Comment by Rudiger Dornbusch

Professor Artis' paper offers, from different perspectives, a challenge to the view that monetary rules and targets are particularly suitable as vehicles for macroeconomic stabilization. I will concentrate my remarks on three issues: to qualify some of the conclusions of the static model, to highlight some of the lessons of the transition problem and finally to offer a somewhat different perspective on the longer term choice between exchange rate and monetary rules.

1. *The Static Model.* Drawing on joint work with D.A. Currie, Professor Artis develops an analysis of the effects of domestic and foreign disturbances in the goods and assets markets on prices and output. The question that is posed is the following: Do exchange rate targets or do monetary targets, under the impact of these disturbances, give rise to more stability in prices? From a certain ambiguity in the answers Artis emerges with the conclusion that on balance an exchange rate target may well be the preferred policy setting.

The basic issues are readily summarized with the help of Figure 1. On the axis we show the home currency price of imports and of domestic goods. With the real interest rate given by perfect capital mobility there is a unique relative price at which the goods market clears and which is shown by the ray OR. Given the nominal money supply there is a unique combination of home and import prices that yield monetary equilibrium shown by the schedule M_0M_0. The schedule is negatively sloped to reflect the fact that a rise in home prices, because it reduces real balances *and* raises real output and therefore money demand, must be offset by exchange appreciation to raise real balances and reduce real money demand. With all disturbances zero the economy would be at its full employment equilibrium A_0.[1]

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[1] Using a simple loglinear example the goods market equilibrium schedule, shown as OR in Figure 1, is:

(1) $a(p - W) = b(e+p^* - p) - ci^* + u$

where w and p are the money wage and the price of domestic output, p^* and e are the foreign price and the domestic price of foreign exchange while i^* is the fixed world interest rate. The term u represents a disturbance term. For given interest rates, demand (u) and money wage the OR schedule, with slope $b/(a+b)$, represents goods market equilibrium.

Equilibrium in the money market requires that:

(2) $m - \theta p - (1-\theta)(e+p^*) = -di^* + ka(p - w) + v$

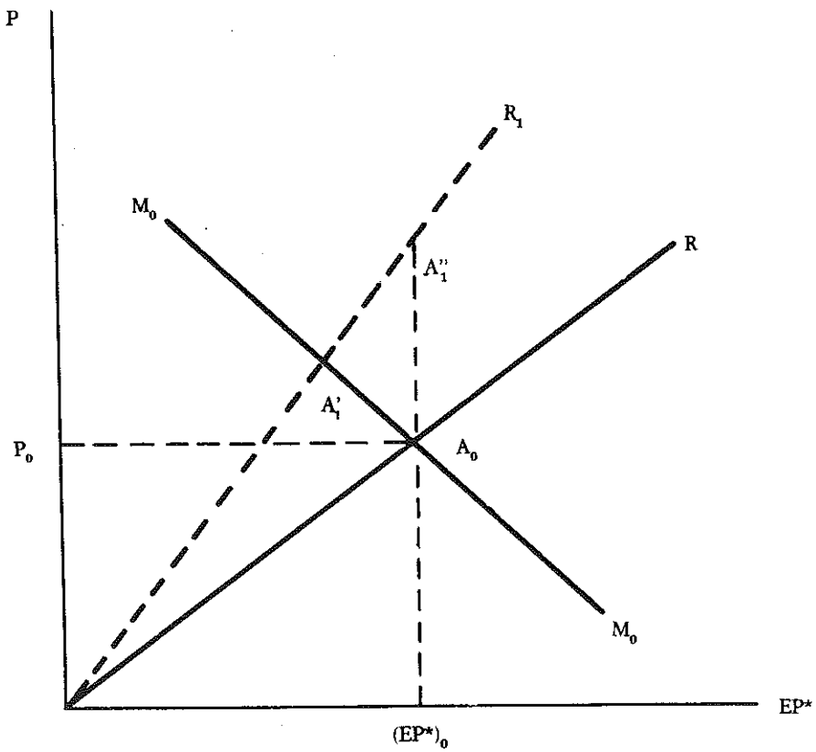
where we already have substituted for output, y, the supply $y = a(p - w)$. For a given money wage, nominal money (m) and shift parameter (v) the schedule MoMo represents monetary equilibrium. The slope is $-(1-\theta)/(\theta+ak)$.

The model can be closed by an assumption about full employment supply:

(3) $y = a(p - w) = \bar{y}$

where $\bar{y}$ is the output level corresponding to full employment.

FIGURE 1



A first important point that Artis makes concerns the "easy cases". If all disturbances are purely monetary, we want to achieve full monetary accommodation, which means stability of import prices through fixed exchange rates. In the same way, with all disturbances arising in foreign prices we want again fixed import prices, but now that means a fully flexible exchange rate and fixed nominal money, again keeping us at A_0. Beyond these cases there is no easy living, as is shown by a domestic demand disturbance which raises the equilibrium relative price of domestic goods – thus shifting OR to OR_1. With fixed money we would stay at A'_1 where the exchange appreciation has helped crowd out some of the demand increase and hence some of the home inflation. But output has risen above normal because of the rise in prices relative to wages and because of the real appreciation. At point A''_1, by contrast, we are fixing the exchange rate allowing money to accommodate the more substantial increase in prices. At A''_1 the real wage in terms of home goods has declined

more than at A'_1, but has remained stable in terms of importables, output still moves, perhaps less than at A'_1, although that will depend on all the goods market parameters. It is apparent that short of presumptions about the various parameters there are no obvious choices between fixed rates and fixed money.

Even without any clear presumption about the preferred rule the Artis analysis leaves open a number of important issues. Restricting the policy objective to stability of prices, or perhaps to stability of output *and* prices leaves out important other variables. I would particularly note the implications already shown in Figure 1 of alternative rules for real wages and the real exchange rate. To the extent that a rule shifts most of the variation (inadvertently perhaps) on the real wage we would think it utterly ill-advised and short-lived. Very much the same applies to the use of the real exchange rate as a means of cooling price pressure, an issue to which I return below.

At the formal level of modelling, the Artis analysis invites a few more comments. A first one that is quite important concerns the issue of the covariance of disturbances. A typical foreign disturbance is realistically a cyclical disturbance or a package of changes in prices, real demand and real interest rates. I would find it much more appropriate to ask the question what rule isolates best against such a composite. That, of course, depends in some measure on the relative stability of monetary and fiscal variables abroad. In this context one should, of course, note the neglect of fiscal considerations in Artis' model. The omission is important because the fiscal structure, even barring activism, can be designed to carry automatic stabilizers that are more or less built around openness. The same arises in respect to wage indexation as an explicit stabilization rule.

A final remark on the theoretical side concerns the neglect of two points. First, the relative supply of assets (or sterilized intervention) which is assumed away, I believe, too hastily with the assumption of perfect capital mobility. The other concerns the role of valuation effects induced by the exchange rate. Suppose foreign prices were to rise and we offset the increase by appreciation. There is an important effect on the home currency and real value of our external debts, an effect on wealth, income spending and the current account which is perhaps as important as the role of the exchange rate on the supply side.

2. *Monetary and Exchange Rate Policy for Disinflation.* The Artis paper recognizes some important questions regarding exchange rates and money in the process of inflation stabilization. In other work (Dornbusch 1980b) I have drawn attention to two problems in particular: the *velocity problem* and the *real appreciation* problem. Briefly, they are the following: The transition to lower inflation reduces nominal interest rates and therefore raises the demand for real balances. Therefore in the transition, on average, nominal money must grow faster than prices. This requirement, of course, stands in sharp contrast to the monetarist thinking that achieves disinflation by reducing money growth below the prevailing rate of inflation.

The real appreciation problem arises when the path of exchange depreciation is manipulated so as to help achieve domestic disinflation. This may either happen explicitly by the use of a monetary target that presets the path of the exchange rate independent of home inflation, or it may arise simply because the exchange rate is left flexible in the face of a rise in the home real interest rate as would emerge from tight money.

Evidence we now have of gradualist stabilization programs in Latin America, especially in Chile and Argentina, is that inflation is extremely slow (years) to come down in the face of determined stabilization of money and fiscal policy. Massive exchange overvaluation results in the adjustment process and threatens, once the current account goes sour and confidence withers, the need for large depreciation and to restore competitiveness and thus the reemergence of inflationary instability.

Much better is the evidence brought by Thomas Sargent who looked at the stabilization of hyperinflations in Europe after World War I. A move towards fully fixed exchange rates, fiscal stabilization and massive money creation through the monetization of capital inflows was in each case accompanied by an immediate disappearance of inflation. The relevance of the evidence for more moderate inflation countries, though, is in question. All the contract problems that make inflation sticky in industrialized countries may make it impossible to move to fixed rates without some intermittent wage-price control scheme.

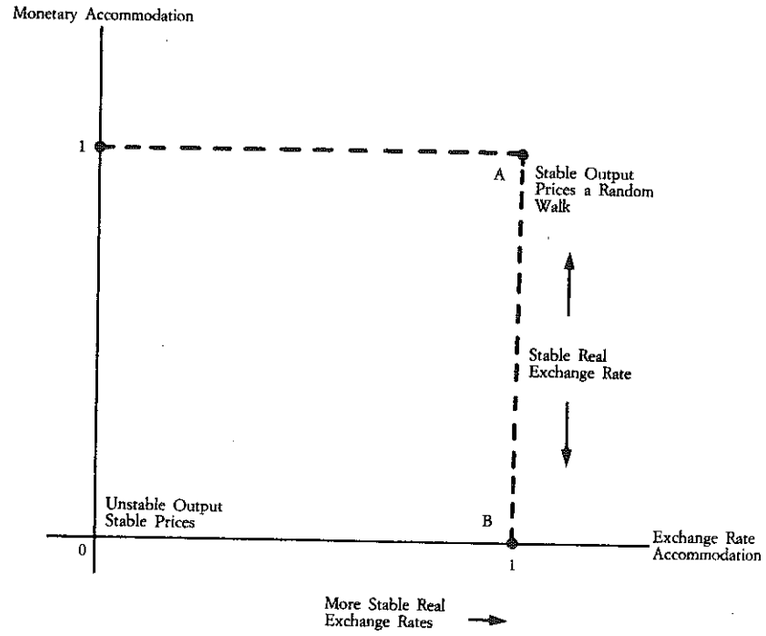
3. *Accommodation and Stability.* There is a third perspective on monetary and exchange rate rules which is suggested by modern inflation models built around the idea of overlapping, longterm wage contract (see Taylor 1979). In these models inflationary deviations from trend arise from the interaction of sticky relative wages and accommodating monetary policies. The more accommodating money the more persistent will be inflation and the more stable output. Conversely, the more tightly controlled money and the more unresponsive money is to price disturbances the more stable inflation and the more unstable output.

Exchange rate policy is readily introduced into these models.[2] Accommodating exchange rate policies, in the face of wage-price disturbances, tend to stabilize real exchange rates and therefore tend to stabilize output. Of course, this happens at the cost of increased persistence and instability of inflation. But there is another role of exchange rates. More accommodating exchange rate policy also affects the supply side, tending to amplify the effect of wage disturbance on prices and real balances. This second channel may well imply that increased exchange accommodation or fixed real exchange rates raise the instability of inflation *and* of output.

The model can be thought of as a managed money and managed exchange rate where the authorities chose – and are understood to have chosen – a set of

[2] See DORNBUSCH (1980a, 1981).

FIGURE 2



reaction coefficients for money and exchange rates. The elasticities of money and the exchange rate to domestic prices are referred to as the degree of indexing or accommodation. The model shows that full indexation for both money and the exchange rate, point A in Figure 2, implies fully stable output, but also prices that are a random walk. This is an economy entirely without anchor. Conversely, at point 0, the economy experiences a minimum of price variability but output is very unstable. Finally real exchange rates are stable with full exchange rate accommodation, but output at B could be quite unstable.

There is no simple rule to choose where in the box to settle. In part it is a question of preference for output versus price stability. In part it is a question of the constraints imposed by the structure and the entirely endogenous

process of wage formation. Given, however, the role of the exchange rate on the supply side it tends to be true that monetary accommodation has to be high relative to exchange rate accommodation if price stability is the target.

The topic Professor Artis has addressed is, indeed, a quite open one, not only in the answers within a given framework or model, but also and I think more importantly, in the way in which we want to think about the problem. On all counts though there is a quite firm conclusion that a monetary rule is hardly the appropriate policy. Even in a box there is plenty of room in the middle.

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