IV Role of the Exchange Rate in External Adjustment

Developing countries generally design their exchange rate policies to maintain external competitiveness at a level consistent with a sustainable balance of payments position. By increasing the price of tradables relative to nontradables, a devaluation simultaneously shifts aggregate demand in favor of nontradables, and aggregate supply in favor of tradables, thereby reducing excess demand for tradables (i.e., improving the current account position). In addition to its expenditure-switching effect, devaluation also reduces aggregate demand through the wealth effect—the rise in the domestic price level brought about by depreciation of the domestic currency lowers the real value of financial assets and reduces absorption.

In view of the critical role of the real exchange rate in maintaining external competitiveness, this rate ought not be allowed to deviate very far from its equilibrium level. Because this equilibrium level is determined endogenously, exchange rate policy needs to take into account the impact of various shocks on the equilibrium real exchange rate. This section first reviews various approaches for determining the equilibrium real exchange rate and examines the impact of a number of domestic and external shocks on this rate. It then focuses on a specific policy designed to maintain external competitiveness in the process of adjustment—that is, a real exchange rate rule, under which the nominal exchange rate is automatically adjusted in response to a differential between domestic and foreign price levels. The latter discussion will highlight some of the problems associated with the adoption of such rules.

Determination of the Equilibrium Exchange Rate

In general, there have been two related approaches for determining the "equilibrium" real exchange rate. The simplest and most popular approach is based on the notion of relative purchasing power parity (PPP). The central tenet of PPP is that the equilibrium exchange rate is proportional to the relative price levels of the home country and its trading partners, that is, to the relative purchasing power of the national currencies. As such, relative PPP is seen as a suitable indicator of the equilibrium exchange rate between currencies, with relative inflation rates determining the rate of change of the nominal exchange rate over time. The application of relative PPP involves using the actual exchange rate to compute relative price levels in common currency terms. Any deviation in the real exchange rate from some base value is taken as an indication that the exchange rate has diverged from its equilibrium PPP value.

An alternative, and theoretically more appealing, definition of the real exchange rate is the relative price of tradable to nontradable goods, which provides a summary measure of the incentives guiding resource allocation between the two key sectors of the economy.[11] If the domestic price of tradables rises relative to the price of nontradables, resources will be reallocated toward the tradable goods sector and the trade balance will improve accordingly. In this context, the equilibrium real exchange rate corresponds to the relative price of tradable to nontradable goods that yields simultaneously internal and external equilibrium.[12] Internal equilibrium implies that the nontradable goods market is cleared continuously, while external equilibrium implies that the current account deficit is financed by sustainable capital inflows.

While real exchange rate indices based on either PPP or the relative price of tradables and nontradables are easy to calculate, there are potential problems with associating any movement in such indices with a change in external competitiveness. As several recent studies have shown, an observed

[11] See, for example, Frenkel (1981), Harberger (1986), Dornbusch (1987), and Edwards (1989).

[12] As prices of tradable and nontradable goods are not typically available and need to be constructed, it is difficult to calculate the real exchange rate defined as the relative price of tradable to nontradable goods. In certain circumstances, such as when the foreign relative price of traded to nontraded goods is constant, the above two indices of real exchange rate would be equivalent. For a discussion of the relative merits of different real exchange rate indicators, see Wickham (1985).

change in an index of real exchange rate may represent a change in the equilibrium real exchange rate arising from different types of external and domestic real shocks.[13] It is worthwhile to describe the effects of some of these shocks—such as differential rates of productivity growth, changes in the terms of trade, tariff reform, changes in the government's fiscal operations, and increases in international interest rates—on the equilibrium real exchange rate in order to highlight the problems associated with setting a target real exchange rate.

Differential rates of technological progress have an important impact on the equilibrium real exchange rate.[14] For example, if productivity rises faster in the tradable goods sector than in the nontradables sector, the relative price of the nontradables rises, owing to the uniform increase in wages in the two sectors. With the price of tradable goods set in world markets, the equilibrium real exchange rate appreciates. Thus, the equilibrium real exchange rate of the countries with higher rates of productivity growth in their traded goods sectors tends to appreciate relative to that of the countries with low rates of productivity growth.[15]

Developing countries have frequently been subjected to *terms of trade shocks*. Conventional wisdom holds that a deterioration in the terms of trade—that is, the world relative price of exportables to importables— results in a depreciation of the equilibrium real exchange rate. The argument goes as follows. Suppose the terms of trade deteriorate because of a decline in the relative price of exportables. This deterioration creates an excess supply of nontradables and excess demand for exportables, leading to a worsening of the current account balance. The current account imbalance is eventually corrected through a reduction in the relative price of nontradables—that is, a depreciation of the real exchange rate—which shifts domestic supply from nontradables to exportables and importables.[16]

The standard analysis of the effects of a *tariff reform* suggests that tariff reduction is typically accompanied by a depreciation of the equilibrium real exchange rate.[17] In qualitative terms, the effect of import liberalization is similar to that of an improvement in the terms of trade (brought about by a reduction in import prices).[18] A lower tariff will reduce the relative price of importables, creating excess demand for these goods and excess supply of both nontradables and exportables. To restore equilibrium, the relative price of nontradables must fall. Thus, in response to a tariff reduction, the equilibrium real exchange rate tends to depreciate.

The equilibrium real exchange rate is also affected by *alternative types of fiscal measures*.[19] Even with an unchanged fiscal deficit, variations in the composition of spending and revenues alter the equilibrium real exchange rate. For example, if the government shifts the composition of its spending in favor of tradables, the price of nontradables falls and the real exchange rate depreciates. Similarly, a change in the structure of taxes affects the equilibrium real exchange rate by inducing a shift in the investment-saving pattern in the economy.[20] In principle, a large number of combinations of fiscal measures yields the same overall fiscal balance, with each of these combinations corresponding to a different equilibrium real exchange rate. Thus, the level of the equilibrium real exchange rate is conditional not only on the overall fiscal position, but also on the composition of government spending and taxes.

An *increase in foreign interest rates* affects the equilibrium real exchange rate through two separate channels. First, under a pegged regime, domestic interest rates rise to maintain parity with foreign rates, thereby reducing the investment-savings gap. The resulting improvement in the current account induces an appreciation in the real equilibrium exchange rate. Second, depending on whether a country is a net creditor or debtor, the current account improves or deteriorates, reflecting the corresponding changes in the net factor income position. This effect reinforces the appreciation of the equilibrium real exchange rate if the country is a net creditor. However, the change in the equilibrium rate is ambiguous, if the country is a large debtor. The effect of higher foreign interest rates also depends on the fiscal reaction of the government. If the government offsets the budgetary impact of the interest rate change by reducing its spending on tradable goods, then the equilibrium real exchange rate tends to appreciate in the long

[13]See, for example, Khan (1986), Khan and Montiel (1987), and Edwards (1989).

[14]This well-known effect is commonly referred to as the "Balassa effect." See Balassa (1964) and Samuelson (1964).

[15]Balassa (1964) provided some empirical support for this hypothesis, although his findings are disputed by Officer (1976).

[16]The worsening of the terms of trade also has negative effects on incomes and wealth that induce a real depreciation.

[17]The analysis applies equally to the case of reducing exchange restrictions.

[18]The quantitative effects, however, will be different because the nature of income effects in the trade liberalization case (arising from improved efficiency) will differ from those in the terms of trade case (arising from changes in the purchasing power of domestic output).

[19]Recent studies examining this issue include Khan and Lizondo (1987), Khan and Montiel (1987), and Edwards (1989).

[20]Related work on fiscal policies, emphasizing intertemporal dynamic considerations, confirms the key role played by the composition of government spending and of taxes in affecting the real exchange rate; see Frenkel and Razin (1987).

run. On the other hand, the equilibrium real exchange rate depreciates if increased interest payments are financed by the imposition of higher taxes, or if they are accompanied by a reduction in government spending on nontradable goods.

Exchange Rate Rules, External Competitiveness, and Inflation

While the real exchange rate may deviate from its equilibrium level because of a variety of real shocks (of the type mentioned above), a major cause of deterioration in external competitiveness in most developing countries has been a high rate of domestic inflation coupled with the maintenance of a fixed nominal exchange rate.[21] One approach for preventing such a deterioration in external competitiveness has been to adopt a real exchange rate rule under which the nominal rate is adjusted continuously and automatically so as to maintain the real exchange rate close to its equilibrium level.

A real exchange rate rule can prevent the emergence of large and sustained misalignments of relative prices and thereby avoid an external imbalance. By allowing the nominal exchange rate to adjust frequently and by relatively small amounts, it is argued, the real exchange rate can be kept at an appropriate level without imposing undue adjustment costs on the economy, thus removing the issue of devaluation from the political arena. Furthermore, it is also claimed that a real exchange rate rule can provide an anchor for expectations because this rule provides market participants with useful information on the likely evolution of relative prices and thus avoids production decisions based on incorrect expectations.[22]

The adoption of a real exchange rate rule, however, gives rise to certain problems. As already discussed, the determination of the equilibrium real exchange rate is not an easy task at a theoretical level, let alone in practice, and serious difficulties can be encountered when the target real exchange rate is set at a wrong level. Therefore, in formulating an exchange rate rule, allowance has to be made for variations of the equilibrium real exchange rate owing to external or domestic shocks. If the shocks are temporary (and likely to be reversed), it may be possible to stay with a real exchange rate rule, but if the shocks persist, the misalignment of the real exchange rate from its equilibrium level could reduce external competitiveness. In this context, the general impossibility of determining, ex ante, whether a particular shock is temporary or permanent constitutes a serious problem.

Recent literature and experience suggest that real exchange rate rules may also have disquieting implications for macroeconomic stability, notwithstanding their favorable effect on the external position. The adoption of a real exchange rate target, which entails the pursuit of a real target with a nominal instrument, may leave a small open economy without a nominal anchor for domestic prices. Consequently, shocks to domestic inflation may acquire a permanent character and, under some circumstances, lead to hyperinflation.[23] To the extent that, in an open economy, the supply of money can be augmented from external sources, an explosive price pattern can emerge even under a nonaccommodative credit policy. For example, if the authorities seek to achieve an overly depreciated real exchange rate (relative to the equilibrium rate) by devaluing the currency, domestic prices would rise, increasing the demand for money and inducing capital inflows to clear the money market. With flexible wages and prices, the real exchange rate would quickly appreciate back to its equilibrium level (through domestic inflation), necessitating another round of devaluation. With nothing to pin down the domestic price level, persistent attempts to achieve a more depreciated real exchange rate through nominal devaluations would merely result in an acceleration of inflation.

A policy of accommodating price disturbances through monetary and exchange rate adjustments will also affect the process of wage determination in the economy. Under such a policy, labor will be less concerned with the employment effects of seeking high nominal wages, as firms are in a position to transmit higher wage costs to higher prices. Thus, wage increases will be more fully reflected in wages and subsequent price increases. The impact on output of such accommodating financial and exchange rate policies will depend on the source of the disturbances. If the supply shocks dominate, the variability of output is increased by the full indexation of the exchange rate. Conversely, if

[21]For example, in the period leading up to the international debt crisis (1978–81), during which almost two thirds of developing countries maintained pegged exchange rates, developing countries as a group experienced a cumulative real exchange rate appreciation of about 4½ percent, attributable to domestic inflation in excess of that in trading partners (see Aghevli and Montiel (1990)).

[22]See Genberg (1981) and Williamson (1981). The arguments favoring real exchange rate rules are similar in a sense to those supporting the case for target zones for the major currencies; see Frenkel and Goldstein (1986).

[23]This problem arises also if the rule involves devaluing the official exchange rate to maintain or reduce the spread between the official and parallel market exchange rates; see Kharas and Pinto (1989).

demand shocks dominate, accommodating policies would stabilize output.[24]

Analytical work on the consequences of real exchange rate rules for price stability is only recent and is limited. Adams and Gros (1986) examine the issue using a sequence of simple analytical models with different assumptions concerning commodity composition, price-wage stickiness, capital mobility, and so forth. They conclude that the monetary authorities may lose control of inflation if they set the nominal exchange rate according to a real exchange rate rule and that, if they do try to control inflation, they are likely to lose control over some other macroeconomic target. They also argue that if the real exchange rate target is over-depreciated relative to the equilibrium real exchange rate, inflation is likely to be higher.

The operation of a real exchange rate rule and fiscal policy are closely connected. For example, Lizondo (1989) develops a framework that incorporates the relationship between the monetization of the fiscal deficit and the rate of exchange rate depreciation. In this framework, the steady-state value of the equilibrium real exchange rate is a function not only of the real variables mentioned above, but also of the domestic rate of inflation. The latter determines the magnitude of the government's real revenue from the inflation tax which in turn affects the steady-state value of private wealth and expenditure, and thereby the equilibrium real exchange rate. Each real exchange rate target is thus associated with a steady-state domestic inflation rate, other things being equal. However, the associated rate of inflation is not necessarily unique, not all real exchange rate targets are feasible, and not all real exchange rate rules will move the economy to the chosen target even if that target is feasible. Thus, it is difficult to set up simple rules that are independent of the stance of fiscal policy.

The above discussion suggests that real exchange rate rules can destabilize prices. This is particularly true if the target real exchange rate is set at an overdepreciated level. In view of the frequency and severity of both external and internal shocks to which developing countries are likely to be subjected, as well as the limited quantitative knowledge currently available regarding the determination of equilibrium real exchange rates, the pursuit of real exchange rate targets could involve a risk of inflation and macroeconomic instability.

The experience of several high inflation countries reinforces the reservation regarding the advisability of real exchange rate rules. Many of these countries experienced high rates of inflation in the past decade that displayed a "plateau" character—periods of fairly stable, albeit high, inflation that rise via discrete jumps to periods of yet higher but again fairly stable inflation. In some cases, such jumps have been associated with discrete devaluations followed by "crawling pegs" based on PPP rules. In their more recent stabilization attempts, these countries have featured a fixed nominal exchange rate to provide a nominal anchor. This is not to suggest that crawling pegs based on PPP are invariably associated with high inflation, but empirically the risks seem to increase.

It would be desirable, nonetheless, to preserve some of the advantages of real exchange rate rules—specifically, the assurance provided by such rules to potential investors in the traded goods sector that the real exchange rate will not be allowed to get too far out of line—without sacrificing domestic price stability. In general, the inflationary potential of real exchange rate rules is a direct consequence of the fact that the system has one less nominal anchor with which to hold down prices. The danger of losing control of inflation under these circumstances could therefore be avoided by putting in place other nominal anchors. One obvious possible anchor is the domestic money supply. Using targets for domestic credit expansion, which control the monetary consequences of fiscal deficits, along with a real exchange rate rule leaves open the possibility of accommodating increases in the money supply coming in the form of capital inflows. However, if targets were set for the growth in the money supply, the inflation generated by nominal depreciations would be checked, since in this case reserve inflows would be sterilized by contracting the supply of domestic credit.[25]

In general, as long as the target real exchange rate is set correctly, the inflationary potential of adopting a real exchange rate target can be contained by adherence to strict fiscal and monetary policies. This approach would prevent the emergence of destabilizing price movements even if the nominal exchange rate is adjusted to maintain competitiveness. Given the uncertainty about the equilibrium value of the real exchange rate, however, it would not be advisable to adhere rigidly to a real exchange rate target, even if financial (fiscal and monetary) policies are formulated in a prudent fashion. The burden of external adjustment should therefore be borne, at least partially, by restrictive financial policies—rather than entirely by exchange

[24]For an analysis of this issue, see Dornbusch (1981, 1982) and Taylor (1979).

[25]To the extent that foreign assets and domestic credit are not perfect substitutes, such a policy may result in higher interest rates and a reduction in aggregate demand and real output. Furthermore, sterilization cannot be sustained indefinitely; if capital inflows persist the rule would have to be abandoned.

rate adjustment. In this context, it should be noted that such policies may themselves be affected by the exchange rate regime adopted by the authorities. In fact, a key argument for fixed nominal exchange rates has long been that such a system creates incentives for the pursuit of responsible financial policies. The next section addresses this issue in depth.