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4 Multiple Exchange Rates for Commercial Transactions

Rudiger Dornbusch

4.1 Introduction

This paper reviews exchange rate arrangements that deviate from unrestricted convertibility at uniform fixed or flexible exchange rates. Broadly, these alternatives are called "multiple exchange rate practices," which are formally defined by International Monetary Fund (1981, 23) guidelines as actions that lead to exchange rate spreads in excess of 2 percent between buying and selling rates. They range from multiple rates for commercial transactions and auction markets for designated items to dual rates for capital movements, black markets, and some forms of exchange rate guarantees. The prize no doubt must go to Chile for introducing a "free" market for foreign exchange among nonhabitual, consenting adults. Although these various forms of exchange rate policy defy a simply classification, they do arise out of a common concern, namely, to strike a balance between the allocative efficiency that almost always comes from uniform rates and the macroeconomic advantages that might be gained from a differentiated exchange rate structure.

In the aftermath of the international debt crisis Latin America exhibits once again on a massive scale this diversity of exchange rate arrangements. But Latin America is not alone in instituting multiple

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rates. In the early 1980s more than 40 IMF members had at least one multiple currency practice, and in its 1984 review the IMF (p. 37) noted:

> During 1983, as in 1980–82, about one-third of the Fund's members engaged in multiple currency practices, although on a trade-weighted basis the proportion of developing-country members with these practices has risen considerably since 1980 and the importance of the practices in the individual economies has grown. Nevertheless, the recent trend toward increased incidence of multiple currency practices among Fund members levelled off somewhat in 1983.

Multiple exchange rate practices have a long history. In the 1930s, if not earlier, multiple rates and restricted convertibility appeared on a broad front throughout the world economy. In Europe exchange control was widely practiced, and Raúl Prebisch introduced multiple rates in Argentina. Throughout the 1950s and early 1960s exotic arrangements existed in virtually all countries. They were not only common but even in some measure respectable, though never uncontroversial. Triffin (1947, 80) put the case as follows:

> Whenever balance of payment difficulties are due, not to international price disparities but to accidental factors or to cyclical fluctuations in foreign income and demand, compensatory policies should be followed to the fullest possible extent. This requires a high level of reserves. . . . When reserves are unsufficient, foreign or international assistance—such as contemplated under the International Monetary Fund—will be necessary. Failing this, exchange control should be used as a third line of defense, in order to continue compensatory policies and avoid the greater evils inseparable from deflation or devaluation. The disadvantage of the latter policies, as compared to exchange control, is that their corrective effect on the balance of payments is likely to depend on a contraction of income several times as severe as the international deficit to be plugged.

The important research question is whether multiple exchange rates are a perfectly sensible quest for extra policy instruments, both micro and macro, or ill-considered distortions with little payoff in terms of effectiveness but major allocational costs. The answer is interesting from the perspective of the users of the rates, but it is quite separately an issue for international supervisory agencies, specifically the IMF and the World Bank, which are charged with monitoring and inhibiting multiple rate practices. The welfare economics of exotic exchange rate arrangements are complicated not only by the fact of variety that makes this very much a study of special cases. The topic is also complicated because it bridges the uncompromising rigor of microeconomics, issues of income distribution via the price system, and the third-best features of macroeconomics according to which effectiveness comes first and resource allocation questions are asked much later.

4.2 An Overview

This section provides a discussion of exchange rate practices that result in a differentiated exchange rate structure for different commercial transactions. Table 4.1 serves as an introduction to the topic and illustrates a concrete example of a multiple rate structure, the case of Argentina in 1949. The table shows a proliferation of rates at which the authorities buy and sell foreign exchange. The buying rates represent the prices at which exporters are required to surrender foreign exchange, whereas the selling rates are the prices at which the central bank sells foreign exchange for import transactions. In each case the exchange rate (pesos/dollars) is expressed as a percentage of the "basic" export rate. Most of those rates are fixed, but there is also a potentially flexible rate applied in the auction market.

Consider now the details of the multiple rate structure. It is readily apparent that agricultural exports receive the least favorable rate: the index is 100 for these traditional exports. This is a common feature of countries in which the economic structure introduces strong sectoral distinctions between traditional commodity exports and nontraditional manufacturing interests. Argentina is a good case in point. Here the traditional export sector is based on agriculture—wheat, meat, hides and processed agricultural goods. But there is also a manufacturing

Table 4.1 **Categories and Values of Exchange Rates in Argentina, 1949 (Index of the basic buying rate = 100)**

Category	Buying Rate	Selling Rate
Preferential A	144	110
Preferential B	169	158
Special	212	—
Basic	100	179
Auction	—	fluctuating
Free	265	269

Source: Adapted from Schlesinger (1952).

Buying rates:

1. Preferential A: wool, hides, vegetable oil, oilcakes, tallow, meat extract, some prepared meats, poultry, live animals, and minerals (except tungsten).
2. Preferential B: combed wool, cheese, butter, casein, powdered milk, ques-bracho extract, pork, eggs, pulses, shark-liver oil, and glycerine.
3. Special: leather goods, footwear, selected textiles, salted meats, ground bones, fresh fruits, tripe, gelatin, stearin, tung oil, tungsten, and mica.
4. Basic: beef, mutton, wheat, corn, barley, rye, and oilseeds.
5. Free: receipts from all nonmerchandise transactions.

Selling rates:

6. Preferential A: coal, coke, and petroleum and petroleum by-products.
7. Preferential B: raw materials and articles of popular consumption.
8. Basic: articles the import of which is considered less essential than others.
9. Auction: imports of permissible luxury goods.
10. Free: remittances for all nonmerchandise transactions.

sector that competes with imports and appears likewise on the export side.

It is also apparent from table 4.1 that a multiple rate system requires an exchange control mechanism to administer and enforce the differential rates. On the export side, where relatively unfavorable rates apply, the surrender of foreign exchange must be enforced. That is the case even if exporters may sell part of their earnings at a flexible rate. On the import side, where preferential rates apply, the rights to import must be licensed. Where foreign exchange for imports is auctioned, the control authorities must determine the amounts to be allocated. The need for and modalities of the exchange control system are evident in table 4.2, which shows the broad possibilities for multiple rate systems. The two main distinctions are whether for a particular transaction the exchange rate is fixed or market determined and whether foreign exchange supplies are rationed or market determined.

System I in the table would possibly apply to the case in which for each transaction a specified amount of foreign exchange is allocated at a given rate. The distribution among competing users would be based on historical precedent or the discretion of the authority, thus posing the maximum potential for abuse and inefficiency. System II applies similarly to the case in which a given amount of foreign exchange would be auctioned among competing users. This system is frequently used for inessential or luxury imports. System III applies to both imports and exports. The government fixes the rate for different transactions, and importers or exporters choose the amount they wish to buy of foreign exchange or the level of exports, and hence the level of export earnings. A special case of this system is, of course, a uniform rate. Finally, system IV applies when the government allows exporters to sell part of their export earnings from particular categories to importers of some specified classes of goods. A special case is that of unrestricted, flexible rates at which exporters can sell all their earnings to any importer. The splitting of markets and the matching and monitoring of quantities are what require exchange control authorities and give multiple rates a bad name.

But multiple rates are also expected to serve a policy purpose. Multiple exchange rates for commercial transactions are typically introduced for one of four reasons: as a means of raising fiscal revenue; as

Table 4.2 **Possible Multiple Exchange Rate Regimes**

Type of Foreign Exchange Supply	Type of Exchange Rate	
	Fixed	Flexible
Rationed	I	II
Market Determined	III	IV

a form of taxation to affect resource allocation and income distribution; as a macroeconomic shock absorber; and as an instrument of trade-balance adjustment. The remainder of this paper examines each of these uses of multiple exchange rates.

4.3 Fiscal Aspects of Multiple Rates

This section examines two ways in which multiple rates have fiscal aspects. First, to the extent that average buying and selling rates differ from each other, they are a source of aggregate revenue or transfers. Second, differential buying and selling rates across sectors engender an implicit system of protection.

4.3.1 The Implicit Tax-Subsidy Structure

Consider a simple model of the world economy in which our model country, Argentina, is a price taker for all commodities, exportables, and importables alike. Suppose further that all world prices are given and equal to one dollar. In the absence of any taxes, transport costs, or other impediments to exchange, and with a uniform exchange rate, the domestic price of all tradable goods would be equal to the common exchange rate. But, in fact, exchange rates differ among transactions, as will, accordingly, the domestic prices of goods. Foreign exchange for the purchase of some favored import goods can be bought at a favorable rate, and the export proceeds of some categories of goods can be sold at high rates. Other import transactions might be implicitly taxed by a high price of foreign exchange, and likewise some export categories might be taxed by particularly unfavorable rates at which foreign exchange resulting from these transactions must be surrendered. A multiple rate structure thus embeds an implicit tax-subsidy structure.

The implicit tax-subsidy structure can be analyzed by focusing on two of its features. One is the difference between the average selling and buying prices, the difference representing net fiscal revenue to the government from the multiple rate system. The other is the dispersion of rates across transactions and the implicit tax-subsidy allocation across commodities. Let e_i be the exchange rate (pesos/U.S. dollars) applied to the ith import transaction, and let e_j be the exchange rate on the export side. The average import and export exchange rates can be defined simply by taking the weighted average of rates across import and export categories. Let $a_i = M_i/M$ and $b_j = X_j/X$ be the shares of the ith import or jth export transaction, respectively, in the total dollar value of imports (M) or exports (X). The average import and export exchange rates are then defined as:

$$(1) \qquad e_m = \sum_i a_i e_i, \; e_x = \sum_j b_j e_j.$$

Fiscal revenue, in pesos, from the multiple exchange rate structure is equal to the excess of proceeds from foreign exchange sales over the revenue from purchases, such that:

$$R = e_m M - e_x X. \tag{2}$$

If trade is balanced in dollars so that $X = M$, this formula reduces to:[1]

$$R = (e_m - e_x)M \tag{2'}$$

The right-hand side of (2') shows that the government derives a net revenue from a multiple rate structure, provided the average selling or import rate exceeds the average buying or export rate. Even though these average rates are not available, a look at table 4.1 immediately indicates that this was obviously not the case in Argentina. For example, the preferential import rates are below the preferential export rates, implying revenue losses unless, as is possibly the case, the large share of "basic" exports that command a very low rate rescues the fiscal balance. More on this point below.

4.3.2 Effective Protection

The multiple rate structure has fiscal aspects not only in the global revenue sense, but also in the allocation of incentives or taxes across activities. Let $e \equiv (e_m + e_x)/2$ be the average exchange rate. Then, the protection or taxation involved for any particular activity is indicated by the relative exchange rate, e_i/e. Activities with a high relative exchange rate on the export side are implicitly subsidized, and activities with a high relative import rate are relatively sheltered from the world markets.

In judging the tax-subsidy features of a multiple rate system, we must, of course, pay attention to the fact that intermediate goods enter into consideration. It is therefore important to define the effective rates of protection implied by the multiple rate structure. The effective rate of protection is defined as the percentage excess of domestic over world value added in a particular activity. Suppose technology is linear with a given input requirement v per unit of output. All goods are internationally traded at the given world prices, and domestic prices are determined by the exchange rate structure. The effective rate of protection for commodity i is then given by:[2]

$$k_i = (T_i - \alpha T_j)/(1 - \alpha), \qquad \alpha = p^*_j v/p^*_i, \qquad T_i = (e_i/e - 1), \tag{3}$$

where α denotes the share of the intermediate factor in income; p^*_i and p^*_j are the world prices in dollars of final and intermediate goods, respectively; and T_i and T_j denote the percentage deviation of a particular exchange rate from the economywide average. Equation (3) thus re-

duces the multiple rate structure to the conventional representation of the effective protection implicit in a tariff structure.

Equation (3) shows that the effective protection rate of an activity depends on the differential rates applied to final goods and inputs and on the differential between final goods and the economywide average. Table 4.1, as an example, indicates a preferential export rate (144) for prepared meats (sausages) and a lower rates (100) for the intermediate good, which in this case is meat. Suppose the income share of meat in the sausage industry is 40 percent and that the economywide exchange rate is 130. Then, the effective protection formula indicates that the sausage industry enjoys a 33.3 percent effective rate of protection. Even though the exchange rate for the final good exceeds the economywide average by only slightly more than 10 percent, there is significant subsidization by the fact that the intermediate good receives an exchange rate that is 23 percent below the average. Of the combined total of 33.3 percent, only about 18 percentage points are the result of the favorable export rate on the final good. The remainder is accounted for by the implicit subsidy stemming from the fact that the intermediate good receives an exchange rate below the economywide average. The Argentine exchange rate structure thus implies an implicit effective protection to processing activities on the export side. Similarly, the low rate for inputs (preferential rates for coal, coke, materials) on the import side compared to that for final goods implies effective protection of domestic manufacturing.

The Argentine example of an effective protection structure makes clear the most basic point about multiple rates for commercial transactions: they are no different from a set of tariffs or taxes. Thus, anything that could be achieved by these multiple rates could, administrative issues aside, be accomplished in precisely the same way by taxes or subsidies, or both.

But what precisely is the equivalence between trade taxes and multiple exchange rates? Suppose we take the basic buying rate as the basis. It does not matter what the basis is, since, as we know from trade theory and Lerner's symmetry theorem in particular, only relative prices and relative rates of taxation matter.

We have seen that the multiple rate structure can be expressed in terms of an equivalent system of effective protection rates. Next, we remember that an import tariff is both a production subsidy and a consumption tax. Similarly, an export subsidy is both a production subsidy and a consumption tax as well. In this interpretation commodity groups with a high tariff equivalent on the import side show protection for producers and taxation of consumers. This is the case, for example, with inessential imports. On the export side we have already noticed the protection granted to processing.

To have a complete idea of the protection structure requires adding together (1) any implicit protection given by the exchange rate structure, (2) protection from quotas and outright taxes or subsidies, and (3) taxes or subsidies implicit in advance deposits, taxes on foreign exchange operations on the import side, or credit subsidies on the export side. These three are the main instruments of commercial policy. Figure 4.1 shows the results of calculations for Argentina showing a broad pattern of sectoral protection through all these instruments combined over the last fifteen years.

The figure shows the peso price of a dollar of traditional exports and of nontraditional exports, respectively, compared to the peso price of a dollar of imports. The calculations are necessarily rough, but the evidence is impressive: Commercial policy through the various instruments placed a massive trade tax on traditional or agricultural exports. Nontraditional exports, by contrast, enjoyed a significant subsidy relative to imports in the mid-1970s, but that differential has since almost disappeared.

4.3.3 Multiple Rates and Efficiency

Multiple exchange rates fit into this protection system as a matter of administrative convenience, not because they can achieve a special effect that cannot be replicated by taxes or subsidies. Because they are so clearly equivalent to taxes and subsidies, there appears no reason to prefer tax-subsidy schemes over multiple exchange rates. A tax-subsidy scheme administered through multiple exchange rates is just as efficient or inefficient as the equivalent system of trade taxes or subsidies. Both as a means of raising general revenue and as an instrument for achieving particular objectives of allocation or distribution, trade taxes are almost always second- or third-best instruments. Their use as a *permanent* system would have to be justified by administrative or political feasibility or convenience rather than by any intrinsic optimality they possess.

Although the use of multiple exchange rates is in all likelihood an inefficient way to achieve long-run revenue, distribution, or allocation objectives, the extent of inefficiency might easily be overestimated. It might appear that a proliferation of multiple rates, as in table 4.1, implies a particularly costly structure. In the revenue case that is true by comparison with, say, a uniform rate e_m that exceeds the export rate e_x and thus generates revenue. But it must also be recognized, as Harberger (1959) has pointed out, that not everyone in an economy can be protected. What matters, by Lerner's symmetry theorem, are relative rates of protection, and thus much of the diversity in table 4.1 cancels out.

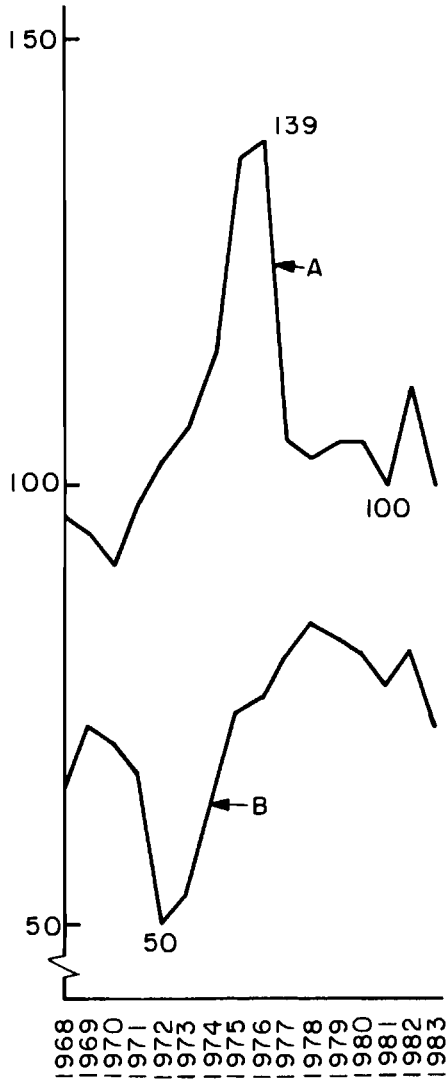

Fig. 4.1 Comparative effective exchange rates in Argentina, 1968–83.
A = Nontraditional exports relative to imports.
B = Traditional exports relative to imports.
Source: El Cronista Comercial, *Carta Económica*, December 1983.

4.4 Macroeconomic Aspects of Multiple Rates

Multiple exchange rates can play a macroeconomic role in two ways. First, they may be an effective instrument of adjustment in cases in which deficit disturbances are transitory and financing is unavailable. Second, they can play the role of a macroeconomic shock absorber, particularly in the case of a transitory improvement in the terms of trade.

4.4.1 Trade-Balance Adjustment

In the absence of reserves or financing, or both, trade deficits require adjustment. Multiple rates *may* be an effective adjustment mechanism in the case of transitory disturbances. I emphasize the case of transitory disturbances because persistent deficits require an adjustment that takes greater account of the inefficiency caused by the lasting trade distortions implicit in multiple rates. In the short run, by contrast, these distortions presumably do not involve significant deadweight losses. If financing, which would be preferable in such a case, is unavailable, multiple rates may be a second-best policy.

There are four possible adjustment policies to correct a deficit: a contraction in aggregate demand, a real depreciation, selective quantitative restrictions, and selective tariffs or equivalent multiple exchange rates. Commercial policy, whichever form it takes, involves a double effect: expenditure *reduction* via the taxation implicit in tariffs, quotas, or multiple rates; and expenditure *switching* as a result of the relative price changes brought about by these policies. To determine which policy intervention is optimal will in general depend on the source of the deficit and the particulars of the short-run macroeconomic flexibility of the economy.

Consider, first, the case in which an increase in aggregate spending causes the deficit. If the economy faces a general increase in spending under conditions of high employment, there will be excess demand for domestic goods and a deficit. A policy combining a reduction in aggregate spending is appropriate, and expenditure-switching policies are not required. But if the disturbances involve a combination of an excess of income over spending and no excess demand for domestic goods, some measure of expenditure switching is also required, since expenditure cutting by itself creates domestic unemployment. The higher domestic unemployment and the more responsive demand and employment, the more appropriate are expenditure-switching policies than expenditure-reducing policies.

The argument against a short-term devaluation as an adjustment policy is well established: In the short run a devaluation may have a net contractionary effect on aggregate demand without at the same

time achieving a significant improvement in the external balance. The reason for this is that a real depreciation will cut the purchasing power of wages and hence real aggregate demand for domestic goods. The rise in employment caused by increased competitiveness may be small if demand (foreign and domestic) is not very elastic in the short run and if imported materials account for a significant share of costs and of the consumption basket. Under these plausible conditions a general devaluation is primarily a transfer abroad, not an employment policy or a policy of trade adjustment. Devaluation is precisely the same as a store announcing a sale on *every* item. Such a sale will result in losses if most items have an inelastic demand. The store owner's purposes would be better served by singling out selected items with high elasticities and concentrating on these as the revenue makers, thus avoiding the transfer applying to low-elasticity goods. This consideration is essential because it is implausible to argue that in the time frame appropriate to a short-run trade problem, elasticities of supply and demand are uniformly high. The contrary is well established.

It is easy to imagine a case in which the demand for imports is price inelastic and the domestic production of import substitutes is also unresponsive to price in the short run. A rise in import prices relative to wages would therefore merely cut the purchasing power of labor. But the inelastic import demand implies that a larger fraction of the reduced income will be spent on imports and that demand for domestic goods and hence employment declines. But if foreign demand and the domestic supply of exportables are price responsive, a depreciation on the export side will lead to increased revenues. Why then not simply concentrate the devaluation on the export side via an export subsidy, leaving aside the real wage cut implied by increased import prices?

There is, of course, no reason to expect that the differential elasticities always make particular export goods the target of policy. It is perfectly possible that export goods are in short-run inelastic supply or are particularly sensitive from the point of view of income distribution, whereas imports lend themselves better to adjustment. In any event, the familiar case for selective interventions rather than the exclusive use of expenditure cuts or uniform devaluation has now been restated.

The next question is how to choose between quotas and tariffs or equivalent multiple exchange rates. The use of quotas for short-run balance-of-payments control has been particularly prevalent in Australia, while other countries have favored tariffs or multiple rates. Quotas have the advantage of volume certainty, but there is little else to recommend them. If import demand is inelastic, imposing selling quotas reduces imports but does so primarily as a consequence of the implied budget surplus. The impact on domestic employment would still be

adverse just as in the devaluation case. There is once again no substantive difference between selective tariffs or subsidies and equivalent multiple rates, and only administrative expediency comes into consideration.

An auction market for a selected group of imports (inessential or luxury goods), combined with a given uniform exchange rate structure for all other goods, is a particularly effective way of coping with a transitory foreign exchange shortage. The authorities determine at each particular time how much foreign exchange to auction for the particular category of imports, and the exchange rate adjusts to clear the market. The fact that the foreign exchange is auctioned implies that in periods of shortage the equilibrium rate in the auction market will be high relative to other rates, thereby increasing fiscal revenue and exerting a net contractionary fiscal effect. The auction market thus serves as a built-in stabilizer even on a basis of constant foreign exchange sales. If during shortages the amount of foreign exchange (in dollars) available for auction were to be reduced, the fiscal contraction (in pesos) would be reinforced.

The economy reacts to the increased auction price through income and substitution effects. The income effect is the counterpart of increased fiscal revenues and clearly implies a reduction in the demand for all goods, thus helping to contain spending. The substitution effects work to increase the demand for goods not rationed. To some extent this means that spending that is rationed in the market for luxury goods may spill over into other, unrestricted imports or reduce exports. But that spillover may be minimal if most of the substitution is intertemporal. Suppose, specifically, that luxury goods are consumer durables. An increase in the current price relative to other goods and relative to the future price of the same durable (once the transitory foreign exchange shortage has disappeared) leads to intertemporal substitution.

Of course, one might think that a devaluation can achieve exactly the same aggregate effect as an auction price system, and it is therefore natural to ask what is special about multiple exchange rates in this context. The chief difference is that an auction price system combines expenditure-switching and expenditure-reducing features. A look at table 4.1 immediately makes this point. An auction rate applied to luxuries is a very special form of taxation. It applies differentially to high-income groups, and it applies to a commodity group that includes a significant share of consumer durables that are particularly sensitive to intertemporal substitution choices.[3] A devaluation, by contrast, would introduce only expenditure-switching effects and, in the absence of other macroeconomic policies, might not even be made to last in real terms. Once again, of course, an ad hoc tax on luxury imports would achieve exactly the same effect.

4.4.2 Macroeconomic Shock Absorber

A flexible multiple exchange rate system can also play a useful role in coping with external disturbances. The classic example is that of a temporary improvement in the terms of trade. One possible adjustment is to allow a uniform real appreciation as increased real incomes are spent in part on domestic goods. But because the real appreciation is transitory, there might be a preference to avoid that adjustment with its implications for losses of competitiveness in nontraditional export and import industries.

The alternative is to reduce the exchange rate applicable to those exports benefiting from improved terms of trade and thus implicitly tax away part of the windfall profits. Moreover, the increased foreign exchange revenues could be used to achieve transitory liberalization in the auction market, where increased supply would reduce the real exchange rate and promote expenditure switching. An example of such a policy toward transitory terms-of-trade improvements is shown in figure 4.1. In the years 1972–74 the boom in world commodity prices raised export revenues from traditional exports, and the Argentine government responded by taxing away the improvements, thus reducing the relative effective exchange rate to only half of that applicable to imports.

A different possibility arises if there is a transitory terms-of-trade deterioration, say, from an increase in world food prices. To be more concrete, suppose the dollar drastically depreciates in world markets, which in turn leads to an increase in the real prices of commodities, including food. The dollar depreciation is seen as an overshooting that shortly will come to be undone. The question arises whether consumption and production patterns in the economy should be made to adjust to the transitory shock. Specifically, suppose that wages respond to the cost of living. Should a government that has the choice allow the commodity price shock to spread to wages, production costs, and prices throughout the economy and then later face the difficulty that wages might not come down easily? If the import price shock feeds through the economy and wages do rise, some sectors will lose competitiveness and there will be unemployment that may well more than offset the improved resource allocation associated with following world prices. The point here is that any time there is a macroeconomic problem in the form of less than fully flexible wages, adjustment to transitory disturbances is costly. Moreover, it may be more costly than simply running down reserves while a special exchange rate prevents the shock from spilling to the home economy.

The case for multiple rates as stated so far is too favorable. If all it involved were the taxation of rents and the compensation of windfall

losses, which otherwise would increase the macroeconomic variance of output, prices, and sectoral allocation, there would be little objection. But the policy may well go beyond that if disturbances in world trade are somewhat persistent. In that case the taxation of transitory terms-of-trade improvements in fact leads to inefficient resource allocation. The failure to pass on the improved terms of trade to producers implies that production will not expand during periods when the real price is high. Production patterns will be frozen regardless of shifting world prices. When that happens the taxation of windfall gains actually becomes a waste of resources. That may still be the preferred policy, but the authority should weigh whatever social benefits accrue from stable or frozen sectoral production patterns or income distribution against the real income gains to be achieved with a resource allocation that leans more in the direction of prices.

4.4.3 Sterilization

We have considered two possibilities in which multiple rates might be used to dampen the impact of disturbances on the economy. First, they function as a fiscal device, producing both expenditure-switching and expenditure-reducing effects. Second, they can be used to limit directly the pass-through to domestic prices and the resource allocation of changes in the world economy. A third possibility presents itself if the multiple rate practice takes the form of the required surrender of foreign exchange earnings from particular transactions in return for a negotiable bond in domestic currency of a specific maturity. This practice represents neither a tax (unless the applicable rate differs from that for other transactions) nor a reallocation of resources. It represents instead a forced loan that helps offset in the short run the monetary effects of export booms.[4]

A policy of postponing the conversion of export earnings into domestic currency by the requirement to surrender earnings in return for an exchange certificate represents a combination of sterilization and taxation. There is implicit taxation because of the delay in payment, the tax being equal to the discount on the exchange certificate. The higher the interest rate and the longer the forced maturity of the exchange certificate, the higher the implicit tax. The delay in payment thus represents a multiple exchange practice with implicit taxation. In addition, of course, there is the possibility of liquidity constraints that make this forced loan have additional adverse effects on absorption.

But the use of exchange certificates also represents an automatic form of sterilization. It is strictly equivalent to the central bank's pegging the rate and expanding the base in the course of a trade surplus and then turning around to offset the expansion by a sale of bonds. In the case of an export boom this forced-loan feature of exchange cer-

tificates does not offset the impact of increased real income and real prices on the economy. It merely avoids reinforcing that mechanism by immediate monetary expansion. Since the exchange certificates do come to maturity at some future date, there will ultimately be a monetary expansion or else a need for a sterilization operation whereby the authorities sell securities and use the proceeds to pay off maturing exchange certificates.

On the import side there is a similar practice in the form of advance deposits. Since these deposits do not carry interest, they represent a form of implicit taxation—the more so, the higher the rate of interest or inflation. They also represent a forced loan and an automatic stabilizer in the case of import booms. An import boom leads to an automatic contraction of the money supply ahead of actual import spending and therefore to increased interest rates and hence increased implicit taxation of imports. Both advance import deposits and exchange certificates therefore share the double feature of implicit taxation through forced lending and monetary stabilization.

4.5 Optimal Adjustment

There is no question that the absence of neutral lump-sum taxes and downward rigidity and upward indexation of wages are major shortcomings. They make it impossible to take literally any blow and adjust to it flexibly, without any *excess* burden. If full flexibility did exist, it would be possible at all times to allocate resources optimally and in the background redistribute income to meet social objectives. But once policy makers operate under the constraints that the effects of the price system on income distribution cannot be simply compensated in their income effects and that wages have a life of their own leading often in the wrong direction, there is a need to consider the trade-offs. Now it may be preferable to "misallocate" resources deliberately in order to avoid spillover or distribution effects. That course of action makes sense only when there are no better ways of compensating and only when disturbances are strictly transitory.[5] But when these restrictive conditions are given, multiple exchange rates do make sense. The fact that in practice they are often abused should lead us to identify clearly the limited range of circumstances in which they apply, not to reject them out of hand.

4.5.1 Optimal Intervention

The problem of the optimal intervention can be formulated in the following manner. Assume the authorities minimize a loss function that is linear-quadratic in two arguments: the costs of deviations from an efficient allocation of resources; and the costs of resource reallocation

or income redistribution associated with changes in relative prices. The objective function is given in equation (4) below. The terms p_t and p_t^* are the domestic and world real price, respectively, of the commodity on which policy focuses.

$$(4) \qquad V = -\frac{1}{2} E \sum_{i=0}^{\infty} [a(p_{t+i} - p_{t+i}^*)^2 + b(p_{t+i} - p_{t+i-1})^2],$$

where the terms a and b are the weights policy makers attach to the costs of misallocation and reallocation, and E is the expectations operator. The functional form implies an increasing marginal cost to deviations from the world price and to price change. The former reflects the basic results in welfare economics; the latter is a plausible assumption about the costs of price changes. Note also that price changes are assumed to be unambiguously perceived as costs. The opposite, of course, might also be the case, namely, the gainers from a relative price change might carry more weight than the losers and hence policy makers could easily move in the direction of efficient resource allocation. But our concern here is with misallocation, and I shall therefore focus on the case in which a price change is perceived as costly and policy makers thus prefer to "coalesce around the status quo."

The solution to the optimization problem is to find a path of domestic prices, p_{t+i}, for a given expected path p_{t+i}^* that maximizes expected utility. The first-order condition of this problem yields the following difference equation in price:

$$(5) \qquad p_t = \gamma p_t^* + \delta p_{t-1} + \delta p_{t+1},$$
$$\gamma = a/(a + 2b), \qquad \delta = b/(a + 2b).$$

Note that the equation admits of a stationary solution, $p = p^*$. That solution prevails, of course, when the costs of price change are zero. Also observe that the current optimal price, p_t, depends both on the international price and on the past and future optimal prices. The appendix outlines the general solution, which involves the entire anticipated path of future prices as well as the initial condition on p_{t-1}. I concentrate here on the special case in which the world price follows a Markov process, such that:

$$(6) \qquad p_t^* = p^* + u_t, \qquad u_t = \rho u_{t-1} + \epsilon_t,$$

where $0 \leq \rho \leq 1$ measures the persistence of disturbances, and u_t is white noise. If ρ is near unity, disturbances are highly persistent and the world price behaves like a random walk. Conversely, with ρ near zero the world price tends to depart only very transitorily from the trend level p^*.

In this special case, and starting from a steady state $p_{t-1}^* = p_{t-1}$, the solution for the optimal price can be written as:

$$p_t = p^* + x\epsilon_t, \qquad x < 1, \tag{7}$$

where x is a fraction that depends both on the persistence of disturbances and on the relative costs of resource misallocation and price changes. This fraction measures the extent to which an innovation in the world price translates into a domestic price adjustment.

Table 4.3 shows the value of the coefficient x for different combinations of the relative cost b/a and the degree of persistence, ρ. The table indicates that with a high persistence of disturbances, adjustment to current prices should be very significant, even if the relative cost of price-change resource allocation is judged to be many times that of efficient resource allocation.

The table brings out that even with a very transitory disturbance and a very high relative cost of reallocating resources, there is some adjustment in the direction of world prices. By contrast, even when disturbances are almost totally persistent and the relative cost of reallocation is virtually negligible, there is still no instantaneous adjustment to world price. That adjustment occurs only over time.

Figure 4.2 shows a simulation for an extreme case in which $\rho = .9$, so that disturbances are highly persistent, and $b/a = 10$, so that there is a large cost assigned to resource reallocation or price changes. Assume a steady-state value of $p^* = 1$, and consider a 50 percent price disturbance. The diagram shows the initial jump in the world price and the gradual tapering off toward the steady-state value. The optimal response is a gradually rising domestic price that meets with the world price after a few years. The initial discrepancy is 25 percent. Note also that the domestic price overshoots and exceeds the world price for some time. The reason for this is that once the domestic price has been pushed up toward the world price, it is costly to take it down again. As the world price falls following the initial jump, the domestic price follows but less rapidly. Even so, the discrepancy is less than 10 percent after only three years and rapidly diminishes to zero.

What does the model imply for multiple rates? If disturbances are relatively short-lived and if policy makers perceive a price change to be costly because of its effects on income distribution, unemployment,

Table 4.3 The Optimal Degree of Adjustment to Disturbances: x

	Relative Cost of Resource Reallocation: b/a		
	.2	1	10
$\rho = .1$	.74	.33	.08
$\rho = .5$	.79	.47	.12
$\rho = .98$	.85	.61	.26

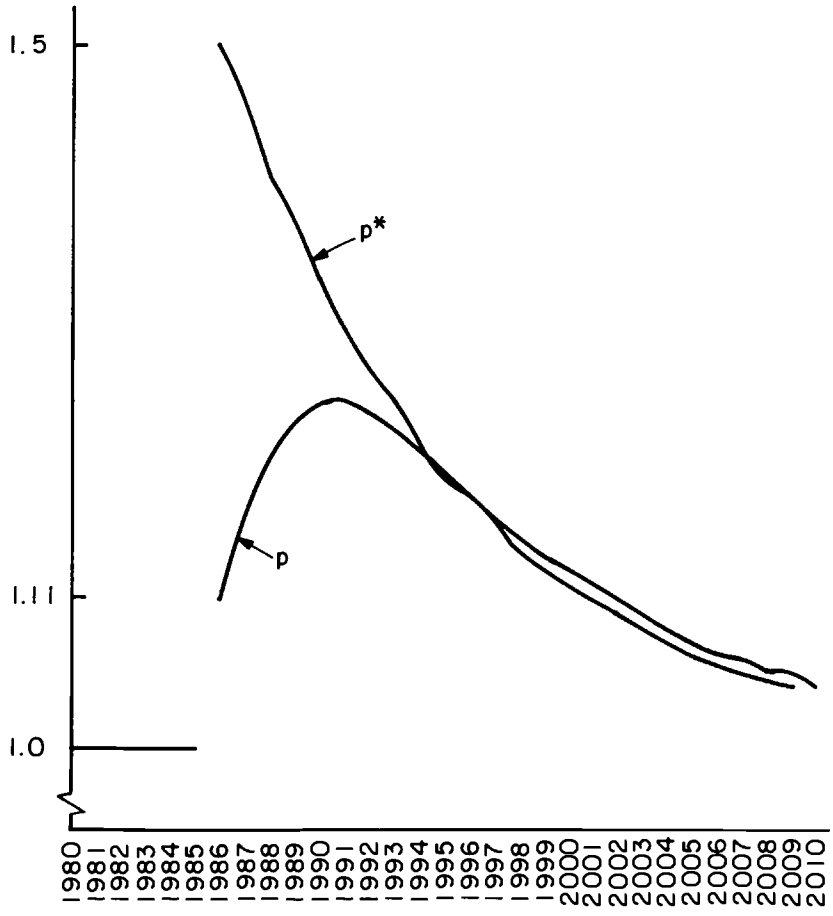

Fig. 4.2 The optimal adjustment to a world price shock.

or inflation indexation, using transitory multiple exchange rate interventions is appropriate. The multiple rate should dampen the impact of the world price change on the economy, but (almost) never completely offset the price change. It is worth thinking about the optimal dampening, because doing so reminds us to make a judgment about the persistence of disturbances and the relative costs of resource reallocation.

The difficulty with such a formulation is that it assumes from the outset that inefficient resource allocation is the only way to avoid or contain the costs of resource reallocation. But clearly it is also conceivable to use fiscal redistribution combined with efficient resource allocation. If disturbances are highly persistent, it is more efficient to

use fiscal redistribution than trade taxes: the incomes of the gaining producers would be taxed and the proceeds distributed to losers.

4.6 Summary

The use of multiple exchange rates represents a combination of expenditure reducing or fiscal policy and expenditure switching. Multiple rates act in the manner of a differentiated tariff and, except for administrative considerations, amount to exactly the same thing. There are good reasons to use these measures as a policy to cope with transitory disturbances. In the case of trade deficits, and in the absence of financing, it may be efficient to concentrate adjustment on a few sectors. Across sectors there are differential speeds of adjustment, and a policy that focuses exclusively on sectors with high responsiveness may be effective. But there are also costs associated with adjusting the economy to transitory disturbances, and therefore multiple rates can be employed to concentrate adjustment on sectors or activities with relatively low costs.

In the case of transitory surpluses induced by terms-of-trade improvements, multiple rates are particularly effective. They serve a direct fiscal role as a built-in stabilizer, thereby reducing the multiplier impact of a disturbance on the economy. But furthermore, they dampen the effect by reducing the resource reallocation brought about by transitory shocks. The extent to which policy makers should dampen the impact of world prices on the nation's economy depends on the persistence of disturbances and on the political costs of adjustment. The lower these adjustment costs and the more persistent the disturbance, the more complete the optimal adjustment to world prices.

Having made the case for the limited use of multiple exchange rates, I conclude with two warnings. First, it is important to bear in mind that any policy rule that always dampens the domestic repercussions of price increases but does not in a symmetric way offset declining world prices in fact systematically reduces the profitability of the sector that is affected. Argentine traditional exports are a good case in point of a policy that has been overused. Second, multiple rates can easily be abused because they do not represent as overt a tax-subsidy scheme as direct taxes and subsidies. Argentina serves once again as the example (*Carta Económica* 1983, 46):

> One of the clearest examples of the costs in terms of distortions of excessive multiple rates occurred in 1973. In that year the international price of wheat stood at a record level and so did the domestic price: the world price stood at an all time high and the domestic

price at an all time low. At the same time, with the help of a whole battery of measures, exports of automobiles to Cuba were subsidized and were paid for by Cuba with promissory notes that exporters discounted with the central bank. The result is the expected: guided by the low domestic prices farmers did not produce much wheat and thus Argentina missed the opportunity to export a competitive commodity at good prices; instead we exported automobiles in exchange for which we received notes that for many years (perhaps even now?) are part of the international reserves of our central bank. (Translation mine)

Appendix: Optimal Adjustment to World Prices

Policy makers maximize an intertemporal loss function:

$$\text{(A1)} \qquad V = \frac{1}{2} E \sum_{i=0}^{\infty} [a(p_{t+i} - p^*_{t+i})^2 + b(p_{t+i} - p_{t+i-1})^2].$$

The first-order condition, or Euler equation, is:

$$\text{(A2)} \quad p_t = \gamma p^*_t + \delta p_{t-1} + \delta p_{t+1}, \qquad \gamma \equiv a/(a + 2b), \qquad \delta \equiv b/(a + 2b).$$

It is immediately apparent from (A2) that with $b = 0$ there is always full and instantaneous adjustment to world prices.

Equation (A2) is a difference equation that can be solved forward.[6] Using the lag operator $Lx_t = x_{t-1}$, we can obtain from (A2):

$$\text{(A2')} \qquad (L^2 - L/p + 1)p_{t+1} = -(\gamma/\delta)p^*_t,$$

which has one stable root. Let λ_1, λ_2 be the roots, of which λ_1 is less than unity in absolute value. Then, rewriting (A2') yields:

$$\text{(A2'')} \qquad p_{t+1}(1 - \lambda_1 L) = -(\gamma/\delta)\frac{p^*_t}{1 - \lambda_2 L}$$

and hence:

$$\text{(A3)} \qquad p_t = \lambda_1 p_{t-1} + (\gamma/\delta)\sum_{i=1}^{\infty} \lambda_1^i p^*_{t+i},$$

where it is assumed that $\lambda_1, \lambda_2 = 1$.

Suppose now that the world price follows a Markov process, such that:

$$\text{(A4)} \qquad p^*_t = p^* + u_t, \qquad u_t = \rho u_{t-1} + \epsilon_t,$$

where ϵ_t is white noise. Then (A3) reduces to:

$$(A3') \qquad p_t = \lambda_1 p_{t-1} + \frac{\lambda_1(\gamma/\delta)}{1 - \lambda_1} p^* + \frac{\lambda_1(\gamma/\delta)}{1 - \lambda_1\rho} \epsilon_t$$

$$= \lambda_1 p_{t-1} + (1 - \lambda_1)p^* + \frac{\lambda_1(\gamma/\delta)}{1 - \lambda_1\rho} \epsilon_t.$$

Notes

1. Equation (2) can be rewritten as $R = e_x(M - X) + (e_m - e_x)M$. The first term represents revenue from depleting foreign exchange reserves and thus cannot properly be thought of as a net revenue.

2. The effective rate of protection of industry i is defined as the percentage excess of domestic value added over world value added, measured in a common currency, or:

$$k_i = [(p_i - vp_j) - e(p_i^* - vp_j^*)]/e(p_i^* - vp_j^*)$$
$$= [(e_i p_i^* - e_j p_j^* v) - e(p_i^* - vp_j^*)]/e(p_i^* - vp_j^*).$$

Dividing by e and p_i^* and defining the exchange rate relative to the average rate, $T_i = (e_i/e - 1)$, reduces the equation to (3).

3. See Dornbusch (1984b) for an analysis of this argument in the context of Chilean currency overvaluation.

4. See Wiesner (1978).

5. It is a silly practice to argue that neutral lump-sum taxes and transfers will address distributional issues, even though we know that these tools simply do not exist. Sticking one's head in the sand, refusing any discussion of second best for societies in which distribution often is more important than efficiency, is poor political economy.

6. See Sargent (1979, 170–200).

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Comment Manuel Guitián

Over a longer period than I like to acknowledge by now, I have enjoyed reading Rudiger Dornbusch's papers, but this, of course, does not mean that I have always agreed with them. The paper I have been invited to discuss can hardly provide an exception to the rule, particularly since my interest in its subject matter is a strong one. This is not only because multiple exchange rate arrangements are a matter of concern from a theoretical and a policy standpoint, but also because the topic is of direct importance to those of us who work at the International Monetary Fund. As the reader may know, the Fund has to oversee the observance of a code of conduct on the part of member countries in their international economic relations; as such, the Fund (and not the World Bank, as the paper indicates) is the only international agency that exercises control over and regulates the exchange practices of those member countries. As a result the institution has jurisdictional responsibilities to discharge in the general deployment of exchange arrangements, which, needless to say, include multiple exchange rate regimes, or as they are referred to in Fund jargon, "multiple currency practices."

In exercising jurisdiction over multiple exchange rates, the Fund monitors on a continuing basis developments in members' exchange systems. As Dornbusch points out in his quotation of the 1984 IMF *Annual Report,* there has been an increase in the incidence in multiple exchange rates since 1980, with some leveling off taking place on this front during 1983. Broadly speaking, the proportion of Fund members resorting to some form of multiple exchange rate regime remains significant. Partly because of this, when I saw the original title of the paper I wondered whether "exotic" (in the sense of unusual, rare, uncommon) was the most appropriate term to apply to multiple exchange rate arrangements.[1] At the risk of unmasking an occupational disease that afflicts those who are concerned on a regular basis with the safeguard of common norms of behavior, I must say that "deviant" came to my mind as a more appropriate term.

Let me now turn to the paper itself. It deals with multiple exchange rates applicable to commercial transactions, and from a general stand-

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point I found some broad grounds for agreement with what Dornbusch has to say on the subject. I can illustrate a few of those grounds by referring to his statement of the equivalence between multiple exchange rates and tax-subsidy trade schemes, particularly the categorization of both of them as "second- or third-best instruments." I also concur with the assertion that the use of multiple exchange rates can be justified only in terms of "administrative or political feasibility or convenience rather than by any intrinsic optimality they possess." I would underscore even more strongly Dornbusch's recognition that multiple exchange rates are of "limited use" and that any resort to using them should be only "transitory" to deal with "short-lived" disturbances. All of these are points with which I cannot but concur. I would add in this context that I believe these considerations apply to multiple exchange rates in general, that is, to those systems established for commercial transactions, as well as to dual exchange rate regimes used to keep current transactions separate from capital transactions.

With areas of agreement out of the way—which is the easy part of my task—let me now turn to the domains of disagreement. These are varied and I must say they concern both matters of substance and matters of emphasis. Let us consider the reasons that are typically adduced for the introduction of multiple exchange rates. The bulk, if not all, of them fall into two main categories—which, by the way, encompass the four purposes identified in the paper. Multiple exchange rates have been used either as means to repress balance-of-payments pressures—these would include Dornbusch's categories of macroeconomic shock absorption and trade-balance adjustment—or as means to attain certain other objectives that are not directly related to the balance of payments—such as, as noted by Dornbusch, objectives regarding fiscal revenues, resource allocation, and income distribution.

A first area of disagreement—though perhaps only partial—arises in connection with a broad conclusion the paper seems to draw concerning the use of multiple exchange rates for reasons other than the balance of payments. Dornbusch begins by suggesting that multiple exchange rates are an inefficient way of achieving long-run revenue, distribution, and allocation objectives, and this idea seems to me unassailable so far as it goes; but then the author proceeds to suggest that there is a risk that the extent of the inefficiency arising from multiple exchange rates might easily be overestimated. In my experience, it is far more likely for the risk to run in the other direction, in other words, the extent of the inefficiency might be underestimated. I do not think the case for overestimation of the inefficiency caused by multiple exchange rates (whichever that case may be) was made in the paper, and I therefore fail to be persuaded by the statement.

Other areas of disagreement—which are related to the first one—concern the particular tone of some of the arguments presented more

than their direction. My comments in this regard reflect the insight I have gathered on this subject in my work at the Fund. From that standpoint, I would stress far more than the paper does the disadvantages of multiple exchange rates that result from the lack of transparency of their effects. In fact, I thought the algebraic derivations and the resulting example provided in the section on effective protection conveyed this point quite effectively. I would contend that the costs of the opaque tax-subsidy schemes that are implicit in multiple exchange rate arrangements typically exceed those that accrue through direct and explicit budgetary means.

Another point I would raise in this context concerns the "transitoriness" that is typically alleged when multiple exchange rate regimes are employed. My impression is that the paper understates an important risk associated with resorting to such regimes: If empirical evidence is to be believed, once they are established, multiple exchange rates typically prove difficult to eliminate and tend to become a permanent feature of the exchange system. In my mind, this is nothing but the corollary of the observation that multiple rates are introduced most frequently for administrative or political convenience. The very process that makes devices like multiple rates more acceptable as a means to suppress an imbalance than the adoption of more direct policy actions is what renders them more difficult to eliminate. In other words, what is convenient to adopt is usually inconvenient to abolish. To the extent that this is the case, the costs of multiple exchange rates in terms of allocative efficiency will outweigh their usefulness as palliatives to existing imbalances and render them less than sensible as policy instruments.

In any discussion of multiple exchange rates, there must be an economic imbalance of some sort somewhere in the background, otherwise there would be no purpose to the discussion. The imbalance may be large or small, and its source may be exogenous or endogenous, transitory or permanent, and so forth. The particular policy response that will be required will depend on some of these characteristics of the imbalance. For example, an exogenous (not policy determined) and transitory (reversible) imbalance will typically call for temporary financing through international reserves or foreign borrowing. This possibility, however, is deliberately left out in the paper, and I cannot but wonder about the reason for this particular assumption. The assumption can only provoke the question whether it is realistic to say that an economy unable to finance a transitory disturbance is not in fact confronting a temporary balance-of-payments problem.

The discussion of the macroeconomic aspects of multiple exchange rates introduced for balance-of-payments purposes (the sections on trade-balance adjustment and macroeconomic shock absorption) seem to me the least persuasive in the paper. If the source of imbalance is

determined by domestic policy (endogenous) and leads to an unsustainable level or rate of the growth of aggregate demand or to an inappropriate cost/price relationship with the rest of the world, policy adjustments directly linked to the source of the problem are required. Palliatives like multiple exchange rates, exchange restrictions, or quantitative controls cannot be substitutes for appropriate policy action on any sustained basis. In effect, they tend to compound the imbalance by adding to the distortions in the economy. This is not to say that there may not be specific instances in which multiple exchange rates can offer a potential useful option by providing a respite to allow the necessary policies to be put in place and take hold, but I would contend that these instances are rare.

My observations to this point also apply to a specific sort of multiple exchange rate system often discussed in the literature, namely, a regime of dual exchange rates that are applicable separately to current and capital transactions. As far as I know, there is no presumption that the resource allocation costs that result from multiple exchange rates depend on the particular type of transactions to which those rates are applied. Nevertheless, an argument is frequently made to the effect that an economy should be insulated from the impact of volatile (and massive?) capital flows and that a dual exchange rate system is useful for this purpose. There are problems with this argument, though, since the larger the capital flows, ceteris paribus, the wider the discrepancy between the exchange rates and, with this discrepancy, the deeper the potential distortions (if the markets are successfully separated) or the stronger the leakages between the two markets (if, as is more likely, transactions cannot be kept separate). In this context, it may be worth stressing that capital movements frequently reflect the stance of domestic policies, and when such stance is inappropriate, dual exchange rates again can only serve to repress and compound the underlying imbalance rather than to solve it.

Finally, there are two further observations that are worth making in this context: one is that even though dual exchange rates can contain or temporarily slow the speed of capital flight, they cannot eliminate the prospect of international reserve losses; the other is that when an imbalance is incurred to prevent or postpone adjustments needed in particular sectors of the economy—as is the case with attempts to sustain unrealistic real wage levels—the use of dual exchange rates to suppress the imbalance may make those sectors able to participate in the free exchange market, instead of those sectors for which the scheme was intended, the ultimate net beneficiaries of the scheme.

In conclusion, perhaps one of the stronger arguments that has been made in favor of multiple exchange rates is that they are more efficient than other means of official interference in external transactions, par-

ticularly quantitative restrictions, which are administratively cumbersome and relatively easy to circumvent. This point is briefly referred to in the paper, but I think it warrants more elaboration. It is also important to note that in economies in which controls are pervasive, multiple rates can serve to impart some influence to price incentives that otherwise might not be allowed to operate at all. Again, all these arguments, despite their partial validity, lose their relevance if they are used to advocate multiple exchange rates as a regime that can be sustained over extended periods of time; their long-run costs in terms of efficiency will clearly exceed any benefits that may be derived from them in the short run.

Note

1. The original title of Dornbusch's paper was "Exotic Exchange Rate Arrangements," and it was later revised to "Multiple Exchange Rates for Commercial Transactions."

Comment Richard C. Marston

This paper on exotic exchange rate arrangements is of the high quality we have come to expect from Dornbusch. It features several simple but insightful analytic models, stripped to their bare essentials to highlight the issues under consideration and buttressed with numerous, well-chosen examples. Dornbusch provides an eclectic view of the literature on what the IMF calls "multiple exchange rate practices," which include legally approved systems of multiple commercial exchange rates and "dual exchange markets," as well as "black markets" outside the law.

The subject I would like to focus on here—dual exchange rates—forms the analytical core of Dornbusch's paper. By dual rates, we mean exchange rate arrangements that separate capital-account transactions from most if not all trade transactions, with the former carried out in the so-called free market. Dual exchange markets are often viewed by governments as an effective way to insulate the trade account, and perhaps the real sector, from financial disturbances affecting the exchange rate. The academic literature on dual markets, on the other hand, focuses on those channels of transmission that still remain open under dual rates.

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This comment reviews the version of the Dornbusch paper presented at the NBER–World Bank conference. Subsequently, Dornbusch made some changes in that paper.

Before addressing Dornbusch's analysis, I would like to begin by examining those channels that dual markets succeed in cutting off, at least under some dual rate systems. This will help in understanding how these systems work, but also in explaining why it is important to keep the free market rate confined to financial transactions. There are two channels I would like to mention.

The first is the influence of changes in exchange rates on domestic wages and aggregate supply. To the extent that imports consist of consumer goods, a depreciation of the domestic currency exerts upward pressure on wages and hence on the supply prices of domestic goods. To the extent that imports consist of materials used in production, the influence of exchange rate changes on aggregate supply is even more direct. It is immediately obvious why dual exchange rate systems almost invariably channel wage goods and imported materials, often called "essential imports," through the regulated exchange market, thus cutting off this important channel.

The second channel is the influence of exchange rate changes on aggregate demand. A depreciation may lead to changes in relative prices, be they the relative prices of foreign to domestic goods or those of traded to nontraded goods, thus shifting aggregate demand. As long as trade transactions are confined to the regulated market, this channel is also cut off.

Thus, on the positive side, the dual rate system can cut off those price channels by which the exchange rate, and hence financial disturbances, affect the real sector of the economy. If a government wants to shield its nation's economy from temporary financial shocks, for example, then cutting off these channels has much to be said for it. Dornbusch cited in his original conference paper the example of Mexico's dual rate, which was adopted in response to the financial crisis of August 1982. Here is a case where it was clearly advantageous to separate the exchange markets for real and financial transactions, even though the insulation afforded by the dual rate system was both incomplete and temporary in nature.

Dornbusch, as well as earlier writers on dual markets, however, emphasizes the negative features of dual rates, specifically, the failure of dual rates to cut off certain financial channels of transmission. The dual exchange market has an interesting effect on real asset values. The separation of real and financial transactions holds the price level, the deflator of asset values, constant (or at least exogenous with respect to financial disturbances originating abroad). But the nominal value of foreign assets changes. The depreciation of the free rate applying to financial transactions leads to a rise in asset values. And this change in wealth in turn affects aggregate demand. If the depreciation is expected, moreover, interest rates also adjust. So the demand for real balances is affected.

Note that these are channels that do not exist in the simple open economy model without capital mobility, the model familiar from the work of James Meade and others in the 1950s. In such a model, with the exchange market consisting of current-account transactions only, the real sector of the economy is insulated from all foreign disturbances, at least in the simplest versions of the model. In the dual market model, in contrast, the real sector is not insulated, because nominal wealth and interest rates are affected by changes in the financial or "free" exchange rate.

The dynamics of wealth accumulation in the dual market model are also quite different from those found in the purely flexible exchange rate models of Kouri (1976) and Dornbusch and Fischer (1980). In the Kouri or Dornbusch-Fischer model, a current-account surplus is accompanied by an appreciation of the exchange rate, since the accumulation of wealth is in the form of foreign assets and that leads to an excess demand for money. In contrast, in the dual market model, as was pointed out by Flood (1978), a current-account surplus is accompanied by a depreciation rather than an appreciation of the domestic currency because the accumulation is in the form of money balances rather than foreign assets (because the current-account imbalance is satisfied with reserve flows). In any case, we see that the dual exchange rate system cannot cut off the financial channel by which changes in the free exchange rate affect the real sector.

The case against the dual market system is stronger than suggested so far if some real trade transactions take place in the free market. In that instance the dual market system does not succeed in cutting off even the wage and relative price channels by which the exchange rate, and hence financial disturbances, can affect the real sector of the economy. But for that reason, it is no longer adequate for a model of dual markets to focus on wealth and interest-rate effects alone, as most of the literature has done.

In a later section of the paper, Dornbusch introduces a more complex model of a dual market that permits some categories of imports and exports to be traded in the free market. In this model the relative prices of traded goods in the regulated and free markets can change, thereby opening up a new channel of transmission. I would argue that Dornbusch does not go far enough in modifying the earlier model to incorporate relative price effects. First, the model still does not include any relative price of domestic and foreign goods. This is a channel of influence incorporated into the dual market models of both Macedo (1982) and Cumby (1984). Second, there is still no supply sector in the model. We therefore have no idea how the labor force is reacting to changes in all of these relative prices.

But here we reach an important issue concerning research on such dual market models. To accommodate this more complex model of the

dual market, Dornbusch has had to grapple with a third dynamic equation. In his model, foreign capital can be accumulated in the free market, since a current-account surplus can occur in that market. He therefore presents an additional accumulation equation. With three dynamic equations, the author now resorts to an analysis of the steady state alone. I would argue that we are much more interested in the short-run dynamics than in the long-run steady state. How do we deal with the short run in a model with three dynamic equations? One answer is to simulate the model dynamically using estimated or nonestimated parameters. Most economists are unenthusiastic about simulation analysis, perhaps because simulations depend so much upon the particular parameters chosen for the model. But I would argue that simulations are preferable to both of the alternatives: focusing on the steady state, as Dornbusch does, or oversimplifying the model by leaving out important channels. Having said that, I should immediately add that the steady-state analysis Dornbusch provides is of considerable interest in itself. No one else, as far as I know, has ever tackled the problem of incorporating real sector transactions into the so-called free market.

I have focused my remarks on the insulation issue because I believe this lies at the heart of dual markets. But in closing, I would like to mention two other issues that are important in evaluating dual exchange rates. The first concerns the distortions to efficient resource allocation that occur when the dual rates, or multiple rates, involve different prices for different goods. Dornbusch does an excellent job of probing the inefficiencies that arise in these dual rate systems, as well as in other "exotic" arrangements. These inefficiencies are a good argument for using dual rates only in speculative crises, although, as with many government policies, the temporary expedient may prove to be permanent. The second issue is one that neither Dornbusch nor the other writers I have mentioned have addressed: the problem of leakages between markets in the dual market system. If the free market premium is large enough, there is obviously an incentive to transfer transactions to the most advantageous market. The possibility of leakages places an effective constraint on the free market premium, if only to prevent resources from being diverted into new ways to cheat the system. We need to see more analysis of this issue to understand better the incentives for cheating and their effects on the workings of the system.

Dornbusch does not cover all of these issues, but his paper provides a firm foundation on which future analysis of the dual market system, as well as other "exotic" arrangements, can be based.

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