THE WILLIAM DAVIDSON INSTITUTE
AT THE UNIVERSITY OF MICHIGAN BUSINESS SCHOOL

Chronic Moderate Inflation in Transition: The Tale of Hungary

by János Vincze

Working Paper Number 176
June 1998

Comments Welcome

Presented at the International Workshop in Transition Economics
A CEPR/WDI Workshop Hosted by CERGE-EI
Prague, 9/12 July 1998

Chronic Moderate Inflation in Transition: The Tale of Hungary

by
János Vincze

National Bank of Hungary

June, 1998

Abstract

In this study I examine two aspects of Hungarian inflation, with some references to other CEEs. The first is the political economy dimension, the second the mechanics of price making. Concerning the former topic I argue that the balance of payment or mercantilistic motive has been the single most important determinant of Hungarian macroeconomic policy. With respect to the second I elaborate on two (interrelated) issues: I make the claim that the nominal exchange rate is in fact a nominal anchor to inflation in a certain sense, and I try to clarify the role of relative price changes. The outcome of the investigation has important consequences on disinflation policies. The political economy thesis implies that without reducing foreign debt to comfortable levels disinflation will be awkward in either a fixed or a flexible exchange rate regime. To achieve price stability, at least initially, targeting the nominal exchange rate seems to be the most viable alternative, though this should be done in a manner different from the current system of preannounced crawling bands. Relative price developments should be taken into account when numerical parameters are rendered to the policy.

I. Introduction

At the outset of the transition several large negative supply shocks hit all CEE economies, including the Hungarian, thus a rise in the price level was something to be expected. The policy responses were multiple, some of them antiinflationary, some, however, inflationary. In Hungary a foreign debt crisis was avoided through a variety of policy measures. Devaluation was a way to improve the foreign debt situation, acting both as a price signal, and as a device to decrease domestic demand through the erosion of the value of forint balances. Tax, subsidy and regulated price changes, aimed at increasing government revenue as well as at administering warranted changes in relative prices, led also to price level hikes. The budget, when in largest need, was also financed by creating high-powered money. Thus on the whole the government and the central bank used inflation directly or indirectly to fight the crisis, and it is not by chance that stabilisation efforts were accompanied by acceleration of inflation.

The debt crisis was escaped from but inflation rates hovering between 15 and 30 % have existed thereafter. This range of inflation is usually called moderate inflation. In the early 1990s it was found (see Dornbusch-Fischer (1993)) that moderate inflationary episodes prevailing for several years had been difficult to combat.

Attempts to reduce them had occasionally met with failure, or if successful they had involved substantial costs in terms of unemployment and lost output. Apparently low inflation could be achieved with enough stamina, i.e. if the authorities wanted the reduction at even very high costs. A particularly telling experience is that of Spain. Between 1978 and 1988 inflation was reduced from 25 % to 5 %, while during the same period the unemployment rate rose from 12 % to 19 %. This illustrates the existence of a high sacrifice ratio, i.e. large output loss per 1 % reduction in the rate of inflation. The explanation offered by Dornbusch and Fischer emphasises the inertial nature of moderate inflation. However, recent evidence reviewed in Burton-Fischer (1998) indicates that the overall performance of moderate inflation stabilisers improved in the 1990s. Hungary has not achieved low inflation, and it may be asked whether it can, without a large sacrifice ratio. In this paper I search for the factors contributing to inflationary inertia in Hungary, and for ways for escaping from it.

Inflation has two aspects: the political economy aspect, i.e. why authorities create inflation, and the price formation aspect, i.e. how price-making agents behave. In a fully specified model these two facets should come together, political and private agent preferences, resource constraints etc. should be coherently formulated in a single framework. In the following I will discuss them separately for the case of Hungary. In Section 2 I argue for the overwhelming importance of the so-called mercantilistic motive for generating inflation, while emphasising that this consideration is linked to fiscal policy. In doing so I will invoke Polish and Czech experience as well. In Sections 3 the focus is shifted to price making. After some graphical and simple statistical analysis a model is set up to explain some salient features of the data. Econometric techniques are also used for substantiating claims derived from the model. In the final Section policy conçlusions are drawn from both types of analysis.

II. The political economy aspect

II. 1 Main motives for generating inflation

The principal causes why monetary authorities will act so as to create inflation can be summarised as follows.[1] 1.Government revenue. Increasing the money supply generates seignoriage (the inflation tax) income for governments. Governments might prefer this sort of revenue to tax revenue of a more explicit type 2. Mercantilistic motive. States might have balance of payments goals. This can be justified by preference for financial stability as high foreign indebtedness may make a country too vulnerable to shocks. Depreciation of the domestic currency, implying inflation, might lead to a better current account position via several channels, of which the relative price channel is perhaps the most obvious. 3. Employment motive. Labour market imperfections might result in less than full employment. Surprise inflation may be a way to decrease real wages set too high by powerful unions, for example. 4. Financial stability. Central banks tend to perpetuate inflation because they don't want to disturb financial markets too much. For instance, tough antiinflationary behaviour by central banks might necessitate abrupt increases in interest rates sometimes. This would mean that interest rates fluctuate too much, causing volatility in asset prices, too. 5. Too costly to stop. High inflation can become persistent simply because the

[1] Cukierman (1992) gives a thorough analysis of theories of inflation.

available mechanisms that would reduce inflation are just leading to the opposite effects that were invoked under points 1 through 3 above. If these effects are considered to be more unsavoury than inflation, the latter may be perpetuated. Thus motive 5 is not really an independent one; it is the mirror image of previous ones. Let me now elaborate on the two motives that seem to be most relevant for transition countries: the government revenue and the mercantilistic motives.

Government revenue motive. The government revenue motive is usually formulated in terms of seigniorage. However, inflation is a source of budgetary revenues in a wider sense than just seigniorage. There might exist political economy reasons why bracket creeping, ad valorem taxes, fees expressed as percentages of transaction values are favoured methods of raising revenue, therefore inflation induced increases in receipts can be important for governments facing difficult political negotiations, and a not too sophisticated electorate or legislature. In these circumstances revenues are automatically rising when inflation accelerates, while nominally fixed expenditures see a decline in real terms. Thus surprise inflation can be an effective way of budgetary consolidation, at least in the short term. The government revenue motive rests on a certain weakness of the political system, if raising revenues via inflation is easier than doing that through straightforward taxation. Without addressing that weakness the fight against inflation will be in jeopardy.

Mercantilistic motive. The mercantilistic motive exists usually in countries having substantial foreign debt, and results in periodic or continuous devaluation of the domestic currency in order to improve the current account. In the background one can detect an inconsistency between the real exchange rate the monetary authority feels to be optimal, and the real exchange rate implied by the structure of the economy. This is basically a policy inconsistency as appropriate fiscal or labour market policies may render the distance nil. I must underline this observation, since it shows that the mercantilistic motive is not independent of fiscal policy. For the mercantilistic motive to be rational it is necessary that nominal exchange rate changes are transformed into at least temporary real exchange rate changes, and that politicians believe that gaining time is useful because conditions determining the real exchange rate might ameliorate. As depreciation becomes more and more predictable exchange rate changes feed only inflation, and the monetary authorities can find themselves in the same sort of trap, as was the case with Israel in the 1980s. (See Cukierman (1992), pp. 83-84.)

2. The Mercantilistic motive in action

In this subsection I undertake the following task: I propose an explanation of inflationary developments in the Czech Republic, Hungary, and Poland. This is an interesting comparison since one could observe significant differences in initial (i.e. 1990) conditions, divergence in the path of later inflation, but maybe curiously, at the time of writing rather little difference between prevailing inflation rates. My explanation will be stylised, I will not go into fine, or quantitative details. I'd like to show that a lot can be elucidated by policy inconsistencies that are resolved through devaluations.[2]

[2] My maintained assumption is that nominal exchange rates have a powerful effect in the longer term on price levels in small open economies, such as the countries in question.

Though at the beginning of transition each transition country saw a substantial surge in inflation rates the three countries to be analysed faced rather different problems. In Poland increasingly high, almost hyper, inflation should be stopped. In Czechoslovakia (the predecessor of the Czech Republic) after a long period of deceptive price stability the task was to make the monetary overhang disappear without generating inflationary inertia. In Hungary inflation was no stranger, though far from being so dangerous as in Poland. Here the authorities saw their main goal as avoiding an imminent balance of payments crisis, while escaping from the threat of an accelerating inflation.

The fight against inflation was regarded as success stories both in Poland and in the Czech Republic, until recently. Poland stabilised from very high inflation and until 1997 disinflation was quite speedy. The Czech Republic achieved single digit inflation in two years, and remained there until 1997. As a contrast to these successes Hungary saw first rather rapid reduction, but then a rebound in the rate of inflation to almost 1991 levels by 1995. In the last few years disinflation is underway, but its speed is not fantastic. More recent developments show, however, some convergence. Disinflation seems to have come to a halt in Poland by 1998, and after the May 1997 crisis Czech inflation accelerated, and by the beginning of 1998 went into the double-digit range again.

Now these are the phenomena. What sense can we make out of them? My main contention is that a large chunk of these developments can be explained by the different weights given to balance of payment (real exchange rate) targets by different countries, and the policy inconsistencies these countries' policy makers exhibited. The theoretical discussion indicates that balance of payments concerns emerge if the desired real exchange rate is weaker than the actual one. It is of course a question whether desires of this sort have some "objective" basis, or are simply rooted in the tastes of policy makers.

Both theoretical and empirical investigations underline the key role of real exchange rate overvaluation in currency crises. This might be regarded as almost trivial, since it seems that a currency crisis is just a necessary downward correction in the real exchange rate, something that would not be obtained by a sharp change in relative inflation rates. (With very low international inflation this would amount to significant degree of deflation.) Though one can feel that a substantial consensus among economists exists concerning the importance of overvaluation, it must be noted that it is rather difficult to attain mutual understanding on the empirical identification of the phenomenon. Overvaluation can be theoretically defined either as a situation where the actual real exchange rate in a managed exchange rate regime is stronger than what it would be in a freely floating system, or as an upward deviation of the actual rate from its steady state value. Both definitions suffer from serious problems. The second definition is predicated on the assumption of the existence of a steady state, that can be unwarranted in a stochastic world where underlying exogenous shocks might not be stationary, or even if they are, the possible existence of multiple equilibria can also militate again the long run equilibrium notion. The first definition evades the use of such a questionable assumption, but it makes another one: there exists a unique free floating (or shadow exchange rate) at every moment. This assumption is suspect,

however. Exchange rates, similarly to other asset prices, should depend on expectations, that is in this case, expectations of future policies. Theoretical models normally employ some specific assumption to uniquely pin down the shadow rate. (For instance by assuming that after floating the flexible regime will remain in existence forever.)

Even if we can agree on the right definition of overvaluation there remains the problem of empirically identifying it. Academics and financial analysts have by and large followed two paths. One possibility is the estimation of cross country regressions, from which hypothetical equilibrium real exchange rates are derived for each country. In this case the regressors include usually fundamental variables, thought to explain the basic aspects of the real economy, as the real exchange rate is a relative price that should be determined by the real sphere n the long run. [3] A much less structural approach rests on the belief in the long run real variables should not deviate too much from their sustainable values, but and reach it on average. Here real exchange rate trends, usually defined as a long moving average, are calculated and actual developments assessed by deviations from trends. Such an approach underscored the calculations of early warning indicators in Kaminsky et al. (1997).

Whatever the methodology it is obvious that reaching consensus on the issue is practically impossible. To indicate the difficulties we can refer to Dornbusch et al. (1995). Here the authors notice that in many South American countries authorities and researchers held different views with respect to the simpler question of whether real exchange rates were appreciating during certain periods. (The question of overvaluation is obviously a much deeper one, than the seemingly statistical problem of the direction of change.) This observation points to another difficulty: to calculate real exchange rates one has to find the appropriate price index, a not at all simple task.[4]

Uncertainty about the right real exchange rate is thus overwhelming. But uncertainty invites caution. Governments that ignore the possibility that exchange rates can be dangerously overvalued can be frustrated, and forced to rethink their targets. This forced rethinking happened in Hungary in 1995, and in the Czech Republic in 1997, after in each country current accounts had been neglected for several years, and real exchange rates appreciated while inflation levels were comparatively low. Initially Czech policy makers might have had a very good case for a low sensitivity towards the real exchange rate, as both balanced budget and low external debt characterised their economy. However, this neglect, together with other policy mistakes led to significant real appreciation, a consumption boom, high current account deficits, and a much more delicate government budget than previously thought. The real exchange rate was widely expected to collapse, and the attack against the crown resulted in substantial depreciation in 1997, with the concomitant rise in inflation. In Hungary the successful stabilisation of 1991 made policy makers forget about the delicacy of the countries internal and external finances. The situation was let to worsen for several

[3] Examples for this methodology include Halpern-Wyplosz (1996).

[4] Dornbusch et al. (1995) make sarcastic remarks about the tendency of governments insisting on that exchange rates are not appreciating if they are measured in the correct way, where the right deflator is usually not the one most readily available one.

years, when in 1995 the necessary adjustment became inevitable.[5] In Poland memories of debt crisis died hard, and with a large deficit still prevailing in 1993 policy makers were more cautious with disinflating. Higher Polish inflation for years can be explained by a concern or maintaining the real exchange rate, but successes eventually numbed the sense of danger, and after 1995 appreciation increased together with substantial reduction the rate of inflation. However recently current accounts started to deteriorate again, and my guess is that some part of the stop in disinflation in 1998 can be attributed to this, and the expectations of a depreciation together with an acceleration in inflation.

Table 1 Hungary

	Current account balance in percent of GDP	CPI inflation, end of period	Percentage depreciation in nominal effective exchange rate, end of period
1990	0.7	34.6	11.8
1991	0.8	31.0	19.4
1992	0.9	24.7	4.1
1993	-11.0	21.1	11.2
1994	-9.8	21.2	21.0
1995	-5.8	28.3	29.2
1996	-3.9	19.8	12.1
1997	-2.2	18.5	11.1

Table 2 Poland

	Current account balance in percent of GDP	CPI inflation, end of period	Percentage depreciation in nominal effective exchange rate, end of period
1990	1.1	225.9	109.1
1991	-1.2	60.3	10.3
1992	1.9	44.4	33.1
1993	-0.1	37.7	25.1
1994	2.3	29.4	23.8
1995	0.7	21.9	10.2
1996	-2.4	18.7	8.4
1997	-4.4	13.2	9.3

[5] It was frequently claimed hat there was no problem with the real exchange rate, as it did not appreciate when measured on a PPI basis. However to assess the sustainability of a real exchange rate it seems advisable to have a look at current accounts as well.

Table 3 Czech Republic

	Current account balance in percent of GDP	CPI inflation, end of period	Percentage depreciation in nominal effective exchange rate, end of period
1993	2.2		
1994	-0.2	9.7	0.1
1995	-3.1	7.9	0.3
1996	-8.6	8.6	-3.6
1997	-6.0	10.0	12.3

Why inflation reduction met with, at least temporary, failure in the Czech Republic can be explained by outside reasons. Real exchange appreciation, or the parallel faster than productivity growth of real wages, might have a root in very favourable outside conditions for Czech workers and industry. Unemployment, generally not very high in the Czech Republic, is the lowest in regions bordering Austria and Bavaria. Apparently successful integration with these developed regions might have implied real exchange rate appreciation on the same lines as the famous Balassa-Samuelson argument: higher productivity in some sectors implies higher wages through wage equalisation even in sectors with lower productivity increases. Thus it is possible that a significant deterioration in competitively would have ensued in any case, but it is also probable that the lack of microeconomic reforms, resulting in inefficient corporate control for Czech enterprises did not alleviate the problem of overvaluation. Policy makers were on the other hand confident enough that keeping the peg would be feasible, and the country would have a good turn before the overvaluation ends with a currency crisis. By hindsight we know that this expectation was frustrated. It is also not the case that the crisis found Czech policy makers completely unawares, as after the crisis the reform programme was set up with notable speed, and the official analysis of the causes of the crisis might have come from a previous critic. Thus the stance of policy must have been described as optimistic gambling, which did not meet with luck.

Certainly initial conditions were much different in Hungary. Policy makers under socialism solved excess demand problems through inflation, rather than through rationing. (See Suranyi-Vincze (1998)). Inflation served as a tax on household wealth during years of macroeconomic adjustment that followed balance of payments difficulties. Thus at the beginning of transition devaluation and inflation was not a novelty, and the real exchange rate was probably an important target of policy. However, the successful stabilisation averted the attention of policy makers from external debt, and this resulted in a significant appreciation in 1992-1994, while inflation was not completely reined in. Fiscal policy and die-hard expectations both played a role in this. High deficits leading to renewed current account imbalances foreshadowed the necessary adjustment in competitiveness, which was prolonged until March 1995. On the other hand an experienced public might not believed in the tacit nominal exchange rate target, proving this by renewed speculation against the

forint, that were usually only half-heartedly accommodated, without a significant adjustment in the budget

In the eighties Poland experienced both a foreign debt crisis and very high inflation. The highly publicised stabilisation programme of 1990 relied also on international help, assuring that the programme would not be abandoned because of the shortage of foreign exchange reserves. Indeed the programme was successful, but it did not stop inflation immediately, and real appreciation followed. (Though in this case after a very substantial initial devaluation.) The concern for the real exchange rate and the balance of payment made Polish policy makers to move towards a crawling peg, and gradual disinflation. This seemed to be successful, not the least because the foreign debt situation became manageable. By 1997 Polish inflation fell to the rate of devaluation, but only after years of significant real exchange rate appreciation.[6] Poland might still prove to be a success story of successful gradual disinflation. However certain signs in 1998 indicate that disinflation might have arrived at a halt. If this is true, and there will be a rebound then the relaxing of the real exchange rate target without supporting this with appropriate fiscal policy changes must be the principal reason. Poland also saw a consumption boom, and high, though controversial balance of payments deficits, with increasing inflows. In many cases this has been a signal of a crisis and devaluation, and a rebound in inflation. Poland also has a heavily unionised labour market that may imply a real exchange rate that is too high to be safe.

My explanation of the diverse paths of inflation thus is based on the dynamics of three factors. The desired real exchange rate, derived from balance of payments concerns, the actual real exchange rate and the expectations concerning its future path. Exchange rate polices has temporaries effects on the real exchange rate, thus in case of a gap between wishes and reality exchange rate policy can be geared towards closing the gap, but in the longer-term it has an impact only on inflation. Gaps can be closed only via real policy adjustments, such as changes in the fiscal stance in a broad sense. Without fiscal adjustment monetary policy can only gain time, at the cost of higher inflation. Though real exchange rate targets are certainly not independent of policy makers' judgements, they are not completely free parameters. If markets will believe that an exchange rate target is unbelievable, keeping to it will entail either enormous costs, or be simply impossible. (Implying a run on exchange rate reserves.) Thus policy makers are sometimes forced to re-evaluate their targets (as happened in Poland in 1991, in Hungary in 1995, and in the Czech Republic in 1997). The nature of these events is such that they both result in an increase in the rate of inflation, and are preceded by somewhat larger inflation than would be otherwise expected. Thus we can say that real exchange rate appreciation is not a cause of a crisis, but rather a prelude to it. Real exchange rates seem to be inherently unstable things for developing countries, with a high potential to precipitously decline. The causes of this phenomenon are outside of the scope of the present investigation. Here I just want to point out the fact: developing countries with a view towards outside financing are vulnerable to crises, thus precaution concerning debt levels is never wholly unjustified. In effect policy makers are always betting on actually how vulnerable their

[6] The special developments of Polish inflation should be attributed to food prices, more than 35 % of the CPI basket. Relative food prices fluctuated a lot, due to cycles of protectionism and liberalisation.

economy is. History has taught us, that too much confidence has many times ended in crises.

III. The mechanics of inflation

In this section I will examine the problem whether the nominal exchange rate can serve as a nominal anchor for Hungary, that is something that can tie down the price level or inflation. As there are a priori two serious candidates, the nominal exchange rate and money. Putting the question in this way implies a bias. I will argue in the concluding section that this bias makes sense, and also that finding a nominal anchor would entail substantial benefits for policy making.

I will pursue my target in a rather eclectic way. First I will rely on a mostly graphical analysis, supplemented by stationarity tests. Secondly I set up a simple (partial) model, devised to capture some essential features of a small open economy. I will seek whether this model is consistent with Hungarian data in a qualitative manner. Eventually I will use regression analysis to see what quantitative information the data furnish us with, provided that my account of them is broadly correct.

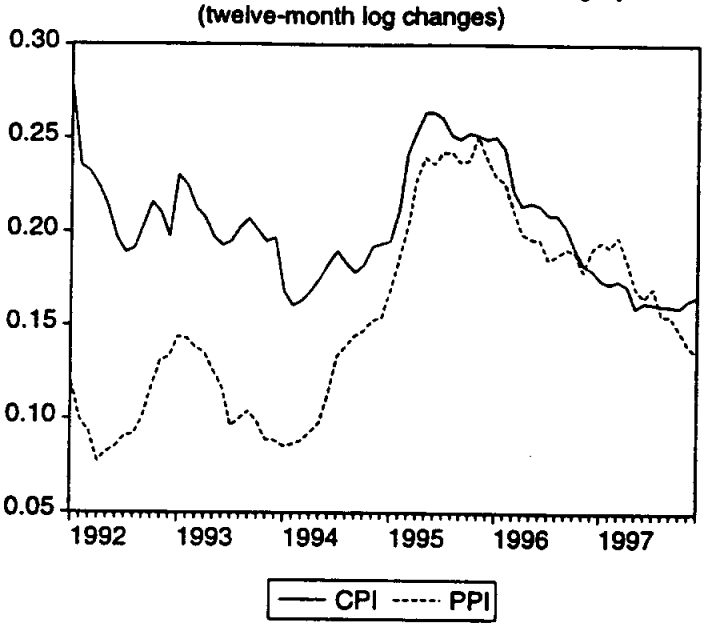
III.1 Stylised facts

In this section I describe in a graphical manner the most pertinent facts belonging to Hungarian inflation. I work with twelve-month logarithmic changes, except when otherwise stated, which, at the neighbourhood of 20 %, implies about two percentage points deviation from the annual growth rates found in statistical publications. This method of description is good for (rough) deseasonalising, and it (partly) smoothes out infrequent, usually once-a-year price changes.

Price indices

Figure 1 shows the most frequently cited price indices: CPI is the consumption price index, whereas PPI refers to the domestic sales price index of the manufacturing industry. Taking our starting point as January 1992 the chart starts after inflation peaked at the beginning of transition. Koen-De Masi (1997) formulate as stylised facts regarding inflation in transition that price liberalisation translated into a surge in the price level, and it was followed by a prolonged period of relatively high inflation. This is by and large true for Hungary, with the qualification that as Hungarian prices had been more liberalised before 1990 than those in other CEE countries, the initial burst was milder. Indeed Hungarian inflation never went as high as to meet the formal criterion given in Begg (1996) for a inflation rate in need of stabilising. Figure 1 also illustrates the fact that early in transition consumer and producer price inflation tended to diverge. (See Dittus (1994).) This gap between the two rates seemed to disappear after the 1995 stabilisation, but apparently it started to reemerge from the second half of 1997.

Figure 1
Consumer and producer price inflation in Hungary
(twelve-month log changes)

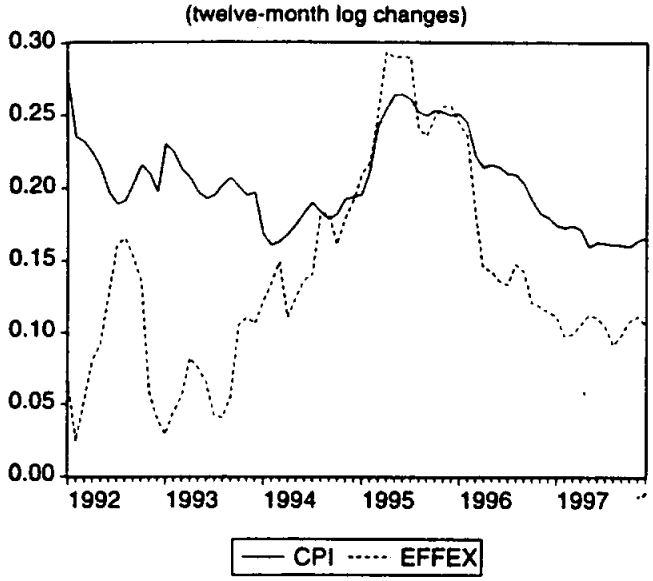


Nominal exchange rates and inflation

On Figure 2 the nominal effective exchange rate of the Forint (EFFEX[7]) is compared with the CPI. A startling feature of this figure is the apparently little coherence before 1995, and the much increased coherence after 1995. Still the increased similarity after 1995 seems to be rather qualitative The only year when the rate of change in the exchange rate and in consumer prices paralleled each other rather closely was 1995. Since 1996 both indexes have declined, but the drop in the rate of (effective) depreciation was generally several percentage points above the rate of disinflation.

[7] The effective nominal exchage reported here was calculated by Zsolt Darvas.

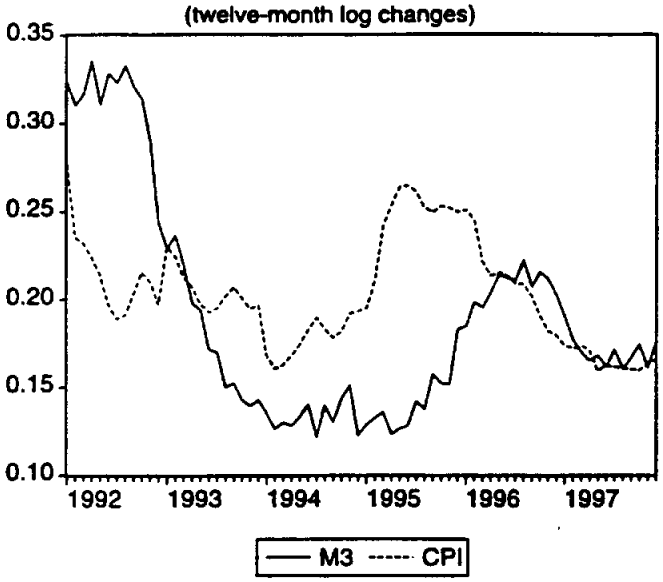
Figure 2
Nominal depreciation and inflation in Hungary
(twelve-month log changes)



Money

On Figure 3 M3 growth rates are shown together with CPI inflation. In 1992 monetary aggregates grew at a much higher rate than inflation, then until mid-1995 at quite rapidly decreasing rates, and then their growth rates started to increase again. Indeed the 1995-96 development of money growth mirrored the path of price indices, when inflation peaked, monetary growth rates stopped falling further. However, money and price growth rates converged only in 1996, and since then their growth rates have moved largely in tandem.

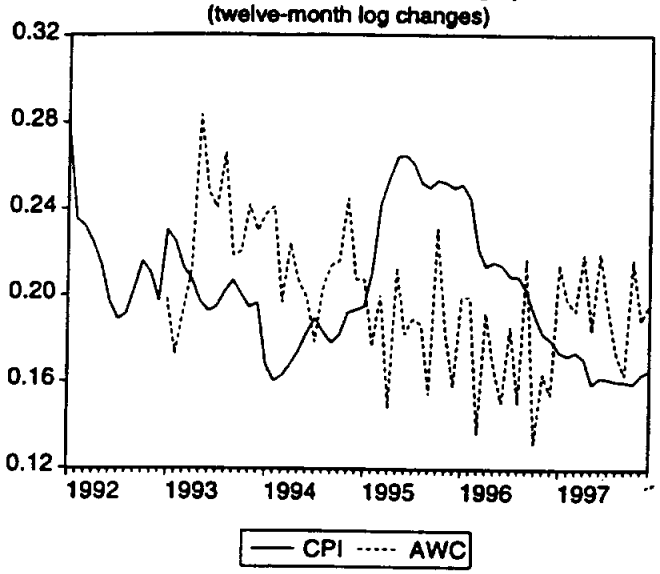
Figure 3
Money growth and inflation in Hungary
(twelve-month log changes)



Wages

On Figure 4 average wage costs in the manufacturing industry (AWC) are plotted together with the CPI. Wage costs exhibit very large high frequency variation, making the visualisation somewhat difficult. Nonetheless it appears that the longer run variance of this series is smaller than that of the CPI, and this is particularly the case after 1995. Thus nominal wages seem to exhibit more stability, in a certain sense, than any other nominal series previously examined.

Figure 4
CPI and wage inflation in Hungary
(twelve-month log changes)



The first four figures suggest that it would be very difficult to find an easy nominal anchor, either the exchange rate, or money, or the nominal wage, for the CPI. Figure I suggests that maybe the PPI, but not the CPI has a common trend with nominal exchange rates. (This amounts to saying that the price index in question when expressed in foreign currency is stationary.) I carried out Phillips-Perron tests for the PPI, the CPI, and each of its four subcomponents. Only for the tradable price index was the existence of a unit root not accepted at the 5 % significance level. Thus the tradable price index appears to be a good candidate for what it was named.

Relative price trends

Transitional economies inherited substantial relative price and wage distortions. Market liberalisation and reform of the budget have resulted in significant relative price changes. This is clearly shown to b the case for Hungary (see Figure 5). Here I plotted changes in three major relative prices, each expressed as relative to a tradable consumer price index: (The tradable price index was constructed as the part of the CPI including manufactured goods prices, but excluding clothing.) RREG is the relative price of regulated prices, (including household energy, fuel and basic communal services), RFOOD is the relative food price index, whereas INREX stands for the internal real exchange rate, that is a non-tradable tradable relative price index. (In accordance with the definition of the tradable index non-tradables include services (non-regulated) and clothing.) For each of these one can observe a clear upward trend, but there exist important differences. The trend is immediately present, and the steepest for regulated prices, in accordance with the guess that these were probably very much distorted before 1990. However, note that as these are regulated prices the increase of them must be attributed to government decisions, and not solely to market forces. Relative food prices initially even decreased, and ever since the upward trend

exhibits substantial cyclical variation. It can also be explained with the special behaviour of agricultural price setting, where supply shocks as well as government intervention can cause big fluctuation. As far as the internal real exchange rate is concerned, it started to increase in 1992, and has done so in a rather obstinate and smooth manner.

Figure 5
Relative price developments in Hungary
(monthly log-price differences)

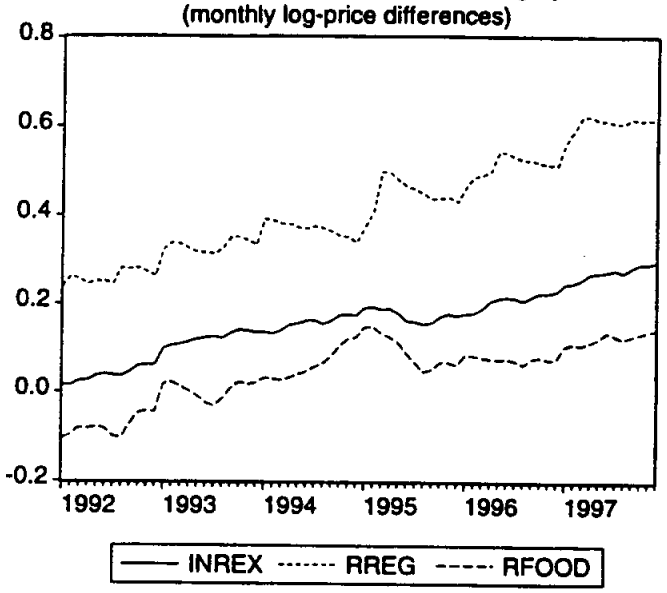


Figure 5 suggests: that relative prices may follow deterministic trends. Testing for the existence of unit roots with deterministic trends could not refute the unit root hypothesis for any of these series, on the other hand their differences did not show the presence of unit roots. There is a widespread feeling that transition requires very large changes in relative prices. The reason for this is obvious. Under the socialist regime the price system did not accomplish its function of equilibrating supply and demand, as social or other considerations asked for keeping certain prices low, while others unreasonably high. Certainly some of the required relative price adjustment occurred rather early in transition, usually following immediately upon price and trade liberalisation. However, it has been observed that relative price adjustment has proved to be a rather prolonged process that has not come to an end in most countries.

The variability of prices

Traditionally economists considered the variability of prices as one of the main costs of inflation. (See Driffill et al. (1990)). The concept of variability can be understood either as the conditional variance of aggregate inflation, or as the (cross sectional) variability of relative prices. There is a general expectation among economists to find positive correlation between relative price variability and the level of aggregate inflation, and there exists an important literature (see for instance Cukierman (1982)) that formulated hypotheses with respect to the positive correlation between relative price variability and the variance of aggregate inflation. Figure 6 shows cross-

sectional variance, when we used the 160 price disaggregation published by the Hungarian Central Statistical Office. One can see that monthly cross-sectional variance has not shown a very clear time pattern. The month to month variation is significant, and again the beginning of 1995 stands out as a special period, where the highest variance can be observed. Otherwise recent years have exhibited somewhat less cross-sectional variability than years closer to the start of transition.

Relative price change distributions are usually found to be non-normal, and this is true for our sample, too. Thus it is advisable to create several indicators for relative price variability besides cross-sectional variance. Here I show skewness, which has been suggested to be relevant for price making. Figure 7 shows a rather stationary pattern, with skewness always positive but having no distinguishable time pattern.

Figure 6
Cross-sectional variance of inflation

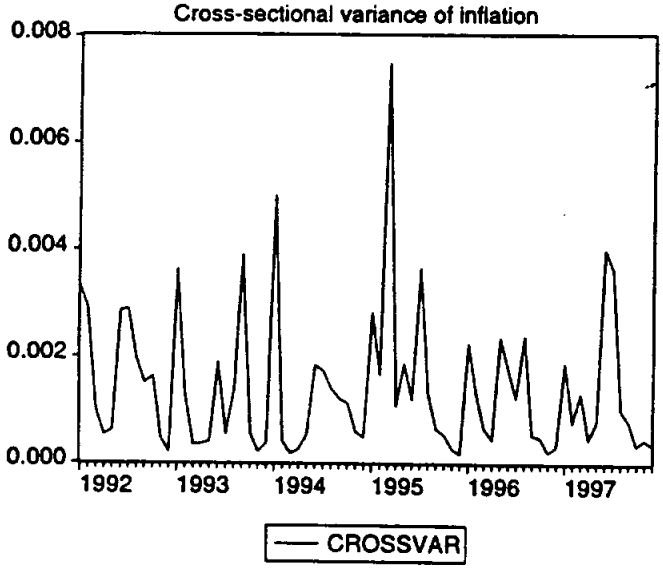
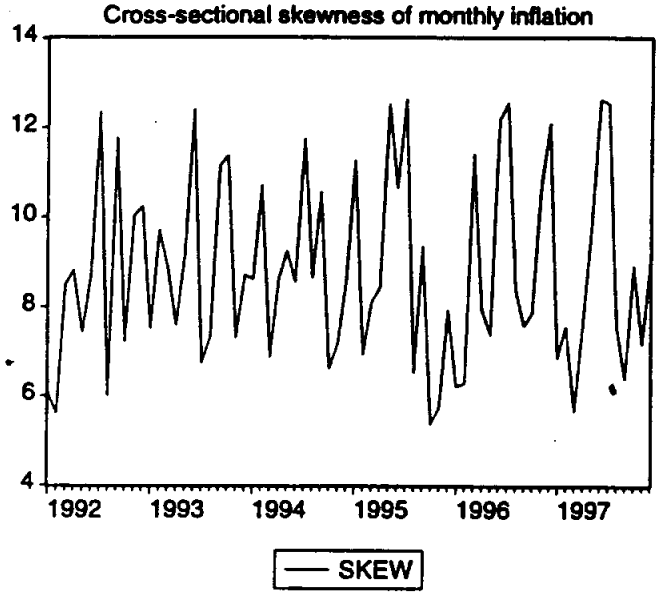


Figure 7
Cross-sectional skewness of monthly inflation



7. Productivity and real exchange rates

Labour productivity, measured as output per employee in manufacturing, clearly shows an unbroken positive trend throughout the period. (See Figure 8.)

Figure 8
Labour productivity in manufacturing
(1992:01=1, log scale)

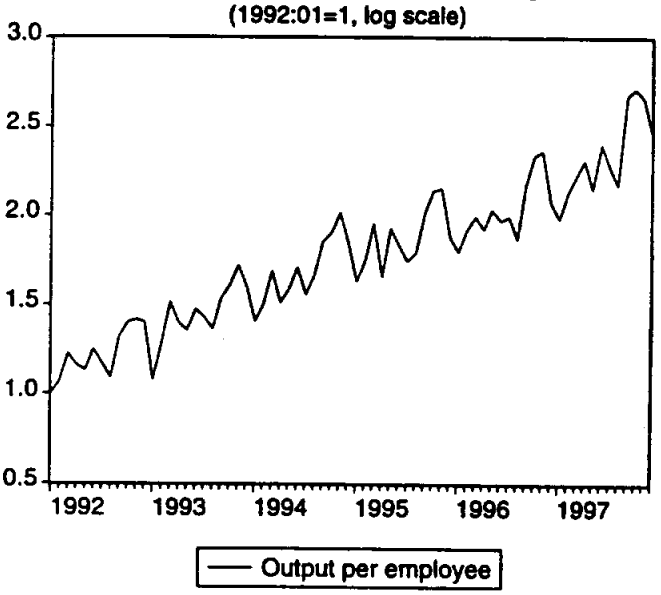
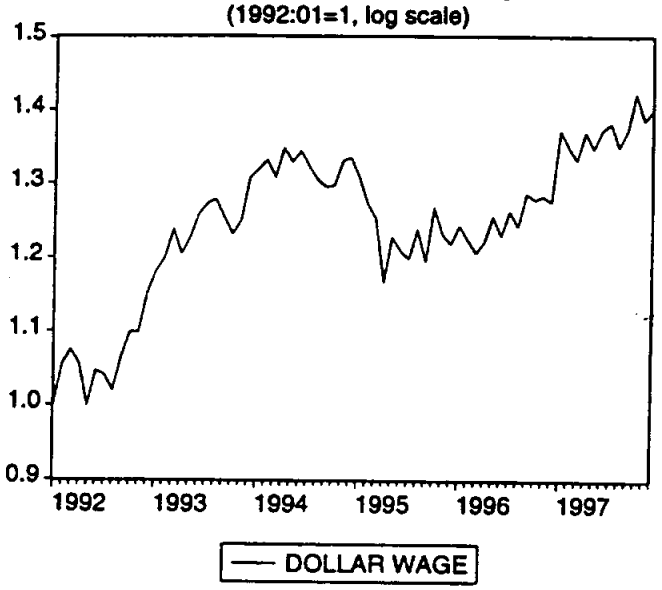


Figure 9 shows that in general the same trending behaviour applies to average wages measured in foreign currency ("dollar" wages). However, the rate of increase here is more modest, and there is some interesting variation. Between 1993 and 1995 dollar

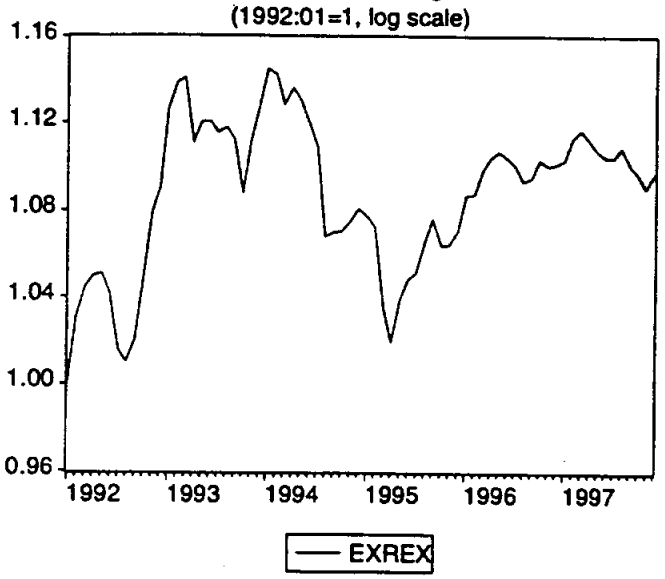
wages increased at a much higher rate, than what looks to be their long run trend. The correction occurred in the first half of 1995, and since then the behaviour seems to be rather regular.

Figure 9
Dollar wages in manufacturing
(1992:01=1, log scale)



Another possible measure of the real exchange rate is the so-called external real exchange rate (EXREX), here measured as the foreign exchange price of tradable goods (Figure 10). This index shows a large increase again between 1993 and 1995, then a correction, and an increase thereafter. However the positive trend recently is not evident, 1996-97 can be interpreted as a period where a zero trend prevails. Also looking at scales one can find that the long run change is much more meagre than in the two previous figures.

Figure 10
External real exchange
(1992:01=1, log scale)



2. The model

The following model can be regarded as a variant of the Balassa-Samuelson analysis. However here capital as a production factor is neglected. On the other hand I allow for monopolistic behaviour in the tradable sector.

In the tradable sector of the economy firms produce some output that can be sold either domestically or abroad.

$$Q=X+Y$$

Here Q is the quantity of output, X denotes domestic sales and Y exports..
The representative firm's profit function can be written as

$$\Pi=EY+PX-W(Q)$$

where E is the nominal exchange rate expressed as the home currency price of foreign exchange, (export and import prices in foreign exchange are taken to be exogenous and suppressed in the following), P is the log of domestic (producer's) price, and $W(q)$ is a wage costs function. Using the convention that lower-case letters denote the logarithm of the corresponding variable, and assuming that labour is the only variable input it is assumed that the production function is of the simple loglinear form

$$q= t + S\,l$$

where S lies between 0 and 1.

Then one can derive that the wage function is

$w(q) = w + 1/S\, q$

where w is the exogenous cost of unit labour.

Also I assume that the firm is a price-maker at home. The decision variables can be taken to be l (labour demand) and p (the domestic tradable price). Then after some straightforward manipulation one can get an expression for the dollar wage (wages in foreign currency) and for the external real exchange rate, i.e. the domestic price of the tradable output expressed in foreign currency.

$$w - e = s + t - (1-S)\, l \qquad (1)$$

$$p - e = -\log(1 - 1/\varepsilon) = EXREX \qquad (2)$$

where ε is the price elasticity of domestic demand, and *EXREX* (the external real exchange rate) is the markup, which is a function of demand elasticity..

Formula (1) shows that the dollar wage increases with technological progress, as represented by t, and decreases with labour supply, which is here taken to be exogenous. In the price setting formula (2) the role of marginal cost is assumed by the exchange rate, which is the marginal opportunity cost of selling at the domestic market. Thus the mark-up depends on demand parameters, but not on technology, or wages.

Nontradable (consumer) prices are obtained by assuming Cobb-Douglas technology in the retail (service) sector, with labour and intermediate goods inputs, together with the assumption of perfect competition.

$$pc = -tn + (1-\alpha)p + \alpha w \qquad (3)$$

where tn is the relevant productivity parameter.

Combining the three equations one gets a formula for the internal real exchange rate.

$$pc - p = -tn + \alpha(s + t - (1-S)l - EXREX) \qquad (4)$$

Obviously this relative price assimilates all of the shocks: labour supply, aggregate demand elasticity, productivity both in the tradable and non-tradable sectors. Provided that labour supply and demand elasticity shocks are stationary, it appears that if productivity growth in the tradable sector (t) times the labour share in the non-tradable sector (α) is higher than productivity growth in the non-tradable sector (tn) than this price will be upward trending. This is the so-called Balassa-Samuelson effect in this framework.

The above model demands a number of remarks. The assumption of an exogenously given export price together with the possibility to determine prices at home may seem odd. It implies that in general there will be price discrimination, and that domestic sales fetching a higher price are on average more profitable than exports. It also

implies that if prices are set before demand is realised and there is some ex post possibility to transfer goods from one market to another, then selling on domestic markets is always preferred by tradable producers, in the sense that unexpected demands there are always fulfilled if possible. However, international price discrimination, the non-fulfilment of the Law of One Price, is a generally well-established fact, and thus the model is consistent with this. The lack of market power abroad is also plausible for domestically owned Hungarian firms that are both small for the world market, and usually do not produce so specialised and so highly regarded items that would place them into a special position vis á vis their competitors. On the other hand exports are carried out more and more by subsidiaries of multinationals, or by firms that are simply production outlets of enterprises having headquarters abroad.[8]

Let us consider now the model's implications that can be compared or tested with data.

1. The external real exchange rate depends on the price elasticity of demand. This elasticity can be variable, and we can also guess that price makers adjust prices with lags, thus we do not necessarily assume that EXREX is a constant. The weaker assumption of stationarity is indeed something that is confirmed by tests. Also it must be noted that the behaviour of EXREX is apparently stabilising after 1996, thus it is not too bold to assume that in a stable macroeconomic environment stationarity will be more obvious. The model implies that technological parameters are irrelevant for the behaviour of the external real exchange rate.
2. If it is true that productivity has a trend in the tradable sector, then the behaviour of the dollar wage must be dominated by this trend, whereas labour supply shocks must also influence its behaviour. For the dollar wage it also can be assumed that slow adjustment of wages can perpetuate shocks to it, especially those caused by step devaluations. Thus we would have a model where the dollar wage and productivity are cointegrated, but short run behaviour depends on labour supply shocks. Looking a the figures one can observe important similarities between the behaviour of the dollar wage and the markup. Apparently deviations from normal behaviour occurred in 1993-1994 in an upward direction, and there was a sharp downward correction in 1995. One can easily interpret these features as the consequence of runaway fiscal imbalances in 1993-94, and then of the adjustment due to the March 1995 stabilisation package. A fiscal expansion can lead to a decrease in demand elasticity, via the increasing demand by less price sensitive agents, and also it can act as a negative shock to labour supply for manufacturing, via higher employment and salaries in the government sector. Thus we can suspect that demand elasticity and labour supply shocks are highly correlated, both stemming mainly from fiscal policy. Thus EXREX may influence the short term evolution of the dollar wage.

[8] Pujol-Griffiths (1996) is a comparable attempt to set up a small estimable mmodel for a transition economy (Poland) in order to analyse inflation. The main difference between their approach and mine is that they do not make the tradable - non-tradable distinction, and thus their producer price equation depends on all sorts of costs, including wages, and, possibly, on technological parameters. Thus they do not derive any fundamental difference for the formulas determining the PPI and the CPI. This approach is also comparable in spirit to the price formation model presented in Martin (1997).

3. For the internal real exchange rate Equation (4) indicates, as noted above, that if it is trending then its trend must lie below that of the dollar wage. Indeed even simple visual inspection shows that this is the case. For this variable the effects of the labour supply and of the demand elasticity shocks are opposite. Fiscal expansion drives up wages through the labour supply channel, but it also drives up tradable prices through reducing the elasticity of demand. Thus if the correlation between the labour supply and elasticity shocks is high, then there would not remain much beside the differential productivity growth to explain the behaviour of the internal real exchange rate. Allowing for slow adjustment of prices should also be part of the story.

3. .Econometric analysis[9]

For the external real exchange rate (EXREX) I estimated two equations. The first was a simple autoregression with two lags. I checked whether technology is a missing factor in this equation by testing for the output-employment ratio as an omitted variable. It did not prove to be significant at the 10 % significance level. The equation showed problems with the normality of residuals, due to some large outliers (see Table 1). Thus I estimated another equation, which is basically an error correction one. Here the dependent variable is tradable inflation (PTRAD), which depends on its lagged value, on the rate of change in the nominal exchange rate (DEXCH), and on lagged EXREX. (See Table 1.) Diagnostics are rather good, except that residuals appear to be heteroskedastic. Inspection of residuals indicates that it is basically due to larger errors in the first half of the sample. The output-employment ratio was again insignificant, confirming the irrelevance of technological variables. [10]

[9] In the following I will not mention seasonality. Whenever it was a problem it was treated by the inclusion of seasonal dummies.

[10] **Statistics:** Individual t-statistics are shown after coefficient estimates, and R^2 is the coefficient of determination. Other (diagnostic) statistics include: *BM: Breusch-Godfrey residual autocorrelation LM test* Testing the null of a white noise error process. *J-B Jarque-Bera Test for Normality:* Under the null of normal disturbances the statistics has a X^2 distribution with two degrees of freedom. *WH White's test for Heteroscedasticity with Cross Terms:* The null hypothesis is unconditional homoscedasticity, and the alternative is that the variance of the error process depends on the regressors, and other second order terms. *ARCH LM test for Autoregressive Conditional Heteroskedasticity CH Chow's Forecast Test* It tests for parameter constancy after a prespecified date (96:01 in this case. Associated probability values are shown in parentheses.

Table 1

External real exchange rate equations
(Sample period: 92:01-97:12)

Dependent variable	EXREX	PTRAD
CONSTANT	0.57(2.65)	0.16(2.46)
EXREX(-1)	1.22(10.93)	-0.03(-2.42)
EXREX(-2)	-0.34(-3.23)	
PTRAD(-1)		0.67(8.20)
DEXCH		0.06(1.84)
R^2	0.86	0.63
JB	13.07(0.01)	0.60(0.74
BG F	0.27(0.77)	0.07(0.94)
ARCH F	0.00(0.97)	2.32(0.13)
WH F	1.81(0.17)	2.17(0.04)
CH F	0.14(0.99)	0.58(0.92)

The model suggests that the dollar wage (DWAGE) can be cointegrated with tradable productivity, measured by the output-employment ratio in manufacturing (OULAB). For the short sample unit root tests were not in favour of this hypothesis at conventional significance level. First I ran a regression for the dollar wage, having its lagged value, the output-employment ratio, and the external real exchange rate as regressors. The inclusion of EXREX can be thought of as a test whether shocks to labour supply and to aggregate demand are correlated. Indeed the first column in Table 2 shows that both productivity and aggregate demand seem to be influential on the dollar wage. Residual autocorrelation remained a problem. Then I estimated another equation explaining the behaviour of changes in the dollar wage (DDWAGE) where I used the residual from the regression of the dollar wage on the output-employment ratio (RESDW), capturing the influence of productivity growth, beside the external real exchange rate. (This equation was estimated by instrumental variables because of the endogeneity of EXREX.) From a statistical point of view this equation behaves quite nicely.

Table 2

Dollar wage equations

Dependent variable	DWAGE	DDWAGE
CONSTANT	0.69(1.38)	-1.51(-2.28)
OULAB	0.06(3.33)	
EXREX	0.45(3.12)	
EXREX(-1)		0.32(2.29)
DWAGE(-1)	0.69(10.28)	
DDWAGE(-1)		-0.25(-2.24)
RESDW(-1)		-0.21(-2.75)
R^2	0.92	0.17
JB	0.40(0.82)	1.73(0.42)
BG F	7.17(0.00)	1.27(0.29)
ARCH F	0.05(0.83)	0.05(0.83)
WH F	0.95(0.46)	1.60(0.11)
CH F	0.96(0.53)	0.63(0.89)

Having no data that would proxy non-tradable productivity growth I first attempted to regress the internal real exchange rate (INREX) on a simple time trend. For the residuals the existence of a unit root could not be refuted at conventional significance levels. Still, I tried to model deviations from the estimated trend (DENTR). Table 3 shows the unsurprising finding that it is slowly changing, and also that the external real exchange rate seems to influence the internal one to some extent, consistently with the model's predictions. Regression diagnostics are rather bad for the first column. Inspection of residuals showed, that the problem was again with the first part of the sample. Reestimating on a sample starting at 1994:01 (see second column) results appear to be more promising, though. (Both equations were estimated by instrumental variables because of the endogeneity of EXREX.)

Table 3

Internal real exchange rate equations

Dependent variable	DENTR (1)	DENTR (2)
CONSTANT	-0.35(-2.63)	-0.53(-3.30)
DENTR(-1)	0.90(21.59)	0.95(20.85)
OUREX	0.07(2.61)	0.11(3.27)
R^2	0.92	0.92
JB	11.97(0.003)	1.62(0.45)
BG F	3.08(0.05)	0.78(0.47)
ARCH F	0.05(0.83)	0.02(0.90)
WH F	5.56(0.00)	2.32(0.02)
CH F	0.53(0.96)	0.37(0.98)

On the whole the results can be interpreted as giving support to the Balassa-Samuelson type model outlined in the previous subsection. (Most statistical problems can be traced back the to beginning of the sample (1992-1994).) This may raise hopes that forecasting inflation with some precision would be feasible with a model that contains in its core some variants of the equations reported above. Apparently by forecasting, or treating as exogenous, the nominal exchange rate one could produce reliable forecasts for the external exchange rate, which would help in forecasting the internal exchange rate, i.e. non-tradable prices. The nature of dollar wage developments can be assessed from the dollar wage equations, i.e. whether changes are stemming from productivity or from some sort of demand shocks.

IV. Policy conclusions

1. Disinflation and financial vulnerability

The analysis in Section 2 suggests that balance of payments concerns have been of enormous importance for exchange rate policies in CEEs. Also it indicates that when real exchange rate concerns were unheeded markets forced exchange rate adjustments on countries. Section 3 shows in some detail how relevant the nominal exchange rate is for inflation in Hungary, thus we can conclude that balance of payments problems are directly relevant for disinflation policies.

Strictly speaking my analysis claimed that governments or markets will probably engineer a depreciation if the balance of payments turns into the wrong direction, feeding thereby inflation. However, one can take a broader view of the problem, and may say that the fundamental problem is financial vulnerability, an issue that recently has been given tremendous attention. It seems that in the Czech Republic and in Hungary vulnerability has been associated with increasing current account deficits and excessively looking real exchange rate appreciation, whereas Polish policies through most of the 1990s were aimed at avoiding the reappearance of these phenomena. The real exchange rate and the current account are best regarded as endogenous variables that can be influenced by certain types of polices, but cannot be directly determined by them. The Hungarian analysis indicates the relevance of fiscal policy, and via inflation

inertia, the temporary relevance of exchange rate policy as well. There might be many other factors relevant for the issue, but whatever the true mechanism behind the emergence of twin phenomena of real exchange rate appreciation and increasing current account deficits, it must be emphasised that countries prone to suffer from capital flow reversals will either pay serious attention to them or incur risks of a currency crises. The recent Czech experiment is particularly relevant to this issue, as it serves as recently available evidence for an association for both markets and policy makers. In a rather old article Herring-Guttentag (1984) borrows the concept of "availability heuristics" from experimental psychology to explain sudden shifts in banks' behaviour. This concept may be relevant for understanding currency crises, and government policies as well. In situations where some rare uncertain event is the issue people are liable to give huge weights to recent (psychologically available) events to form expectations. Thus we can predict that in the foreseeable future current account deficits and real exchange rates will be in the focus of both policy makers and financial markets, thus a when any or both of them would "deteriorate" would give rise to preferences for nominal exchange rate depreciation. Thus we may conclude that vulnerability should be decreased in order that policy makers become more confident with exchange rate policies, and tolerate significant appreciation even in the short term.

From the above it follows that without the support of fiscal policy disinflation would not be permanently successful, and its speed will also depend on the fiscal stance. Observable fiscal balance may not be the best indicator of it.. Other Easter European experience shows that those countries that exhibited substantial rebounds in inflation rates after successfully looking initial stabilisation (Bulgaria, Romania) had government budgets going bust. In the case of Hungary fiscal imbalances cam easily explain the increase in foreign debt between 1992 and 1994, and thus provided the basis for the acceleration of inflation in 1995. Though the Czech budget has always looked strong, accounting for contingent liabilities having to do with weak corporate governance and banking sector problems, must have raised deficit figures substantially.[11] I would like to argue even more strongly in favour of a tight fiscal stance, in the same flavour as was done by Begg (1997). Probably the only arm of government that can have permanent effects on the real exchange rate is fiscal policy.[12] Thus if present real exchange rates are thought to be vulnerable fiscal adjustment is the only thing a government can really contemplate, as an alternative to doing nothing. If Central European countries are really vulnerable in this sense, and thus should achieve significantly lower levels of foreign debt, then this may imply that fulfilling Maastricht debt and deficit criteria is just not enough for them. Especially with large private capital inflows there is a case for reducing public debt even beyond the point where present EU directives say they should be. This is not a very popular advice for fiscal policy as some may believe that adjustment so far has been

[11] Off-balance sheet government activities are seen to be crucial to understand the East Asian crises, where countries seemingly pursuing tight fiscal policies were found to be weak.

[12] Incomes policy must be effective only as part of fiscal policy. Fiscal policy must influence the labour demand curve when state employment is large. However, government sector wage reductions have proved to be counterproductive in many cases. They would increase corruption, and lessen the efficiency of the government. A smaller government sector with higher average wages might have a more lasting and favourable impact on the labour demand curve.

tremendous, for instance in Hungary. It may seems to be politically crazy and unviable.

2. The role of monetary policy

According to the analysis included in Section in Hungary the nominal exchange rate ties down the rate of inflation in the sense that it basically determines a significant part of the CPI, while the relative price of other items depends on real factors, that can be reasonably approximated by trends. Thus the exchange rate can be used as a nominal anchor by whose manipulation the rate of inflation can be controlled. I could not propose a rigorous test against possible alternatives to controlling inflation. Recently the idea of utilising a monetary aggregate has been gaining reputation. (See Begg et al. (1997) and Coorey et al. (1998).) Though I did not address the problem in earnest M3 does not look like an anchor for Hungary by visual and simple statistical tests I reported. Anyway for money to be anchor requires the satisfaction of rather complex conditions. Indeed one should demand the existence of a stable money demand function. On a priori grounds one can be suspicious of the usefulness of any money demand function econometrically estimated, even if it would look well. Reported estimates rely on panel data, but it would be rather strange if any central bank would base its policy on a money demand function where its country is pooled with other countries. Some central banks in CEEs apparently utilise money demand functions, but it is far from clear exactly how. Problems of identifying any scale (transactions) variable are forbidding in my opinion. Beside the uncertainty of GDP or other activity measures asset trade involves also transaction demand for currencies. For Hungary this must be very relevant, partly because of the still underdeveloped payments system, and partly because of tax avoidance. Also money demand must depend on the black economy and on explicitly criminal activities. Indeed the parallel movement of money and prices in recent years must be illusory. Another practical issue is that as until now monetary policy practically pegged the exchange rate, money must have been largely endogenous. A shift in regime would question the validity of parameter estimates, and would invoke Goodhart's Law.

Another possibility would be to use some interest rate rule. The reason against resorting to this road is practical. Their application would require again either the existence of an explicit model or the measurement of some "gap" variable to measure inflationary pressures. . Any statistically based estimate of the natural level of GDP or NAIRU is highly suspect at this stage. There are very few data, of questionable quality, and estimation would require necessarily some heroic assumption. Also the consequences of interest rate rules on the market exchange rate would be rather uncertain. To some extent targeting the nominal exchange rate is the best solution by default. One needs only to identify a part of the CPI which is reasonably "tradable", and try to capture short run movements statistically. Her our chances are better, as we have better quality price information, and with higher frequency data. Relative price trends appear to be quite stable to justify the assumption that local trends can be used for their forecast.

From what I have written it can be inferred that disinflationary policies must rely on targeting some weighted average of inflation and real exchange rates, with state-dependent features. Obviously the budget and the balance of payments must be

relevant state-variables, but foreign conditions must be taken into account as well. The analysis in Section3 suggests that the dollar wage, or rather unit labour costs, and also the external real exchange rates should be included in the relevant real exchange rate target, as they can give information aggregate demand, and labour market shocks, that are not immediately present in deficit measures.

Also it seems reasonable to use the nominal exchange rate as an operative target, but in a more flexible framework than that prevailing now.[13] Indeed flexibility is important, and the lack of unnecessary commitments. The policy would aim at reducing the trend rate of inflation, but it must be made clear that it must not come at every cost. To put it simply: doing it at every cost is just not credible for a country like Hungary. The lack of commitments can be of some help against speculative attacks, though it would be unwise to believe that it would reduce their probability to nil. Then of course policy credibility would be an issue that must be solved somehow.

The appropriate operational procedures should involve the exercise of both exchange market intervention and setting central bank rates, or open market operations. It is rightfully feared that without some intervention exchange rates might reflect too much short term relative yields considerations. High interest rates can lead to temporary overvaluation even if it would not prevail in the longer term. To prevent this from occurring direct intervention on the foreign exchange market may become necessary. We just do not understand well enough foreign exchange markets to use indirect methods solely for exchange rate targeting purposes.[14]

The finding that the Balassa-Samuelson type analysis has a chance to satisfactorily describe the Hungarian economy might mean for some that the extent of overvaluation puts a floor on inflation, because negative inflation rates cannot be achieved even in the tradable sector. I do not think that it should be the case necessarily. In fact in the longer term the forint may appreciate in nominal effective terms and this would led low (less than 5 %) inflation rates. However, if one of our goals is to have a stable exchange rate vis a vis the euro, this indeed may result in more than 5 % inflation almost necessarily, and for reasons grounded in the real economy. This ramification is important when one wants to design future convergence criteria for Hungary.

***

Inflation is largely decided by political preferences. Largely but not totally. Also political preferences are not just a matter of taste, as they should be rooted in viability considerations. Disinflation programs must be robust in the sense that possible exogenous shocks should not deviate the program from the planned course. Different economies may exhibit various weaknesses that may be liable for failure. My contention is that transition countries suffer from delicate external equilibrium, stemming from their need to modernise, i.e. make substantial investments, but without

[13] In fact the Reserve Bank of New Zeeland is generally thought to use the nominal exchange rate as its operative target.

[14] It might be expected that intervention will be biased towards avoiding appreciation.

a high enough propensity to save to escape from accumulating foreign debt. To be highly indebted would not involve any problem only in an idealised world with well-informed and rational creditors and debtors, and, accordingly, smoothly functioning markets. Recent turbulence on capital markets might be indicative of how far, still, reality is from the ideal. This justifies the claim that policy makers should not necessarily aim at fast disinflation, as it might risk toppling the precarious external balance. Or alternatively they may give a larger weight to price stability, and neglect the danger of a debt crisis. This is indeed up to judgement and taste, and can be successful. It would be wrong to conclude from the failure of the Czech attempt that it was bound to founder. Still this example may serve as a useful warning that one should be very strong on the side of real fundamentals to be comfortable with a determined attack on inflation. Decreasing financial vulnerability can involve some output sacrifice, but my guess is that it would not be tremendous. It does not seem to be the case that inflationary inertia in Hungary has been caused by labour market rigidities (see Blanchard (1998).) However, there is little chance that vulnerability can be reduced close to zero in the foreseeable future, implying that inflation would be irreversible, without getting rid of the national currency.

References

Ball, Lawrence and N. Gregory Mankiw (1994) Asymmetric Price Adjustment and Economic Fluctuations, The Economic Journal, pp. 247-262.

Begg, David, L. Hesselman and R. Smith (1996) Money in transition: how much do we know?, IMF. European I Department.

Begg, David (1998) Disinflatioin in Central and Central Europe. The Experience to Date, to appear in Cottarelli-Szapáry (1998).

Begg, David (1997) Pegging-out: Lessons from the Czech Exchage rate crisis.

Burton, David and Stanley Fischer (1998) Ending Moderate Inflations, to appear in Cottarelli-Szapáry (1998).

Coorey, Sharmini, Mauro Mecagni and Erik Offerdal (1998) Designing Disinflation Programs inTransition Economies: The Implications of Relative Price Adjustment, to appear in Cottarelli-Szapáry (1998).

Cukierman, Alex (1992) Central Bank Strategy, Credibility and Independence: Theory and Evidence, The MIT Press.

Cottarelli, Carlo and György Szapáry (eds.) (1998) Moderate Inflation: The Experience of Transition Economies, International Monetary Fund and National Bank of Hungary.

Dittus, Peter (1993) Consumer prices outpacing producer prices: a problem? Bank Review 4, pp. 45-57

Dornbusch, Rudiger, Ilan Goldfajn and Rodrigo O. Valdes (1995) Currency Crises and Collapses, Brookings Papers on Economic Activity, No. 2.

Dornbusch, Rudiger and Stanley Fischer (1993) Moderate Inflation, The World Bank Economic Review, Vol 7, No. 1. pp. 1-44.

Driffil, John, G.E. Mizon, A. Ulph: (1990) The costs of inflation, 1013-1066, in: Handbook of Monetary Economics, Vol. II., eds. by B.M. Friedman and F.H. Hahn, Elsevier.

Guttentag, Jack and Richard Herring (1984) Credit Rationing and Financial Disorder, Journalof Finance, December.

Halpern-Wyplosz (1995) Equilibrium real exchange rates in transition, CEPR Discussion Paper.

Kaminsky G. L., Lisondo, S.- Reinhart, C. M., (1997). The Leading Indicators of Currency Crises. CEPR Working Paper.

Koen, Vincent and Paula De Masi (1997) Prices in transition: Ten stylised facts. IMF Working Paper.

Martin, Christopher (1997) Price formation in an open economy: Theory and evidence for the United Kingdom, 1951-1991. The Economic Journal, September.

Pujol, Thierry and Mark Griffiths (1998) Moderate Inflation in Poland: A Real Story, to appear in Cottarelli-Szapáry (1998).

Surányi, György and János Vincze (1998) Inflation in Hungary (1990-1997) to appear in Cottarelli-Szapáry (1998).

Vincze, János and István Zsoldos (1997) The Structure and Level of Consumer Prices in Hungary (1991-1996) (in Hungarian) Bankszemle, 1997/6.