

Achieving Low Inflation in Transition Economies

The Role of Relative Price Adjustment

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Many transition economies have been unable to reduce inflation to low levels on a sustained basis. Monetary growth has been a dominant factor. Relative price adjustment and nominal wage shocks are also partly to blame, but their impact on inflation can be modified by monetary and exchange rate policy.

MANY TRANSITION economies have succeeded in reducing very high inflation rates to 15–30 percent annually. But few have succeeded in achieving inflation rates below 10 percent on a sustained basis. Are loose financial policies and strong wage pressures—the usual culprits—fueling inflation in the transition countries, or are there forces peculiar to these economies that make it difficult to bring inflation rates down rapidly? Is the ongoing adjustment of relative prices—a necessary process in the transition economies—responsible for the failure to achieve and sustain low inflation rates?

If relative price adjustments are an important factor, reducing inflation to low levels in these countries may be associated with some cost in terms of growth. In countries where relative price shocks are significant, a rapid reduction in inflation is likely to bring about a greater output loss if economic agents whose prices have not increased resist or face costs in adjusting their own prices. When prices are “sticky,” their downward adjustment normally occurs through unemployment and recession or, in fast-growing economies, through a temporary slowdown in growth. Since structural transformation is associated with large relative price shocks that may make disinflation costly in the short term, transition countries need to take care that attempts to meet low inflation targets do not result in delays to structural reforms. If structural reforms are postponed, any reduction in inflation is likely to be short-lived, as economic pressures will inevitably spill over and lead to renewed bouts of inflation. (For example, keeping prices for public services artificially low may require unsustainable fiscal subsidies that create inflationary pressures.)

What is the link?

According to classical economic theory, changes in relative prices are caused by real shocks and should not necessarily lead to an overall increase in the price level—that is, inflation. Nevertheless, a link between inflation and the variation of relative prices has been observed in the market

economies since the 1920s. Measuring relative price variability in an objective and consistent manner across countries is not a simple task, however, not least because of the lack of comparable data. The literature defines the relative price change of a good in relation to an aggregate price index such as the consumer price index (CPI). For instance, if the inflation rate for bread exceeds the overall inflation rate of the CPI, the *relative* price of bread can be said to have increased.

It follows that large relative price shifts would result in a greater dispersion of the inflation rates of individual goods or services (“commodities”) around the inflation rate of the overall index—that is, an increase in the *variance* of the inflation rates for individual commodities (Diagram 1). A country that liberalizes prices and undertakes substantial structural reform can be expected to have a greater variance in the distribution of its commodity inflation rates than a fully liberalized country or one that undertakes no reform. The question of whether relative price adjustment is associated with overall inflation can then be analyzed empirically in terms of whether changes in the variance of individual commodity inflation rates are systematically related to shifts in the inflation rate of the CPI (Diagram 2).

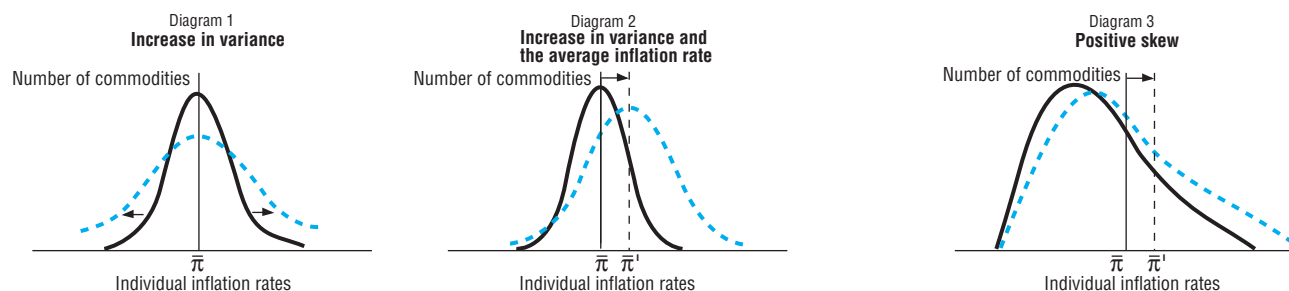
Variance is not the whole story, however. Recent literature on the subject suggests that if relative price shocks cause inflation—rather than the reverse—then one should observe a distribution of commodity

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What is the link between relative price shifts and inflation?



Source: Sharmini Coorey, Mauro Mecagni, and Erik Offerdal, 1996.

$\bar{\pi}$ = the average inflation rate of the consumer price index.

inflation rates that is skewed in a positive direction (Diagram 3). This is because an increase in variance alone need not cause inflation to accelerate if increases in the prices of some goods are matched by declines in the prices of others. However, if price adjustment is sticky—either because producers and wage earners resist lowering their prices or because there are costs to changing prices (“menu costs”)—a relative price shock would lead to higher inflation. In this case, the distribution of commodity inflation rates would be characterized by a few large price increases exceeding (“leading”) overall inflation, while most of the price changes would be clustered slightly below the mean. Thus, finding a positive skew in the distribution of individual commodity inflation rates would provide prima facie evidence of large relative price shocks and downward price stickiness.

The extent of adjustment

In light of these considerations, we analyzed the distributions of inflation rates for the commodities that make up the CPI in 21 transition economies in the Baltics, Eastern Europe, and the former Soviet Union (FSU) from the first quarter of 1992 through the third quarter of 1995. The analysis offers several insights:

- Inflation distributions in transition economies indeed display a high degree of variance, indicating that significant relative price adjustments take place throughout the transition period, continuing well beyond the initial stage of comprehensive liberalization. Typically, relative price variance increases sharply at the beginning of the transition period, coinciding with initial liberalization. Although variance subsequently declines, it remains high relative to market economies. Even as late as

1995, relative price variance in transition economies, with a few exceptions (the Czech Republic, for example), remained significantly higher than in market economies. This was true even for countries, such as Estonia and Poland, that had liberalized comprehensively at the beginning of the transition—although variance in these cases tends to be lower than it is for more gradual reformers like Moldova and Russia (Chart 1).

- Inflation distributions in the transition economies are frequently highly skewed in a positive direction, suggesting—as discussed above—that individual prices are downwardly sticky and that a few significant relative price shocks underlie inflation. Moreover, a closer analysis of five countries—the Czech Republic, Estonia, Moldova, Poland, and Russia—shows that this is not simply the result of random price shocks but rather of sustained relative price adjustments.

- Analysis of data for the five countries also suggests that relative price shocks have different causes at different stages of transition. The initial spurt of variance (which is frequently concurrent with an upward spike in inflation) early in the transition process tends to coincide with periods of intensive trade and price liberalization, increases in wages and administered prices, tax reform, and terms of trade shocks. In contrast, during the later stages of transition, prices of capital-intensive services (for example, housing, utilities, and transportation) increase relative to other prices. Cost recovery tends to affect the pricing of these types of services (which in many cases are supplied by the public sector) more gradually than it affects the pricing of other goods or services—particularly tradables, which are subject to international

competition. This is consistent with the notion that the adjustments of prices for such services is more marked in the later stages of transition, as consumers’ real incomes rise, because producers revalue their assets and recapitalize to meet growing demand.

Influences on inflation

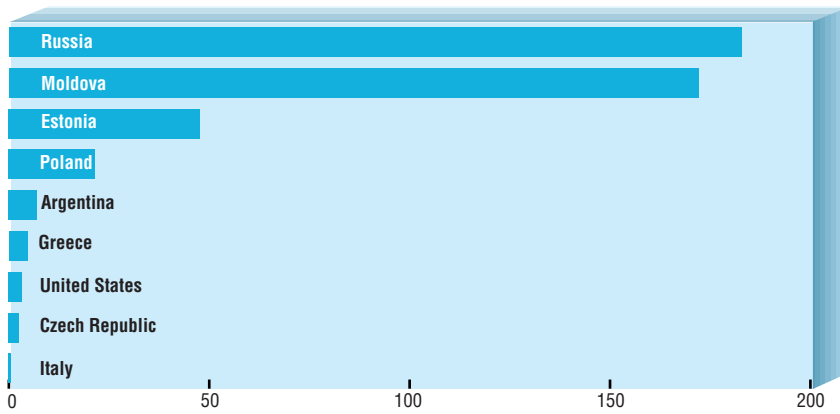
Other macroeconomic variables condition the relationship between relative price adjustment and inflation. In particular, relative price shocks will have a greater effect on inflation if they are accommodated by monetary policy. Thus, the fact that inflation rates rose more in the United States than in Germany following the oil shock of the early 1970s has been attributed to the less accommodating stance of Germany’s monetary policy. If relative price shocks are found to have an effect on inflation even after controlling for money growth, it must be the result of an increase in the velocity of circulation of money, assuming output growth is more or less fixed during the relevant period. In effect, price shocks push real money holdings—that is, the stock of money divided by the price level—temporarily away from equilibrium, until the public is able to readjust its holdings to the desired level. In transition economies as in market economies, any longer-term effect on inflation would depend on downward price stickiness and the extent of monetary accommodation.

With these considerations in mind, we analyzed the association between relative price adjustment—as measured by variance and skewness—and inflation while controlling for the impact of several other factors—money growth, nominal wage increases, inertia, and real exchange rate movements (Coorey, Mecagni, and Offerdal,

Chart 1

Relative price variability is high in some transition economies ¹

(average in the first three quarters of 1995)



Source: Sharmine Coorey, Mauro Mecagni, and Erik Offerdal, 1996.

¹ Measured by variance calculated as the weighted sum of squared deviations of individual commodity inflation rates from the weighted overall inflation rate, in logarithms.

1996). The three groups of countries—the Baltics, Eastern Europe, and the FSU—show distinctly different patterns, despite some similarities across all 21 countries in the sample.

- Money growth plays a dominant role in explaining inflation in all three groups. It is responsible for, on average, about one-third to one-half of quarterly inflation (Chart 2). The monetary aggregates most closely associated with inflation are broad money (including foreign deposits) and domestic credit of the banking system.

- Nominal wage shocks have a substantial impact on inflation in two of the groups, accounting, on average, for about one-fifth to one-fourth of inflation in Eastern Europe and the FSU. Wage pressures do not appear to have been a significant factor in the Baltics, however.

- Relative price adjustment—as measured by variance and skewness—has a statistically significant impact on inflation although the magnitude of the impact varies more by group of countries and sample period than is the case for the other variables. Relative price variance is found to be closely associated with wage shocks in the FSU. When either variance or wage growth is dropped from the estimation, the other variable is found to contribute about one-fifth of inflation in the FSU. Variance has a sizable impact on inflation during the initial liberalization period in Eastern Europe, but its impact generally decreases thereafter. The estimated contribution of relative price shocks—measured by skewness—is small in the Baltics.

- As discussed above, the indicator (variance or skewness) that captures the effect of relative price adjustment on inflation

appears to be related to the stage of transition. Generally, in Eastern Europe and the FSU, variance seems to be significant during the initial phase of liberalization. However, skewness, rather than variance, is significant in the post-liberalization periods in Eastern Europe and the Baltics, suggesting that price stickiness becomes an important factor at intermediate levels of inflation.

- Inertia—captured by lagged inflation—is a significant factor at intermediate levels of inflation and in the later stages of transition, suggesting that reducing inflation at these stages may entail costs in terms of output.

- Although many transition economies have experienced marked appreciation of their real exchange rates, the estimations do not show real appreciation to have a significant impact on inflation.

Monetary accommodation

How do we reconcile the strong evidence of substantial and prolonged relative price adjustment—as indicated by high variance and frequent strong skewness—with the comparatively limited estimated direct

impact of variance and skewness on inflation during the post-liberalization period in the Baltics and Eastern Europe? Similarly, why does the substantial real appreciation experienced by many transition economies not have a stronger estimated association with inflation? One explanation is that the estimations capture only the direct impact of relative price shocks, including real exchange rate movements, within a given quarter. If monetary accommodation takes place during the same or subsequent quarters, the total effect of these shocks on inflation would be captured by the money growth variable. Thus, although substantial relative price adjustment and real appreciation are features of transition economies, the limited impact on inflation estimated for these variables is likely to reflect rapid monetary accommodation.

How does such rapid monetary accommodation take place? A closer examination of the sources of money growth in the five countries is illustrative. In countries with exchange rate anchors—the Czech Republic, Estonia, and Poland—almost the entire increase in base money, which underlies the increase in broad money, originates from the accumulation of international reserves by the central bank, frequently at a rapid clip (see table). This suggests that even if such countries pursued tight credit policies, monetary accommodation of relative price shocks would take place via capital inflows through the balance of payments. Indeed, the Czech Republic appears to have attempted to slow base money expansion through sizable sterilization operations. By contrast, money growth in Moldova and Russia—which did not have exchange rate anchors—reflects domestic credit growth by the central bank rather than accumulation of official reserves.

Policy implications

The empirical evidence suggests that money growth is a dominant influence on

Sources of money growth, 1992–95 ¹

(average growth rates per quarter)

	Czech Republic	Poland	Estonia	Moldova	Russia
Broad money	4.6	7.8	8.6	26.1	36.0
Base money	4.6	6.0	10.6	27.3	39.8
Net domestic assets ^{2, 3}	-17.8	1.4	-1.1	28.1	36.4
Net international reserves ³	22.4	4.6	11.7	-0.8	3.4

Source: Coorey, Mecagni, and Offerdal, 1996.

¹ From the last quarter of 1992 through the third quarter of 1995, on an end-of-period basis, except for Poland, for which data are through the second quarter of 1995.

² Derived residually.

³ Contributions to the growth in base money.

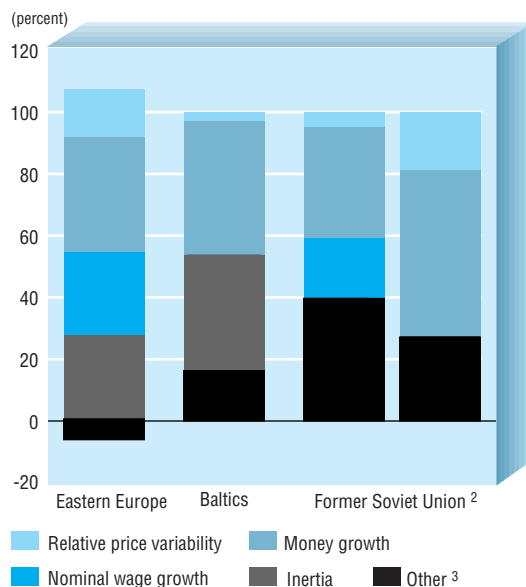
inflation. While substantial relative price shocks and downward price stickiness are evident in almost all transition economies, the estimated impact of relative price adjustment on inflation varies across countries and time periods. The potential impact of relative price adjustment on inflation depends on the preferences and policy reactions in each country, in particular with regard to the extent of monetary accommodation. What, then, are the implications for policy?

- If there is a willingness to use monetary policy aggressively, relative price adjustment need not create a “floor” below which inflation cannot be reduced. The evidence suggests that to reduce inflation rapidly to low levels, policymakers would need to sharply curtail monetary accommodation. But sizable and continuous relative price changes could, in principle, compound the adverse impact on growth of tightening monetary policy sufficiently to achieve low inflation, particularly at intermediate levels of inflation where inertia and downward price stickiness are found to play a greater role.

- The worsening of any given trade-off between growth and inflation when relative price changes are important suggests that, for a given set of preferences between these objectives, policymakers may choose to tolerate a higher level of inflation in the presence of substantial relative price adjustment. Against this must be set the risks and opportunity costs of remaining at intermediate inflation levels. The evidence suggests that inertia and downward stickiness become significant at these levels—implying that the output costs of disinflation will increase in the future—and a chance that high inflation could return if the economy is subject to large relative price shocks. While rapid disinflation may still be optimal if the long-term benefits are sufficiently large relative to the short-term costs, the need to adjust relative prices as a prerequisite for structural reform tilts the balance toward a more gradual but sustained reduction in inflation.

- The analysis brings to the fore a dilemma for exchange rate policy: although an exchange rate anchor may play an effective role in countries with high inflation rates, it can also slow disinflation in transition economies with intermediate rates of inflation by permitting monetary

Chart 2
The contribution of different factors to inflation is not uniform in transition economies, 1992–95¹



Source: Sharmini Coorey, Mauro Mecagni, and Erik Offerdal, 1996.
¹ From a regression of quarterly inflation on the respective variables, evaluated at the sample mean.
² Based on two specifications, including and excluding nominal wage growth.
³ Includes the regression constants, the change in the real exchange rate, and dummy variables for exchange rate anchors, seasonal effects, and one outlier observation for the FSU.

accommodation of relative price shocks and real appreciation. The evidence suggests that money growth resulting from capital inflows and external reserve accumulation—reflecting official intervention—can be substantial at intermediate inflation levels. A money-based anchor could, in principle, check money expansion and make disinflation easier in these cases, but the resulting nominal appreciation may slow output growth, particularly of exports.

- If policymakers choose to pursue an exchange rate anchor strategy—and there may be good reasons for not abandoning such a strategy once it is in place—or if they cannot permit significant nominal appreciation, inflation targets should be realistic and reflect the likelihood that inflation will persist at intermediate levels. Although inflation may eventually decline, other factors (such as inertia) are likely to entail output costs at this stage.

- If adjustment programs envisage a gradual reduction of inflation from intermediate to low levels, increased exchange rate flexibility—either through a switch to a money-based anchor or to a widening of an exchange rate band—may be needed. If the goal is faster reduction of inflation to low levels, policymakers need to make strong and credible commitments to

limiting foreign exchange intervention, thereby controlling money growth and allowing nominal appreciation. This is especially important if ambitious structural reforms are envisaged. However, the design of monetary programs and the exchange rate anchor strategy should anticipate that significant fluctuations in velocity, and hence instability in the demand for money, may accompany large relative price adjustments, particularly in the short run.

Conclusion

The analysis of inflation rates for the individual commodities that constitute the CPI in 21 transition economies suggests that substantial relative price adjustments take place throughout the transition process, following even comprehensive initial liberalization. Typically, a few significant positive relative price shocks underlie inflation, while other prices show some downward stickiness. However, the estimated direct impact of relative price adjustment on inflation is, overall, modest and depends on the extent of monetary accommodation,

which is a dominant factor in explaining inflation. Nominal wage shocks and inertia are also important. Hence, the achievement of low inflation in transition economies is not necessarily constrained by relative price adjustment, provided there is a willingness to use monetary policy sufficiently aggressively, even if this may entail significant nominal exchange rate appreciation and, most likely, some output costs in the short run. [F&D]

The work on which this article is based was done while the authors were in the IMF's Policy Development and Review Department.

Suggestions for further reading:

Sharmini Coorey, Mauro Mecagni, and Erik Offerdal, 1996, “Disinflation in Transition Economies: The Role of Relative Price Adjustment,” *IMF Working Paper 96/138* (Washington: International Monetary Fund).

—, 1997, “Designing Disinflation Programs in Transition Economies: The Implications of Relative Price Adjustment,” *IMF Paper on Policy Analysis and Assessment 97/1* (Washington: International Monetary Fund).