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## FOREIGN EXCHANGE REGIMES FOR DUTCH DISEASE PRONE LDCs

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## Summary

Dutch Disease in its different forms un avoidably sets up a trade-off between the goals of an efficient economy, an acceptable income distribution and an administrable tax system. Each of the forms of Dutch Disease, Evolutionary, Innovational, and Acute, present the problem in a slightly different way, however all have their root in sharp discontinuities in total factor productivity between different lines of production, which, in turn, use different factor mixes and hence generate considerable rent which accrues to a limited number of owners.

The most common policy towards Dutch Disease consists of adopting an "exchange rate system" consisting of a financial exchange rate and a range of export taxes, import subsidies, import duties and export subsidies. However, various contractual arrangements have increasingly limited the use of export subsidies and high tariffs. As a result, the financial exchange rate has increasingly been forced to locate near the top of the range.

This development has created problems for Dutch Disease cases in which export taxes cannot be levied on the high productivity sector for practical reasons (e.g. coca paste, smuggled diamonds or coffee, "nature" tourism). In this case, it becomes necessary to segment the exchange market itself and use a lower tier exchange rate to implicitly tax the high-productivity export sectors. Such a segmentation must be undertaken with care, however, to avoid its degeneration into a distortionary multiple exchange rate system.

The Certimpex system, a simple system based on a transferable import license given to exporters, would appear to satisfy the minimal need for segmentation, without being easily subject to administrative abuse and without creating arbitrage incentives qualitatively different from those existing in any tariff/subsidy regime. The practical operation of similar systems in a number of countries in different parts of the world adds weight to the view that this system may be a useful complement to the more standard tools with which countries respond to the different varieties of Dutch Disease.

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## I

## INTRODUCTION

Differences in productivity between activities in the same country are a natural part of the flux of a flexible (and growing) economy. Indeed, innovation and competition should continuously be adding new activities that are more productive than the older ones, thereby inducing them, in turn, to become more productive, or alternatively supplanting them in the portfolio of ongoing production. At any point in time, therefore, a cross-section of existing productive activities will show coexistence of a range of productivities. How closely bunched these productivities are at the *margin* constitutes an indicator of the effectiveness of adjustment in the corresponding economy.

When large gaps in productivity appear between different productive activities, and particularly when these are lasting, either large rents appear or the lower productivity activities are forced to close, often producing unemployment of labor and capital of considerable duration. It is this complex of events that has been called "Dutch Disease".

Dutch Disease became noted in the literature as a result of the discovery of gas field off the coast of Holland which produced a real revaluation of the florin which, in turn, caused much of the remainder of Dutch traded output to be threatened with closure. However, a similar phenomenon of large productivity differences between sectors with very different factor demands had long been

noted in some resource rich LDCs, particularly in the Southern Cone of Latin America. There, the phenomenon was called "unbalanced economic structure<sup>1</sup>" and gave rise, in part, to Structuralism. The main concern in the Southern Cone was with the income distribution consequences of large rents being concentrated in few hands, although the problem later seen in Holland was also noted.

The following sections of this paper attempt to describe different kinds of Dutch Disease along with the main policy choices decision makers face as they try to satisfy efficiency and distributional objectives. Then, the complications introduced by monopoly power in export markets are considered and their interactions with productivity differences are explored.

Finally, attention is given to the different mixes of exchange rate and tax/subsidy policy that can be used to deal with Dutch Disease of various sorts. In this context, an exchange market based alternative is developed which enlarges the policy set available to decision makers and allows the more conventional policy tools to stay more easily within currently accepted magnitudes.

## II

### EVOLUTIONARY DUTCH DISEASE: INDUSTRIALIZATION

One kind of Dutch Disease is the almost natural outcome of

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<sup>1</sup> The term appears most forcefully in the writings of Marcelo Diamand of Buenos Aires, starting in the early 1960s.

LDCs efforts to industrialize. The stylized facts of the process are as follows:

"Latinia" (or it could just as well be "Pooristan" in Asia or "Congania" in Africa) is a country exporting products originating in its highly productive plantations and its mines of high quality ore. It produces most of its own food but imports some types of food for the production of which its climate is unsuitable, and it imports all its sophisticated manufactures. Ownership of the plantations and the mines is concentrated in the hands of a small number of families. The exchange rate has settled at a level consistent with the productivity of the plantations and the mines: reasonable profits are made by landowners and mine-owners.

Then, population growth forces upon the government the need to speed up the generation of jobs<sup>2</sup>. Existing mines cannot absorb significant additional labor: the marginal product of labor in the sector declines very rapidly as additional miners are added. Expanding the number of mines, on the other hand, depends on finding and developing new ore bodies, a highly capital intensive activity with a long gestation period. In addition, mining is not

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<sup>2</sup> One could ask why the government needs to intervene at all. Perhaps the labor market functions smoothly enough to absorb the heightened population growth with no more than minor reductions in the real wage. Our stylized facts, however, involve an imperfect labor market, where the supply curve of labor is very flat and does not shift down easily in the face of increased difficulty of finding jobs, and where, as indicated in what follows, the demand elasticity of labor is quite low, at least in the short to medium run. Moreover, the government feels pressure to expand job creation from an increasingly politicized electorate as well as from an elite who fear the potential threat of a mass of radicalized unemployed and underemployed.

particularly labor intensive, and so even a rapid expansion of the sector would not provide an adequate number of jobs. The prospects in agriculture are similar: existing farms cannot productively absorb the increase of the labor force naturally occurring in agriculture, in many cases the marginal product of labor is already very low if not zero. Moreover, expansion of the agricultural frontier is very capital intensive: irrigation, drainage and/or extensive clearance would be required, which imply large infrastructure projects with long gestation periods. Finally, there is the question of how much additional land can be made sufficiently productive to warrant the investment.

Expansion into industry seems the obvious way out: it faces none of the nature-given limitations of mining or agriculture, quite the contrary: it can provide all the jobs required, depending only on the rate of investment and on the degree of capital intensity, both of which are decision variables subject to human control. Moreover, expansion of industry will bring with it a growth of demand for existing and new services, typically labor intensive.

Industry also has several other attractions. For one, it symbolizes modernity: all the important modern nations have industrialized economies. Second, industry is seen as the repository of technological change and of learning by doing<sup>3</sup>. Third, industrialization will reduce the country's exposure to the

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<sup>3</sup> A view that is once again coming into its own with the recent work on endogenous growth models. See, for instance Grossman and Helpman 1991.

risk of declining terms of trade<sup>4</sup>. Thus, the choice of becoming an industrial country seems to be a logical one for Latinia.

There is only one difficulty, albeit an important one: total factor productivity in industry is well below that of mining or plantation agriculture. Or put another way, at the going exchange rate, the desired industrial production is unable to compete with imported products. The reasons are several: (i) new producers will, for a time at least, be less efficient than long established ones; this is the *infant industry* argument<sup>5</sup> (ii) domestic markets are small and therefore the new producers serving them will not be able to benefit from *economies of scale*<sup>6</sup>; (iii) the infrastructure with

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<sup>4</sup> Another old concern, never fully proven nor fully laid to rest, perhaps properly so, for what country gets hurt by what price changes naturally depends on the circumstances. Generalizations can hardly be expected to be correct all the time nor to carry over fully from one historical period to another. For traditional statements of conflicting views Cf. Prebisch 1959, Haberler 1961, a more recent empirical view can be found in Wheeler 1984.

<sup>5</sup> It is typical of Latinian conditions at this stage that capital markets are not developed enough to finance the learning period. Nobody in the economy knows how long that learning might take and what it might cost and there is no market for underwriting this kind of risk. Furthermore, market discount rates are typically higher than the social discount rate, due to myopia, external interdependency of consumption and savings behavior as well as the high proportion of the population that does not save through the financial market. On these points, Cf. Baldwin 1969, Feldstein 1965, Frisch 1964, Marglin 1963, UNIDO 1972.

<sup>6</sup> One might argue that there is nothing to prevent a new producer from immediately entering the world market, thus avoiding any limitations to his scale. On the other hand, while there are some individuals that run at birth, most pass through the crawling and walking stages first; similarly there are firms that are export oriented from inception, yet most serve a local market first. Moreover, it should be noted that in the presence of transportation costs, even under free trade the price in the domestic market will be above the FOB export price, and hence it will be even harder to compete in the export market than in the home market.

which the new industrial producers must work is less supportive than the equivalent in more advanced countries, this is the *infant economy argument*<sup>7</sup>; and, (iv) a range of technical skills and supportive services taken for granted in more industrialized countries are not available<sup>8</sup>. Whatever the cause or causes, there is a substantial gap between costs in the traditional economic activities of Latinia and in the new, desired, industrial activities.

Put another way, Latinia's comparative advantage does not decline smoothly and imperceptively from one kind of mining and agriculture to other kinds and eventually to some kinds of industry and then on to others. Instead, there is a discrete and substantial step between the comparative advantage of mining and agriculture and that of industry<sup>9</sup>. Moreover, this gap is one that will persist for a considerable time<sup>10</sup>. We have here the typical cost

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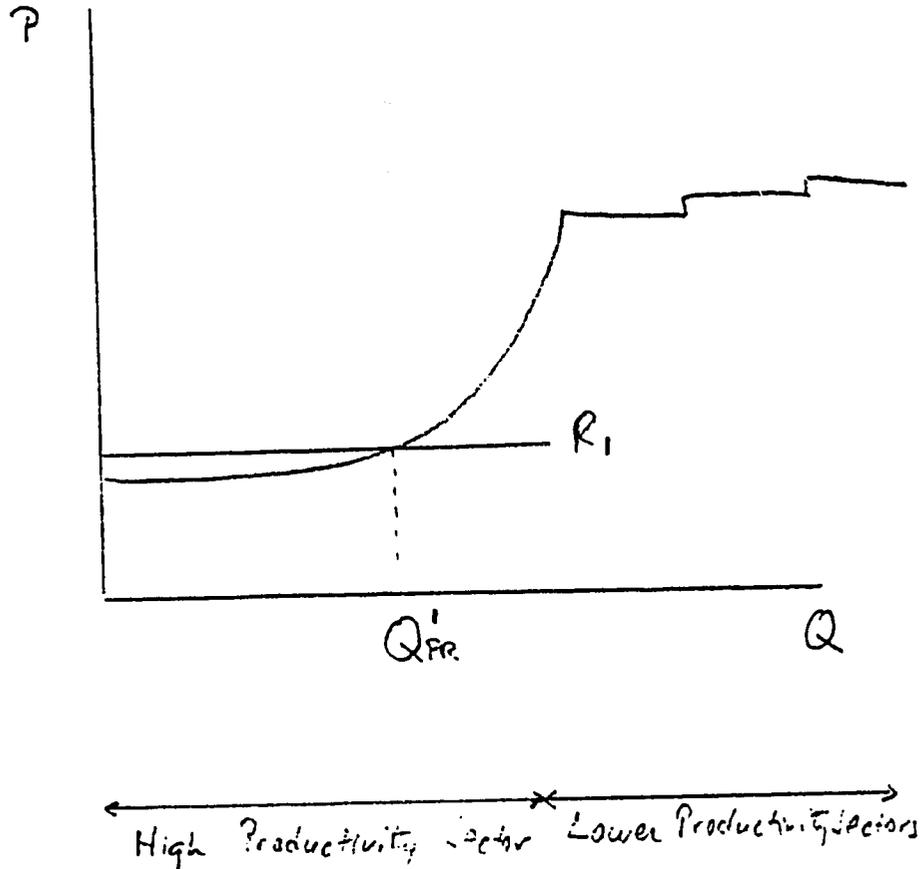
<sup>7</sup> Perhaps it could just as well be called an *external economy argument* for it relates to costs caused by conditions external to the firm.

<sup>8</sup> Again an *external economy* problem.

<sup>9</sup> In a formal sense, the model of discrete Ricardian comparative advantage presented by Samuelson 1964 is more applicable than the continuous model of Ricardian comparative advantage presented in Dornbusch, Fischer and Samuelson 1977. At best, both should be combined, with discrete steps between large sectors and continuity within them.

<sup>10</sup> This is not to say that the gap will not eventually disappear, given adequate time and suitable policy. Certainly, as learning takes place and infrastructure and ancillary services develop, costs should come down. If the domestic market expands sufficiently, or conditions make export sales possible, then the economy-of-scale disadvantages could also be overcome. At that point, total factor productivity in industry would have moved closer to that of the primary sectors. If, in turn, these have

Figure 1



$R$  = exchange rate

$Q'_{PR}$  = production in h. p. sector

expanded up their cost curve, marginal total factor productivity in the primary sectors may be equal to that of industry. Note, however, that intramarginal productivity will still be higher: otherwise there would be no rent on land or royalties on mining properties. Accordingly, income distribution concerns will still remain. Cf. Diamond 1973 Ch 12, Schydrowsky 1981.

differential underlying the Dutch Disease. For ease of reference, it is graphed as Figure 1.

The policy problem of how to deal with this *Evolutionary Dutch Disease* must be confronted by Latinia's government. If industry is to arise, its cost differential with the primary sectors must be covered, otherwise investors will not find it sufficiently profitable to invest in its establishment. The government must do something. The policy alternatives it faces are three:

(1) **Generalized Devaluation:** which consists of devaluing the exchange rate from its old "primary sector cost parity" to a new "industrial sector cost parity", sufficiently high to enable the new sectors to compete with imports. This is shown in Figure 2.

Whether the required *real* devaluation can be achieved with a once-and-for-all increase or whether the devaluation sets off an exchange rate-cost-price spiral depends on the mechanism for wage determination and on the target returns which entrepreneurs aspire to<sup>11</sup>. For the devaluation must bring about a reduction in some

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<sup>11</sup> While early in the industrialization of LDCs it is unlikely that there be explicit wage indexation, particularly to the exchange rate, it is quite plausible that the supply price of labor depends on the cost of living. Consequently, the price increases of food and other imports of import competing production resulting from the devaluation may feed through to wage increases and thus set off a wage-exchange rate spiral.

On the profit side, it is also quite plausible that the *normal profits* required by entrepreneurs to make their services available and reflected in their supply curve be either directly expressed in foreign exchange or be very sensitive to the real value of these profits. Again, such a situation will imply that devaluation will feed through to increases in the supply price of entrepreneurship and can thereby set off a price-exchange rate spiral.

Certainly, nothing prevents wage and normal profit indexation of exist at the same time.

Figure 2

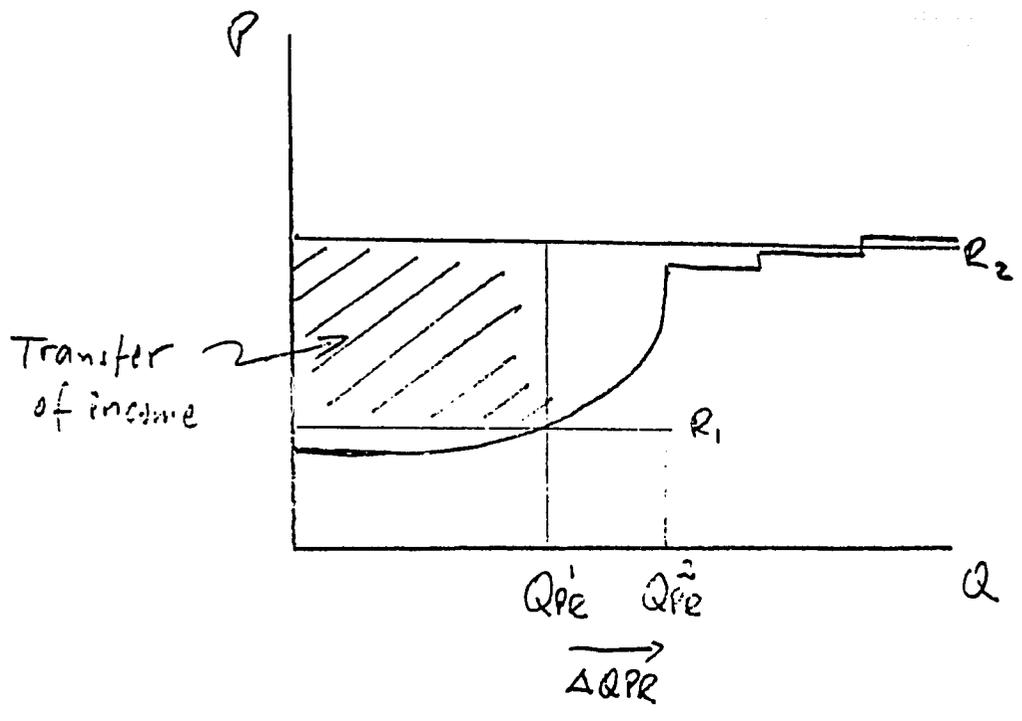
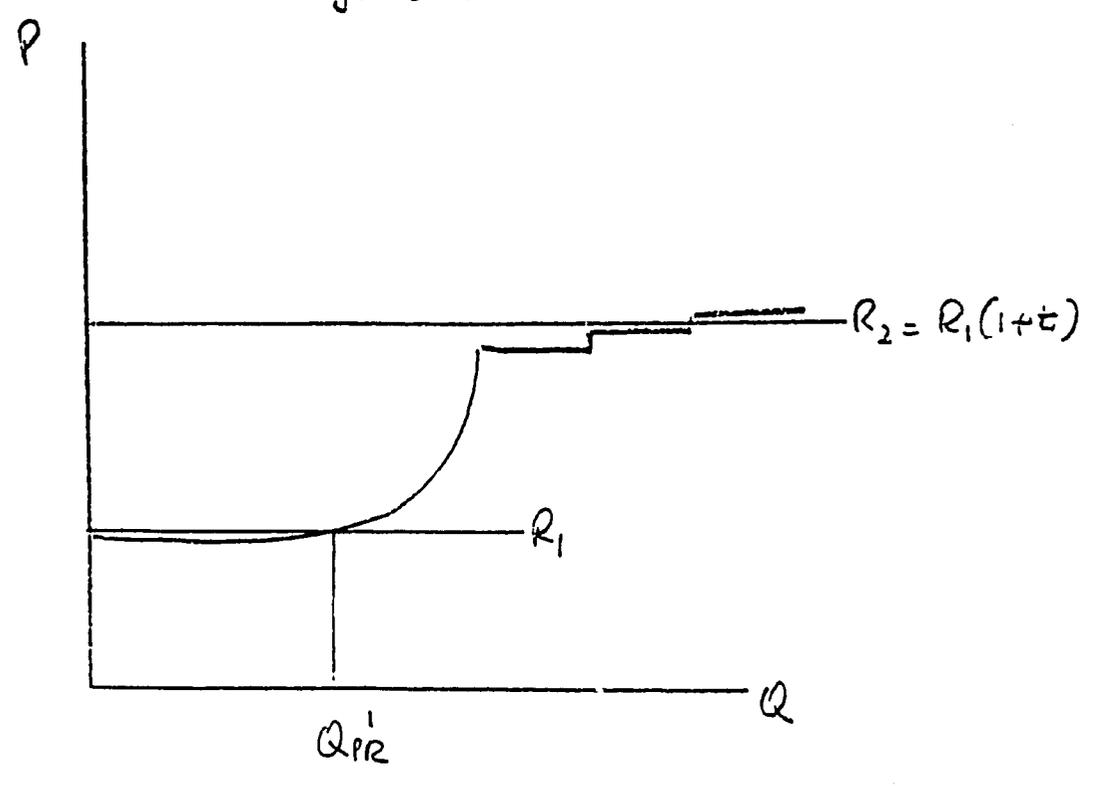


Figure 3



factor's return, otherwise the lower total factor productivity of the new industrial sectors cannot be accommodated. A real devaluation of the required magnitude, once attained, will cause:

- a) competitiveness of the new industrial sector;
- b) an expansion of the primary sectors up their cost curves until the cost of the marginal unit of output is equal to that of industry; and
- c) a transfer of income from wages and profits to rent on land and royalties on mines.

(2) **Partial Devaluation:** which consists of devaluing the exchange rate only for the new industrial activities but not for the pre-existing primary sectors. See Figure 3. A partial devaluation can be symmetric, consisting of tariffs on industrial imports and comparable subsidies on industrial exports, or it can be asymmetric, consisting only of tariffs. For the short run, there is no practical difference between the two, since new production at the start will ordinarily be only for the domestic market. However, over the longer run, an asymmetric system will develop a cumulative anti-export bias which will severely hobble sustained growth.

With the partial devaluation in place, Latinia will observe:

- a) competitiveness of the new industrial sector, in the domestic market only or potentially also in the export market, depending on whether the selective devaluation has been asymmetric or symmetric;

b) no change in output of the primary sectors<sup>12</sup>;  
 c) a shift in income distribution from the users of the newly domesticated industrial goods to their producers (via higher prices) and to the state (via import duties). Since users typically include rent and royalty receivers, the real income of these groups goes down. Moreover, most of the income redistribution, at least initially<sup>13</sup>, accrues to the state.

(3) **Compensated Devaluation:** in which the exchange rate is devalued for all producers, however this devaluation is compensated by subsidies on imported food and by off-setting taxation on pre-existing ("traditional") exports. This offset can take the form of an export tax (see Figure 4) or it can take the form of a property tax on land and mines (Figure 5).<sup>14</sup>

If the off-set is an export tax, it effectively leaves the net

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<sup>12</sup> Unless the primary sectors use some of the new domestic industrial production as an input, in which case, their costs will go up and their output will decline. Such typically only occurs well along in the industrialization cycle. Output could also contract if the establishment and subsequent expansion of new industrial sectors caused labor costs to rise in the primary sectors. Given the shape of the supply curve of labor (see fn.2) and the slow rate at which new jobs are created even with a substantial spurt of industrialization, increases of labor costs in primary sectors are also not of concern until quite late in the industrialization cycle and then more as a result of unionization of plantation style agriculture than as a result of labor market tightness.

<sup>13</sup> Initially, domestic production capacity is small and most of demand is satisfied by imports. This balance gradually changes as domestic supply expands in an import-substituting mode.

<sup>14</sup> Compensated devaluation was first proposed independently by Diamand (see CARTTA 1966 and Diamand 1973) and Schydrowsky 1967.

Figure 4

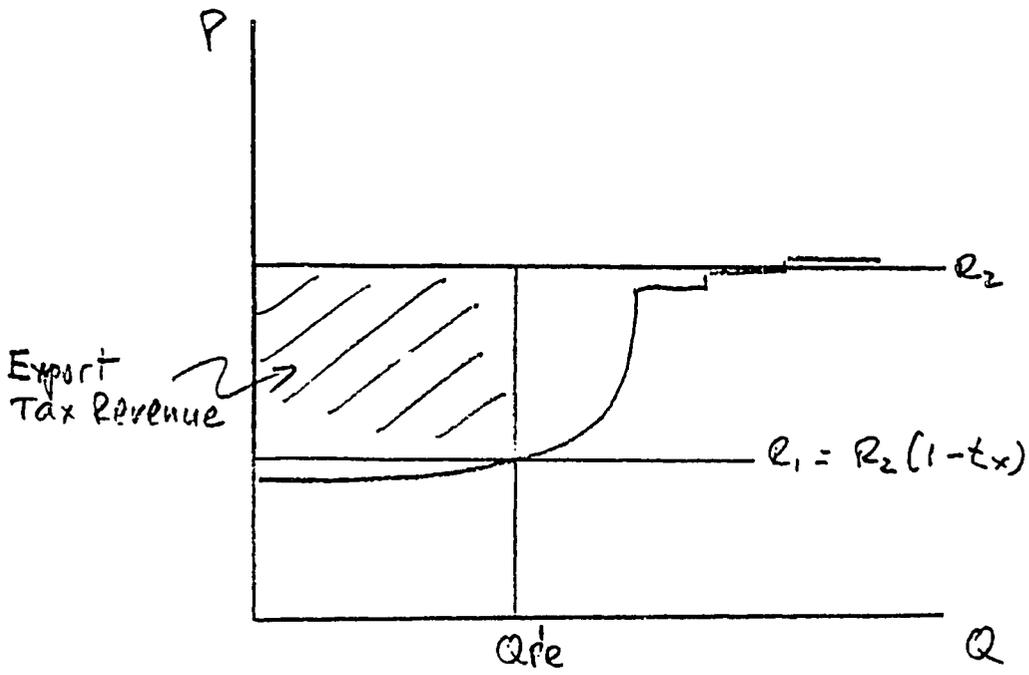
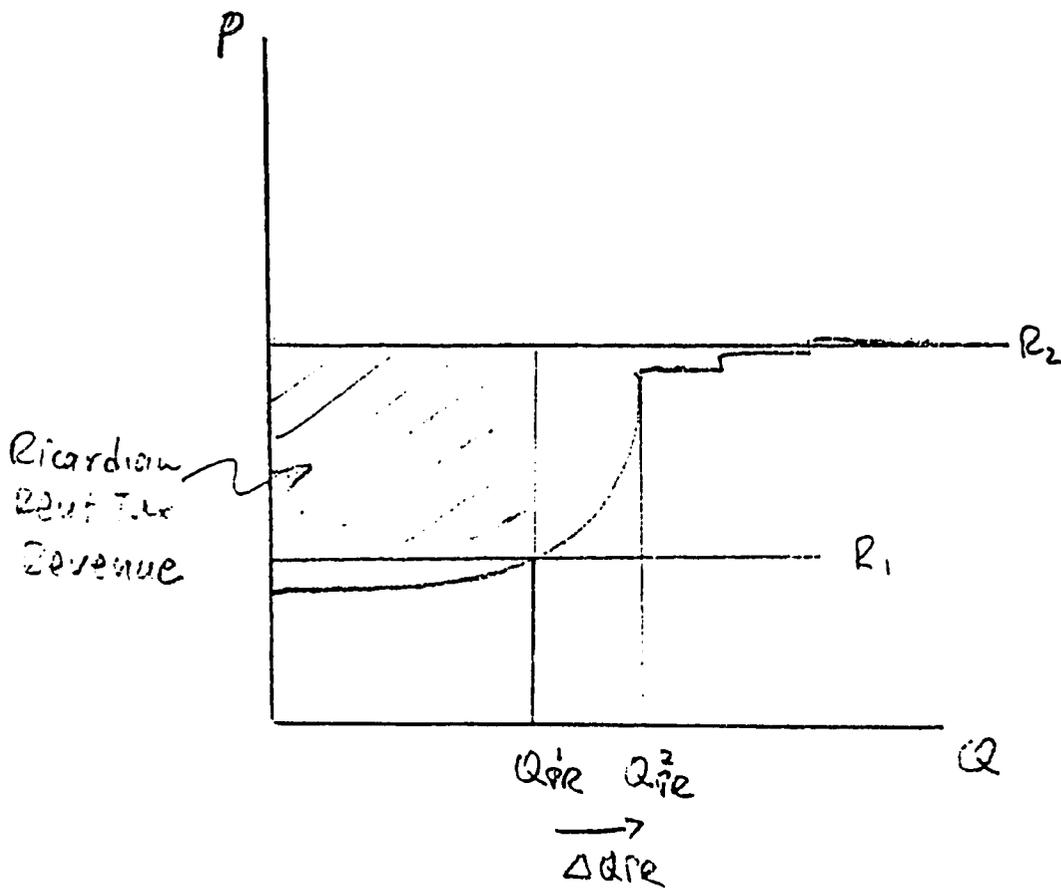


Figure 5



number of domestic currency units received by the primary exporters unchanged. At the same time, the number of domestic currency units received by the industrial producers per dollar's worth of output has gone up. The effect is the same as in the case of a symmetric partial devaluation, the only difference is the base line exchange rate against which taxation is applied. Thus, in Figure 3,  $R_1$  is the base line exchange rate, "the" exchange rate, while  $R_2$  is achieved by levying a tariff and applying an export subsidy (to make things symmetric); in Figure 4, on the other hand,  $R_2$  is "the" exchange rate, while  $R_1$  is achieved by levying an export tax.

Accordingly, an export tax based compensated devaluation has the same effects as a symmetric partial devaluation: industry will become competitive, primary output will not change, and there will only be very minor income redistribution.

If compensation is achieved by levying a property tax, then the higher exchange rate applies to all production, as in a generalized devaluation; however, the windfall accruing to land rent and mining royalties is taxed away. Compare Figure 5 with Figure 2. In this case, we get (a) competitiveness of industry, (b) expansion of primary production up its cost curve, but (c) no income redistribution.

In comparing these alternatives, Latinia's government recognizes a generalized devaluation as providing efficiency, since at the margin productivity will be equal in all sectors. However, this efficiency is bought at the price of massive income redistribution. Moreover, this trade-off between efficiency and

income distribution depends on the shape of the supply curve in the primary sector. An L-shaped curve (Figure 6A) will generate no efficiency loss and maximal income redistribution; a flatter curve (Figure 6B) will mean more efficiency loss and proportionately less income redistribution.

In contrast, a partial devaluation will make industry competitive with minimal income redistribution, although a cost will be incurred in accepting differential marginal productivity between the primary and industrial sectors. An export-tax-based compensated devaluation, in turn, has no immediate gain compared to a partial devaluation but has the disadvantage of requiring a food import subsidy. Finally, a property-tax-based compensated devaluation would provide efficiency with no income redistribution but would require a tax collection apparatus well above Latinia's administrative capacity in addition to the import subsidy.

In practice, thus, Latinia has to choose between efficiency with massive income redistribution (generalized devaluation) and some inefficiency with minimal income redistribution (partial devaluation). Latinia, not surprisingly, adopts the policy of partial devaluation and usually of the asymmetric variety, i.e. protection. Its policy becomes that of Import-Substituting-Industrialization (ISI).

Latinia's policy choice is a crucial one for the persistence of Evolutionary Dutch Disease, for it does two things: (i) by adopting partial devaluation, Latinia accepts the existence of a gap in productivity levels, and, (ii) by adopting an asymmetric

Figure 6A

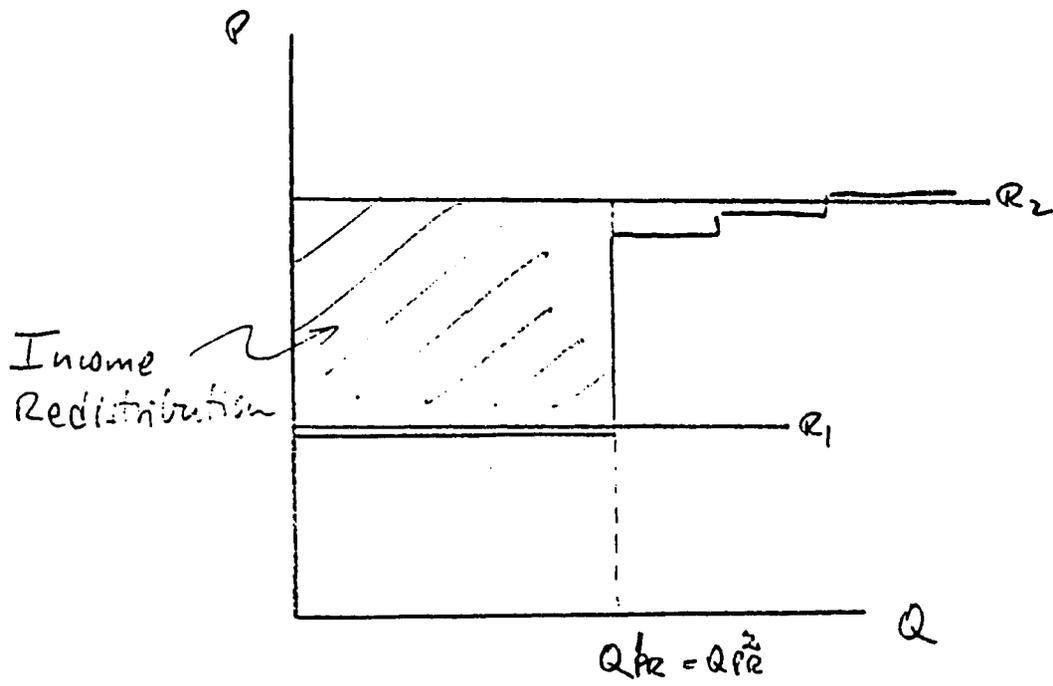
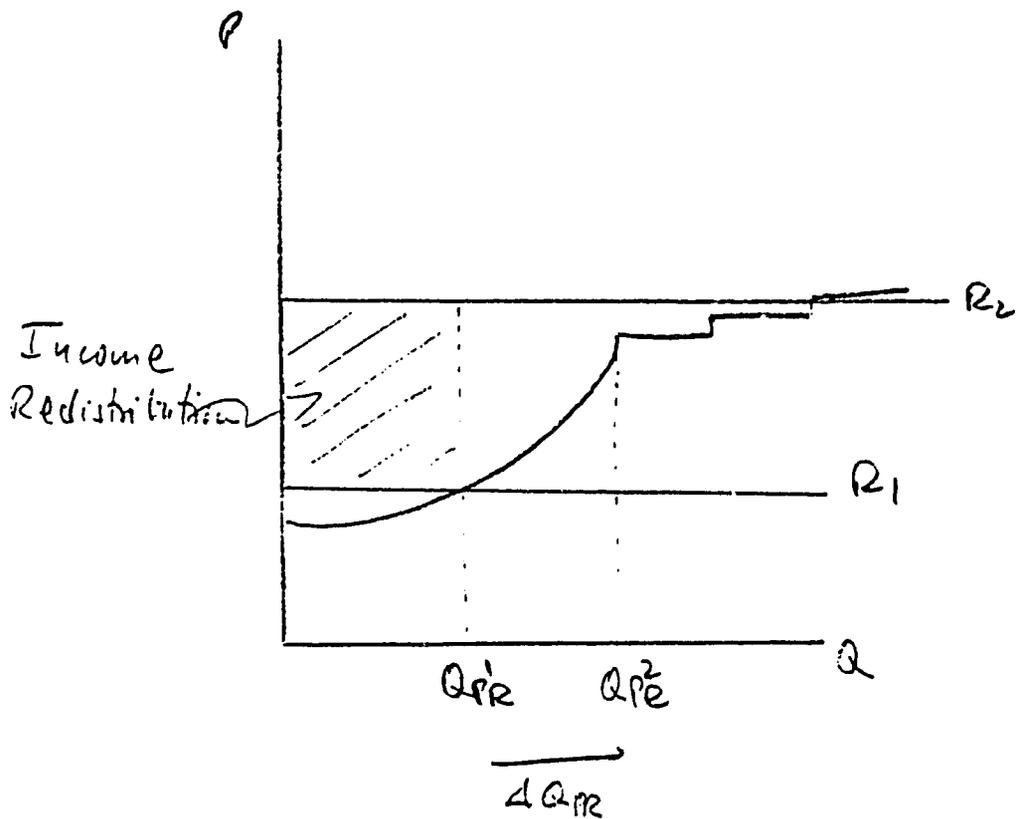


Figure 6B



partial devaluation, i.e. only tariffs, it slows down the process of productivity convergence. For, with this policy, industry becomes locked into the domestic market and thereby is limited in the economies of scale and the learning by doing it can achieve. On the other hand, with ISI, foreign exchange becomes the binding constraint on economic output and this foreign exchange scarcity limits the importation of new and up-to-date technology as well as desirable inputs. Finally, the ISI dynamic involves repeated upward ratcheting of the tariff levels under the combined pressure of "vested interests" and "development policy", to accommodate the domestic cost levels of backward integration in import substitution<sup>15</sup>. As a result, additional productivity gaps are built into the productive system<sup>16</sup>, adding "mini" Dutch Disease problems within the industrial sector<sup>17</sup>.

With the passage of time, productivity gains will occur in the industrial sector, as learning by doing takes place, a larger market enables economies of scale to be realized, appropriate

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<sup>15</sup> Cf. Hirschman 1968. Note also that with industry unable to export due to the anti-export bias resulting from the asymmetric partial devaluation, new foreign exchange availabilities required for economic expansion must come from additional import substitution, hence providing additional impetus to raising tariffs.

<sup>16</sup> Note that while marginal private productivity of factors will be equalized across industrial sectors if the corresponding factors markets are competitive, social marginal productivity will not be equalized, since differences in the tariffs between sectors signifies unequal deviations of market product prices from their shadow analogues.

<sup>17</sup> For other criticisms of the ISI strategy, Cf. Felix 1970, Little, Scitovsky & Scott 1970, Schydrowsky 1972. For a recent review of the strategy, see Bruton 1989.

industrial infrastructure is put in place and a range of technical and supportive services appear. These productivity gains translate into cost reductions and greater price competitiveness of domestic output vis-a-vis imports. As a result, redundant protection appears<sup>18</sup>. On the other hand, these productivity gains mean that the original productivity gap between primary and industrial production that characterizes Evolutionary Dutch Disease gets smaller. However, for this gap to disappear altogether it is necessary for the primary sector to expand up the relevant cost curves, but this, in turn, requires the eventual disappearance of the wedge between the net exchange rates applying to different sectors put in place by the partial devaluation. Unifying the net exchange range in its turn, requires dealing with the contraposition of efficiency, equity and administrative feasibility which bedeviled the choice of industrialization policy at its inception.

Several alternative developments occurring in variants of "Latinia" make dealing with this dilemma easier. The most optimistic version is one in which the tax administration has evolved to the point where it can successfully administer a tax on the Ricardian rent accruing to land and mine ownership. In this case, a compensated devaluation with off-setting Ricardian rent taxation can be put in place. As a result of such a policy,

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<sup>18</sup> It is not surprising, therefore, that studies of protection in the more advanced semi-industrialized LDCs always confront the problem of "water in the tariff": domestic prices exceed the CIF price of comparable imports by less than the legislated rates. Cf. Balassa 1971 and 1982.

marginal output in the primary sectors gets the same net exchange rate as industrial production and hence primary production will expand up its cost curves until marginal cost equals the common exchange rate. Since the same equilibrium condition holds in industry, marginal costs are equal in all sectors and efficiency is achieved<sup>19</sup>. At the same time, the Ricardian rent tax neutralizes the income distribution effects. Implementing such a compensated devaluation on the trade policy side is easy <sup>20</sup>, but the same cannot be said of the design and implementation of the off-setting tax policy. The difficulty there is that the windfall to be offset will vary over time with the international price of the output as well as with eventual fluctuations in the exchange rate. The result is a cumbersome tax formula far removed from the customary norms of property taxation. In addition, returning the revenue from the wind-fall tax to consumers in order to maintain distributional neutrality will require import subsidization of formerly low tariff goods or some more cumbersome alternative.

Another variant of developments in "Latinia" is one in which the state has become owner of the major enterprise(s) of the

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<sup>19</sup> Note that efficiency will be achieved fully only under free trade. If some tariffs or subsidies remain, there will still be productivity differentials and there may also be untaxed intramarginal rents. Moreover, and even more fundamentally, efficiency will only have been achieved if market prices are equal to shadow prices, a condition for which at least full employment of labor is necessary. For a discussion of the differences between competitiveness and productivity in Latin America and its quantitative importance, see Schydrowsky 1989.

<sup>20</sup>  $t^* = (1+t)/(1+d) - 1$ , where  $t^*$ =new tariff level,  $t$ =old tariff level,  $d$ =rate of devaluation. For detailed discussion, see Cf. Schydrowsky 1967.

primary sector, through purchase or expropriation. The representative examples of this case are oil in Venezuela (PDVSA) and copper in Chile (CODELCO). With the state being the owner, the windfall from compensated devaluation accrues directly to a state-owned enterprise from whence the treasury can acquire it directly, even in the form of "dividends". In this case, no explicit off-setting tax is needed; all that is required is that the corresponding state-owned enterprise not be an independent fiefdom<sup>21</sup>. It is worth noting that practical application of this solution is much more feasible when the rent accrues to a homogenous resource than when it accrues to a heterogenous one. By the same token, state ownership of mining resources is much more common than of farmland, and within mining, it is more likely to be concentrated in the few large mines. Accordingly, compensated devaluation with off-setting state-owned enterprise monopoly profits will be a feasible policy in a reduced number of important but special cases. Again, in this case, the revenue side has become simpler, however, the need to effectively compensate the consumers remains.

The most common Latinian situation is one in which the primary

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<sup>21</sup> It can be argued that a state-owned enterprise should have expanded output up the supply curve even if it made losses, because the gains of expansion at shadow price are clear. There are two difficulties with this view: (i) few countries have a consistent decision-making system based on shadow prices; (ii) even fewer countries have succeeded in implementing a performance evaluation system for state-owned enterprises in which the profit and loss statement is recalculated at shadow prices. Thus, while desirable in principle, it is unrealistic in practice to expect state-owned enterprises to conduct its business on the basis of what would be desirable (and profitable) at shadow prices.

sector is not state owned and where the tax administration is not capable of handling a Ricardian offset. In this case the choice is between continuing to live with a slowly shrinking productivity differential and forcing convergence of productivities through liberalization, with or without devaluation. Forcing convergence through liberalization will succeed (i) in so far as there was x-inefficiency in the productive system: entrepreneurs will try harder in order to stay afloat in face of stiffer competition, and, (ii) if the productivity gap is not excessively wide, so that increases in x-efficiency can indeed close it. If there is insufficient x-inefficiency to be squeezed out or the gap is very large, liberalization will lead to bankruptcy and the extinction of existing lines of production. With such plant closures, unification of efficiency levels will have been achieved in a trivial sense, but the outcome will be globally inefficient due to involuntary idleness of factors of production<sup>22</sup>. Convergence of efficiency in a true sense can only be achieved by this route if new activities can be found that have sufficiently small productivity differentials with the primary sector. But such new activities will again have the disadvantage of requiring some time before they reach their long term cost levels.

The mix of convergence and plant closures that is achieved

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<sup>22</sup> The nature of the adjustment in the factor markets, particularly for labor and for entrepreneurship again becomes critical at this juncture. Notice that involuntary idleness of factors implies discrepancy between market and shadow prices, hence marginal costs that are forced into equality at market prices may still be unequal at shadow prices.

depends in part on what devaluation accompanies the liberalization. At one extreme stands a devaluation equal to that of a compensated devaluation without offset to the windfall accruing to the primary sector. Such a devaluation would generate convergence easily and would require no closures. However, it would also produce very substantial income redistribution effects in favor of owners of land and mines. At the other extreme stands no devaluation. In this case, owners do not gain, but convergence will be difficult and closures extensive. Intermediate situations will each have its own combination of efficiency gain, plant closures and income redistribution. Absent an effective intervention of the fiscal system, efficiency in production and acceptability of income distribution cannot be achieved together<sup>23</sup>. In this scenario, then, the original dilemma between the requirements of industrialization and of an acceptable income distribution continue to bedevil policy making.

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<sup>23</sup> It is the old story of trying to achieve two objectives with only one instrument.

## III

## INNOVATIONAL DUTCH DISEASE: NEW EXPORT PRODUCTS

Consider again the original situation of Latinia, our peaceful example of raw material exporter. Now assume that one day a new product is introduced with dramatically lower costs of production than existing output. It could be poppy or coca leaf farming, it could be diamond mining in river beds made dry from drought or it could be ecological tourism, or something else. Whatever it is, the total factor productivity in the new production is substantially greater than in existing output, the new production generates a substantial amount of foreign exchange revenue, and its long run cost curve is flat enough so that it will take a considerable time before the sector has grown enough to start experiencing increasing costs.

The net effect of the appearance of the new sector is to create a productive structure very similar to that achieved in an evolutionary manner by Latinia as described in the previous section: the new sector can operate profitably at an exchange rate at which other producers in the economy would be making losses. However, in this instance the temporary sequence of the emergence of the productivity gap is reversed: the lower productivity sectors are in existence first and the higher productivity sector appears later. Nonetheless, the occurrence of the innovation will force the government to confront issues of structure of production and

employment as well as of income distribution.

A first fundamental issue which Latinia's government has to deal with in such a situation is whether it wishes to accept the plant closures that will result from the appearance of the new sector in the absence of any intervention. Such plant closures would occur as a result of a pincer movement between prices and costs in the production of all pre-existing traded goods, consequently reducing their profitability. Prices would come down as a result of the revaluation of the exchange rate consequent to the large increase of foreign exchange availability brought about by the exports of new-sector output; costs would rise as the new sector bid labor and materials away from existing uses.<sup>24</sup>

The government may well wish to let the mix of production change; after all, the appearance of a new sector signifies a long-term change in comparative advantage and it is efficient to reallocate resources accordingly. However, if Latinia was not at full employment to start with, then there would be substantial reason for resisting plant closures<sup>25</sup>. Moreover, even if full employment obtained, there might be reason to intervene on income distribution grounds, since the new boom sector is likely be rent intensive.

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<sup>24</sup> Cf. Neary & Van Wijnbergen 1986, Summary Ch.1.

<sup>25</sup> Note that even if market prices differ from shadow prices one would expect the appearance of a new sector to make reallocation of resources desirable. Furthermore, the availability of additional foreign exchange should produce a change in relative shadow prices, and thereby making reallocation desirable. However, it does not follow that all market closures are desirable, hence there is room for government policy.

Given a decision to intervene, the government once again faces three options:

(i) **Maintain the Real Exchange Rate:** by means of an expansion of domestic demand sufficient to absorb the new booming supply of foreign exchange without a revaluation.

The extent to which such a policy is successful without the need for nominal devaluation and the consequent risk of a inflationary spiral depends of the extent to which there is initial slack in the economy, the extent to which the supply curves of labor and of traded and particularly non-traded output are highly elastic, and, the extent to which the switch of procurement from domestic supply to imports does not involve significant cost increases<sup>26</sup>. A constant real exchange rate, if maintained, will cause:

- a) continued competitiveness of established production;
- b) expansion of the new sector up its supply curve until the cost of the marginal unit of output is equal to that of pre-existing sectors (which, as noted earlier, may take considerable time);
- c) a concentration of a very major part of the income originating in the new sector in the hands of the owners of the factor of production specific to that sector, i.e.

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<sup>26</sup> Otherwise there will be discrete increases in the price level every time a domestic traded-goods producing activity hits the ceiling of full capacity output. Correspondingly, the spill over into imports will be impeded and the domestic expansion needed to absorb the new foreign exchange will be greater with the consequent increase in demand pressure on non-traded outputs.

land rent or mining royalties.

(ii) **Partial revaluation:** which consists of revaluing the exchange rate only for the new sector but not for the remainder of the pre-existing activities. Such a partial revaluation could be implemented with an export tax or with a property tax on Ricardian rent<sup>27</sup>. With a partial revaluation in place, Latinia's government would observe:

- a) continued competitiveness of the pre-existing economic activities;
- b) a gap in productivities between the new sector and all other sectors if an export tax is used; and expansion of the new sector up its supply curve until the cost of the marginal unit of output is equal to that of other sectors if a property tax is used;
- c) appropriation of a major part of the gain from the new sector for the treasury, to be redistributed to the population in the form of fiscal expenditure or tax reduction.

(iii) **Compensated revaluation:** in which the nominal exchange rate is revalued but import tariffs and export subsidies are raised in an off-setting manner to maintain the net exchange rate constant for other activities. On this alternative, Latinia's government would observe:

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<sup>27</sup> Note that taxation is not practicable in the case of illegal crops such as poppies or coca leaf. This problem is of major practical importance and is central to the discussion of Sec. VIII.

- a) continued competitiveness of the pre-existing economic activities;
- b) a gap in productivities between the new sector and all other sectors reflective of the new wedge introduced by the increases in tariffs and export subsidies. The situation in this regard is equal to that obtaining in the case of a partial revaluation with export tax.
- c) appropriation of a major part of the gain from the new sector for the treasury through the net effect of the higher import duties minus export subsidies, to be redistributed to the population in the form of fiscal expenditure or tax reduction.

It is clear that these alternatives are the correlates of those facing a country afflicted with Evolutionary Dutch Disease. In the Innovational case, we again have a choice between achieving efficiency with undesirable income distribution consequences, achieving income distribution goals with production inefficiency, or achieving efficiency and a desirable income distribution but at the cost of a complex and difficult-to-administer tax system. If the choice is made in this instance on the same grounds as in the Evolutionary Dutch Disease, namely to respect income distribution constraints and to avoid administrative problems, then partial revaluation through export taxation will be the policy adopted.

The long term consequences of choosing partial revaluation are fundamentally different than of choosing partial devaluation in the Evolutionary Dutch Disease case. Partial revaluation does not

introduce any discrimination against non-boom exports that did not exist previously; it is a symmetrical policy. By comparison, partial devaluation, as usually implemented (i.e. with tariffs) has an anti-export bias and is therefore asymmetric. It follows that Innovational Dutch Disease, if dealt with through partial revaluation, will not create the foreign exchange bottlenecks typical of the Import Substituting Industrialization sequence induced by the partial devaluation treatment of the Evolutionary Dutch Disease.

Innovational Dutch Disease also does not tend to last forever: (i) costs of production eventually increase as production expands and the best (cheapest) factors of production are exhausted. Oil extraction costs rise as the wells are depleted; mining costs go up as the high quality veins have been worked; agricultural costs increase as the land is farmed more extensively or more intensively, etc. (ii) The productivity of the non-boom sectors rises secularly over time, thus gradually closing the productivity gap.

As the productivity gap produced by Innovational Dutch Disease narrows, the export tax becomes untenable at its original rate and the tax burden gradually has to be shared by the other sectors, whose productivity has increased in the meantime.

The ultimate disappearance of a productivity gap in Innovational Dutch Disease confronts the same problems as in the Evolutionary version of the disease; enough institutional evolution has to occur for removal of the tax wedge between the sectors to be

feasible without violation of an income distribution constraint.

#### IV

#### ACUTE DUTCH DISEASE: RAW MATERIAL BOOM

A third kind of Dutch Disease occurs when one or more sectors producing exportables experience a sudden and temporary price boom. The booming sector's comparative advantage has suddenly become considerably stronger: a large productivity gap has been introduced between the boom sector and all others<sup>28</sup>.

The net effect of the change is to create, for the duration of the boom, a productive structure very similar to that achieved in an evolutionary manner or by innovation as described in the previous sections: the boom sector can operate profitably at an exchange rate at which other producers in the economy would be making losses. Moreover, in this instance the temporary sequence of the emergence of the productivity gap has the lower productivity sectors in existence first and the higher productivity sector appearing later. The government will once again have to confront the same issues of structure of production and employment and of income distribution as in the two preceding cases, modified, this

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<sup>28</sup> It could be argued that there has been no productivity increase in real terms, all that has happened is a terms of trade improvement. However, for a small price taking country, an increase in the world price of its exports has the same welfare increasing effect as neutral technological change in that product's production process. Note also that the Domestic Resource Cost of Foreign Exchange falls when the world price of the product rises; and any gap between a given product's DRC and that of others would increase accordingly.

time, by the knowledge that the boom represents a temporary shift in comparative advantage of uncertain duration and subject to reversal in the near future<sup>29</sup>.

The temporal nature of the shift in comparative advantage colors the policy response. Unless the adjustment costs are exceedingly small, there is no justification to accept the plant closures that would result from the raw material boom in the absence of any intervention. Intervention, therefore, seems unavoidable in the case of Acute Dutch Disease<sup>30</sup>.

Given such a decision, the government once again faces the same three options as in the case of Innovational Dutch Disease:

- (i) **Maintenance of the Real Exchange Rate**
- (ii) **Partial revaluation**
- (iii) **Compensated revaluation**

The choice between them is necessarily driven by the temporary nature of the boom: narrow interventions are to be preferred to widespread ones, administrative burdens are to be minimized and reversal should be possible with minimum difficulty, cost and dislocation. It follows that partial revaluation with an export tax

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<sup>29</sup> Note that the size of the price increase marks the distinction between a boom capable of generating Acute Dutch Disease and ordinary export price fluctuations requiring some kind of stabilization. For a recent exploration of the latter issues see Basch and Engel 1992 and Hausmann et al. 1991.

<sup>30</sup> Acute Dutch Disease has spawned a large theoretical and applied literature adapting trade theory models to temporary booms and chronicling the actual experience of LDCs subject to such booms. See, for instance, Corden 1984, Neary and Van Wijnbergen 1986 and Gelb 1986. For a detailed analysis of Indonesia's successful avoidance of the pains of Acute Dutch Disease, see Ramli 1991.

is the most appropriate policy: it is narrow, easy to administer and easy to reverse; moreover, it has few effects external to the specific taxed sector.

The consequences of choosing selective revaluation to deal with Acute Dutch Disease are fundamentally the same as in the case of Innovational Dutch Disease. Selective revaluation does not introduce any discrimination against non-boom exports that did not exist previously; it thus does not interfere with their expansion.

Acute Dutch Disease by definition does not last very long: (i) raw material prices that go up must come back down, and they may eventually settle at a higher, the same or a lower relative level. When the turnaround occurs, productivity differentials narrow, disappear, or reverse; (ii) cost of production in raw materials increase over time as the best (cheapest) resources are exhausted. Oil extraction costs rise as the wells are depleted; mining costs go up as the high quality veins have been worked; agricultural costs increase as the land is farmed more extensively or more intensively, etc.; (iii) the productivity of the non-boom sectors rises secularly over time, thus gradually closing the productivity gap.

As the productivity gap produced by Acute Dutch Disease shrinks, the export tax must be reduced accordingly. It is important, therefore, that the government correctly recognize the export tax revenue as a temporary windfall and not assign it to fund recurrent expenditure; otherwise once the boom is over, a fiscal deficit will remain.

## V

## MIXED CASES

Reality has a habit of eschewing neat distinctions and, thus, it is quite common for different kinds of Dutch Disease to coexist. Most LDCs have Evolutionary Dutch Disease to some extent. How strong it is depends on how well endowed they are with raw materials or first rate agricultural land. Furthermore, different LDCs have adopted different policies in the face of Evolutionary Dutch Disease, and, therefore, have followed different growth paths.

In Latin America, Venezuela's and Ecuador's Evolutionary Dutch Diseases are oil related, Colombia's, El Salvador's, Costa Rica's and Guatemala's coffee related, Bolivia's was tin related<sup>31</sup>, Chile's is copper related, Peru's is general mining related, Argentina's and Uruguay's are cattle and grain related. In Asia, Bangladesh's Evolutionary Dutch Disease related to jute and tea, Indonesia, Malaysia and Brunei's related to oil, Sri Lanka's related to tea. In Africa, Nigeria's, Algeria's and Angola's related to oil and gas, Zambia's is related to copper, while West African countries' tended to relate to cocoa and timber and East Africa's to coffee. In the Middle East, oil related Evolutionary Dutch Disease is the most notable case.

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<sup>31</sup> The past tense is appropriate because the collapse of the tin market at least temporarily ended this version of Bolivia's Evolutionary Dutch Disease. Note, however, that Bolivia now has a strong case of Innovational Dutch Disease as a result of the boom in coca leaf and basic paste production. This is discussed below.

Some LDCs do not have Evolutionary Dutch Disease because they have no dominant primary sector. Such is the case of South Korea, Hong Kong, Taiwan and Israel. As a result, their trade policies have not been as constrained by the income distribution effects of general devaluation. Moreover, in the absence of strong primary export sectors, they have also not been free for long to neglect export promotion of non-traditional products and therefore rapidly moved from asymmetric partial devaluations to more symmetry. Other countries have not let their Evolutionary Dutch Disease lead them into the dead end of strict ISI. Such are the cases of Brazil, Colombia, Indonesia, and more recently Costa Rica. These countries have been distinguished by a policy which has not restricted exports to originate in the primary sector: they have adopted a **symmetric** partial devaluation policy to industrialize, by providing non-traditional exports with tax rebates and other supports comparable to the protection provided by tariffs in the domestic market.

A number of LDCs have been affected by Innovational Dutch Disease. The most notorious cases are related to the drug trade, particularly of cocaine paste. The agricultural raw material for cocaine paste is coca leaf, which grows almost exclusively in Peru and Bolivia. In the last decade, this crop has had an extraordinary expansion, supplying an enormously increased demand of cocaine in the U.S. and elsewhere. Due in part to the favorable soil and climatic conditions, the cost of production of coca leaf on the Eastern Slopes of the Andes is extremely low. Since the area is

remote and hard to police, it is also a favorable location for an illegal crop. World market conditions, on the other hand, make for a high price of the finished product, which translates into a price of coca leaf, which is a small fraction of the street price of cocaine but still sufficient to convert coca leaf into the strongest comparative advantage sector of Peru and Bolivia by a wide margin.

A quite different case of innovation is the green revolution in a number of Asian countries. In that case, yields have risen substantially and agriculture's position in the comparative advantage ranking has improved notably. Innovational Dutch Disease might have resulted from this change, since much of that agricultural output was import competing and hence reduced the demand for foreign exchange. However, no such consequence ensued for two reasons: (i) the productivity gaining sector was relatively low in the comparative advantage ranking at the outset and the improvement made it rise but on the whole did not make agriculture the lead comparative advantage sector by a wide margin; (ii) land tenure in Asian agriculture was sufficiently diffused to keep the gains from being concentrated in very few very visible hands; (iii) the gainers in the income distribution were mostly not at the top of the income distribution.

Other cases of Innovational Dutch Disease are the appearance of fishmeal in the late 1950's in Peru, the development of massive "nature" tourism (trekking, etc.) in Nepal over the last ten years, and the growth of family remittances from nationals working abroad

in Turkey, Spain, Bangladesh, Pakistan, El Salvador, Peru and other countries. In all these cases, very substantial amounts of foreign exchange became available on a sustained basis from completely new sources with important potential and actual effects on exchange rates, foreign exchange availability and international reserves.

Acute Dutch Disease, in turn, has affected all oil and gas producing LDCs. However, it has also affected other LDCs at various times as the prices of their exports has sky-rocketed temporarily. One only has to remember the general raw material boom of the mid seventies, consequent to the first oil shock, or the coffee and sugar price cycles, or the tin cycles, or, indeed, the longish cycles of copper prices. While it is difficult to pinpoint when the run-of-the-mill upswing in a cycle becomes Acute Dutch Disease, it is clear that when silver goes from \$.05 a lb to \$.30 a lb. over a period of two years, or when gold goes from \$30 an ounce to \$800, we are in the presence of an Acute Dutch Disease situation for producing countries.

The contemporary existence of different kinds of Dutch Disease poses policy problems for the affected countries. Evolutionary Dutch Disease tends to be dealt with by asymmetrical Partial Devaluation, i.e. import restrictions. But when Innovational Dutch Disease hits, it is the traditional export sectors that feel the pinch as much as the newer import competing sectors. Since exports cannot be helped by tariffs, the government must shift gears and move to a Partial Revaluation, and impose export taxes on the new sector. This will cause opposition on the grounds that the

government wishes to kill the new goose that lays golden eggs<sup>32</sup>. Furthermore, the simultaneous use of export taxes and import duties makes the trade regime more complicated. If, in addition, there is a price boom for a traditional export, say coffee, then the situation is further complicated, for a temporary export tax would be needed for that product. At this point the trade regime would consist of a base-line exchange rate, usefully thought of as the "financial" exchange rate, a range of import duties reflecting a set of partially devaluated exchange rates designed to make import competing production competitive ("commodity import rates"), and several export taxes intended to implement partial revaluations in response to developments in various export sectors ("commodity export rates"). The net effect is the equivalent of a multiple exchange rate system operated through a mix of a single explicit exchange rate and a wide range of trade taxes. In that context, where the financial exchange rate is placed within the range of commodity rates is largely a historical accident and could be modified at will by a fully compensated devaluation. However, where the financial rate is set determines the corresponding levels of explicit trade taxation and, hence, significantly affects the *perception* of who is taxed and who is protected in the economy as

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<sup>32</sup> At a minimum, the tax will slow down the new sector's accumulation of retained earnings and hence its growth rate. But, on the other hand, the tax will prevent undesirable effects in the rest of the economy.

well as who is efficient and who is not<sup>33</sup>. By the same token, as the intensity of the different kinds of Dutch Disease changes, policy adjustments are hampered by lack of clarity as to the origin and purpose of different parts of the implicit multiple exchange rate system.

## VI

### OPTIMAL TARIFF COMPLICATIONS

Up to this point, the discussion of policy vis-a-vis Dutch Disease has been entirely driven by the trade-offs between efficiency and income distribution considerations. It has been shown how the initial conditions and dominant income distribution concerns typically lead countries to discriminate in different ways between the strong comparative advantage sector and the rest of the economy. In the case of Evolutionary Dutch Disease, discrimination takes the explicit form of being in favor of lower productivity activities selling on the domestic market, by imposing protection against imports. In the case of Innovational Dutch Disease, on the other hand, the natural policy is to discriminate against the new high productivity activity by levying an export tax. The same occurs in the case of Acute Dutch Disease. The common element of

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<sup>33</sup> At issue here is the industrial inefficiency illusion resulting from inappropriate evaluation of costs of production by translation to dollars with the financial rate of exchange (see Diamand 1973 and Schydrowsky 1972), as well as the identification of efficiency with competitiveness, an equality which holds only when market prices and shadow prices are equal (see Schydrowsky 1989 and 1991).

these policies is to depart as little as possible from the initial conditions: leave the (financial) exchange rate unchanged and do the minimum necessary on the tax side. The net effect, nonetheless, is deliberate discrimination against the strongest comparative advantage sector and the principal motivation is to affect the income distribution as little as possible.

A completely different reason for discriminating against certain exports is relevant in those cases where a country has monopoly power; in such a case the well-known optimal tariff argument comes into play. However, there is no *a priori* reason for the product(s) in which a country has monopoly power to coincide with the strongest comparative advantage sector, although such a coincidence may occur in practice. When there is coincidence, the argument in favor of an explicit or implicit export tax becomes stronger, if not, the range of sectors subject to such taxation becomes greater and the design of a desirable exchange rate system (financial exchange rate plus trade taxes) becomes more complicated.

There are three cases of monopoly power in exports of considerable empirical importance: foreign-owned mining operations of an enclave nature, raw material for the drug trade, and, worker remittances. It is worth examining each in turn.

(1) **Foreign-owned mining operations:** Consider a situation in which a foreign corporation owns a mine or an oil well in Latinia. Its costs are made up of mostly imported materials, local labor, and local taxes. Energy is self generated on the basis of oil, a

traded good. Any profits made are remitted to headquarters. To all practical purposes, Latinia is not exporting the ore or the oil but rather it is selling labor and taxes to the foreign company. Correspondingly, the relevant question is what kind of demand elasticity a company has for Latinia's labor and taxes. Evidently, this will depend on the time frame involved as well as the market for the product that the company faces.

In the short run, given a particular investment in mining or well capacity, even if the company sells in a fully competitive product market, the demand elasticity for labor is very low: a higher wage will come directly out of company profits. By the same token, a higher wage (or a lower exchange rate) will cause the company to **increase** the amount of foreign exchange brought into Latinia. If the company has some monopoly power in the product market, it will pass some of that higher cost on to its buyers, thereby bolstering company profits. Something similar happens to taxes: in the presence of competitive product markets, an increase in taxes will come at the expense of profits and vice versa<sup>34</sup>; in monopolistic product markets, increased tax rates can be shifted forward partially.

A useful way in which to visualize the company's situation in the short run is that it must pay a given wage and tax bill in

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<sup>34</sup> Note, however, that as a result of U.S. tax law, in some situations there may be a shift of revenue from the U.S. treasury to Latinia's treasury. This happens if Latinia's corporate tax rate is raised from a rate below the U.S. rate and the U.S. corporation can therefore get an increase in its U.S. tax credit exactly equal to the increase in taxes levied by Latinia.

local currency for its current level of operation. Then, if Latinia devalues, the company will need to supply less dollars; this fits with devaluation reducing costs. Conversely, with a revaluation, the company will have to supply more dollars, its costs will have increased. It is immediately obvious that this implies a *downward falling supply curve* of foreign exchange: a more devalued rate brings forth fewer dollars, a more revalued rate more dollars. Surely, in this case, it pays to revalue in the short run.

The difficulty arises in the long run. Investors ordinarily have more than one source from which to procure the kind of oil or ore that Latinia provides. All then depends on the extent to which Latinia has some monopoly power in this longer run: are supplies from Latinia's competitors sufficiently inelastic as to make it possible for Latinia to "tax" the foreign buyers through expensive labor costs and high taxes? In addition Latinia may be such a cheap source of supply that its buyers cannot afford to switch away from it. In other words, it may be the equivalent of a Saudi Arabia in terms of the cost of its exports. Even if it is not the lowest cost supplier, Latinia may still have some monopoly power even in the long run in view of companies' desire to diversify their sources of supply, in view of specific features of its product (e.g. degree of sulfur in its oil, match of the mix of metals in its ores with certain refiners' installations), geographical location (e.g. weather or political risk to shipping lanes), etc.

Finally, it is necessary to take into account the relative importance of the short and the long run. The short run may be

long, because, even with taxation, profits may be attractive enough to keep the company operating at present levels for a long time. The long run may also be irrelevant because there are no more worthwhile mines to exploit. Or, by contrast, the long run may be crucial because mining investment is looked to as a major source of future growth, numerous companies are currently looking into the possibility of investing and competition with other locations is strong.

(2) **Narcodollars:** There is little question that the price elasticity of demand for addictive narcotics is low. Nor is there much question that the market for at least cocaine, if not opium, is cartelized. Hence the narcotics syndicates are monopolists on the selling side and monopsonists on the buying side. It follows that in the short run, producing countries face an inelastic demand curve. Moreover, the growth of the market is not particularly related to price: it is marketing that shifts the demand curve, although marketing expense may take the form of cutting the price on introductory lots<sup>35</sup>. Nor is there much risk of geographical substitution, for in addition to the climatic requirements, illegal crops can only be grown in inaccessible places. Short-run monopoly

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<sup>35</sup> It seems that the longer term profitability of being a dealer is such that the marketing costs are incurred by the dealers at all levels and not the syndicate. In any case, the profitability up and down the marketing chain is such that small changes in the street price do not get shifted back to the demand price. This is consistent with the small proportion of the street price accounted for by the agricultural input. In the case of cocaine, the cost of coca leaf accounts for about .2% of the street price in the U.S. (A gram of cocaine sells on the street for \$100; that is the price Peruvian peasants are paid for 50 Kgs. of coca leaf, which yield 500 grams of cocaine.)

power will, therefore, also be long-run monopoly power.

In the case of coca leaf and basic paste, the Colombia owners of the processing labs have been paying the cost of Peruvian or Bolivian production in local currency. A flat supply curve has been opposed to a very steep demand curve. A devaluation would lower the supply curve and imply a smaller amount of currency sold; the converse would occur with a revaluation<sup>36</sup>. As a result the supply curve for foreign exchange has been *forward falling with regard to the exchange rate*. An export tax, if one could be levied, or a revalued exchange rate would clearly benefit the producing countries.

Recent forward integration of the basic paste industry in Peru and Bolivia have complicated the picture somewhat. While Colombians owned the labs, they behaved much as the foreign owners of enclave mining operations: all profits were sent abroad. Hence, they only sold enough foreign currency to cover their costs. As locals began to own processing labs, the situation changed: they still need to pay the cost of production of leaf and basic paste but they often use their profits as retained earnings for expansion. Now, an implicit export tax (i.e. cost increase or revaluation) will slow

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<sup>36</sup> It could be argued that a devaluation would increase the price of traded goods in the local economy and in turn raise the supply price of labor, thereby pushing up the local supply curve of coca leaf and paste. Some effect of this kind no doubt exists; however, given the geographical distance between the coca growing areas and the economic heartland of these countries, the various non-economic elements affecting migration and the segmentations in their labor markets, the pass-through effects of devaluation on the supply curve of cocaine raw materials in the Upper Amazon are quite small.

down the expansion of the Peruvian and Bolivian owned paste processing labs that are trying to take the market away from the Colombian labs and thereby reduce the growth of foreign exchange earnings. If this process is basically driven by price, we have a classic case of Innovational Dutch Disease superimposed upon a situation of inelastic demand for the raw material. However, if this process of diffusion of fabrication rights is controlled by a negotiation process within the syndicate<sup>37</sup>, then the inelasticity of demand for paste dominates, for the growth of foreign exchange earnings from fabrication is independent of the price of paste.

(3) **Remittances:** Nationals working abroad send a part of their earnings to the home country for several reasons: (i) to support their families; (ii) to acquire assets for current use of their families, such as housing, or for later use by themselves, e.g. construction lots; and, (iii) to set their relatives up in business, perhaps with a view to later joining the business themselves. Financial savings, by comparison, are typically kept in the country of residence ( e.g. the U.S.) or sent to a third country (e.g. the U.K. or Kuwait by workers in Saudi Arabia).

It is a common characteristic of the motivations listed that they are "target" motivations, i.e. they are worth doing over a wide range of costs. Hence they are very price inelastic.

Consider a young Salvadoran working illegally in the U.S. who sends his mother a money order every month. The amount he sends depends on two variables: how much the mother needs to get by on

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<sup>37</sup> Considerations of safety from raids may also play a role.

and how much the son has left over after covering his own needs. If the Salvadoran exchange rate is revalued in real terms and the mother needs more dollars to survive, that will increase the son's remittances; if the exchange rate is devalued and the mother needs less, the son is more likely to retain a greater part of his surplus for his own needs. On that score, *the supply of foreign exchange is forward falling with regard to the exchange rate.*

Consider now the alien sending money home to buy a house for his family. The family could never afford to acquire a home with just their own earnings. On the other hand, the son's surplus over his own needs in the U.S. can quite quickly cover the cost of almost any conceivable house the family can aspire to. How much the son remits depends on the price of the house in dollars. If the exchange rate is devalued in real terms, he will send less, if it is revalued in real terms, he will send more. Again, *the supply curve of foreign exchange is forward falling with regard to the exchange rate.*

Consider now the case of the purchase of a business. This will typically be a corner grocery store or a small workshop or perhaps a car to be used as a taxi-cab. The amount of capital involved is out of range for any conceivable rate of the family's savings back home, but it can be covered in a limited number of months of surplus by the remitter in the U.S. The situation is similar to that of a house purchase: *the supply of foreign exchange is forward falling with regard to the exchange rate.*

It should be clear from the above discussion why remittances

respond inversely to the exchange rate: they reflect target objectives. However, a caveat must be added: there is an upper bound to the purchase price of each asset above which it will not be bought and there is an upper bound to the family support that will not be exceeded. Hence the demand curve for local currency from remittances is inelastic in a considerable range, but as the price of local currency rises (the exchange rate is revalued), the point is eventually reached at which the demand curve becomes increasingly elastic. The golden goose of remittances can be killed.

The three cases have in common forward falling supply curves of foreign exchange. Accordingly, increases in cost will call forth a higher supply of foreign exchange. Hence, a selective revaluation would appear to be the appropriate policy. However, explicit export taxation will not usually be feasible: foreign private investment is often protected by non-discrimination contracts, narcotics raw material producers do not as a rule pay export taxes, while remittances often make their way into countries in small bills by a myriad of hard-to-police channels. Selective revaluation, therefore, would need to be implemented by means of a compensated revaluation, in the context of which the export tax is levied through a revaluation of the financial exchange rate. Alternative ways for doing so are discussed in the next two sections.

## VII

## TAX BASED POLICY: A SUMMARY

## 1. Objective:

The policy is designed for economies which exhibit the coexistence of productive sectors with widely differing total factor productivity. Because the discretely higher productivity is based on the existence of specific factors of production in some sectors (e.g. land or ore bodies), and because the ownership of these specific factors is highly concentrated, the resulting large economic rents inevitably have strong income distribution effects. The importance of these effects is enhanced as a result of the dynamic nature of the process: either lower productivity sectors are added to pre-existing higher productivity ones (Evolutionary Dutch Disease) or higher productivity sectors are added to pre-existing lower productivity ones (Innovational and Acute Dutch Disease). In either case, in the absence of an explicit policy, very substantial changes in income distribution would occur<sup>38</sup>.

The tax based policy is designed to reconcile the efficiency and distributional objectives, recognizing on the one hand that good allocation requires having no inter-sectoral productivity differential at the margin, while social and political stability require avoiding major income redistribution. The basic tools in

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<sup>38</sup> In addition, there would be changes in the level and/or structure of output which might also be undesirable. For instance, in the case of Acute Dutch Disease, some activities might temporarily shut down, only to reopen later. See Neary and Van Wijnbergen 1986, Ch. 1.

this tax-based policy are the exchange rate, import and export taxation/subsidization and the taxation of Ricardian rent.

## 2. Alternatives:

The two major alternatives available are (a) to operate only with the exchange rate and import and export taxes and subsidies, and, (b) to operate, in addition, with property taxation.

### (a) Exchange Rate and Import/Export Taxes and Subsidies Only:

The essence of these policy alternatives is to discriminate between high and low total factor productivity sectors in terms of the number of units of local currency at which a dollar's worth of exports or import competing output will be sold: high-productivity sectors get less local currency per dollar and low-productivity sectors get more. As a consequence, high-productivity sectors generate less rent and consumers of high-productivity sector output or of the imports financed by that output, pay lower prices. The income distributional goals are thus achieved.

Different mixes of "financial" exchange rate and of trade taxes and subsidies can be used in a veritable "Exchange Rate System" to achieve this effect, viz.:

#### (i) **Low exchange rate and high tariffs/export subsidies.**

In this case, the financial exchange rate is at the bottom of the range and applies to the high productivity sector(s), while lower productivity sectors receive higher "commodity exchange rates" by virtue of the imposition of tariffs. This

is the traditional policy producing Import Substituting Industrialization. Note, however, that if only tariffs are used, the system will be asymmetrical and will bring about the problems which bedevil import substitution. Hence, a useful modification of this version is to add export subsidies for approximate symmetry. With this addition, the system still provides for a low commodity exchange rate for the high productivity sector(s) and higher commodity rates on both import substituting and export output in lower productivity sectors by virtue of tariffs and subsidies.

**(ii) High exchange rate and export taxes/import subsidies.**

This case is exactly the opposite of the above. Now, the financial exchange rate is placed at the top of the spectrum, making the low productivity sector(s) competitive, and the commodity rate for the high productivity sector(s) is reduced by export taxation. For full symmetry with the preceding case, it is also necessary to add import subsidies for sectors that have intermediate productivity and would have intermediate tariffs. Notice that in this case, the low productivity sectors are export competitive as well as competitive in their domestic markets.

**(iii) Mid-range exchange rate, export taxes/import subsidies, and import tariffs/export subsidies.**

Any combination of financial exchange rate and trade taxation and subsidization between the two extremes described above is a possible alternative. It is necessary to bear in mind,

however, that unless export subsidies are fully as great as import duties, the lower the financial exchange rate, the greater the anti-export bias. Conversely, unless import subsidies are used on what would in other systems be low tariff items, a high financial exchange rate will raise the prices of certain importables such as food and may have undesirable income distribution effects.

The choice between these alternative structures of the exchange rate system can be based on how they compare along four dimensions: (1) impact on relative prices, (2) fiscal effects, (3) international legal acceptability, and, (4) administrative feasibility. Each of these merits examination in turn.

**(1) Impact on relative prices:**

As far as visible trade is concerned, the same "commodity exchange rates" can be achieved with any desired "financial" exchange rate, as long as a suitable mix of trade taxation and subsidies are added. By the same token a *fully compensated* devaluation or revaluation will leave the relative prices of goods unchanged<sup>39</sup>. The same does not hold for invisibles: these are not subject to import or export taxation or subsidization and thus for them the net exchange rate is equal to the financial rate.

It follows that different mixes of financial exchange rate and trade taxation/subsidization will change the relative price of

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<sup>39</sup> Note that low financial rate systems usually include significant anti-export bias because they do not include adequate export subsidies. By the same token, high financial rate systems, where they exist, rarely include extensive import subsidies. The symmetry achievable in principle thus rarely obtains in practice.

invisibles and will affect the corresponding flows across the exchanges. For instance, a compensated devaluation will make outward tourism more expensive and inward tourism cheaper; it will raise the value of sales commissions received by importers and the cost of such commissions paid by exporters; it will raise the interest cost of borrowings in foreign currency and similarly the value of interest earnings in foreign currency; it will also raise the cost of remitting profits abroad and increase the benefit of bringing home profits earned abroad.

The net impact on existing foreign investment is more complex to assess. A compensated devaluation will raise the local currency cost of profit remittances, hence the direct impact is to reduce the dollar amount of remitted profits for a given level of profit flow in local currency. However, if the compensated devaluation has reduced the anti-export bias of the exchange rate system and thereby has increased the country's exports and its level of activity, then it is possible that the profit flow in local currency may also have risen. Whether the rise in the local profit flow is greater or less than the direct exchange rate effect depends on a the macroeconomic response of the economy to the reduction in anti-export bias.

The impact on the profitability of new foreign investment depends on similar interactions. With relative product prices unchanged, *per unit* profits in local currency are unchanged. But with a more devalued financial exchange rate, *per unit* profits in dollars will have gone down. At the same time, the dollar cost of

the imported component of investment will not have changed, while the dollar cost of the local cost of investment will have increased. Thus, for the return on investment in dollars not to go down, the volume of output must increase. This can occur if output in the economy expands as a result of the appearance of new or greater exports pursuant to a reduction in the anti-export bias of the exchange rate system, one of the usual effects of a compensated devaluation.

Given the foregoing, it would appear that to set the financial rate higher within the exchange rate system is likely to make foreign direct investment less profitable and *ceteris paribus* less attractive to the investor, however, if a country's growth path improves due to a lessened anti-export bias, FDI might well increase.

How placing the financial rate within the system affects the balance of invisibles also depends on the reaction of the rest of the items in this account.

**(2) Fiscal impact:**

A low financial rate system bases its tax revenue on imports and pays out some subsidies on non-traditional (i.e. lower productivity) exports. By comparison, a high financial rate system bases its revenue on export taxes collected from traditional (i.e. high productivity) exports, while paying out some subsidies to imports. If trade is balanced, a fully compensated devaluation or revaluation would leave all product prices unchanged and therefore would also have no net fiscal effect: all changes in tax base would

offset each other. If trade is not balanced, fully compensated devaluation or revaluation is still fiscally neutral as long as the trade imbalance is fully funded by public capital inflows or outflows. Insofar as there is a private sector net inflow of funds, a compensated devaluation, by raising the financial rate will cause a fiscal deterioration, while a compensated revaluation would cause a fiscal gain. Conversely, if there is a net private outflow of funds, a compensated devaluation will bring about fiscal improvement and a compensated revaluation fiscal deterioration<sup>40</sup>.

Additional fiscal effects result from changes in anti-export bias that lead to export expansion. Such effects are particularly strong if there is excess capacity in the economy resulting from earlier import substitution excesses. In this case, as the foreign exchange constraint to the level of economic activity is relaxed, pursuant to new export growth stimulated by lower anti-export bias, the level of activity and the tax base will both grow, with the consequent increase in fiscal revenue<sup>41</sup>.

### **(3) International legal acceptability:**

Numerous international commitments embodied in the GATT bear on the use of trade taxation and subsidization. Additional

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<sup>40</sup> Note that the inclusion of the form of financing as one of the determinants of the fiscal effect of modifications in the mix between financial exchange rate and trade taxation completes the analysis found in Schydrowsky 1967, where the implicit assumption was that private flows would be the counterpart to any trade imbalance.

<sup>41</sup> For a detailed examination of the effects as well as quantification at various levels of disaggregation for Argentina and Peru, see Schydrowsky 1971 and Schydrowsky et al. 1983 Ch.V.

international commitments are entered into by LDCs as part of their loan agreements with the World Bank and the Regional Development Banks as well as pursuant to Stand-By Agreements with the IMF. Furthermore, U.S. legislation and practice assesses countervailing duties and anti-dumping duties on exports to the U.S. which benefit from export subsidies broadly defined.

The net impact of the legal situation is to make widespread use of sizable export subsidies untenable. High import tariffs are legal but come under increasing pressure from the development agencies. Hence, an exchange rate system based on a high financial rate and low tariffs/export subsidies appears preferable. The corollary of this system, however, is the use of export taxes and import *subsidies*. There is no legal impediment to the former: countries are held to be free to impose taxes on their own exports if they so desire. The situation of import subsidies is more ambiguous: they are not prohibited, however, the IMF frowns upon them as a fiscal expense. Use of import subsidies, therefore, would require that a case be made showing the net fiscal effect of their application to be neutral, or at least small<sup>42</sup>.

#### **(4) Administrative feasibility:**

The relative feasibility of different mixes of trade taxation

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<sup>42</sup> The problem here is one of the baseline of comparison. If the comparison is to a system consisting of a low exchange rate and high tariffs and subsidies, then the fiscal effect of compensated devaluation can be used to defend the inclusion of import subsidies. Compared, however, to a devaluation that is only partially compensated, a fully compensated devaluation will show a worse fiscal effect. Defense of an import subsidy must then be made on other grounds, such as anti-inflationary and/or income distributional effects.

and subsidization depends in part of the explicit capabilities of each LDC's public administration and in part on the relative ease of evasion each mix offers.

Import tariff administration usually has a long history and an established personnel. By the same token, the techniques for avoiding and evading tariffs have also been refined over the years. These techniques range the gamut from misclassification of the merchandise in order to place it into a lower tariff category, through misstatement of weight or amount, through outright smuggling, either over an unguarded border, through the customs house via bribery, or through an Armed Services Bazaar. Moreover, the higher the tariffs are, the greater the incentive to evade or avoid them.

Export taxes, particularly on traditional products, also have a long history and tend to be easy to administer because there are usually few products and few points of export involved. However, there are also well documented cases of widespread smuggling to evade export taxes<sup>43</sup>. Furthermore, one very important export crop, raw material for drugs, is virtually immune to explicit export taxation. For exports that can be captured in the administrative net of export registries, moreover, understatements of volume and value represent a problem.

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<sup>43</sup> West and East Africa both have yielded a substantial number of cases where coffee and other crops have been smuggled across borders to evade either explicit taxation and/or taxation through exchange control. Similar accounts are heard about rice smuggling between Guyana and Surinam and cattle smuggling between Uruguay and Brazil.

On the other hand, the administration of export subsidies has a much shorter history. Accordingly, the classification of products and the processing of the payments can represent a significant obstacle to the successful and fluid operation of an export subsidy system. Moreover, deliberate misclassification of merchandise<sup>44</sup> or minimal manufacture to fit into a higher subsidy category are major problems<sup>45</sup>.

While the more direct schemes for evasion of duties and taxes or for obtention of subsidies are the more colorful, the quantitatively more important problem for trade tax administration lies in the possibilities and incentives for over and undervaluation of the merchandise. These incentives may be very strong although they are not as straightforward as they may seem:

(i) import duties provide prima-facie incentives for under-invoicing; however, the lower costs will translate into higher profits and higher profit taxes. Unless profit taxation is 100% at the margin, a net incentive remains. However, for national businesses, undervaluation also poses the problem of how to pay the supplier for the difference between the true

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<sup>44</sup> A notable case in Colombia involved the collection over a period of several years of export rebates on millions of dollars' worth of clothing by a firm that apparently never shipped any clothing and either disbanded soon after the subsidy was reduced or never existed in the first place. The fraud was never "discovered", yet analysis of the export statistics revealed its existence. See Morawetz 1980.

<sup>45</sup> When Peru's export subsidy included payment to gold handicrafts, a number of producers found it profitable to cast gold into golden ashtrays with Peru's coat-of-arms stamped into their centers. This converted the gold to gold handicrafts. Once abroad, the ashtrays were melted down again.

and the lower invoiced value of the merchandise. If this is done totally off the books, corporate profits become overstated, thus negating part of the gain from undervaluation of imports; if purchase commissions or similar items are entered as costs, experienced tax auditors would quickly pick up the ruse<sup>46</sup>. Multinational enterprises change valuations by using transfer prices; however this means that profits in the selling unit of the multinational group go down while those in the buying unit go up. The tax implications may be desirable<sup>47</sup>, but the associated redistribution of cash flows may run counter to the MNE's desires<sup>48</sup>. Moreover, the resulting profit statements may be misleading of true subsidiary performance and thus cause problem with the performance evaluation system within the MNE.

(ii) export taxes provide clear incentives for under-invoicing although there are again a number of off-setting complications with income taxation. The main difficulty, however, in this case is the inward transfer of the sales value not shown on

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<sup>46</sup> In practice, the problem has traditionally been swept into the general fudging of income tax liabilities made possible by inflation, weak auditing and general corruptibility of the tax inspectors. More recently, the tightening of tax inspections has made this obstacle real in a number of countries.

<sup>47</sup> Given the nature of the U.S. tax laws, with the associated tax credits for payment of foreign income tax, the calculation of net tax advantage of transfer pricing within MNEs is a very complex operation. For discussion see Robbins et al. 1973, particularly the appendix simulations.

<sup>48</sup> For instance, cash may increase in a subsidiary subject to considerable exchange risk or in one which is not supposed to expand.

the invoice, an amount which often has to be paid the original producer of the merchandise by the intermediary exporter. This either leads to a chain of off-the-books transactions or to parallel book-keeping entries for fictional services rendered.

(iii) import subsidies provide incentives to over-invoice with the added incentive that in this case corporate income taxes are saved as well! The only enterprises for which this may cause difficulty are U.S. multinational enterprises in so far as the higher transfer prices may cause profits to rise in the U.S. and hence be subject to higher corporate taxes. Domestic enterprises simply leave the over-invoiced amount abroad as capital flight.

(iv) export subsidies provide incentives to over-invoice the exports, with the consequent increase in corporate tax liability<sup>49</sup>. The further complications in this case are the same as those occurring from the under-invoicing of imports.

The foregoing indicates that incentives to evade and to over- and underinvoice occur no matter what mix of exchange rate and trade taxation/subsidization is used. Administrative elements therefore push the mix towards generating evasion and misvaluation incentives where they can be most easily countered by administrative means. This usually implies minimizing the number and the complexity of specification of the items on which taxes or subsidies are paid.

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<sup>49</sup> In a number of export subsidy regimes, the income represented by the subsidy is tax free. This allows the government to set a lower explicit subsidy rate. However, it also lowers the tax loss from over-invoicing since the additional subsidy collected escapes the tax.

For instance, ore exports are easier to police than an equivalent value of ladies garments; while the former have easy-to-specify product descriptions, the latter come in such infinite variety that verification of invoice value is extremely difficult. On balance, therefore, administrative reasons argue for a financial exchange rate in the center of the commodity rates, but tending more to the top of the range than towards the bottom. Correspondingly, import duties and export subsidies will be rather lower and export taxes and import subsidies rather higher<sup>50</sup>.

In summary, the legal and administrative reasons argue for a higher financial rate within the exchange rate system, while the relative price and fiscal reasons can press composition of the system in either direction depending on the net reaction of invisibles and on whether the public or the private sector finances the balance of trade deficit.

(b) Exchange Rate, Import Taxes, Export Subsidies and Ricardian Rent Taxes:

The essence of these policy alternatives is to achieve the same discrimination between high and low productivity sectors as with the use of exchange rate and trade taxes/subsidies only, except that this discrimination is limited to existing production, while there is to be no discrimination on additional production.

The differentiation between existing ("old") production and additional ("new") production is achieved by levying a property tax

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<sup>50</sup> Think, for instance, of Argentina with exports concentrated in grain and a few basic petrochemical and steel items easy to identify.

on land or on mines equal to the windfall generated by raising the financial exchange rate without compensatory export tax. This tax on Ricardian rent thus substitutes for an export tax but is set at a rate which only picks up the additional revenue received from "old" production. Moreover, because it is a tax not related to output, it does not and cannot affect profits from "new" production. In consequence, "new" production receives the full revenue from the higher exchange rate.

An export tax lowers the domestic price of exports and thereby has two distributional effects: (i) it lowers revenue to exporters, and, (ii) it lowers the price to domestic consumers of the taxed exportables. Both effects have important impacts on the income distribution. The Ricardian tax only substitutes for the first of these effects; for the second to occur, the government must distribute the revenue of the tax in some manner to consumers. Unless this occurs, replacing an export tax by a Ricardian rent tax will have important income distributional consequences.

Different mixes of financial exchange rate, Ricardian rent tax and trade taxes and subsidies are feasible:

**(1) Low exchange rate and high tariffs/export subsidies.**

If the financial exchange rate is set at the bottom of the range, just making the high productivity sector export competitive, there will be no room for a Ricardian rent tax.

**(2) High exchange rate, high Ricardian rent tax, and user subsidies.**

This is the opposite extreme. With the exchange rate at the

top of the spectrum, differential rents are generated all along the line in the productive system and the Ricardian rent tax system must be differentiated to tax different productive assets in accordance with the rent they generate. On the other side of the market, in order to prevent undesirable income distribution effects, the revenue from this rent tax needs to be distributed back to users, in subsidies related to the products used.

**(3) Mid-range exchange rate, Ricardian rent tax, import duties export subsidies, and user subsidies.**

In this case, the exchange rate is high enough to generate substantial rent in the high productivity sector, but not so high as to enable the lower productivity sectors to compete. Hence, the exchange rate is complemented on the one hand with a Ricardian rent tax to pick up the excess profits on "old" production in the high productivity sector, and on the other, with tariffs and export subsidies to ensure the competitiveness in domestic and foreign markets of the lower productivity sectors. Finally, to compensate for the distributional effects on consumers of the higher exchange rate, a consumption subsidy equivalent to the revenue generated by the Ricardian tax is added.

The choice between the various alternative structures of exchange rate systems cum Ricardian rent tax can be based on how they compare along the same four dimensions used to compare systems without Ricardian rent tax, namely: (1) impact on relative prices,

(2) fiscal effects, (3) international legal acceptability, and, (4) administrative feasibility. Each one again merits examination in turn.

**(1) Impact on relative prices:**

The purpose of using Ricardian rent taxation is to change relative product prices facing producers at the margin. Hence, discrimination against high productivity producers will be lower, the higher the financial exchange rate is set and the lower, correspondingly, are tariffs and export subsidies.

Relative product prices will also change for consumers on two counts: (i) the price of exportables will rise due to the narrowing of the discrimination against high productivity producers at the margin; and, (ii) the price of some imports (and import competing production) will rise since the higher financial rate is likely to carry through to higher "commodity" exchange rates for some imports, as a result of the manner in which the treasury returns to the public the revenue raised through the Ricardian rent tax (i.e. in ways other than an import subsidy).

The relative prices of invisibles will also change, consequent to modifications in the financial exchange rate. These changes are no different than those occurring in compensated devaluations using export taxes rather than Ricardian rent taxation, hence no further elaboration is needed.

**(2) Fiscal impact:**

The instantaneous effect is no different from the export taxation case, for the export tax base is substituted precisely by

the rent tax base. However, in a slightly longer time horizon, the high productivity sectors will expand and the tax effect of that expansion depends on the extent to which domestic factors of production are fully employed or not. If, as is often the case, there is some excess capacity and some underemployment, and the foreign exchange availability is the dominant constraint on economic activity, then economic expansion should occur and the fiscal balance should improve as a consequence of the growth in the revenue base.

In addition, in the even longer short run, other exports should grow, consequent to the reduction in the anti-export bias, once again expanding activity and the tax base. Moreover, the higher the financial exchange rate is set, the smaller the anti-export bias and the greater the share of output that will become export competitive.

### **(3) International legal acceptability:**

There are no specific international restrictions on the use of property taxation. The added elements arising from Ricardian rent taxation over and above the tax/subsidy case discussed before, are two: (i) refundability of domestic taxes on exports; and, (ii) acceptability of the return of the Ricardian rent tax revenue via fiscal subsidy.

The issue of refundability of domestic taxation on exports is important because if the Ricardian tax were refundable, it would negate its purpose in picking up intramarginal rent. Fortunately, international rules allow the refund only of indirect taxes, hence

this aspect presents no problems.

The existence of a consumption subsidy presents a greater problem, in view of concerns at the international agencies about their fiscal cost as well as their alleged distortionary effects. On the other hand, targeted anti-poverty safety nets have recently acquired a fair degree of international acceptability, despite the difficulties encountered in implementing them. Thus, a suitably designed subsidy program oriented at returning the Ricardian rent tax revenue to consumers can probably be made internationally acceptable.

**(4) Administrative feasibility:**

There are two administrative problems added by replacing export taxes with a Ricardian rent tax: (i) setting and administering the tax, and, (ii) defining and administering the subsidy intended to return the tax revenue collected to the consumers.

Setting the tax is simple in principle but complicated in practice. The objective is to collect from each producer an amount of revenue equal to the increase accruing to him(her) as a result of an increase in the financial exchange rate. Since the difference in rates is known, the administrative system needs to reveal the value of sales to which this difference applies as well as the identity of the legal owner of these sales (and who by that token is the legal subject of the tax).

Identifying volumes of production and their owners is not a simple matter in LDCs. Identifying exports is not difficult, for

their name must appear on bills of lading or other export documents. However, exporters may well be intermediaries, not producers and, even less, owners of land or mines. Moreover, export sales are only part of the tax base; domestic sales matter just as much. Hence, what is required is a cadastral system showing ownership of land and mines as well as volume and value of production in the very recent past, preferably in the last tax year. These are not data which are currently available in many LDCs. Moreover, since the information is required to levy a tax, not provide a subsidy, there is little interest on the part of the public in coming forward with this information.

Once the tax base has been identified and the initial rate set, a formula needs to be devised for modifying the rate in accordance with price changes in the product and with later devaluations. However, price changes are unlikely to be uniform within the various qualities making up a single "product", hence at least some disaggregation of production by quality is needed for the initial year<sup>51</sup>.

The revenue dispersal system may be just as complicated to administer. The prices which increase comprise the major export products and those imports for which compensation through import duty reduction is insufficient to keep prices constant. In other words, they are likely to cover an important share of consumption

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<sup>51</sup> If producers change their quality mix in response to later relative price changes, strict equality with an export tax would require adjustment of the tax rate. However, for administrative simplicity's sake, it seems more reasonable to lump such changes with output increases.

expenditure, particularly if food and clothing are involved. On the other hand, consumers affected run the gamut of the income distribution. Reaching this range of consumers by administrative means is difficult: most do not pay personal income tax, most are not affected by wage taxation (including social security) and the products for which prices have risen consequent to the incompletely compensated devaluation, are typically not subject to sales or value added taxation. Hence, there is no simple way to compensate for the price rise through offsetting changes in direct or indirect taxation. Almost unavoidably, therefore, the consumption effects of the Ricardian rent tax will only be very partially offset. The recent experience with operating "safety net" programs are good examples of the considerable difficulty involved in reaching even a relatively small fraction of the population affected.

On balance, the main argument for a high Ricardian rent tax combined with low tariffs and export subsidies derives from the gain in output and efficiency by equalizing producer incentives at the margin. On the other hand, the overwhelming difficulties of administering the tax and running the compensatory consumer subsidy system argue for a low to moderate Ricardian rent tax, concentrated on few products and producers and off-set mostly through direct and indirect tax reduction.

## VIII

## EXCHANGE MARKET BASED POLICY: AN ALTERNATIVE

In a number of empirically important cases export taxation and Ricardian rent taxation are both infeasible for administrative reasons, yet discrimination between sectors is desirable on income distribution grounds and/or on optimum tariff grounds. Examples of this kind of situation are (i) the production of coca leaf and basic paste, on which no export tax can be enforced, (ii) revenue from tourism in Nepal, for which the suppliers are so numerous as to make enforcement of a tax extremely costly, (iii) mining for diamonds in the drought-dried river beds of Angola, from which the product is smuggled abroad, (iv) various staple crops in Africa, which are traditionally smuggled across borders to escape taxation, and, (v) remittances to Latin America and elsewhere, which are often repatriated in small amounts and through "informal" channels<sup>52</sup>.

Since all foreign exchange revenue must be converted to local currency for use, an obvious way to tax such hard-to-reach foreign exchange sources is through a compensated revaluation: revalue the financial exchange rate and compensate the effect on not-to-be-taxed sectors by raising the rates of import duties and export subsidies. Unfortunately, this situation may be precluded by

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<sup>52</sup> In some of these cases the distributional and optimum tariff arguments may be opposed to each other. For instance, remittances mostly go to the middle and lower strata of the income distribution, although they are quite price inelastic. Whether or not it is desirable to tax them is therefore a complex decision.

contractual commitments such as membership in a free trade area, stand-by agreements with the IMF, structural adjustment loans from the World Bank or the Regional Development Banks, etc. Moreover, there are other draw-backs to high tariffs and subsidies as discussed in the previous section. It may become necessary, in such circumstances to find a solution in the foreign exchange market itself.

#### 1. Objective:

To segment the foreign exchange market into a lower tier serving the discriminated-against sectors and a higher tier serving the favored sectors.

#### 2. Core Mechanism:

Consider the adoption of the following four rulings:

(i) importers clearing through customs must present an import authorization equal in face amount to the CIF value of the merchandise to be cleared, such import authorization to be called "Certimpex" (Certificate to import from exports);

(ii) exporters shipping "favored" exports will receive Certimpex equal in face amount to the FOB value of the merchandise exported when their invoice is paid through the domestic banking system and cleared through the Central Bank clearing house;

(iii) exporters are allowed to sell their Certimpex freely to importers and banks are allowed to divide Certimpex into smaller face value certificates or aggregate them into larger blocks as requested by their customers;

(iv) non-favored exports are not entitled to receive Certimpex.

Upon enactment of these rulings, in addition to the existing market for foreign exchange, a new market in Certimpex will appear. The two markets together will be the equivalent of a two-tier foreign exchange market. In the higher tier will be the exporters of favored products as well as all importers. The realized price at which they buy and sell their foreign exchange is the sum of the price for "pure" foreign exchange plus that for Certimpex.

In the lower tier will be the exporters of non-favored products as well as other suppliers and demanders of foreign exchange. The realized price at which they buy and sell is the price for "pure" foreign exchange.

As long as favored exports are less than total imports, the certimpex will have a positive price and there will be discrimination in the desired direction. Accordingly, the price for "pure" foreign exchange will fall, while the sum of the price for foreign exchange plus Certimpex may equal the original price for foreign exchange or may rise, as discussed below.<sup>53</sup>

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<sup>53</sup> Some care has to be taken in the transition from a single market to a segmented market, since it is likely that with market segmentation the price for pure foreign exchange will fall but the price for pure foreign exchange plus certimpex will be above the original single market price for foreign exchange. In that case, there is the possibility of domestic price increases as imports get more expensive. This eventuality can be avoided by central bank sales of Certimpex, which will shift the full discrimination backwards onto the non-favored exports. Alternatively, the price increase could be compensated by devaluation of the import rate through tariff reduction. While this latter alternative will lower tax revenue, there will be an off-set through the tax equivalent of the Central Bank's cheaper purchase of foreign exchange at the

### 3. Treatment of invisibles:

The general principle is to operate on the basis of administrative simplicity. Thus:

(i) Tourism: In-bound tourism is too hard to effectively trace and lends itself too well to money laundering and invoice falsification. Goes to the low tier. The purchase of foreign exchange for out-bound tourism is also hard to police and hence it is difficult to effectively force it into the high tier. The most that can be done without great administrative complexity is to require Certimpex for the purchase of airline tickets.

(ii) Insurance, freight and communications: in so far as it is directly associated with imports, it goes into the high tier, imports are valued CIF; moreover telecommunications is a sufficiently oligopolized industry as to go through the high tier too. Other services of this sort, e.g. private couriers, etc. go through the low tier.

(iii) Interest: when paid goes through the high tier, when collected, will go through the high tier only if remitted through the banking system on duly registered investments, otherwise money laundering and arbitrage between the markets runs rampant.

(iv) Capital flows: registered foreign private investment goes through the high tier, short term capital flows through the

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newly lowered pure exchange price. See below for further discussion of tax and monetary effects.

low tier and government debt flows through the low tier as well.

#### 4. Fiscal Effects:

Consider the instantaneous effect of implementation of the system in a situation in which, say, one third of exports consists of non-favored products. Implementing the certimpex system alone would drive the pure foreign exchange price down but the high tier price would settle above the earlier single price. Moreover, imports would have to fall by a third since they are forced to equal favored exports in value. To avoid this, the government would have to sell certimpex in an amount equal to a third of exports. The government's revenue from the sale of these certimpex would be exactly equal to the tax on non-favored exports. If aggregate demand stayed constant, the domestic price level would not have to change and the new tax would be shifted backwards entirely onto the non-favored exports. Alternatively, if aggregate demand expanded, some of the tax would be borne by consumers or would come out of the expansion of aggregate output. In either case, going from no export tax to an export tax imposed through the Certimpex system will yield revenue.

If the intention, however, is to unwind an import substitution type exchange rate system, with low exchange rate, high tariffs and no export subsidies, then the fiscal effect will be neutral. Consider the following: the Certimpex system is put in at the same time as import duties are reduced, but aggregate demand is held constant. Now, the high tier exchange rate will be devalued by the

reduction in the import duties and the lower tier rate will stay where it is, with the difference picked up by the price of the Certimpex. Since the government must issue Certimpex equal to the third of imports not covered by favored export revenue, it will collect the equivalent of the Certimpex price as a tax on the foreign exchange generated by non-favored sectors. This export tax will be exactly equal in amount to the import duties foregone by tariff reductions, as was shown in the earlier discussion on compensated devaluation.

The general outcome depends, as can be seen, on what policy mix is implemented and what macropolicy accompanies it. However, as long as the government is a net buyer of foreign exchange to pay debt (which goes through the lower tier) and as long as it has to engage in some arbitrage between the tiers through the issue of Certimpex, there will be some fiscal gain from the system.

In addition, if a reduction in the anti-export bias of the system occurs, which leads to an expansion of exports, there is likely to be an additional gain in revenue arising from the indirect expansion in tax base consequent to the increase in exports.

#### 5. Monetary effects:

The monetary effects of the system are exactly equal to those which occur in a unitary exchange rate system with an export tax on some products. The only case in which there is a difference occurs when reserves are accumulated or decumulated. Since these are bought in the lower tier, reserve accumulation is less expansionary

that in a unitary rate system. On the other hand, reserves may be decumulated in either market, and their contractionary effect will be different depending on the market to which reserves are lost.

#### 6. International legal acceptability:

Segmentation of exchange markets between current and capital account have a long history and are acceptable according to the IMF Articles of Agreement. However, such segmentation is not popular and there is much concern that what starts as a dual rate system may easily become a multiple rate system and get out of control<sup>54</sup>.

Specific systems similar to the Certimpex here proposed have operated successfully in a number of countries at different times. Notable cases are the Export Bonus Voucher system in Pakistan, which operated in the 60s and 70s <sup>55</sup>, the Wage Earners Scheme, which operated in Bangladesh during most of the 70s and into the 80s, the Foreign Exchange Certificate System which operated in Peru during 1948-1960<sup>56</sup> and again in 1967-1975, and the equivalent system which is still operating in Colombia at present and which generates a discount of 12.5% from the "official" price for foreign

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<sup>54</sup> The certimpex system, as proposed, is unified, in the sense that all exports get the equivalent of 100% of the export value as certimpex and all imports need to present 100% of the value in certimpex. However, it would not be hard to segment the system further, creating a range for certimpex percentages for exports, ranging, say, from 10% to 150%, and require that imports of different priority present certimpex equal to from 50% to 300% of their value. It is this kind of further differentiation that causes may observers concern.

<sup>55</sup> See Bruton and Bose 1963 for a description.

<sup>56</sup> See Tsiang 1957 for a description.

exchange sold on the free market in the form of drafts and 25% on bills sold legally in the street<sup>57</sup>.

### 7. Evasion:

Whenever there is market segmentation, an incentive for evasion or for arbitrage is established and this is no less true for the Certimpex system. The two pressure points arise around the issuance and the utilization of the certimpex: foreign exchange revenue not entitled to certimpex will attempt to obtain them, and imports will attempt to get in without adequate coverage by Certimpex.

For foreign exchange revenue not entitled to Certimpex to receive some, the most feasible route is to relabel the revenue as favored exports. At the extreme, this involves either outright fraud, i.e. claiming that exports occurred which in fact did not occur and obtaining the corresponding documentation through bribery or intimidation. A more conventional technique consists of exporting legitimate merchandise but overinvoicing it in order to obtain more Certimpex, with the overinvoiced amount being covered by foreign exchange from the lower tier of the market<sup>58</sup>. Note,

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<sup>57</sup> The Colombian system has its roots in the recommendations of the same Klein-Sachs mission that put in the Peruvian system in 1949, but has undergone numerous transmutations in the intervening forty odd years. It is now governed by Junta Monetaria Resolucion Numero 57 de 1991 (Junio 26) and Banco de la Republica Resolucion Externa Numero 3 de 1991 (Septiembre 13) and Numero 6 de 1991 (Octubre 8).

<sup>58</sup> Anybody could potentially play this game by buying foreign exchange in the lower tier of the market, sending it abroad and then bringing it back as part of the payment for the inflated invoice.

however, that in this case profits and hence corporate tax liabilities would increase.

On the import side, the incentive would be to underinvoice in order to reduce the amount of Certimpex required for import and hence to realize the savings on the Certimpex premium. Such a course of action would again increase domestic profits and hence taxes, and also raises the question analyzed previously about the account on which the remainder of the payment would enter the books. A more radical solution to detouring the Certimpex requirement for imports is to smuggle the goods outright!

The certimpex system thus generates no new phenomena not already present as a consequence of import duties or export subsidies. Deterrence, therefore, takes the usual forms: spot checks on valuations, cross-checks on prices paid across time, comparisons between prices paid by different companies at the same point in time, tightening of audit requirements and auditor liability for undetected fraud, tracing the source of funds through the banking system to the payer abroad, cooperation with international efforts against money laundering, etc. No doubt some arbitrage will wind up occurring. The objective is to keep it small enough to enable the system as a whole to be effective in collecting an export tax through the revaluation of the lower tier exchange rate.

## IX CONCLUSION

Dutch Disease in its different forms unavoidably sets up a trade-off between the goals of an efficient economy, an acceptable income distribution and an administrable tax system. Each of the forms of Dutch Disease, Evolutionary, Innovational, and Acute, present the problem in a slightly different way, however all have their root in sharp discontinuities in total factor productivity between different lines of production, which, in turn, use different factor mixes and hence generate considerable rent which accrues to a limited number of owners.

The most common policy towards Dutch Disease consists of adopting an "exchange rate system" consisting of a financial exchange rate and a range of export taxes, import subsidies, import duties and export subsidies. However, various contractual arrangements have increasingly limited the use of export subsidies and high tariffs. As a result, the financial exchange rate has increasingly been forced to locate near the top of the range.

This development has created problems for Dutch Disease cases in which export taxes cannot be levied on the high productivity sector for practical reasons (e.g. coca paste, smuggled diamonds or coffee, "nature" tourism). In this case, it becomes necessary to segment the exchange market itself and use a lower tier exchange rate to implicitly tax the high-productivity export sectors. Such a segmentation must be undertaken with care, however, to avoid its

degeneration into a distortionary multiple exchange rate system.

The Certimpex system, a simple system based on a transferable import license given to exporters, would appear to satisfy the minimal need for segmentation, without being easily subject to administrative abuse and without creating arbitrage incentives qualitatively different from those existing in any tariff/subsidy regime. The practical operation of similar systems in a number of countries in different parts of the world adds weight to the view that this system may be a useful complement to the more standard tools with which countries respond to the different varieties of Dutch Disease.

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