Inflation expectations abated and the ruble stabilized. In the summer of 1994 monthly inflation was under 5% for the first time since the start of transition. However, by the autumn it became apparent that the government would be unable to resist demands for budget financing. Currency markets recognized this, and in October 1994 the ruble depreciated approximately 20% in one day. Consequently, inflation jumped again to more than 15% per month. In the end, federal government deficit for 1994 was more than 10%, much larger than in 1993. Although inflation was lower, it was still around 300% for the year.

At the beginning of 1995 the Russian authorities were ready for another stabilization attempt. Structural reforms were started and authorities were willing to cut expenditures in order to reduce the public sector deficit. Again, the IMF was ready to provide financing under a new program. The Central Bank of Russia adopted an informal crawling peg policy, and the rate of depreciation was chosen to be smaller than the prevailing inflation rate. Therefore gradual real appreciation of the ruble would be used as a tool for disinflation. Because Russia was dollarized to such a high degree, an external anchor was deemed important for influencing inflationary expectations. Russia did cut the federal government deficit almost in half 1995. By the end of 1995 the monthly inflation rate was consistently below 5%. However, in the run-up to presidential elections in the summer of 1996 public expenditures were increased again, and tax evasion accelerated. But this time the central bank was not forced to finance the deficit, as Russian government had gained access to capital markets. Russia was able to sell bonds, denominated both in rubles and dollars, and to both foreign and domestic investors. In 1996, although the federal

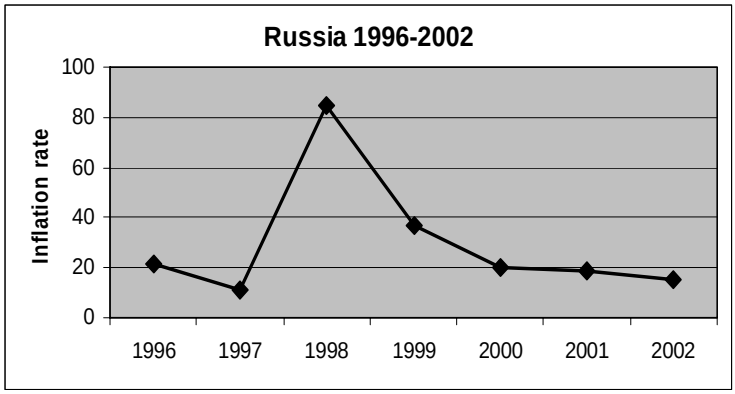
government deficit was 9.4% of GDP, the inflation declined to under 50% and fell into the teens in 1997. It seemed that the transition adjustments had taken place successfully.

Russia's fiscal difficulties reemerged in 1998 for two related reasons. First, tax collections lagged as domestic reforms faltered and second, the Asian emerging markets crisis made investors more cautious and financing of the deficit increasingly difficult. Russia's risk premium in the international bond markets shot up and although a new program with the IMF was agreed upon in July, it soon proved to be inadequate. In August Russia had to let the ruble float and declare moratorium on its debts. Monetary and exchange rate policies had been unable to contain inflation, because fiscal policy was not on sustainable path. Following the large devaluation of the ruble inflation shot up again, and immediately after the crisis monthly inflation was over 35%.

However, the reversal was short lived and, surprisingly, by the beginning of 1999 monthly inflation was again clearly below 5%. There are several reasons for this favorable development. After the devaluation Russian authorities were fairly quick in stabilizing the external value of the ruble, partly with the help of capital controls. Capital controls prevented the reemergence of foreign lending to Russian banks and thus helped curb the growth of domestic credit. Also, the fiscal deficit was curtailed dramatically, as Russia had stopped servicing almost all of its debt. Later in 1999 (and beyond) sharply higher oil prices improved Russia's terms of trade substantially. As Russian government derives a substantial part of its tax revenue from the energy sector[12], this terms of trade shock had a very positive effect on Russia's fiscal position. Fiscal surpluses beginning in 2000 have helped to keep annual inflation rates below 20% in the recent years. Also, Russia has returned to a policy of crawling peg, where the ruble depreciates fairly steadily against the dollar. The crawling peg regime provides a nominal anchor and this time fiscal policy is consistent with the exchange rate regime.

Although inflation is now low by Russia's historical standard and is fairly stable as well, Russia is the one transition country where a successful stabilization program has not brought inflation down to developed country levels. Although, high oil prices have contributed to a substantial current account surplus, the Central Bank of Russia has not been willing to let the ruble appreciate, as this would make many Russian manufacturers less competitive. Also, the central bank does not have adequate monetary policy tools to

sterilize the capital inflows, and therefore persistent inflation is the natural response. The Central Bank of Russia will most probably try to push down inflation only gradually. And as long as the Russian government is able to maintain its present fiscal stance, the central bank will not face substantial pressures to alter its own policies.



6 Is inflation inevitable in transition?

The story of inflation in transition countries is not just a tale of wild hyperinflation following a structural change that was followed by an astounding ability to disinflate. There are aspects of the transition process that inevitably lead to inflation. These issues are becoming more important now that the overall disinflation has been so successful. As we have seen, inflation rates are at 'western' levels in many transition countries. Now an

[12] Tax evasion is more difficult in this sector than elsewhere because oil flows through pipelines owned by Transneft, which is, in turn, owned by the Russian government.

important issue faced by policy makers is whether the Euro inflation rate is the appropriate target or whether inflation somewhat greater than in Europe is the appropriate and realistic target. In this event, efforts to maintain too low an inflation rate can lead to recession. In this section we will examine the reasons why some inflation is inevitable and appropriate in transition.

Inflation might be inevitable in transition due to structural adjustments, income convergence and Balassa-Samuelson effects. The size of the inflation differential is particularly important in the countries that want to join the euro area in the near future. Higher inflation, resulting from income convergence, could in principle threaten the attainment of Maastricht criterion on inflation. This could, in turn, delay the countries' entry into the euro area.

Following the seminal contributions of Balassa and Samuelson just 40 years ago, the Balassa-Samuelson effect is understood to explain the often observed tendency of prices for non-traded goods to increase faster than the prices of traded goods. The Balassa-Samuelson effect offers as an explanation the differences in productivity growth between the traded and non-traded sectors. Starting point for the analysis is the observation that productivity growth in the traded goods sector is usually faster than in the non-traded goods sector. The reasons for this in the transition countries are straightforward. With the freeing up of market controls and the opening of the economies, the sectors that were most quickly exposed to competitive pressures were the traded goods sectors. That is, it is assumed that the law of one price holds for traded goods (but not for non-traded goods). As productivity in the traded goods sector increases, wages in that sector go up as well. It is assumed that labor is to some extent mobile across sectors, and therefore wages rise in the non-traded goods sector (such as the service sector and government) as well. Higher wages in the non-traded sector are possible only if the relative price of non-traded goods increases. As wages increase throughout the economy more rapidly than average productivity, the overall price level increases as well.[13] The resulting inflation leads to an increase in the real exchange rate.

In fact, interest in the Balassa-Samuelson effect stems from the observation of real exchange rate appreciation in transition countries. The figure depicts evolution of the real

[13] An appendix includes a formal presentation of the Balassa-Samuelson effect on inflation in the traded and non-traded goods sectors and on inflation differentials between countries (i.e. the real exchange rate changes).

effective exchange rate in a number of transition countries between 1994 and 2002. We can see that there has been a general tendency for the real effective exchange rates to appreciate, although there have been reversals in the trend in some countries (e.g. in Russia after the August 1998 crisis).

The enormous interest in EU accession and convergence has led to a large number of studies that test and measure the magnitude of the effect in the transition countries. Recent reviews are provided by Mihaljek (2002) and Égert (2003). Partly this strand of literature has been prompted by the EU accession countries' desire to enter the euro area. As the entry criteria to the euro area include exchange rate stability[14] and inflation convergence,[15] a strong tendency towards high inflation rates as the pace of structural adjustment in the traded and non-traded goods sectors diverge could endanger the simultaneous attainment of both criteria. As the accession countries have grown faster than the current EU members, convergence in the income levels is taking place, although there are still considerable gap between per capita GDP in the current EU countries and the accession countries.[16] Therefore higher inflation, resulting from Balassa-Samuelson effect, is at least a possibility, if the nominal exchange rate is fixed. Also, as noted earlier, price levels in the accession countries are clearly lower than in the EU countries, and also in this respect there is room for catching up, i.e. higher inflation.

Typically, empirical efforts to measure the Balassa-Samuelson effect regress the relative price of non-traded to traded goods on indicators of labor productivity in both sectors. Some recent contributions include Arratibel et al. (2002), Coricelli and Jazbec (2001), Mihaljek (2002), and Égert (2003). Arratibel et al. use monthly data between 1990 and 2001 (when available) for 10 accession countries, and include a large number of control variables in their estimations. They find that Balassa-Samuelson effect is "relatively insignificant" in explaining inflation developments in the accession countries. Coricelli and Jazbec (2001) also include countries of the former Soviet Union in their estimation with data for 1990-1998. They find that in the early years of transition

[14] Exchange rate stability is defined as participation in the Exchange Rate Mechanism for at least two years without devaluation of the central parity and without significant tensions in the foreign exchange market. Also, the exchange rate must be close to the central parity for the two-year period.
[15] Inflation can not exceed the average inflation of the three EU countries with the *lowest* inflation by more than 1.5 percentage points.
[16] In 2002, the average per capita GDP in the ten countries slated to join the EU in May 2004 was 46% of the EU average (Eurostat, 2003).

structural reforms were more important in explaining relative price movements. Their estimate of the contribution of the Balassa-Samuelson effect is approximately one percentage point per annum. Mihaljek (2002) explains inflation differentials between the euro area and six transition countries with differential growth of productivity across sectors. The quarterly data starts from the mid-90s, and therefore avoids using observations from the early years of transition. With the exception of Slovenia, the contribution of the Balassa-Samuelson effect to the annual inflation differential is less than one percentage point.

One recurring problem in estimating relative prices is the definition of traded and non-traded sectors. Many studies proxy traded goods prices with producer price index and non-traded goods prices with consumer price index. Some others divide, for example, the GDP deflator into traded and non-traded parts. Sometimes everything except manufacturing is deemed non-traded, and sometimes agriculture is traded and sometimes not. Égert (2003) uses a very detailed dataset[17], which allows better distinction between traded and non-traded sectors. Although the study concerns only Estonia, it can also shed light on the evolution of the Balassa-Samuelson effect in the other transition countries. Although the Balassa-Samuelson effect is estimated to average between 2% and 3% for the whole sample period (1993-2002), it is shown to decline quite clearly over the decade in question. At the end of the period the inflation contribution is less than one percentage point.[18] This is quite understandable, as Estonia has rapidly converged towards the EU level, both in per capita income and in productivity.

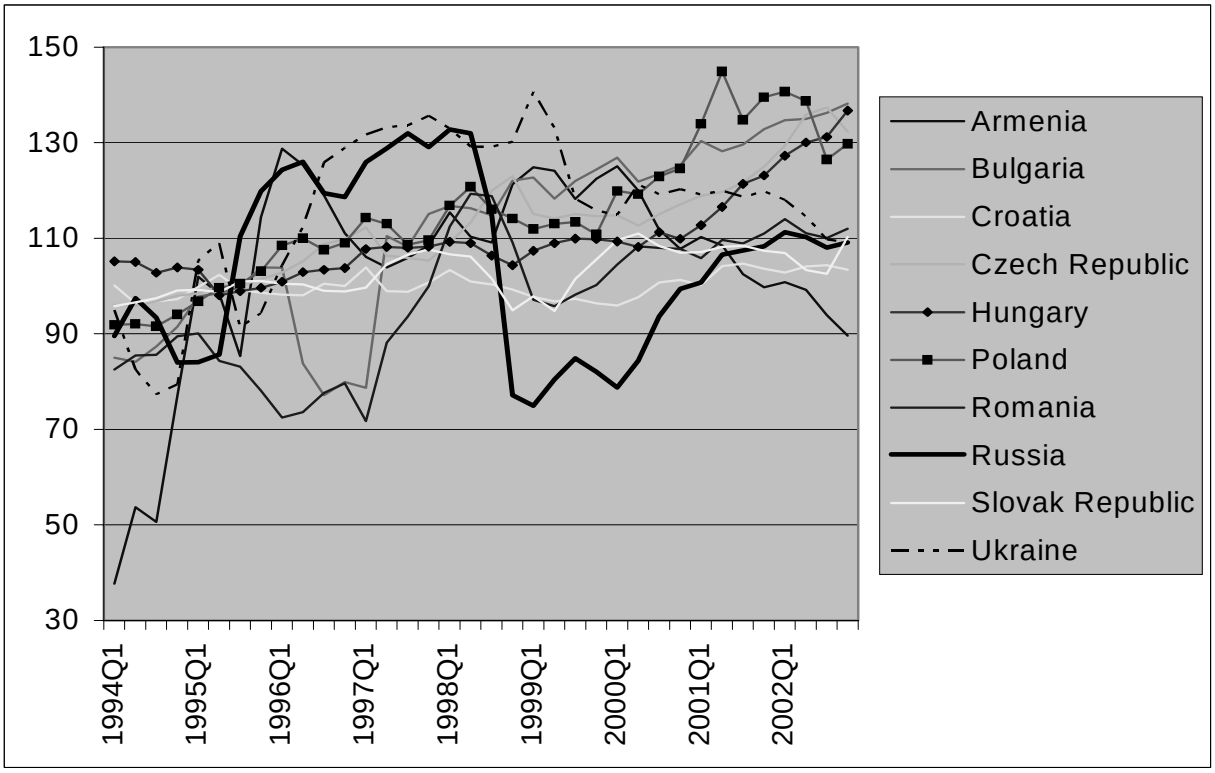
In addition, empirical studies on Balassa-Samuelson effect have concentrated on the behavior of the real exchange rates. De Broeck and Sløk (2001) examine the effect of sectoral productivity growth on real exchange rate movements in a sample of 26 transition countries (and 17 OECD countries). They find that differential productivity growth exerts a different influence on the real exchange rate in the accession countries compared to the other transition countries. In the EU accession countries the Balassa-Samuelson effect appears to have its predicted influence on real exchange rate, but in the other transition countries there appears to be very little connection between the two. In the accession countries of the Central and Eastern Europe, De Broeck and Sløk estimate the Balassa-

[17] CPI disaggregated into 260 items and GDP disaggregated into 15 sectors.
[18] As Estonia has a rigidly fixed exchange rate, the Balassa-Samuelson effect should manifest itself as higher inflation.

Samuelson effect to raise annual inflation by one percentage point at the end of the sample period.

The empirical research on Balassa-Samuelson effect confirms that it has had influence on inflation and real exchange rate developments in the transition countries. However, the estimated magnitude of Balassa-Samuelson effect is relatively small, generally around one percentage point per annum. Moreover, the size of the Balassa-Samuelson effect is supposed to decrease as income convergence takes place. This is also what is found in the empirical studies. Policymakers in the accession countries can rest easy. The thrust of the research on the Balassa-Samuelson effect suggests that inflation differentials are no more than 1-2 percent and will diminish over time.

Real effective exchange rate in selected transition countries, 1/1994-4/2002, 1995=100



7 Conclusions

Disinflation in the transition economies has been, as we noted at the outset, remarkable. It is easy to look at the equally remarkable monetary reforms and attribute the disinflation success to them. Indeed, inflation is a monetary phenomenon and the institutions for responsible monetary policy did not exist in these countries fifteen years ago. Central banks as responsible and independent keepers of monetary discipline are a new phenomenon. Moreover, the entire financial structure was geared to soft budget constraints that exacerbated inflation pressures. So, one concluding observation is that disinflation is due to rapid institution building and important government sector structural reforms in many transition countries. Inflation continues to be a problem where institutional development lags. Proponents of specific monetary policy approaches will look to the transition countries for evidence that favors a particular policy stance. However, there has been substantial disinflation with every imaginable exchange rate regime[19] and approach to monetary policy. We do not see evidence in support of a specific approach in the transition experience. Instead, the transition experience argues in favor of good macroeconomic fundamentals. In particular, fiscal constraint may be more important because it is a necessary precursor to an appropriate monetary policy.

Finally, although the disinflation has been remarkable, there can be too much of a good thing. The very low inflation rates attained in the in 2001 and 2002 throughout the region may not be sustainable. First, there are large relative price adjustments still to be made. These adjustments are similar to an external shock that can influence inflation rates. Similarly, the recent disinflation might be largely due to transitory global shocks, which mask some of the remaining problems in the transition countries. Second, any acceleration of inflation that results can easily erode confidence in policy makers and effect inflation expectations. Similarly, any slowdown in the pace of EU expansion could lead to altered inflation expectations. Third, the very low inflation rates divert attention from some of the macro fundamentals that could be problematic. In particular, recent increases in government deficits are surprisingly large. Moreover, remaining structural reforms need to effect some hard to reach sectors such as health care and pension systems. So, contrary to

[19] For a recent overview of exchange rate regimes in the accession countries, see Begg et al. (2003). Keller and Richardson (2003) discuss monetary policy frameworks and exchange rate regimes in the CIS.

our original thoughts, perhaps the roller coaster ride called transition is not over. Inflation rates might well diverge from developed country levels in many of the transition economies and it is not obvious how policy will respond.

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APPENDIX: The Balassa-Samuelson effect

More formally, we can briefly sketch a version of the Balassa-Samuelson effect. A similar exposition can be found e.g. in Obstfeld and Rogoff (1999). It is assumed that a small open economy produces two composite goods, tradables and non-tradables. If we let the subscript *T* to denote the traded sector and *NT* the non-traded sector, output is given by constant-returns technology production functions:

$$\begin{aligned} Y_T &= A_T F(K_T, L_T) \\ Y_{NT} &= A_{NT} G(K_{NT}, L_{NT}) \end{aligned} \qquad (4.1)$$

K_i denotes capital used in the sector i, and L_i labor in sector i. The supply of labor fixed at $L=L_T+L_{NT}$. Labor is immobile internationally, but can move between the two domestic sectors. This insures that workers will earn the same wage in both sectors. Capital is mobile internationally, and because of this domestic capital's rate of return is equal to the world interest rate r. We can define capital-labor ratios in the two sectors as $k_T \equiv K_T/L_T$ and $k_{NT} \equiv K_{NT}/L_{NT}$ and express output per a worker employed as $y_T=A_T f(k_T) \equiv A_T F(k_T,1)$ and $y_{NT}=A_{NT} g(k_{NT}) \equiv A_{NT} G(k_{NT},1)$. The relative price of non-tradable goods in terms of tradables is p. With this notation, we can write four first-order conditions (two relating to traded sector and two to non-traded) from representative companies' profit maximization problems:

$$\begin{aligned} &A_T f'(k_T) = r \\ &A_T\left[f(k_T) - f'(k_T)k_T\right] = w \\ &pA_{NT} g'(k_{NT}) = r \\ &pA_{nT}\left[g(k_{NT}) - g'(k_{NT})k_{NT}\right] = w \end{aligned} \qquad (4.2)$$

As r is given by the international capital markets, the four first-order conditions allow us to determine the four unknown, w, p, k_T and k_N.

To assess the dynamic implications of the aforementioned analysis, one can take logarithmic derivative of p:

$$\hat{p} = \frac{\mu_{LNT}}{\mu_{LT}} \hat{A}_T - \hat{A}_{NT} \qquad (4.3)$$

Here variables marked with "^" denote logarithmic derivatives (or very small percentage changes), and μ_{LT} and μ_{LNT} are the labor's share of income generated in the tradables and non-tradables sectors, respectively. As wages are equal across sectors, the ratio of μ_{LNT} to μ_{LT} can be written also in the following form:

$$\frac{\mu_{LNT}}{\mu_{LT}} = \frac{L_{NT} Y_Y}{p L_T Y_{NT}} \tag{4.4}$$

The Balassa-Samuelson effect assumes that purchasing power parity holds for the traded goods, i.e. their price is the same across countries (when expressed in the same currency). In the following, we use the price of tradables as numeraire and set it to be 1. If one writes the price level both in the home country (P) and rest of the world (or in the relevant trading partner, P^*) as a geometric average of the tradable and non-tradable goods, with the weight of tradables being γ, the ratio of home to foreign price level is:

$$\frac{P^*}{P} = \left(\frac{p^*}{p} \right)^{1-\gamma} \tag{4.5}$$

Here p is the price of non-tradables in the home country and p^* is the price of non-tradables in the foreign country. By log-differentiating 4.5 and using the expression for changes in the price of non-tradables (4.3), we can assess the effect of relative productivity changes on real exchange rates (or, the ratio of two countries' price levels):

$$\hat{P}^* - \hat{P} = (1-\gamma)(\hat{p}^* - \hat{p}) = (1-\gamma)\left[(\hat{A}_{NT} - \hat{A}^*_{NT}) - \frac{\mu_{LNT}}{\mu_{LT}} (\hat{A}_T - \hat{A}^*_T) \right] \tag{4.6}$$

If the ratio of μ_{LNT} to μ_{LT} is larger than one, real exchange rate of a country will appreciate, if productivity in its tradable sector, relative to the foreign country, rises faster than productivity in its non-tradables, again relative to the foreign country. It is generally assumed that this is the case in poorer countries, which are in the process of catching up with more affluent economies.

Table 1. Inflation in Central and Eastern Europe and the CIS

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Central eastern Europe and the Baltic states													
Croatia	123	665.5	1,517.5	97.6	2	3.5	3.6	5.7	4.2	6.2	4.9	2.4	2.4
Czech Republic	52	11.1	20.8	9.9	9.1	8.8	8.5	10.7	2.1	3.9	4.7	1.8	0.2
Estonia	210.5	1,076.0	89.8	47.7	29	23.1	11.2	8.1	3.3	4	5.8	3.6	1.4
Hungary	35	23	22.5	18.8	28.2	23.6	18.3	14.3	10	9.8	9.2	4.8	4.7
Latvia	172.2	951.2	109.2	35.9	25	17.6	8.4	4.7	2.4	2.6	2.5	1.9	3.3
Lithuania	224.7	1,020.5	410.4	72.1	39.6	24.6	8.9	5.1	0.8	1	1.3	0.3	-0.8
Poland	70.3	43	35.3	32.2	27.8	19.9	14.9	11.8	7.3	10.1	5.5	1.7	0.5
Slovak Republic	61.2	10	23.2	13.4	9.9	5.8	6.1	6.7	10.6	12	7.1	3.3	8.5
Slovenia	117.7	207.3	32.9	21	13.5	9.9	8.4	7.9	6.1	8.9	8.4	7.5	6.1
Median	*117.7*	207.3	35.3	*32.2*	25	*17.6*	*8.5*	*7.9*	*4.2*	*6.2*	*5.5*	2.4	*2.4*
South-eastern Europe													
Albania	35.5	226	85	22.6	7.8	12.7	33.2	20.6	0.4	0.1	3.1	5.4	3.5
Bulgaria	333.5	82	73	96.3	62	123	1,082.0	22.2	0.7	9.9	7.4	5.9	2
FYR Macedonia	114.9	1,664.4	338.4	126.5	16.4	2.5	0.8	2.3	-1.3	6.5	5.3	2.4	1.5
Romania	170.2	210.4	256.1	136.7	32.3	38.8	154.8	59.1	45.8	45.7	34.5	22.5	14.5
Serbia and Montenegro	121	9,237.0	16.5×10^{12}	3.3	78.6	94.3	21.3	29.5	37.1	60.4	91.3	21.4	12
Median	*121*	*226*	*170.6* [1]	*96.3*	*32.3*	38.8	*33.2*	*22.2*	*0.7*	*9.9*	*7.4*	*5.9*	3.5

[1] The value for Serbia and Montenegro in 1993 is not included in the median.

Commonwealth of Independent States													
Armenia	274	1,346.0	1,822.0	4,962.0	175.8	18.7	14	8.7	0.7	-0.8	3.2	1.2	6.1
Azerbaijan	107	912	1,129.0	1,664.0	412	19.7	3.5	-0.8	-8.5	1.8	1.5	2.8	2.1
Belarus	94.1	970.8	1,190.2	2,221.0	709.3	52.7	63.8	73.2	293.8	168.9	61.4	42.6	29
Georgia	79	887.4	3,125.4	15,606.5	162.7	39.4	7.1	3.6	19.2	4.1	4.6	5.6	5
Kazakhstan	78.8	1,381.0	1,662.3	1,892.0	176.3	39.1	17.4	7.1	8.3	13.2	8.4	5.8	6.1
Kyrgyz Republic	85	855	772.4	180.7	43.5	31.9	23.4	10.5	35.9	18.7	6.9	2.1	2.4
Moldova	98	1,276.4	1,184.0	487	30.2	23.5	11.8	7.7	39.3	31.1	9.6	5.2	10
Russia	92.7	1,526.0	875	311.4	197.7	47.8	14.7	27.6	86.1	20.8	21.6	15.7	13.9
Tajikistan	112	1,157.0	2,195.0	350	609	418	88	43.2	27.6	32.9	38.6	12.2	16
Turkmenistan	103	493	3,102.0	1,748.0	1,005.3	992.4	83.7	16.8	24.2	8.3	11.6	10.6	9.6
Ukraine	91	1,210.0	4,734.0	891	377	80	15.9	10.6	22.7	28.2	12	0.8	5.1
Uzbekistan	109.7	645.2	534.2	1,568.3	304.6	54	70.9	29	29.1	25	27.2	27.6	12.4
Median	*96.1*	*1,063.9*	1426.3	*1,616.2*	2512	*43.6*	*16.6*	10.5	25.9	*19.8*	*10.6*	*5.7*	*7.9*
2004 and 2007 EU Accession countries													
Median	*144*	*62.5*	*54.2*	*34.1*	28	*21.5*	*8.9*	*9.4*	*4.7*	*9.4*	*6.5*	*3.4*	*2.7*

Table 2. Disinflation thresholds

Country	Peak Inflation (1990-2002)	Peak Inflation Date	Stabilization Program Date	Months To	Inflation < 60	Months To	Inflation < 30	Months To	Inflation < 15	Months To	Inflation < 7.5
Albania	336.80	1992, Oct.	1992, Aug.	14	1993, Oct.	3	1994, Jan.	15	1995, Apr.	2	1995, Jun.
Armenia	29600.90	1994, May	1994, Dec.	13	1996, Jan.	4	1996, May	25	1998, Jun.	2	1998, Aug.
Azerbaijan	1899.00	1994, Nov.	1995, Jan.	13	1996, Feb.	3	1996, May	5	1996, Oct.	4	1997, Feb.
Belarus	2809.60	1994, Aug.	1994, Nov.	18	1996, May	NA	NA	NA	NA	NA	NA
Bulgaria (1)	304.50	1992, Jan.	1994, Dec.	8	1995, Aug.	NA	NA	NA	NA	NA	NA
Bulgaria (2)	2040.40	1997, Mar.	1997, Apr.	12	1998, Apr.	0	1998, Apr.	3	1998, Jul.	2	1998, Sep.
Croatia	1944.90	1993, Jun.	1993, Oct.	12	1994, Oct.	1	1994, Nov.	1	1994, Dec.	0	1994, Dec.
Czech Republic	67.60	1991, Jun.	1991, Jan.	3	1991, Apr.	1	1991, Jul.	2	1991, Oct.	86	1998, Dec.
Estonia	1241.90	1992, Sep.	1992, Jun.	16	1993, Oct.	18	1995, Apr.	21	1997, Jan.	20	1998, Sep.
Georgia	50654.00	1994, Sep.	1994, Sep.	14	1995, Nov.	12	1996, Nov.	2	1997, Jan.	4	1997, May
Hungary	31.00	1995, Jun.	1990, Mar.	10	1991, Jan	13	1992, Feb.	77	1998, Jul.	41	2001, Dec.
Kazakhstan	3033.30	1994, Jun.	1994, Jan.	25	1996, Feb.	11	1997, Jan.	9	1997, Oct.	10	1998, Aug.
Kyrgyz Republic	1257.00	1992, Dec.	1993, May	23	1995, Apr.	23	1997, Mar.	10	1998, Jan.	44	2001, Sep.
Latvia	1444.60	1992, Nov.	1992, Jun.	16	1993, Oct.	15	1995, Jan.	23	1996, Dec.	12	1997, Dec.

Lithuania	1412.60	1992, Nov.	1992, Jun.	28	1994, Oct.	20	1996, Jun.	7	1997, Jan.	13	1998, Feb.
Macedonia, FYR	2100.30	1992, Oct.	1994, Jan.	12	1995, Jan.	2	1995, Mar.	4	1995, Jul.	7	1996, Feb.
Moldova	2198.40	1992, Dec.	1993, Sep.	9	1994, Jun.	9	1995, Mar.	14	1996, Jun.	62	2001, Aug.
Poland	1173.00	1990, Feb.	1990, Jan.	24	1992, Jan.	43	1995, Aug.	23	1997, Jul.	44	2001, Mar.
Romania (I)	317.00	1993, Nov	1993, Oct.	16	1995, Feb.	NA	NA	NA	NA	NA	NA
Romania (II)	177.41	1997, Jun.	1998, Mar.	3	1998, Jun.	19	2002, Jan.	NA	NA	NA	NA
Russia (I)	2321.60	1992, Dec.	1995, Apr.	14	1996, Jun.	5	1996, Nov.	7	1997, Jun.	NA	NA
Russia (II)	126.52	1997, Jul.	1999, Sep.	2	1999, Nov.	4	2000, Mar.	NA	NA	NA	NA
Slovak Republic	73.70	1991, Jun.	1991, Jan.	3	1991, May	1	1991, Jun.	2	1991, Oct.	51	1996, Jan
Slovenia	88.20	1992, Dec.	1992, Feb.	NA	NA	3	1992, Oct.	32	1995, Jun.	39	1998, Sep.
Ukraine	10155.00	1993, Dec.	1994, Nov.	24	1996, Nov.	4	1997, Mar.	6	1997, Sep.	50	2001, Nov.

This table reproduces and extends the results obtained by Cottarelli and Doyle (1999) in Table 2 using an updated dataset. Periods between thresholds were defined using the three-month moving averages of annualized monthly inflation rates. When these first fell below a threshold, and remained there for a year, the country was deemed to have crossed the threshold. *Sources: Cottarelli and Doyle (1999); EBRD data.*

Table 3. Monetization ratios

	1995	2001
Albania	46.8	64.4
Armenia (M3)	7.7	13.4
Azerbaijan	12.3	12.9
Belarus	15.0	15.2
Bosnia	14.8	44.6
Bulgaria	65.4	40.9
Croatia (M4)	25.0	65.1
Czech Rep	75.3	73.4
Estonia	26.5	41.7
FYR Macedonia	11.0	29.8
Georgia (M3)	5.0	11.1
Hungary	41.9	46.9
Kazakhstan	11.4	17.7
Kyrgyz Rep. (M3)	17.2	11.1
Latvia	22.5	32.0
Lithuania	22.7	26.7
Moldova (M3)	16.5	23.3
Poland	36.1	43.8
Romania	25.3	23.2
Russia	15.5	17.7
Serbia	---	14.0
Slovak Rep.	65.4	70.5
Slovenia	27.8	41.2
Tajikstan	19.1	9.5
Turkmenistan (M3)	18.9	17.6
Ukraine (M3)	12.7	22.3
Uzbekistan (M3)	18.2	12.4

Source: EBRD data

Note: Ratios of M2 to GDP in % unless otherwise noted in parentheses.

Table 4a. Price levels relative to the OECD or the US

	Relative to OECD 29				Relative to OECD 30			Relative to the US
	1990	1993	1996	1998	1999	2000	2001	2003
Czech Republic	23	30	39	41	39	36	39	55
Hungary	38	43	44	45	42	39	43	54
Poland	29	38	46	49	45	45	51	53
Slovak Republic					33	32	33	37

Source: *Main Economic Indicators*, OECD, February 1999 and October 2003.

Table 4b Price levels relative to OECD, 1999 by type of goods

	Bu	Cr	Cz	Es	Hu	La	Li	Po	Ro	Ru	Sk	Sl	Uk
Consumer Non durables	42	77	58	60	60	63	59	61	43	40	51	87	34
Consumer Semi durables	43	90	65	72	62	93	74	68	32	53	54	85	45
Consumer durables	48	90	70	64	73	79	69	81	63	69	63	79	71
Producers goods	40	66	60	77	66	74	71	64	43	31	59	80	37
Consumer services	19	39	26	31	30	29	24	34	24	13	20	51	11
Government services	12	39	23	23	24	19	19	27	13	8	17	47	5
GDP	24	54	39	43	42	42	38	45	29	22	33	64	17

Source: *Purchasing Power Parities and Real Expenditures*, OECD 2002, Table 11.

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