MULTIPLE EXCHANGE RATES FOR COMMERCIAL TRANSACTIONS

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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". These practices are formally defined by the IMF (1981, p. 23) guidelines as action that leads to exchange rate spreads in excess of 2 percent between buying and selling rates.

Multiple exchange rate practices have a long history. In the 1930s, if not earlier, multiple rates and restricted convertibility appear on a broad front throughout the world economy. In Europe, exchange control was widely practiced and Raoul 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.

The important research question to which an answer is attempted here is whether they are a perfectly sensible quest for extra policy instruments, 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, but it is quite separately an issue for international supervisory agencies, specifically the IMF and the World Bank, who are charged with monitoring and inhibiting multiple role practices. The welfare economics of exotic exchange rate arrangements are complicated not
only by the fact of variety which 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 where effectiveness comes first and resource allocation questions are asked much later.
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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". These practices are formally defined by the IMF (1981, p.23) guidelines as action that leads 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 non-habitual, consenting adults. While these various forms of exchange rate policy defy a simple classification, they do arise out of a common concern, namely to strike a balance between the allocative efficiency that comes almost always 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 shows once again on a massive scale this diversity of exchange rate arrangements. But Latin America is not alone in practicing multiple rates. In the early 1980s more than 40 IMF members had at least one multiple currency practice and its 1984 review the IMF (1984, p.37) notes:

"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 appear on a broad front throughout the world economy. In Europe, exchange control was widely practiced and Raoul 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, p.80) puts 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 insufficient, 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 they are a perfectly sensible quest for extra policy instruments, 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, but it is quite separately an issue for international supervisory agencies, specifically the IMF and the World Bank, who are charged with monitoring and inhibiting multiple role practices. The welfare economics of exotic exchange rate arrangements are complicated not only by the fact of variety which 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 where effectiveness comes first and resource allocation questions are asked much later.

1. An Overview.

In this section we discuss exchange rate practices that result in a differentiated exchange rate structure for different commercial transactions.

Table 1 serves as an introduction to the topic and shows 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 in Table 1 show 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/$) is expressed as a percent of the "basic" export rate. Most of these rates are fixed, but there is also a potentially flexible rate applied in the auction market.
Table 1: Categories and Exchange Rates: Argentina 1949
(Index basic buying rate = 100)

<table>
<thead>
<tr>
<th>Category</th>
<th>Buying Rate</th>
<th>Selling Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preferential A</td>
<td>144</td>
<td>110</td>
</tr>
<tr>
<td>Preferential B</td>
<td>169</td>
<td>158</td>
</tr>
<tr>
<td>Special</td>
<td>212</td>
<td>---</td>
</tr>
<tr>
<td>Basic</td>
<td>100</td>
<td>179</td>
</tr>
<tr>
<td>Auction</td>
<td>---</td>
<td>fluctuating</td>
</tr>
<tr>
<td>Free</td>
<td>265</td>
<td>269</td>
</tr>
</tbody>
</table>

Buying rates

1. Preferential "A": wool, hides, vegetable oil, oilcakes, tallow, meat extract, some prepared meats, poultry, live animals, minerals (except tungsten).

2. Preferential "B": combed wool, cheese, butter, casein, powdered milk, ques-bracho extract, pork, eggs, pulses, shark-liver oil, 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, oilseeds.

5. Free: receipts from all nonmerchandise transactions.

Selling rates

6. Preferential "A": coal, coke, and petroleum and by-products.

7. Preferential "B": raw materials and articles of popular consumption.

8. Basic: articles the import of which is considered less essential.


10. Free: remittances for all nonmerchandise transactions.

Source: Adapted from Schlesinger (1952).
Consider now the details of the multiple rate structure. It is readily
seen that agricultural exports receive the least favorable rate—the index is
100 for these traditional exports. This is a common feature in countries
where the economic structure introduces strong sectoral distinctions between
traditional commodity exports and non-traditional manufacturing interests.
Argentina is a good case in point. Here the traditional export sector is
related to agriculture—wheat, meat, hides and processed agricultural-based
goods. But there is also an a manufacturing sector that competes with
imports and appears likewise on the export side.

It is apparent from Table 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 licenced. 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 apparent from Table 2 which shows the broad
possibilities for multiple rate systems. The two main dimensions 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 would possibly apply to imports where for each transaction a
specified amount of foreign exchange is allocated at a given rate. The
distribution among competing users would involve history or discretion and
thus maximum potential for abuse and/or efficiency. System II applies
similarly to imports where a given amount would be auctioned among competing
users. This system is frequently used for inessential or luxury import.
Table 2: Multiple Rate Regimes

<table>
<thead>
<tr>
<th>Foreign Exchange</th>
<th>Exchange Rate:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply</td>
<td></td>
</tr>
<tr>
<td>Rationed</td>
<td>Fixed</td>
</tr>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td>Market</td>
<td>III</td>
</tr>
<tr>
<td>Determined</td>
<td></td>
</tr>
</tbody>
</table>
System III applies to both imports and exports. The government fixes the rate for different transactions and importers or exporters chose the amount they wish to buy of foreign exchange or the level of exports and hence of export earnings. A special case of this system, of course, is a uniform rate. System IV finally applies when the government allows exporters to sell part of their export earnings from particular categories to importers of some specified classes of goods. As a special case we have here uniform, unrestricted flexible rates where exporters can sell all his earnings to any importer. The splitting of markets and matching and monitoring of quantities is what requires exchange control authorities and gives 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 a form of taxation to affect resource allocation and income distribution,
- as a macroeconomic shock absorber,
- as an instrument of trade balance adjustment.

Following this broad overview we now turn to a more detailed evaluation of multiple rates. We start by developing fiscal aspects.

2. Fiscal Aspects.

In this section we show how multiple rates have fiscal aspects in two respects. First to the extent that average buying and selling rates differ they are a source of aggregate revenue or transfers. Second differential
buying and selling rates across sectors involve an implicit system of protection.

The Implicit Tax-Subsidy Structure: Consider a simple model of the world economy where 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 $1. In the absence of any taxes, transport costs or other impediments and with a uniform exchange rate the domestic price of all tradeable goods would be equal to the common exchange rate. But in fact exchange rates differ among transactions and so 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 export proceeds of some categories 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 accordingly embeds an implicit t-x-subsidy structure.

The implicit tax-subsidy structure can be analysed by focussing on two 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 aspect is the dispersion of rates across transactions and the implicit tax-subsidy allocation across commodities. Let $e_i$ be the exchange rate (pesos/$U.S.$) applied to the $i$th import transaction and $e_j$ the rate on the export side. We can define the average import and export exchange rates 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 $i$th import or $j$th export transaction respectively in total dollar value
of imports \( (M) \) or exports \( (X) \). The average import and export exchange rates then are defined as:

\[
(1) \quad e_m = \frac{\sum_i a_i e_i}{\sum_i a_i}, \quad e_x = \frac{\sum_j b_j e_j}{\sum_j b_j}
\]

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:

\[
(2) \quad R = e_m M - e_x X
\]

If trade is balanced in dollars so that \( X = M \) this formula reduces to:

\[
(2a) \quad R = (e_m - e_x) M
\]

The right-hand side of (2a) 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 we do not have these average rates available a look at Table 1 immediately shows that this was not obviously 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.

**Effective Protection:** The multiple rate structure implies fiscal aspects not only in the global revenue sense, but also in the allocation of incentives or taxes across activities. Let \( e = (e_m + e_x)/2 \) 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 where the relative import rate is high 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. That leads us 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 with given world prices and domestic prices determined by the exchange rate structure. The effective rate of protection for commodity $i$ then is given by:

\[ k_i = \frac{(T_i - \alpha T_j)}{(1-\alpha)}, \quad \alpha = \frac{p^*_j v}{p^*_i}, \quad T_i = (e_i / e - 1) \]

where $\alpha$ denotes the share of the intermediate factor in income and $p^*_i$ and $p^*_j$ are the world prices in dollars of final and intermediate goods respectively and $T_i$ and $T_j$ denote the percentage devaluation of a particular exchange rate from the economy-wide average. Equation (3) thus reduces the multiple rate structure to the conventional representation of 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 economy-wide average. Table 1, as an example, shows a preferential export rate (144) for prepared meats (sausages) compared to a lower rate (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 economy-wide 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 economy wide average only by 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 due to the favorable export rate on the final good. The remainder is accounted for by the implicit subsidy that stems from the fact that the intermediate good receives an exchange rate below the economy-wide average. The Argentinian 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 final goods implies effective protection of domestic manufacturing.

The Argentinian example of 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 and/or subsidies. With that in mind there are only two issues to be considered. But what precisely is the equivalence between trade taxes and multiple 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, that only relative prices and relative rates of taxation matter.

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

To have a complete idea of the protection structure we must add together any implicit protection given by the exchange rate structure, protection from quotas and outright taxes or subsidies, as well as 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 1 shows the result of calculations for Argentina, reported in El Crowista Comercial showing the broad pattern of sectoral protection through all these instruments combined in the last fifteen years.

The Figure shows the peso price of a dollar of traditional exports and of non-traditional 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 places a massive trade tax on traditional or agricultural exports. Non-traditional exports, by contrast enjoyed a significant subsidy relative to imports in the mid-1970s, but that differential has since almost disappeared.

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 for a preference of 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
Figure 1  Argentinian Comparative Effective Exchange Rates

A: Non-Traditional Exports Relative to Imports

B: Traditional Exports Relative to Imports
are almost always second or third best instruments. Their use, as a permanent system, would have to be justified by administrative and/or political feasibility or convenience rather than on any intrinsic optimality.

While the use of multiple rates is in all likelihood an inefficient way of achieving longrun 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 1, implies a particularly costly structure. For the revenue case that is true by comparison with say a uniform rate \( e_u \) that exceeds the export rate \( e_x \) and thus generates revenue. But it must also be recognized as Harberger (1954) has pointed out, that not everybody in an economy can be protected. What matters by Lerner's symmetry theorem are relative rates of protection and with that in mind much of the diversity in Table 1 cancels out.

3. **Macroeconomic Aspects of Multiple Rates.**

Multiple rates can play a macroeconomic role in two ways. First they may be an effective instrument of adjustment in a circumstance where 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 terms of trade improvement.

**Trade Balance Adjustment:** In the absence of reserves and/or financing trade deficits require adjustment. Multiple rates may be an effective adjustment mechanism in the case of transitory disturbances. We emphasize the case of transitory disturbances since persistent deficits require an adjustment that pays more attention to the inefficiency caused by lasting trade distortions implicit in multiple rates. In the shortrun by contrast these distortions presumably do not involve significant deadweight losses. If financing, which
would be preferred in such a case, is unavailable then 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 rates. Commercial policy, whichever of the forms 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 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 shortrun macroeconomic flexibility of the economy.

Consider first the case where an increase in aggregate spending causes the deficit. If we face 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 then some measure of expenditure switching, too, is required since expenditure cutting by itself creates domestic unemployment. The higher domestic unemployment and the more responsive demand and employment, the more appropriate are switching policies compared to expenditure reducing policies.

The argument against a shortterm devaluation as an adjustment policy is well established: in the shortrun 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 is that a real depreciation
will cut the purchasing power of wages and hence real aggregate demand for domestic goods. The gain in employment due to 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 rate on every item. Such a sale makes losses if most items have an inelastic demand and the purposes would be better served by singling out selected items with high elasticities and concentrate on these as the revenue makers, thus avoiding the transfer abroad 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 appears well-established.

It is easy to imagine the case where demand for imports is price inelastic and 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 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 an income distribution point of view whereas imports lend themselves better to adjustment. In any event, the familiar case for selective interventions over the exclusive use of expenditure cuts or uniform devaluation has now been restated.

The next question is how to chose between quotas and tariffs or equivalent multiple rates. The use of quotas for shortrun balance of payments control has been particularly used 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 then imposing and 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. As between selective tariffs or subsidies and equivalent multiple rates there is once again no substantive difference 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 point in time how much foreign exchange to auction for the particular category 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 thus increasing fiscal revenue and exerting a net contractionary fiscal effect. The auction market thus serves as 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 via income and substitution effects. The income effect is the counterpart of increased fiscal revenues and clearly implies a reduction in demand for all goods, thus helping contain spending. The substitution effects work to increase 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 spill-over 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 and it is therefore natural to ask what is special about multiple rates in this context. The chief difference is that an auction price system combines expenditure switching and expenditure reducing features. A look at Table 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. A devaluation, by contrast would only introduce expenditure switching effects and, in the absence of other macroeconomic policies might not even be made to stick in real terms. Once again, of course, an ad hoc tax on luxury imports would achieve exactly the same effect.
Macroeconomic Shock Absorber: A flexible multiple rate system can also play a useful role in coping with external disturbances. The classical example is that of a temporary terms of trade improvement. 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 non-traditional exports and import industries.

The alternative is to reduce the exchange rate applicable to those exports benefitting 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 gains is shown in Figure 1. In 1972-74 the boom in world commodity prices raised export revenues in traditional exports and the Argentinian government responded by taxing away the gains thus reducing the relative effective exchange rate to only half of that applicable to imports.

A different possibility arises when there is a transitory terms of trade deterioration, say from an increase in world food prices. To be concrete suppose there is a drastic depreciation of the dollar in world markets that 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, then 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 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 avoids the shock from spilling to the home economy.

The case for multiple rates as stated so far is too favorable. If all it involved was taxation of rents, and compensation of windfall losses, which otherwise would increase macroeconomic variance of output, prices and sectoral allocation there would be little objection. But the policy may well go beyond that to the extent that disturbances in world trade are somewhat persistent. In that case taxation of transitory terms of trade gain, in fact, lead 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 taxation of windfall gains actually becomes a wasting of resources. That may still be the preferred policy, but at least one should weigh whatever social benefits from stable or frozen sectoral product patterns or income distribution against the real income gains to be achieved with resource allocation that leans more in the direction of prices.

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 resource allocation of changes in the
world economy. A third possibility presents itself when the multiple rate
practice takes the form of required surrender of foreign exchange earnings
from particular transactions in return for a negotiable bond in home currency
of specified maturity. This practice represents neither a tax, unless the
applicable rate differs from that for other transactions, nor a reallocation
of resources. It represents in fact a forced loan that helps offset in the
shortrun the monetary effects of export booms.4

A policy of postponing conversion of export earnings into home
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 an 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 which make this forced loan have
additional adverse effects on absorption.

But the use of exchange certificates represents also an automatic form
of sterilization. It is strictly equivalent to the central bank 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 certificates does not offset the
impact of increased real income and real prices on the economy. It merely
avoids to reinforce that mechanism by immediate monetary expansion. Since
the exchange certificates do come to maturity some time there will ultimately
be a monetary expansion or else the need for a sterilization operation where the authorities sell securities and use the proceeds to pay off maturing exchange certificates.

On the import side there is similar practice in the form of advance deposits. Since these deposits do not carry interest they involve implicit taxation, the more so the higher the rate of interest and/or inflation. They also represent a forced loan and an automatic stabilizer in 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 increasing implicit taxation of imports. Both advance import deposits and exchange certificates thus share the double feature of implicit taxation via forced lending and monetary stabilization.

4. Optimal Adjustment.

There is no question that absence of neutral lumpsum 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 we could at all times allocate resources optimally and in the background redistribute income to meet social objectives. But once policy makers operate under the constraint that the price system's effects 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 deliberately "misallocate" resources in order to avoid spill-over effects or distribution effects. That makes sense only when there are no better ways of compensating and only when disturbances are strictly transitory. But when these restrictive conditions are given then multiple
rates do make sense. The fact that in practice they are often abused should lead us to clearly identify the limited range of circumstances where they apply, not to reject them out of hand.

Optimal Intervention: We can formulate this problem in the following manner. We 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 (4). The terms $p_t$ and $p^*_t$ are the domestic and world real price of the commodity on which policy focusses.

\begin{equation}
V = - \frac{1}{2} E \sum_{i=0}^{\infty} \left[ a(p_{t+i} - p^*_{t+i})^2 + b(p_{t+i} - p_{t+i-1})^2 \right]
\end{equation}

The terms $a$ and $b$ are the policy makers weights attached to the costs of misallocation and reallocation and $E$ is the expectations operator. The functional form implies an increasing marginal cost to deviations from 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 change. Note also that we assume price changes are unambiguously perceived as costs. The opposite of course might also be the case, namely a situation where the gainers from a relative price change carry more weight than the losers and hence policy makers can easily move in the direction of efficient resource allocation. But our concern here is with misallocation and hence we focus on the case where price change is perceived as costly and hence policy makers 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 $p^*_t$ that maximizes expected utility.
The first order condition of this problem yields a difference equation in price:

\[ p_t = \gamma p_t^* + \delta p_{t-1} + \delta p_{t+1} ; \quad \gamma = a/(a+2b); \quad \delta = b/(a+2b) \]

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

\[ p_t^* = p^* + u_t, \quad u_t = \rho u_{t-1} + \epsilon_t \]

where \( 0 < \rho < 1 \) measures the persistence of disturbances and \( u_t \) is white noise. If \( \rho \) is near unity then disturbances are highly persistent and world price behaves like a random walk. Conversely, with \( \rho \) near zero 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:

\[ p_t = p^* + x\epsilon_t ; \quad x < 1 \]

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

Table 3 shows the value of the coefficient $x$ for different combinations of the relative cost $b/a$ and the degree of persistence, $\rho$. The table brings out that with 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 or 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 only occurs over time.

Figure 2 shows a simulation for an extreme case where $\rho = .9$ so that disturbances are highly persistent and $b/a = 10$ so that there is a large cost assigned to resource reallocation or price changes. We assume a steady state value of $p^* = 1$ and consider a 50 percent price disturbance. The diagram shows the 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 after a few periods with the world price. The initial discrepancy is 25 percent. Note also that the domestic price overshoots and exceeds the world price for some time. The reason is that once the domestic price has been pushed up toward the world price it is costly to take down again. As the world price comes down, following the initial jump the domestic price follows, but less rapidly. Even so the discrepancy is less than ten percent already after three periods and rapidly tones down to zero.

What does the model imply for multiple rates? If disturbances are
Table 3: The Optimal Degree of Adjustment to Disturbances: x

<table>
<thead>
<tr>
<th>Relative cost of reallocation: b/a</th>
<th>.2</th>
<th>1</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>p = .1</td>
<td>.74</td>
<td>.33</td>
<td>.08</td>
</tr>
<tr>
<td>p = .5</td>
<td>.79</td>
<td>.47</td>
<td>.12</td>
</tr>
<tr>
<td>p = .98</td>
<td>.85</td>
<td>.61</td>
<td>.26</td>
</tr>
</tbody>
</table>

Note: For explanation see text.
Figure 2  The Optimal Adjustment to a World Price Shock
relatively shortlived and if policy makers perceive price change to be
costly because of income distribution, unemployment or inflation indexation
linkages, then using transitory multiple 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 that reminds us to make a
judgment about persistence and relative costs.

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

Summary: The use of multiple exchange rates represents a combination of
expenditure reducing or fiscal policy and expenditure switching. It acts in
the manner of a differentiated tariff and except for administrative
considerations comes to exactly the same thing. There are good reasons to
use such 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 policy may gain by focussing
exclusively on sectors with high responsiveness. But, there are also costs
to adjusting the economy to transitory disturbances and therefore multiple
rates can serve 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 an economy should dampen the impact of world prices on the economy depends on the persistence of disturbances and 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 limited use of multiple exchange rates we conclude with two warnings. First it is important to bear in mind that any policy rule that always dampens the domestic repercussion 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. Argentinian traditional exports are a good case in point of a policy that is overdone. 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 the example (Carta Economica 1984, p.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."
BIBLIOGRAPHY


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APPENDIX

Optimal Adjustment to World Prices

Policy makers maximize an intertemporal loss function:

\[ V = \frac{1}{2} E \sum_{i=0}^{\infty} \left[ a(p_{t+i} - \pi_t^*)^2 + b(p_{t+i} - \pi_{t+i-1})^2 \right] \]

The first order condition or Euler equation is:

\[ p_t = \gamma \pi_t^* + \delta p_{t-1} + \delta p_{t+1} \]
\[ \gamma \equiv a/(a+2b) , \quad \delta \equiv b/(a+2b) \]

It is immediately apparent from (2) that with \( b = 0 \) there is always full and instantaneous adjustment to world prices.

Equation (2) is a difference equation that can be solved forward.\(^1\)

Using the lag operator \( Lx_t = x_{t-1} \) we obtain from (2):

\[ (2a) \ (L^2 - \frac{\gamma}{\delta} L + 1)p_{t+1} = - \frac{\gamma}{\delta} \pi_t^* \]

which has one stable root. Let \( \lambda_1, \lambda_2 \) be the roots of which \( \lambda_1 \) is less than unity in absolute value. Then rewriting (2a) we obtain:

\[ (2b) \ p_{t+1}(1-\lambda_1 L) = - (\gamma/\delta) \frac{\pi_t^*}{1-\lambda_2 L} \]

and hence
(3) \[ p_t = \lambda_1 p_{t-1} + \frac{(\gamma/\delta)}{1-\lambda_1} \sum_{i=1}^{\infty} \lambda_1^i p_{t+i}^* \]

where we have used the property that \( \lambda_1 \lambda_2 = 1 \).

Suppose now that the world price follows a Markov process:

(4) \[ p_t^* = p^* + u_t, \quad u_t = \rho u_{t-1} + \varepsilon_t \]

where \( \varepsilon_t \) is white noise. Then (3) reduces to:

(3a) \[ p_t = \lambda_1 p_{t-1} + \frac{\lambda_1 (\gamma/\delta)}{1-\lambda_1} p^* + \frac{\lambda_1 (\gamma/\delta)}{1-\lambda_1 \rho} \varepsilon_t \]

\[ = \lambda_1 p_{t-1} + (1-\lambda_1) p^* + \frac{\lambda_1 (\gamma/\delta)}{1-\lambda_1 \rho} \varepsilon_t \]
This paper is part of a study on exotic exchange rate arrangements prepared for the Trade and Adjustment Policy Division of the World Bank. Companion papers deal with dual rates for capital account transactions and with collapsing exchange rate regimes. I am indebted to members of the division and my conference discussants for helpful comments and suggestions.

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

\[
k_i = \left( \left( p_{i} - v_{p_j} \right) - e \left( p_{i}^* - v_{p_j}^* \right) \right) / e \left( p_{i}^* - v_{p_j}^* \right) = \left( (e_i p_{i}^* - e_j p_{j}^* v) - e \left( p_{i}^* - v_{p_j}^* \right) \right) / e \left( p_{i}^* - v_{p_j}^* \right).
\]

Dividing by \( e \) and \( p_{i}^* \) and defining the exchange rate relative to the average rate, \( T_i = (e_i / e - 1) \), the equation reduces to (3).

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


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