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Saving: Domestic and Foreign

We now address ourselves to a somewhat more difficult set of questions, relating exchange control regimes to saving formation. The analysis is complex, partly because we must distinguish between domestic and foreign saving, and hence we must examine not merely how the trade regime may influence each of these two types of saving but also how they interact with each other (as indeed they do, as we shall see below). But the complexity also follows, and mainly, from the numerous possible linkages between the foreign trade regime and domestic saving formation. In the analysis that follows, we will initially discuss these linkages between trade regimes and domestic saving (Section I-III) and then between those regimes and foreign saving (Section IV).

The analysis of possibilities and of the empirical evidence in regard thereto does not lead to strong *generalizations* in support of either Phase II type, retrictionist exchange control regimes, or, for that matter, of Phase IV type, liberalized regimes.[1] It does however undermine the occasional claim that restrictionist exchange control regimes, while creating static inefficiencies (as discussed in Chapter 5), are "dynamically" efficient *via* their beneficial effects on capital formation. Such a *generalization* is just not supportable, in theory owing to a multiplicity of possible linkages between the trade regime and saving and in practice owing to conflicting empirical evidence on these linkages.

As recommended at the outset of the volume, therefore, the present chapter is best read for its value as a manual (i.e., as a reference for ideas, hypotheses, statistical evidence, and techniques for economists planning to analyze the interaction of trade policies and saving formation for *their* country), rather than as a source of strong cross-country or time-series generalizations on how restrictionist or liberalized trade regimes would affect saving formation.

I. POSSIBLE LINKS BETWEEN DOMESTIC SAVING AND FOREIGN TRADE REGIMES

We begin with a purely theoretical analysis of possible linkages between the foreign trade regime and domestic saving. It should be noted at the outset that the linkages that we will discuss in terms of alternative "model" types relate to the exchange control mechanism essentially in two ways. (1) We may argue that Phase II type exchange control regimes imply, for example, the relative expansion (or contraction) of sectors, regions, functional incomes, and hence (owing to differential saving propensities) smaller or larger savings. These and similar other arguments focus essentially on the fact that Phase II regimes are characterized by overvalued exchange rates. (2) On the other hand, we can also produce arguments that relate to differences *within* Phase II regimes. For example, the tax revenue, and hence overall saving, effects of the Phase II regime could differ depending on whether tariffs are in operation to mop up (partly or overwhelmingly) the import premiums in the Phase II situation. The former set of arguments embraces many more possible linkages and is also probably the most significant. Hence the main focus here will be put on those arguments, though our (taxonomic) analysis will naturally extend to both sets of arguments. Note however that we will *not* be discussing whether the saving so resulting from any specific trade regime, whether larger or smaller than in alternative trade regimes, is socially *optimal*; this issue is deferred until later.

A. Income Distribution and Saving

The link of saving in an economy to its foreign trade regime, *via* the income distribution associated with that regime, has been well recognized as a possibility in trade-theoretic literature. This argument was noted many years ago and has been resuscitated by a number of trade theorists in recent years.[2] In principle, there are a number of models that could be constructed to analyze such saving linkages with specific foreign trade regimes. We discuss here a few of them to suggest the kinds of arguments that may be relevant to examine in empirical analysis.

1. SAVING AND FUNCTIONAL INCOME DISTRIBUTION.

One approach is to assume with the Cambridge (U.K.) school that there are specific and significant differences between the "wage earners" and the "capitalists" in their saving propensities. As the trade regime alters the distribution of income between these two classes of income earners, it correspondingly alters total saving and hence the rate of saving (the latter depending also on the effect of the trade regime on the income level).[3]

The neatest model along these line has been developed by Pattanaik.[4] He works with two commodities (1 and 2) and two factors (L and K) in a small economy (with given international prices). Commodity 2 is the importable and commodity 1 the exportable; one of them must be a capital good and the other a consumer good. The symbol z represents the K/L ratio, with the subscripts 1 and 2 denoting the commodity and the superscripts A and F representing autarky and free trade, respectively. The policy shift from autarky to free trade—which is welfare improving for this small country—is analyzed. The average propensity to save from labor income (i.e., $L \cdot w$ where w is the price/wage of labor in terms of commodity 2) is s_w, and from capital income (i.e., $K \cdot r$ where r is the price/rental of capital in terms of commodity 2) is s_r; and, a la Cambridge school, it is assumed that $s_w < s_r$. S and Y are total savings and income, measured in units of commodity 2. The model is then essentially of the Heckscher-Ohlin variety except for the introduction of the two saving function; the new wrinkle essentially is that one is deploying a certain type of demand function (as the total savings generated represent demand for the capital good).

Assume now that commodity 1 (the exportable) is labor intensive ($z_1 < z_2$). A shift from autarky to free trade in raising the (relative) price of the exportable then lowers national income measured in terms of *exportables* (given the concavity of the production possibility curve to the origin). Thanks to the Stolper-Samuelson theorem, it also raises the share of labor in income and lowers the share of capital; and, given $s_w < s_r$, this implies that the *average* (weighted) propensity to save must also fall. Hence *total* saving in terms of exportables will necessarily fall. But, since Y (measured in terms of *importables*) rises with the rise in the price of the exportable with free trade, one cannot conclude that saving measured in importables (S) will also fall.

Pattanaik, however, establishes the necessary and sufficient conditions for s to fall by showing that:

$$s^F - s^A < 0$$

that is, saving under free trade will be less than under autarky, that is

$$\left\{ s_w \cdot L(w^F - w^A) + s_r \cdot K(r^F - r^A) \right\} < 0 \text{ if } \frac{s_w}{z \cdot s_1} < \frac{r^A - r^F}{w^F - w^A}$$

In conjunction with his derivation:

$$\left\{ \frac{1}{z_2^A} \geqslant \frac{r^A - r^F}{w^F - w^A} \geqslant \frac{1}{z_2^F} \right\}$$

it is then easy to see that a change in the trade regime from autarky to free trade will reduce s (i.e., saving measured in terms of importables) if $z/z_2^F >$ s_w/s_r and only if $z/z_2^A > s_w/s_r$. [Since $z_2^F > z_2^A$ (i.e., the capital-labor ratio in the capital-intensive commodity 2 must rise under free trade, which reduces the relative commodity price of 2), it follows that $z/z_2^F > s_w/s_r$ implies $z/z_2^A >$ s_w/s_r.] Since savings will necessasrily fall, measured in terms of exportables, it is clear that when $z/z_2^F > s_w/s_r$,—a condition that would be necessarily satisfied if $s_w = 0$ or negligible—we would have an unambiguous decline in total saving with a change in the trade regime from autarky to free trade.

This Heckscher-Ohlin-Pattanaik type of model thus makes saving very clearly a function of the functional distribution of income that results from the resource allocation associated with a specific trade policy. This model is direct-ly relevant to the analysis of exchange control regimes as well, since a Phase II type restrictionist exchange control regime can be identified in such a model with a "real" situation where there is a tariff.[5] This is because under such a regime exports are domestically priced at the exchange parity and imports at the parity plus the import premium. When the Phase II type exchange control regime is also characterized by some export subsidies, this argument must be modified but is not reversed as long as we plausibly assume that the average rate of export subsidization is below the average import premium. Moreover, if tariffs or exchange auctions are introduced to mop up the import premium, we merely substitute the average tariff or auction premium for the import premium in the argument above. The only difference, with subsidies and tariffs being introduced, is that revenue effects would have to be considered. Thus, if revenue is gathered in lieu of import premiums, public saving could rise and may exceed the private saving that may have resulted from the "rents" earned on import licenses. On the other hand, a profligate govern-ment and accumulating rentiers could continue to make the net effect adverse to the overall savings rate (more on this later).

It is sufficient to note that the model—which deliberately ignores revenue effects—does suggest the possibility that overall saving may fall unambiguous-ly if an overvalued exchange rate is replaced by a unified exchange rate in a developing economy that exports labor-intensive goods, where the saving is ex-clusively a function of market-determined wages and profits and where the propensity to save out of profits exceeds the propensity to save out of wages.

On the other hand, possibly the only statistical estimation of saving func-tions along functional-income-distributional lines in the project by Behrman

for Chile (reported in Table 6-3 below) suggests that "shifts from nonwage to wage income and from the rest of the economy to agriculture would both increase savings."[6] Behrman notes that this result, which is anti-Kaldorian in inverting the relative rankings of labor and non-labor saving propensities, may be due to the inclusion in labor income of income from self-employed proprietors.[7]

2. SAVING AND SECTORAL INCOME DISTRIBUTION

There are also a number of hypotheses that could be advanced about the link between, *not* functional distribution, but the sectoral composition of value-added and the overall saving in the economy assuming, of course, that the sectoral propensities to save are reasonably stable and it is meaningful to define, for predictive analysis, the overall saving propensity as a weighted sum of the sectoral saving propensities. In the literature on trade and saving, it is possible to detect, though not always in the formalized models of economic theorists, the following four varieties of such sector-specific arguments:[8]

a. The Export Sector vs. the Rest. Maizels, in particular, and several other economists following him,[9] have argued that the relative growth of the export sector in the economy is conducive to greater saving. It is best to quote Maizels on this, as the writers that follow him have usually fitted regressions linking saving to exports with a nod in the direction of Maizels for the underlying rationale of their procedure:[10]

> . . . variations in exports might well result in associated variations in domestic savings. This could occur either because the propensity to save is higher in the export sector than elsewhere or because government savings rely heavily on taxes on foreign trade. In Malaya, for example, the ratio of savings to income of the tin and rubber companies is no doubt considerably higher than that of companies producing for the home market (and certainly much higher than for peasants), while in 1963 Customs duties were estimated to bring in over 40 per cent of total tax revenue. It seems probable that in countries like Malaya a close relationship exists between changes in exports (and thus in the net income of the export sector) and changes in gross domestic savings.

The relationship of export growth to overall saving is then based on two underlying functions. One relates exports to taxation and thence to public saving and the other links exports to higher corporate saving via the higher propensity to save of the corporations in the export sector. These links will be well to remember when we examine the evidence that is produced in support this export-sector linkage to saving.

In turn, however, this linkage ties trade regimes to saving performance, of

course. Let us take again the two-sector (exportables and importables) model of traditional trade theory. An overvalued exchange rate then implies a relative overexpansion of the importable sector and underexpansion of the exportable sector. Consider, however, the theory of overvaluation in terms of the familiar Salter-Pearce model of two traded goods and one non-traded good.[11] The analysis of this model is rather complex when overvaluation is considered as distinct from the traditional question of whether a devaluation will improve or worsen the trade balance. However, it is known from the standard trade-theoretic analysis of this model that, under certain plausible assumptions, we *could* deduce that overvaluation would adversely affect the production of the exportable sector (even though the relative expansion of the importable sector does not follow with the same degree of plausibility in the [three-good] Salter-Pearce model as in the traditional [two-tradeable-goods] Heckscher-Ohlin model). In fact, as the *empirical* analysis of Chapter 7 strongly indicates, over-valued exchange rate regimes in Phase II *are* generally associated with relative-ly poor export performance (and hence presumably with relative underexpan-sion of exportable production).

It then follows that, insofar as overvaluation does lead to such relative underexpansion of the exportable sector, the Maizels hypothesis would imply that overvaluation *adversely* affects the saving generated in the economy (ex-cept insofar as we can assert that the changed composition of investment and output leads to an overall increase in national income to offset the falling, weighted, propensity to save in the economy) for, part of the Maizels argu-ment relates to the size of the exportable sector.

However, the other part of Maizels's argument depends on exports in-creasing, as distinct from the exportable sector expanding: increased exports are supposed to lead to increased tax revenue and hence increased public sav-ing. It is also seen from Chapter 7 that, under fairly plausible assumptions, the volume of exports (and hence also value, if international prices are given) will also fall with overvaluation: so that this second element in Maizels' overall hypothesis would also be sustained, and overvaluation would lead to reduced saving, *ceteris paribus*

b. The Corporate Sector vs. the Rest. A quite unrelated argument on saving arises from the observation that the major contribution, certainly at the margin, to overall domestic saving may come from the corporate sector. It may both have a larger propensity to save *and* be more readily taxable and at higher rates than other sectors. If therefore overvaluation leads to the relative expansion of those production sectors that have a larger incidence of the cor-porate sector within them, the net result could be to increase corporate, and hence total, saving.

While this argument is, in principle, of interest, note that it is not

necessarily linked to any one of the production sectors. Thus it is perfectly possible in a developing country of the Salter-Pearce variety (with exportables, importables, and non-traded goods) that the incidence of the corporate sector is highest in the importable sector because non-traded goods are services and the exportables are agricultural goods produced in the traditional organizational molds, *or* highest in the exportable sector because it is characterized by plantations that are virtually corporations (as in Maizels' Malayan example) whereas the importable sector has smaller sized concerns and the non-traded sector consists of services. Thus, even if one assumes that the non-traded sector has the least incidence of the corporate form of organization, an overvalued exchange rate, as under the Phase II type of exchange control regime, which (under suitable restrictions) leads to a relative expansion of the importable and reduction of the exportable sector, may be associated with a change in either direction in the average propensity to save and in the tax revenue gathered.

c. The Urban Sector vs. the Rural Sector. Yet another link between the foreign trade regime and the saving performance of the economy may be asserted in the form of the impact of the regime on the relative sizes of the urban and the rural sectors. Two aspects of this link need to be discussed: (a) the relationship between the relative size of the two sectors and the overall propensity to save; and (b) the relationship between the foreign trade regime and the relative size of the urban and rural sectors.

Regarding the former, there is some evidence for India (to be shortly discussed), for example, that the urban sector may be a better saver than the rural sector. This comes about not merely because of the presence of the corporate sector in greater degree in the urban sector (which reduces the argument to that just discussed in the preceding subsection) but also because urban households may have a higher average propensity to save than the rural households. It also occurs because the tax net of the government on urban incomes may be more effective and/or feasible than the tax net on rural incomes. These parameters are also related to the degree of inequality of (earned and unearned) incomes. These are not identical between urban and rural sectors and greater inequality would, *ceteris paribus*, be associated with higher propensity to save on the average within a sector if the poor tend to dissave and the rich to save much.

With regard to the impact of the trade regime on the relative size of the rural and urban sectors, this in turn can be related to the expansion and contraction of the production sectors (i.e., exportables, importables, and non-traded goods), *if* each of the latter tends to be predominantly located within the rural or the urban sector. Thus the underexpansion of exports, brought about by overvaluation, could well imply for a specific developing country

(e.g., undivided Pakistan) the underexpansion of the rural sector and a decline in its relative share within total national income.

Given these arguments, it would appear that overvaluation could lead to more saving by relatively expanding the importable sector and inhibiting the growth of the exportable sector, thus increasing incomes in the urban and depressing them in the rural sector if the average propensity to save and the taxability in the urban sector were higher than in the rural sector.

d. Regional Income Distribution. Finally, we may note the argument that the foreign trade regime may increase saving by expanding production sectors and incomes[12] in high-saving (geographic) regions. This asymmetry in saving propensities between regions may come from the differences in income inequality among them, or from income differentials between them (such that, for example, the more affluent region has a higher propensity to save).[13] This argument is clearly akin to, though different from, the rural-versus-urban type of argument that we have just discussed.

B. Tax Revenues and Saving

Our analysis so far has *not* ignored the effects of trade regimes on saving *via* their effects on tax revenues. However, the only effects systematically considered have been those associated with the relative expansion and contraction of sectors of production. Hence we have really been contrasting (restrictionist) Phase II with (liberal) Phase IV regimes. For the same type of comparison, we should now also note that an overvalued rate (vis-à-vis a unified exchange rate) implies, when there is a trade deficit reflecting absorption of foreign capital as in a typical developing country, that the government is losing net "revenue". This is merely the other side of the proposition, now well understood, that a devaluation from a position of trade deficit has a built-in deflationary impact.[14]

We should also note that, even as *among* Phase II regimes, those that rely less heavily on QRs and relatively more on tariffs will also generate correspondingly more tariff revenue and hence more (overall) revenue (since the loss in revenue from taxing the profits implied by the import premiums should be less than the tariff revenue as long as import premiums were not taxed at a marginal rate of 100 percent). Hence, we should consider the possibility of greater public saving and hence greater overall saving (allowing for offset by reduced private saving) under an exchange control regime with greater reliance on tariffs during Phase II.

The arguments just advanced are generally unfavorable to overvalued exchange rates, and hence to exchange control regimes of the Phase II variety.

We may next consider, however, a different type of revenue argument that might work in favor of QRs. Thus one may argue that the exclusion of items of conspicuous consumption by QRs or prohibitive tariffs could help the tax effort. It is difficult to sustain a broad-based tax effort when conspicuous consumption makes economic inequalities more offensive and taxation of one's (inevitably) modest income more intolerable.[15] However, this argument applies only to conspicuous consumption imports. It is moreover virtually irrelevant when only imports, and not domestic import-substituting production, are moderated or eliminated.

C. Foreign Trade Constraint and Saving

The arguments linking the trade regime to saving that have been developed so far are essentially within the "flow"-analytic framework of the Harrod-Domar type growth models—*ex-ante* saving automatically translates into *ex-post* investment. But it is equally possible to construct "structural" models where the ability to raise saving *ex-post* depends critically on the capacity to transform *ex-ante* saving into investment.

The latter is the case with the well-known Mahalanobis-Feldman models. Here, there are two sectors: capital goods and consumer goods, and a closed economy. The division of the output of capital goods into two classes of capital goods, those producing capital goods and the others producing consumer goods, fixes the productive capacity for the *next* period in the two sectors. This capacity is not transferable, once installed, between the two sectors. It is then easy to see that if one wishes to raise the rate of saving (the ratio of capital goods output to total output) in the future, one must accordingly plan for the investment allocation between capital goods and consumer goods *now*. Alternatively, such allocation now will freeze the feasible rates of saving in the future. Thus, take the customary formulation of the Mahalanobis model.[16] Divide current investment flow I_t into two parts, $\lambda_k I_t$ and $\lambda_c I_t$ where λ_k is the proportion going to the capital goods sector and λ_c to the consumer goods sector. Then:

$$I_t - I_{t-1} = \lambda_k \beta_k I_{t-1}$$

and

$$C_t - C_{t-1} = \lambda_c \beta_c I_{t-1}$$

where β_k and β_c are the output-capital ratios in the capital and consumer goods sectors, respectively, and I and C represent investment and consumption goods outputs, respectively. From the first equation, we can write:

$$I_t = I_0 \, (1 + \lambda_k \beta_k)^t$$

and the second equation can be rewritten as:

$$\sum_{r=1}^{t} (C_r - C_{r-1}) = \sum_{r-1}^{t} \lambda_c \beta_c I_{r-1}$$

which can be shown to lead to:

$$\sum_{r=1}^{t} (C_r - C_{r-1}) = \frac{\beta_c \lambda_c}{\beta_k \lambda_k} \, I_0 \, [(1 + \lambda_k \beta_k)^t - 1]$$

Since $(I_t - I_0) = I_0 \left[\left\{ 1 + \lambda_k \beta_k \right\}^t - 1 \right]$, we get by adding it to $(C_t - C_0)$ from the preceding equation, the complete solution for output at time t:

$$Y_t \approx Y_0 \left[1 + \frac{I_0}{Y_0} \left(\frac{\beta_c \lambda_c + \beta_k \lambda_k}{\beta_k \lambda_k} \right) \cdot \left\{ (1 + \lambda_k \beta_k)^t - 1 \right\} \right]$$

Now, in this result, $\beta_k \lambda_k / (\beta_c \lambda_c + \beta_k \lambda_k)$ is nothing but the share of incremental investment in incremental output: and, of course, this is also the share of incremental savings in incremental income, the marginal saving ratio. Thus the saving ratios, marginal and average,[17] are functions of λ_k, β_k, and β_r. The *ex-ante* behavior of saving units such as households plays no role in determining the savings that emerge in the economy. Just as the Harrod-Domar model, concentrating on the latter, totally ignores the structural factors, the Mahalanobis model does the exact opposite.

Basically the same idea of a "structural" constraint on the ability to raise savings underlies the numerous "two-gap," open-economy models of the type used intensively by Hollis Chenery and his associates. The simplest way to understand the two-gap models is to take the stylized picture of an economy that produces only corn (the consumer good) with tractors (the capital good) that are wholly imported with corn that is saved and exported for this purpose. Assume that, in this economy, the government decides to increase capital formation. The finance minister will raise taxes and create the additional savings in the form of corn (not consumed). But this incremental saving must be transformed into tractors through foreign trade. If this is a small country in Samuelson's sense—that is, the terms of trade are given to it—then the saved corn can be turned into tractors. The "savings constraint," that is, the ability of the finance minister to get the economy to save corn, is the only constraint

then on raising savings and investment. But assume instead that the country faces unitary elasticity of demand for corn in international markets. In this case, the saved corn buys you no more tractors. There is now a "foreign exchange" constraint on raising savings and investment for the finance minister can raise savings through fiscal policy, only to have them dissipated (in terms of trade loss in this instance).[18]

The two-gap models essentially build variations on this theme. Later, when we discuss the interaction between foreign aid and domestic savings, we will have occasion to state and analyze the resulting economic issues at greater length. Presently, however, it is enough to note that, *if* foreign transformation presents a constraint on raising savings *ex post*, then clearly an improvement in export performance would help to increase savings and an overvalued exchange rate, in inhibiting exports, would reduce them.[19]

Yet another argument of a "structural" variety must be noted here. It carries the Mahalanobis-type argument to its extreme in arguing that, even if the finance minister is unwilling to raise savings through fiscal policy and if the investment allocation is designed so as to raise the ratio of investment to consumer goods in the system, there would be no choice except to have a higher savings ratio: "you cannot eat steel, so more steel production must imply more investment/saving." A trade regime that promotes or permits greater production of steel must therefore be more productive of saving. This argument however is surely simplistic. In practice, the resulting excess demand for consumer goods, unless fiscal policy is also geared to raising saving to match the higher ratio of investment goods to total production, would surely spill over into the balance of payments, steel would pile up for lack of demand, and so on. It is more sensible to think of the Mahalanobis model as rather providing a rationale for planning investment allocations so as to *permit* the transformation of *ex-ante* saving into *ex-post* investment.

The simplistic version of the Mahalanobis-type argument above has its counterpart also in the earlier argument, familiar from the standard discussion of import restrictions, that the elimination of consumer goods imports would lead to "forced saving" as incomes cannot be spent on these goods. Since, as we have seen, nearly all the developing countries have drastically reduced consumer goods imports, can we infer that this must have led to higher saving? Clearly the argument is fallacious except in a short-run framework. Once we permit domestic adjustment in expenditure patterns and in the production of import substitutes to occur, the argument loses substance.

D. Money, Trade Regimes, and Saving

The final set of arguments that we may consider in relating trade regimes to saving center round the effects of monetary phenomena associated with the

trade regimes. We cite and analyze here the most influential argument in this area.

Thus, assume that the willingness to use QRs to suppress the balance of payments deficit that would accompany internal inflation leads to an "ill-disciplined" government that then can inflate more than would be the case if the fixed rate of exchange were maintained without QRs (causing a deficit) or if the exchange rate were adjusted downward (causing the political difficulties associated with devaluations). If then the system of overvalued exchange rates permits greater inflation, what can we infer about saving performance from this possibility?

If we assume, as in recent discussions initiated by Edward Shaw and Ronald McKinnon,[20] that there is a tendency for the money interest rates to be sticky in developing countries, the greater the inflation, the lower the real interest rate. If then the saving performance is positively associated with real interest rates, the net effect of the overvalued exchange rate system would be to lower the saving performance of the economy.

The argument, as presented above, already suggests some doubts. Should we necessarily assume that money rates of interest would remain sticky at levels invariant to the rate of inflation? Moreover, the argument about lower real interest rates leading to lower saving applies, at best, to non-governmental saving, and ignores the real possibility that governmental saving may be inversely related to non-governmental saving (as it represents a policy variable, and tax revenues and public saving therefrom may be raised precisely to offset lower private saving). Besides, it is not at all clear that inflation is not accompanied by income distribution in favor of the richer, higher propensity to save classes at the expense of the less-saving poor classes, so that the weighted propensity to save may rise even if each component propensity to save falls thanks to the real-interest-fall effect. It is also not evident that those whose real incomes are adversely affected by the inflation do not wind up saving more because they are Champernowne men: whose objective is to provide for a certain target level of saving.[21]

II. EMPIRICAL EVIDENCE ON LINKS BETWEEN DOMESTIC SAVING AND FOREIGN TRADE REGIMES

We now review the evidence in support or refutation of these alternative, possible links between saving and foreign trade regimes, drawing upon both the evidence in the country studies in the Project and, where relevant, on the evidence from other analyses.

A. Income Distribution

1. FUNCTIONAL INCOME DISTRIBUTION.

As before, we begin with functional income distribution. There is no systematic evidence on this in any of the country studies. However, some support for the view that the savings out of wage and non-wage income are systematically different is available from cross-sectional analysis across countries as also from time-series analysis. Thus, Houthakker[22] has analyzed twenty-eight countries (including DCs) and estimated the following linear regressions:

$$S_{pers} = -1.09 + 0.081\, Y_{pd} \qquad (6.1)$$
$$(2.35) \quad (0.011)$$

$$S_{pers} = \begin{array}{c} 0.080\, Y_{pd} \\ (0.011) \end{array} \qquad (6.2)$$

where S_{pers} is personal saving *per capita* per year and Y_{pd} is *per capita* disposable income per year in U.S. dollars at 1955 prices and official exchange rates.[23] The intercept in Equation 6.1 is smaller than its standard error; hence Equation 6.2 is estimated and yields a marginal propensity to save of 0.08.

However, when Houthakker distinguished between *per capita* income from employment and transfers (L) and other personal income (P), he obtained the following equation:

$$S_{pers} = \begin{array}{cc} 0.043\, L & + 0.120\, P \\ (0.022) & (0.041) \end{array} \qquad (6.3)$$

and it is clear that the marginal propensity to save from wage (and transfer) income is about a third of that from non-wage income.

Houthakker's result on this differential propensity to save out of wage and non-wage income has been reinforced by Williamson's later analysis of Asian LDCs (including Japan).[24] He distinguishes between wage and salary income, and non-labor income, and separates out transfers. Writing

$S_{i,t}$ = Personal saving in nation i at time t

$Y^P_{i,t}$ = Personal income

$Y^w_{i,t}$ = Wage and salary income

$Y^e_{i,t}$ = Non-labor income (including property and entrepreneurial income)

$Y^T_{i,t}$ = Direct taxes on households *minus* net transfers to them

$Y^d_{i,t}$ = Disposable income

he then postulates a linear savings function of the type:

$$S_{i,t} = \alpha + \beta Y^w_{i,t} + \gamma Y^e_{i,t} + Y^T_{i,t} \qquad (6.4)$$

He then distinguishes between a "short-period" and a "long-period" formulation of the estimating equation by expressing all variables as deviations from their means ($t = 0$ representing means over a given national time series), to write:

$$(S_{i,t} - S_{i,0}) = \beta(Y^w_{i,t} - Y^w_{i,0}) + \gamma(Y^e_{i,t} - Y^e_{i,0}) + \lambda(Y^T_{i,t} - Y^T_{i,0}) \qquad (6.5)$$

for the short-period saving function and, treating the country observations as deviations from the Asian average taken as a group (such that $i = 0$, $t = 0$ represents a mean for the whole Asian sample):

$$(S_{i,0} - S_{0,0}) = \beta(Y^w_{i,0} - Y^w_{0,0}) + \gamma(Y^e_{i,0} - Y^e_{0,0}) + \lambda(Y^T_{i,0} - Y^T_{0,0}) \qquad (6.6)$$

for the long-term saving function.

Williamson finds extremely good fits for these equations, using the Asian data. "The parameters of the long-run saving function are less than those of the short-run savings function. Furthermore, the coefficient attached to non-labour income in all tests far exceeds that of labour income. . . ."[25] In fact, the former lies between 0.25 and 1.47 whereas the latter ranges between zero and 0.10.

While, however, the functional shares hypothesis is useful and important in explaining personal savings behavior, the question as to whether a country's trade regime will significantly influence it in any one direction, and if so in which direction, is a separate question. The evidence on the latter issue is not compelling in the country studies in the Project.

Thus, it appears more likely that the impact was probably on the distribution between different labor groups, as distinct from the impact on profits versus wages. As Krueger has argued for Turkey:[26]

> . . . the import-substitution industries generally paid higher wages, required skilled workers, and offered fewer employment opportunities than did the traditional and export-oriented industries. Minimum wage legislation also contributed, since the import-substitution firms, being large and visible, could evade it less easily than the smaller, relatively labor-intensive traditional firms.

The consequent increase in demand for skilled workers undoubtedly raised the wages of those men relative to those of the unskilled. The fact that demand for unskilled labor rose more slowly than under an alternative trade regime probably meant fewer employment opportunities, rather than lower wages, in the presence of minimum wage legislation.

The incidence of fewer employment opportunities for unskilled workers was on the urban unemployed and those in rural areas who would have migrated if employment had been available. Insofar as there would have been more migration, per capita incomes in the agricultural sector might have been higher had urban employment increased more rapidly. Regardless of whether it was the urban unemployed or potential migrants who were adversely affected, the income-distributional effect was to increase the labor income accruing to one group and reduce the labor income going to another. Without quantitative evidence to estimate the magnitude of the increase in skilled workers' incomes and the elasticity of demand for unskilled workers, it is not possible to estimate whether labor income increased or decreased. With the two changes in offsetting directions, however, it is likely that any change in aggregate labor income was relatively small.

On the other hand, for Philippines, it seems that the devaluation and decontrol, characterizing a shift from Phase II to Phase III, may well have resulted in a rise in the saving ratio, thanks to income distributional change in favor of profits and against wages. Thus, Williamson[27] has argued that this led to an upward shift in the saving function after 1960, income having been redistributed from the urban wage earners, in Manila, to entrepreneurs and property owners in the export sector. Note that this evidence goes *against* the proponents of exchange control regimes who contend that they must lead to *greater* savings.

Interestingly, in the Chilean case, Behrman's short-run general equilibrium simulation runs indicate that devaluation would have a negative impact on labor's share in national income while increasing the share of agriculture, the latter helping and the former *reducing* (in an anti-Kaldor fashion) saving formation.[28]

Finally, we may recall here the classic study of devaluation by Díaz Alejandro for the Argentine economy, which explicitly built into the formal and empirical analysis of the 1958 devaluation of the Argentine peso the redistributive effect thereof in favor of the rural producer-exporters who had a higher marginal propensity to save than the wage earners.[29]

2. SECTORAL INCOME DISTRIBUTION.

The more substantial evidence however relates to the sectoral distribution and there, in turn, to the possible relationship between exports and savings.

a. Exports and Saving. As we shall see, however, the cross-country regressions support the hypothesis of exports leading to saving while the evidence in the countries in the Project, which probes below the apparent relationship to test the underlying rationale, is not so conclusive and seems to suggest caution until further research along these lines has been undertaken.

The work of Maizels, as we noted, was the pioneering one in this area. His regression results, which embrace only eleven countries, are reproduced in Table 6-1. It is seen that the coefficient (b') of exports is positive in nearly all cases. If we (heuristically) add together ($b' - c$), where c is the coefficient on GDP minus exports, as the "net" export coefficient—we would have to re-estimate its significance, of course—the coefficient declines to extremely low levels, however, for Rhodesia/Nyasaland as a whole, Jamaica and Iceland, and is almost halved for South Africa.

The Weisskopf results are based on a time-series analysis of seventeen countries, all LDCs, and (as with Maizels's data) relate to total (as distinct from per capita) savings and real variables.[30] These results, based on a regression that "explains" savings as a (linear) function of income, capital inflow (defined as imports *minus* exports), and exports, turn up generally negative coefficients on capital inflow and positive on exports, so that if we subtract the coefficient on capital inflow from that on exports, we get a "net" export coefficient that is even more pronounced than the "gross" coefficient in Weisskopf's results.

The analysis by Papanek, embracing only LDC observation in 1950s and 1960s, confirms the high correlation between exports and savings. However, he uses *per capita*, real variables, and also distinguishes between primary and other exports. He gets positive, statistically significant coefficients for both types of exports in this cross-section analysis.[31]

The evidence on this issue in the country studies in the Project however is not so clear-cut. In particular, for the India study, the authors specifically tested one underlying hypothesis that is held to account (as we noted in Section I) partly for the relationship between exports and savings, namely, that the corporation savings propensity in the export sector exceeds that in other sectors. Noting that the corporate savings is not an important saver in the Indian economy, the authors tested to see whether the industries favored by the import-substitution policies were relatively better savers.[32]

A number of alternative relationships between retained earnings (RE) and profits after taxes (PAT) for public limited companies were estimated, of which the following were reported on:

$$RE = \alpha + \beta(PAT) + u \tag{6.7a}$$

$$\frac{RE}{N} = \alpha + \frac{\beta}{N} + \gamma(\frac{PAT}{N}) + u \quad (N \text{ is net worth}) \tag{6.7b}$$

$$\frac{RE}{N} = \alpha + \frac{\beta}{\sqrt{N}} + \gamma(\frac{PAT}{\sqrt{N}}) + u \tag{6.7c}$$

Table 6-1. Summary of Results of Regressions of Gross Domestic Saving on GDP and Exports: Several Countries and Periods

	Period	Coefficient of[a]			R^2
		Q	X	$Q-X$	
More Developed Countries					
Australia	1950-62	0.28 (0.07)	—	—	0.588
		—	2.85 (0.68)	−0.42 (0.19	0.831
South Africa	1950-60	0.32 (0.02)	—	—	0.974
		—	0.57 (0.36)	0.24 (0.12)	0.966
Iceland	1950-61	0.24 (0.03)	—	—	0.896
			0.26 (0.23)	0.23 (0.08)	0.896
Ireland	1950-62	0.20 (0.05)	—	—	0.625
		—	0.49 (0.13)	0.00 (0.09)	0.756
Less Developed Countries					
Burma	1950-61	0.20 (0.03)	—	—	0.789
		—	0.59 (0.19)	0.12 (0.05)	0.858
India	1950-60	0.32 (0.05)	—	—	0.809
		—	2.23 (0.99)	0.30 (0.05)	0.874
Rhodesia/Nyasaland	1952-62	0.47 (0.02)	—	—	0.982
		—	0.51 (0.08)	0.42 (0.09)	0.983
Malawi	1954-63	−0.27 (0.07)	—	—	0.660
		—	−0.62 (0.25)	−0.13 (0.12)	0.741
Rhodesia	1954-63	0.34 (0.04)	—	· —	0.892
		—	0.57 (0.23)	0.21 (0.13)	0.906
Zambia	1954-63	0.57 (0.07)	—	—	0.895
		—	0.75 (0.34)	−0.15 (0.37)	0.932
Jamaica	1953-60	0.15 (0.03)	—	—	0.840
		—	0.24 (0.31)	0.11 (0.12)	0.843
Trinidad and Tobago	1951-61	0.22 (0.03)	—	—	0.888
		—	0.38 (0.05)	−0.05 (0.09)	0.951

[a]Based on regressions of annual data at constant prices. The equations used were:

$$S_t = a + bQ_t \text{ and } S_t = a' + b'X_t + c(Q_t - X_t),$$

where S = gross domestic saving, Q = gross domestic product and X = merchandise exports.
Source: Maizels, op. cit., p. 95.

The relationship in Equation 6.7a is straightforward and needs no explanation. The relationship in Equation 6.7b was suggested by the fact that the Reserve Bank publishes only pooled data relating to the companies operating in different sectors of the economy and *not* individual company data. Since the number of companies in each sector had changed over time, it is possible that some heteroskedasticity may be present in Equation 6.7a. Equation 6.7b, with

$\alpha = 0$, would then correspond to Equation 6.7a with correction for heteroskedasticity if one assumed that the residual variance in Equation 6.7a was proportional to the square of net worth. Similarly, Equation 6.7c, with $\alpha = 0$, would be the correct estimating equation if the residual variance in Equation 6.7a was proportional to net worth. Note, however, that the coefficient α in the equations estimated was *not* specified to be zero so that the *data* could determine whether it indeed was significantly different from zero. Also, a positive (negative) α (in Equations 6.7b or 6.7c) would imply that for any given level of profits after tax, retained earnings would be higher (lower) the larger the net worth. The regression results relating to ten industries, for the years 1950-1958 and 1960-1961 to 1968-1969, are reproduced here in Table 6-2.

The first four industries in Table 6-2 are, by and large, long-established and "traditional" industries. The first two are also major exporters, and none can be considered to have been "helped" by the foreign trade regime. Industries 5 to 10 did certainly "benefit" from such controls, however. Looking at the results obtained by estimating Equation 6.7a, the authors then note that while two out of four traditional industries had marginal propensities to save exceeding 0.50, the corresponding figure was four out of six in the case of the remaining industries. The correction for heteroskedasticity (Equations 6.7b or 6.7c) improves the goodness of fit and Equation 6.7c seems to yield a better fit to a certain extent in almost all cases though in none of the cases is the increase in R^2 very large.

Confining their attention to estimated Equation 6.7c, in Table 6-2, the authors then concluded that, keeping net worth constant, an increase of a unit in profits after taxes would have increased retained earnings by more than 0.75 unit in all cases except jute for which the figure is 0.74. Thus their analysis suggested that all the ten industries considered were good savers regardless of whether they were export oriented or import substituting in structure.

In order to examine rigorously, however, whether the "non-traditional" (mainly import-substituting) industries were (on the average) better or worse savers than traditional industries, they ran a number of statistical tests. These tests were performed as follows. A common marginal propensity to save (i.e., β of Equation 6.7a, γ of Equation 6.7b and Equation 6.7c), was estimated for the two *groups* of industries while allowing the other parameters to vary among industries, using an appropriate (slope) dummy variable technique. It turned out that the coefficient of this dummy variable (i.e., a variable that had the value zero for all the observations relating to traditional industries and the value of *PAT* [for Equation 6.7a], *PAT/N* [for Equation 6.7b], and $PAT\sqrt{N}$ for Equation 6.7c] corresponding to each observation relating to non-traditional industries) was negative in each case (i.e., for Equations 6.7a, 6.7b, and 6.7c), suggesting that non-traditional industries on the average had a lower marginal propensity to save (MPS). However, the "*t*" values of these

Table 6-2. Corporate Saving Regressions in Selected Industries: India

	$RE = \alpha + \beta(PAT)$			$\frac{RE}{N} = \alpha + \beta\frac{1}{N} + \gamma(\frac{PAT}{N})$				$\frac{RE}{\sqrt{N}} = \alpha + \frac{\beta}{\sqrt{N}} + \gamma(\frac{PAT}{\sqrt{N}})$			
	α	β	R^2	α	β	γ	R^2	α	β	γ	R^2
1. Cotton Textiles	-707.43 (-7.3)	0.77 (11.4)	0.890	-0.05 (-26.7)	245.64 (7.4)	0.86 (76.2)	0.997	-14.48 (-25.4)	1227.07 (16.4)	0.85 (73.5)	0.987
2. Jute Manufactures	-139.77 (-17.85)	0.73 (33.15)	0.986	-0.01 (-1.03)	-71.27 (-1.09)	0.74 (29.27)	0.986	-2.07 (-1.08)	-2.38 (-0.02)	0.74 (29.74)	0.986
3. Cement	-73.40 (-2.12)	0.48 (7.37)	0.773	-0.06 (-11.32)	7.74 (0.96)	0.90 (17.72)	0.957	-7.13 (-10.83)	225.27 (8.68)	0.86 (18.54)	0.960
4. Electricity Generation & Supply	-57.29 (-3.42)	0.50 (11.83)	0.897	-0.05 (-3.34)	-2.16 (-0.13)	0.91 (6.60)	0.798	-6.06 (-5.30)	183.73 (4.08)	0.94 (10.56)	0.938
5. Aluminium	-16.83 (-1.64)	0.59 (18.40)	0.955	-0.05 (-4.47)	21.21 (2.75)	0.80 (9.75)	0.924	-4.77 (-7.68)	84.40 (6.73)	0.96 (18.40)	0.984
6. Iron and Steel	-103.73 (-0.99)	0.63 (6.68)	0.736	-0.04 (-6.83)	-73.50 (-2.43)	0.98 (17.56)	0.964	-6.88 (-6.25)	238.31 (3.75)	0.94 (13.85)	0.929
7. Transport Equipment	-21.93 (-0.84)	0.48 (13.25)	0.917	-0.04 (-5.45)	31.88 (5.36)	0.79 (12.25)	0.939	-4.87 (-5.93)	142.01 (5.78)	0.78 (13.74)	0.969
8. Electrical Equipment	-29.80 (-1.48)	0.57 (15.13)	0.934	-0.02 (-2.14)	3.91 (0.90)	0.67 (8.16)	0.853	-4.95 (-7.82)	103.28 (7.08)	0.89 (18.57)	0.982
9. Other Equipment	-96.41 (-2.45)	0.65 (7.81)	0.793	-0.03 (-2.93)	22.70 (1.10)	0.67 (10.21)	0.874	-4.30 (-5.23)	150.98 (3.77)	0.76 (13.99)	0.929
10. Basic Chemicals	-19.92 (-0.82)	0.44 (10.26)	0.868	-0.05 (-4.46)	21.21 (2.75)	0.80 (9.76)	0.931	-7.21 (-7.93)	196.47 (7.42)	0.93 (14.53)	0.977

Note: Figures in parentheses are t values. Variables are explained in the text.

Source: *India*, op. cit., Chapter 16, Table 16-5, p. 237.

coefficients turned out to be insignificant so that the average MPS of non-traditional industries was not significantly different (at 1 percent level) from that of traditional industries (except in the case of Equation 6.7a).[33]

After comparing the average MPS of the two groups of industries, these authors also examined whether there was any significant difference between the MPS of industries *within* each group. This was done through an analysis of variance test, which compares the increase (after dividing by the appropriate degrees of freedom) in the residual sum of squares brought about by estimating a common slope for the group in relation to the sum of the residual sum of squares of the industries in the group when a separate regression is estimated for each industry. It turned out that the MPS of the non-traditional industries did not differ significantly (in a statistical sense) regardless of the form of the relationship (Equations 6.7a, 6.7b, or 6.7c) estimated. The traditional industries had, however, significantly different (at 1 percent level) MPS except in the case of Equation 6.7a.[34]

They concluded therefore that it was not possible to argue on the basis of the available and analyzed evidence that any systematic differences in the marginal propensity to save could be discerned by different industries, or by traditional as against non-traditional industries. In fact, the only significant differences within any group of industries that were observed belong to the limited group of traditional industries.

A note of skepticism about the relationship between exports and saving, indicating that it may well be spurious, is also suggested by the Turkish study of Anne Krueger. This study does not contain any systematic examination of Turkish saving behavior. But it is interesting that, in her discussion of the income distributional impact of the Turkish exchange control regime, Krueger notes that, on the issue of "export versus import-competing interests," the effects of the trade regime were swamped by *other* policies:[35]

> In an exchange-control regime with currency overvaluation, theory predicts that potential exporters will be adversely affected relative to those whose interests lie in import-competing production. In Turkey, however, the major exporting interests are in agriculture and mining. The effect for agriculture of any redistribution away from exporting interests that might have resulted from currency overvaluation was largely offset by the government's price policies towards agriculture. . . . price intervention by the various state agencies and cooperatives resulted in severing the relations between the real exchange rate and the price received by farmers for wheat, tobacco, figs, raisins and hazelnuts. For those commodities, which constitute the bulk of agricultural exports, the chief determinant of prices was the nature of the price support program, and not the real exchange rate. . . .
>
> The second export sector in which adverse income distributional consequences might have been expected was the mining sector. There can be little doubt that mining activity was stagnant and even declining in response to the ero-

sion of the real exchange rate. However, in terms of the personal income distribution it is not clear that there would have been any effect: most mining enterprises are state-owned. During the 1950's, Central Bank credits covered most of the SEE [State Economic Enterprises] deficits, with the result that the incidence of the losses was spread over the entire community.

Clearly, in the Turkish case, it would not have been meaningful to link exports directly to saving, for the simple reason that the impact of changed exports on domestic income shares could not have been predicted by merely looking at exports.

We should thus conclude cautiously that, while there *is* much empirical evidence in support of a statistical association between exports and saving, there is little evidence so far for some of the hypotheses that could provide a *rationale* for such an association implying a causal relationship running from exports to saving. At the same time, it is clear that there is evidence of neither kind in support of the opposite contention that an overvalued exchange rate regime (i.e., a Phase II exchange control regime) would provide more saving, so that there is little comfort in the statistical evidence examined so far for those who would seek to excuse the static inefficiencies of a restrictive exchange control regime on the ground that it contributes to growth by increasing domestic saving.

b. Corporate Sector and Saving. Next, we may consider the linkage between domestic saving and foreign trade regimes *via* the relative size of the corporate sector. Quite aside from the fact that the corporate sector is potentially more taxable than other sectors in many LDCs, it is also a sector that probably saves better than other sectors.

While the early, cross-sectional work of Houthakker again suggested that this is the case, evidence of a more persuasive type is available in the Chilean study of Behrman's. Since we will refer to his econometric estimates fairly frequently and as they are fairly rich in variables and hypotheses, we have reproduced here as Table 6-3 his results on the real consumption-saving functions for households and non-profit institutions, business, and the government during 1945-1965.

A principal statistic of direct interest to us in Table 6-3 is that the marginal saving propensity for the business sector is indeed substantially greater than for the household and non-profit institutions sector, though it is below that for the government. Thus, *after adjustment* (for households for permanent income considerations), the point estimates of marginal saving propensities run from 0.04 to 0.38 for households and non-profit institutions, 0.55 to 0.63 for business, and 0.67 to 0.73 for the government. It follows that income shifts within the private sector from households to business and income shifts from the private sector to the government would tend to increase real saving.[36]

Table 6-3. Real Consumption-Saving Functions for Chilean Households and Nonprofit Institutions, Business, and the Government 1945-1965[a]

		Rate of Inflation		Per Capita Real Monetary Balances	PLD NER for the Black Market	Inverse of GDP Deflator	Real Foreign Savings	Standard Deviation Rate of Inflation	Standard Deviation PLD EER	Non Wage Income/Total Income	Agric./Total GDP	Constant	R² SE DW
Dependent Variable	Per Capita Real Disposable Income Z1[b]	Z1[b]	Z2[b]	Z1[b]									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Real per capita Private Consumption													
I	-0.623 (6.5) [0.6]	2.24 (6.9) [-0.0]	-0.418 (6.2)		13.6 (2.9) [0.0]	-1.04 (4.9) [-0.0]		3.65 (3.7) [0.0]	-61.9 (1.6)[c] [-0.0]	508.0 (4.0) [0.1]	-2083.0 (4.0) [-0.2]	798.0 (3.8)	0.98 18.5 2.4
II	-0.674 (5.8) [0.6]	2.32 (5.4) [-0.0]	-0.439 (4.8)	-9128. (2.0) [1.2]		-1.11 (4.6) [-0.0]		4.75 (3.6) [0.0]	-72.0 (1.5)[c] [-0.0]	512.0 (3.5) [0.1]	-1841.0 (3.0) [-0.1]	572.0 (2.0)	0.98 20.9 2.5
III	-0.961 (24.6) [0.9]	1.94 (4.7) [-0.0]	-0.371 (4.4)		15.0 (2.3) [0.1]		0.837[d] (4.3) [0.0]	2.0 (1.6)[c] [0.0]		790.0 (4.7) [0.1]	-591.0 (1.1)[e] [-0.0]		0.96 26.9 2.4

	Real After Tax Non-Wage Income	PLD EER Z1[b]	Z2[b]	Real Monetary Balances		Inverse of GDP Deflator						Constant	R² SE DW
Real Business Savings													
I	0.633 (13.4) [0.3]	26.0 (5.5) [-0.2]		-0.627 (5.1) [-1.5]		4.55 (4.7) [0.4]						664.0 (2.5)	0.94 89.9 2.1

		Real Government Revenues			Real Foreign Savings				
		Z1b	Z2b	Z3b	Z1b	Z2b	Z3b		
II	0.554	108.9	18.9	−0.767		−0.178		650.0	0.91
	(10.9)	(2.4)	(2.1)	(4.4)		(1.6)c		(2.0)	110.0
	[0.3]	[−0.2]		[−1.9]		[−0.0]			2.4

Real Government Consumption

		Real Government Revenues			Real Foreign Savings				
I	0.331	−0.667						516.0	0.94
	(11.0)	(1.1)e						(4.9)	94.5
	[0.6]	[−0.0]							1.7
II	0.275	1.25	0.400	−0.252	0.0372			758.0	0.96
	(7.0)	(1.2)	(1.5)	(1.6)	(1.4)			(4.8)	80.0
	[0.5]	[0.0]	[0.1]	[−0.0]					2.2

aThe absolute value of the t statistics are given in parentheses beneath the point estimates. All point estimates are significantly nonzero at the five percent level unless otherwise noted. Long-run elasticities at the point of sample means are given in brackets beneath the t statistics.

bThe Hall-Sutch [1969] polynomial method with the tail constrained to zero is used for this variable. Zi ($i = 1$ or 2) is the order of the polynomial. The implied lag structures are as follows:

		Lags (no. of years)				
		−0	−1	−2	−3	Σ
Real Per Capita Private Consumption						
I	Income	0.249	0.187	0.125	0.063	0.623
	Rate of Inflation	−227.0	−44.5	53.9	68.8	−148.0
II	Income	0.270	0.202	0.135	0.067	0.674
	Rate of Inflation	−225.0	−37.4	62.9	75.4	−125.0
	Monetary Balances	0.3651	0.2738	0.1826	0.093	0.9128
III	Income	0.385	0.288	0.192	0.096	0.961
	Rate of Inflation	−183.0	−25.7	−57.0	65.6	−85.8

Table 6-3 continued

				Lags		
Real Business Savings: Real Cost of Foreign Exchange Adjusted for Import Taxes	I	−10.4	−7.80	−5.20	−2.60	−26.0
	II	−13.3	−42.9	9.3	23.6	−23.3
Real Government Consumption: Real Net Foreign Savings	III	0.065	0.250	0.153	0.004	0.465

[c]Significantly nonzero at the ten percent level.

[d]Per capita for real household-and-nonprofit-institutional savings estimates.

[e]Significantly nonzero at the 15 percent level.

$\hat{R}^2$ = Coefficient of multiple determination adjusted for degrees of freedom.

SE = Standard error of estimate.

DW = Durbin-Watson statistic.

Source: *Chile*, op. cit., pages 282-284.

For Chile, Behrman also argues that differentials in saving propensities of the different sectors were important because the foreign trade regimes did affect (though not in any clear direction) the distribution of resources among the sectors. He focuses however on the distribution between the private sector as a whole and the government sector. Hence we will revert to his specific arguments later when discussing the tax revenue effects.

The other country in the Project for which the corporate sector is important is South Korea. Frank and others sought to estimate corporate saving (*SC*) as a function of non-agricultural value added (*YNA*), the expected real rate of interest, and the average rate of subsidy on exports. Their results were significant only for the value added and the nominal rate of interest on savings deposits (*RD*):[37]

$$SC = -0.5689 + 0.0730 \, YNA + 115.2640 \, RD \qquad (6.8)$$
$$(-0.16) \quad (10.51) \qquad\qquad (4.13)$$

<div align="center">

Regression technique: Ordinary least squares
Sample: 1960 to 1970

$R^2 = 0.9827$
$d = 1.6131$

</div>

The household and government saving functions however were successfully estimated with other independent variables: for example, government expenditure was assumed exogenous, and government income explained by tariff revenue functions that distinguished among direct and indirect (trade and domestic) taxes. The three sectors therefore had divergent behavioral relationships for their saving, and hence the effect of alternative foreign trade regimes on overall saving turned out to be a most important ingredient of the general conclusions that emerged from their simulation exercises on alternative trade regimes.[38]

In conclusion, there is little doubt that wherever the corporate sector manages to make a non-negligible contribution to the country's saving formation—and this does not seem to be the case with many of the other countries in the Project, as seen from Table 6-4—we must contend with the possibility of an impact of the foreign trade regime on domestic saving. However, the net direction of this impact, for restrictionist, Phase II type exchange control regimes for example, is not necessarily favorable or unfavorable. We might merely note, however, at a somewhat *a priori* level, that the inefficient pattern of resource allocation *within* the import-substituting sector as also the occasional inducement to excess capacity (and related phenomena documented in Chapter 5) may well result in a reduced growth of the industrial, corporation-

Table 6-4. Estimated Shares of Government, Corporate, and Personal Saving in Total Domestic Saving in Countries in the Project

Country	Period	*Percentage Share in Total Domestic Savings*		
		Government	*Corporate*	*(Other) Private*
Brazil	1960	29	71	
	1970	8	92	
Chile	1960	30	70	
	1970	49	51	
Colombia	1960	24	76	
	1970	31	69	
Egypt	1965 1973	Negative	—	
Ghana		N.A.	N.A.	
India	1960-1961	23	9	68
	1970-1971	18	5	77
Israel	1960	16	84	
Philippines	1960	14	19	67
	1970	12	34	54
South Korea	1960	104	27	Negative
	1970	61	11	28
Turkey	1965	29	71	

Sources:

1. The Indian estimates are from *National Accounts Statistics, 1960-1961 to 1974-1975,* Central Statistical Organization, Government of India, New Delhi, October 1976; net savings estimates are utilized here.

2. The Philippines and South Korean estimates follow U.N. definitions and come from *The Yearbook of National Accounts Statistics, 1975,* United Nations, New York, 1976.

3. The estimates for Brazil, Chile, Colombia, Egypt, Israel and Turkey come from *World Tables, 1976,* I.B.R.D., Washington, D.C., 1976.

intensive sector below what a liberalized, Phase IV type exchange control regime would lead to. Hence, the result may well have been to make the Phase II regimes of the 1950s and early 1960s marginally harmful to growth of saving and capital formation if, as seems to be the case for countries such as Chile, the marginal propensity to save of the corporation sector is higher than in other private sectors.

c. Urban vs. Rural Sectors. In addition to its corporation intensity relative to the rural sector in nearly all of the countries in the Project, the urban sector may also be a better saver because of a higher propensity to save by urban

households. The only evidence in support of this possibility seems to be from the India study.

The authors of the India volume argue that:[39]

The National Council for Applied Economic Research conducted two household savings surveys, the first in 1960, covering urban households, and the second in 1962, covering rural households. The Council has also conducted another survey in the early 1970s, the results of which are yet to be published. The earlier surveys, however, showed that the marginal propensity to save (MPS), net of rural households, was 0.168 when savings in the form of currency, consumer durables and livestock were included, and 0.145 if these were excluded. The MPS of urban households was higher, at 0.34, coming down to 0.24 if the top and bottom 10 percent of income groups are excluded on assumption that their incomes are affected by transitory factors, influencing excessively the estimated MPS.

The authors note that the urban sector is also a better contributor to the direct tax revenues because agricultural income is hardly taxed in India.[40]

It may be contended that the Phase II type foreign trade regime in India helped the urban sector grow relative to the rural sector by discriminating against the exportable rural sector. But this argument must be put into perspective by noting that many of the agriculture-based exports were in oligopolistic markets, to which the optimum tariff argument may reasonably be applied and that the main discrimination against exports was really *within* the manufacturing, and hence largely urban sector.[41] Moreover, if one associates increasing (relative) urbanization with income expansion in the low-income countries and if (as per our arguments in Chapter 5) the Indian foreign trade regime reduced income expansion from given investments, *ceteris paribus*, the result would be to reduce urbanization and thus militate *against* the growth of saving.

On the other hand, for Pakistan, the evidence on urban and rural saving propensities seems to suggest that the latter is higher than the former in contrast to the Indian estimates. Thus, for 1963-1964, the rural ratio of gross saving to gross personal income was estimated at 12.00 percent for East Pakistan and the urban ratio at 9.9 percent; the corresponding ratios for West Pakistan were 9.2 and 6.7 percent.[42] With calculations of implicit exchange rates for "rural" exports and "urban" (manufacturing) imports then suggesting that the rural sector would have had better terms of trade under a liberalized regime with domestic prices closer to international prices, it has been argued that the result under the Phase II type exchange control regime was to shift income away from the rural to the urban sector and hence actually to *retard* domestic savings and capital formation.[43] The effect of this particular chain of arguments is then again to undermine the position of those who would justify restrictionist exchange control regimes on the ground that they add to domestic saving by turning their argument on its head.

Finally, we may note that, for Chile as well, Behrman's econometric analysis suggests that the rural sector may be a better saver than the urban sector. However his analysis of the relationship between the foreign trade regimes and saving formation does not build exclusively on this particular sectoral difference in saving propensities.[44]

d. Regional Income Distribution. The case of Pakistan again illustrates the regional wrinkle in the argument. With East Pakistan more heavily agricultural, the region lost income to West Pakistan (as just argued). Since East Pakistan had also a higher saving rate, both urban and rural, compared to West Pakistan,[45] it could be argued that this *regional* shift in income distribution, thanks to the Phase II exchange control regime, also adversely affected domestic saving.

B. Tax Revenues and Saving

Before we discuss the evidence on the relationship of the foreign trade regime to domestic saving *via* tax revenues, let us first look at the evidence on the relationship of tax revenues to saving. The latter must clearly relate to both the possibly adverse saving effect on those taxed and the possibly favorable effect on public saving.

There is some cross-sectional evidence in Houthakker's study[46] that governmental saving is positively related to governmental tax revenues, with some indication that there may be a positive intercept, implying that governments with low revenues have higher saving ratios. But clearly the net effect must allow for the possible decline in personal and corporate saving that could result from the tax revenues. Nothing systematic is available on this in Houthakker's own analysis. However, Williamson (who used *direct* taxes as an explanatory variable in his personal saving regressions) generally found an insignificant effect (except for only one regression where the coefficient was large and negative), and if one may contrast (as one really cannot) this result he obtained with Houthakker's coefficient on government tax revenues (at 0.017), it would appear that the latter will approximate the net effect of taxes on savings, thus indicating a net, favorable effect on overall saving from tax revenues.[47]

As elsewhere, the analyses of a time-series variety in the countries in the Project are far more thorough and persuasive on this issue. Thus, for Chile, Behrman's work on estimating saving propensities (which we have already noted) led him to the conclusion that the marginal propensity to save of the Chilean government (during 1945-1965) was higher than that of the private sector and, furthermore, that the restrictive exchange control regimes did

influence, though not in any clear direction, the division of resources between the government and the private sector:[48]

> More restrictive regimes have shifted resources to the government in at least two important ways. First, government imports have been given high priority at substantially overvalued EER's. . . . In 1971, for example, the government share of imports increased to 45 percent mainly because government imports were exempted from the 10,000 percent prior import deposit requirement introduced in May of that year. Second, the government netted substantial revenues from its operation of the multiple exchange-rate system because of the large differential. . .between the escudo price it paid to large-scale mining enterprises for dollars and the price at which it sold such dollars. . . .
>
> On the other hand, greater restrictiveness worked in the opposite direction: First, it reduced the quantity of foreign trade, a relatively easy source of tax revenue. . . . Tax revenues related to foreign trade as a proportion of total taxes have dropped secularly, from a mean of 0.83 in 1908-1927 to a mean of 0.18 in 1965-70. . . . Second, at times it lowered the effective average import tax rates since restrictions usually were applied more stringently to commodities with higher legal tax rates. The intensity of restrictions also has had some relation to the availability of loans to the government from foreign sources. . . .
>
> Partially as a result of these counterbalancing effects, the share of the government in GNP, savings, and investment does not indicate any strong phase association.

In addition to the kinds of interactions noted by Behrman in the foregoing quote, we should also note here the important point that governments lose revenue when import premiums accrue to import licenses in a QR regime and hence, *ceteris paribus*, a Phase II regime that relies heavily on QRs is losing revenue and hence—assuming, as we just argued, that increased public savings would dominate reduced private saving from the premiums—reducing aggregate saving. As it happens, the import premiums that were lost to tax revenue under restrictive exchange control regimes could amount to large sums indeed. For India, the authors of that volume produce the following estimate:[49]

> If we allow for an average premium of 40 percent on imports, and assume an average import bill of Rs. 18 billions (which is the approximate average for the import bill for the first four years of the Third Plan) and assume, in turn, that half of this could have been subject to this premium-siphoning exercise, we would have had an annual tax revenue collection of Rs. 350 billions on this account alone, representing nearly 10 percent of the tax revenue in India during 1969-70 of Rs. 39.9 billions. Thus, even if nothing else had been changed in the Indian economic regime, a shift to an exchange rate regime which eliminated this premium, by devaluation or by the use of adjustable tariffs or exchange auctions suitably designed, would have helped generate greater savings.

However, the authors also add that all the increase in taxation would not have implied a corresponding increase in savings in the economy. This is because, aside from the reduced private saving from the premiums, other factors needed to be taken into account: (1) the bulk of the imports went to the corporate manufacturing sector as the AU import licensing became more important, and the profits of that sector were subject to the 50 percent corporation tax anyway,[50] and also (2) the corporate sector in India had a rather large propensity to save out of incremental retained earnings.

For Pakistan also, similarly large estimates of revenue loss from QRs have been made. Thus, citing Papanek's earlier work, Nurul Islam argues that.[51]

> The importers earned the excess, windfall profits on the landed cost of imports, arising from import restrictions. The windfall profits amounted to 40% to 50% over the landed cost of imports during the sixties. During the early fifties, when the exchange restrictions were at their peak, the scarcity margins on the landed cost of imports were probably in the neighborhood of 60% rather than 40%. Total private imports in the fifties were about Rs. 800 million annually, yielding total annual profits of about Rs. 480-500 million to the private traders engaged in import trade. The order of magnitude of the profits on import trade can be gauged from the fact that it constituted about 5% of the annual income from the non-agricultural sector in the fifties.
>
> During the sixties, imports on private accounts were about Rs. 2000 million annually and profits at the rate of 50% over the landed cost amounted to Rs. 1000 million. This was about 6% of the annual non-agricultural GNP in current prices during the sixties. Similarly, high profits were earned throughout the period, by the industrialists producing import substitutes for the domestic market. Profit rates of about 50 to 100% were reported in the fifties, but had declined to about 20-50% by the sixties.

Similarly, Krueger's data on import premiums in Turkey for 1968 provided her with an estimated "average windfall gain, or premium, of TL 23.11 per TL 9 of licenses received," indicating again a very sizeable loss of revenue to the government.[52]

Aside from the above type of argument, Michaely has noted another interesting aspect of this phenomenon for Israel:[53]

> . . . the government of Israel is a major recipient of capital imports, mainly in the forms of sales abroad of Independence and Development bonds, the reparations payments from Germany (during 1953-63), and grants and loans from foreign governments (mainly the United States). To this should be added the income of the Jewish Agency from the United Jewish Appeal, which for the present purpose is almost equivalent to a government income. A rule of behavior to which the government has normally adhered is that government receipts from abroad are

allocated to the development budget. Since capital imports are recorded in the government's accounts at the formal rate of exchange, maintaining a rate below the equilibrium level leads to a *reduction* in the size of these receipts as expressed in local currency. This would be so even if the *effective* rate for foreign trade purposes were not below its equilibrium level: maintaining a rate higher than the formal rate by means of duties on imports and subsidies to exports implies, in effect, a net result in which part of the potential revenue in the development budget (from capital imports) is diverted, as revenue from tariff duties, to the current budget.

In Table 6-5, column 1 contains one possible, and arbitrary, estimate of this revenue loss. The estimate is initially based on the assumption that the *average* effective exchange rate (EER) for value added in exports is the equilibirum exchange rate. This assumption facilitates the computations involved, but there is

Table 6-5. Effect of Exchange Rate on the Development Budget, 1951-1968: Israel

Year	Loss of Revenue in Development Budget (IL mill.)	Column 1 as Percentage of	
		GNP	Net Domestic Investment
	(1)	(2)	(3)
1951	5	0.8	3.3
1952	7	0.7	2.6
1953	36	2.6	12.2
1954	70	3.9	19.0
1955	3	0.1	0.5
1956	32	1.3	6.2
1957	59	2.0	8.9
1958	85	2.5	11.8
1959	104	2.6	13.1
1960	111	2.5	13.0
1961	156	2.9	13.8
1962	0	0	0
1963	8	0.1	0.5
1964	13	0.1	0.6
1965	18	0.2	0.9
1966	51	0.4	3.4
1967	87	0.7	10.3
1968	133	1.0	7.2

Source: *Israel,* op. cit., Table 6-3, p. 157; original for explanatory notes.

almost no doubt that it *under*estimates the level of the equilibrium rate and thus also the results in column 1. The figures shown . . . are derived by multiplying the excess of the EER for exports over the formal rate by the amount (in foreign exchange) of the capital inflow recorded as revenue in the development budget. The results are then put in perspective by comparing them with GNP (column 2) and net domestic investment (column 3). Although the size varies markedly in different years (naturally, it is smallest immediately after a formal devaluation and then rises gradually), it is as a rule rather significant. This impression is strengthened if the downward bias just pointed out is borne in mind and if it is noted that the estimate in column 1 is based only on the budget of the government proper, and not on the accounts of the Jewish Agency, in which a similar element is contained.

Michaely thus concludes that the maintenance of a below equilibrium formal exchange rate was of some consequence in reducing governmental saving.[54]

C. Foreign Exchange Constraint and Saving

Recall that, in the presence of a foreign exchange constraint, increased availability of foreign exchange, *via* export expansion or (better still) foreign aid, enables *ex-ante* saving to be translated into *ex-post* saving. But so does any policy that reduces the imports "required" to sustain any given amount of investment and/or income.

While therefore increased exports under a liberalized trade regime may help realize greater *ex-post* saving, aside from possibly increasing *ex-ante* saving as discussed earlier, we could argue that an overvalued exchange rate may—by increasing inventories and capacity underutilization, biasing choice of technique toward "subsidized" imports of equipment, and so on—increase rather than reduce the import-requirement coefficients for investment and/or income and hence actually retard the growth of *ex-post* saving.[55] Since there is certainly evidence in the country studies for the latter effect of exchange control regimes, the question then is whether one can plausibly argue that these or other LDCs can be characterized as being subject to a binding foreign exchange constraint. Here, we may cite the work of Luis Landau on Latin American countries, and of Thomas Weisskopf on a wider range of LDCs, which attempts to devise tests to classify countries mainly according to savings and foreign exchange constraints.[56] Landau concludes that eight countries (Bolivia, Chile, Colombia, Dominican Republic, Guatemala, Nicaragua, Panama, and Uruguay) were on a binding foreign exchange constraint, with six others (Costa Rica, Honduras, Argentina, Ecuador, El Salvador, and Mexico) alternating between trade and savings gaps. Weisskopf, whose model and analysis are somewhat different, also finds that as many as eight countries had

a clear foreign exchange gap (Brazil, Cyprus, Dominican Republic, Guatemala, Ireland, Pakistan, Paraguay, and Peru), with six others being "hybrid" cases characterized by both trade and savings constraints.

We may therefore conclude that, taking the evidence on the import requirements increasing effects of exchange control regimes and on the possibility of certain LDCs being characterized by a binding foreign exchange constraint, it is arguable, with some plausibility, that exchange control regimes may be harmful to achieving higher saving.

D. Capital Markets and Saving

The final argument to be evaluated now is that relating exchange control regimes to lower saving *via* their ostensible effect on lowering real interest rates. The evidence on this issue is far from clear-cut, with several cross-sectional and time-series studies outside the Project showing negligible, or even negative, coefficients and with two analyses in the Project, for South Korea and Chile, showing some form of significant relationship of personal saving either (positively) to the (real or nominal) interest rate or (negatively) to the rate of inflation.

In his cross-sectional study mentioned earlier, Houthakker in fact found it distressing that "the rate of interest was not found effective as an explanatory variable" and went on to speculate that perhaps he had not used the correct measure and that the rate of return on the non-financial assets of manufacturing industries might have produced better results.[57]

Williamson's examination of Asian LDCs was more definitive but consistently turned up a negative coefficient on real interest rates.[58] This led him to speculate that this was probably because "savings and investment decisions are highly interdependent in the Asian household sector," that is, presumably higher interest rates inhibit investment and hence the saving that is undertaken to finance the investments.[59]

Serious evidence in favor of the *positive* relationship between real interest rates and saving however comes from South Korea.[60] Thus, Frank and others have shown that business saving in Korea was moderately responsive to interest rates, the elasticity of response (to *nominal* interest rates) being estimated at 0.34. Household saving was even more sensitive, showing response to both the rate of inflation and the interest rate on time deposits.[61] This result, however, seems to have been heavily influenced by the major interest rate reform of 1965. Prior to that, the real interest rates actually were so low that, for instance, the real rate of return on time deposits had been − 10 to − 15 percent. The interest rate reform changed the situation dramatically, so that "from 1964 to 1966, the real rate of return (deflated by movements in the

wholesale price index) rose about 11 percentage points on demand deposits, and rose about 26 percentage points on time deposits of longer maturities."[62] The steep rise in household saving, from practically negligible levels during 1960-1964, to nearly a quarter of total saving during 1965-1970,[63] was thus quite a dominant fact on the scene. One may therefore still entertain a reasonable skepticism whether a finding dominated by a steep rise of the real interest rate from negative to high, "normal" levels, and an associated rise in personal saving from negligible to "reasonable" levels has anything illuminating to offer if one is interested in the effects on saving of variations in real interest rates within narrower bounds and in the positive-values range. The analysis by Behrman of the Chilean saving function for households (Table 6-3 above) also indicates a significant (negative) response to the rate of inflation, but not to real interest rates directly.

III. OVERALL PHASE RELATIONSHIPS

The evidence on the possible links between foreign trade regimes and domestic saving is thus not as clear-cut as the proponents or opponents of restrictionist exchange control regimes would wish. But the weight of our evidence seems to throw serious doubt on the view that such exchange control regimes, while they are inefficient on static tests (of the kind undertaken in Chapter 5), offset this inefficiency through their beneficial effects on domestic saving and capital formation. If anything, the evidence indicates the opposite for many possible linkages, taken each in turn.

When we consider overall associations between restrictionist and liberalized phases and the behavior of the overall saving rate, the conclusions are no more favorable to the proponents of restrictionist exchange control regimes. Thus Behrman notes the lack of any systematic relationship between Chilean phases and domestic saving. Similarly, Bhagwati and Srinivasan also discuss at some length this issue for India.[64] They begin with the simple relationship:

$$S_t = \alpha_0 + a_1 Y_t + u_t \tag{6.9}$$

where S_t is total saving, Y_t is national income, and u_t a random disturbance term, all relating to year t. The period of the analysis being 1951-1952 to 1969-1970, they divide the period into 1951-1952 to 1959-1960 and 1960-1961 to 1969-1970, roughly approximating the fact that the latter period had a rather more stringent exchange control regime than the former, on the average. Thus the problem is to see if any significant change in saving behavior could be observed between the decade of the fifties and that of the sixties.

While they work with four alternative measures of real saving—the combination of superscripts I and II, and the subscripts 1 and 2 to S giving the rele-

vant measure used, as explained in their work—the best fits alone are reproduced here, in Table 6-6. It is then clear that there is little evidence in the Indian case for the argument that greater stringency of exchange control during the 1960s was associated with a significantly higher marginal propensity to save (except in one regression).[65]

IV. POSSIBLE LINKS BETWEEN FOREIGN CAPITAL FLOWS AND FOREIGN TRADE REGIMES

So far, we have been considering links between foreign trade regimes and domestic saving and have found little firm evidence that restrictionist exchange control regimes can be rescued from the judgment (reached in Chapter 5) that they are inefficient by pointing to beneficial effects regarding domestic saving. We may well ask, however, whether any links can be established between *foreign* capital and foreign trade regimes.

In assessing this question, we need to distinguish between official and private capital flows. The motivating forces governing the two are surely not identical (except in the pure Marxist-Leninist model where foreign aid is being dispensed for imperialist reasons by a donor government exclusively controlled by the capitalist interests) and therefore we should not expect to be anything but misled by failing to distinguish between them.

Table 6-6.   Saving Regressions for India: 1951-1952 to 1959-1960 and 1960-1961 to 1969-1970

	1951-1952 to 1959-1960		*1960-1961 to 1969-1970*	
1. S_1^I =	$-815 + 0.18\,Y$ (520) (0.04)	$R^2 = 0.73$	$-592 + 0.18\,Y$ (698) (0.04)	$R^2 = 0.73$
2. S_2^I =	$-1087 + 0.21\,Y$ (607) (0.05)	$R^2 = 0.72$	$-1271 + 0.22\,Y$ (560) (0.03)	$R^2 = 0.87$
3. S_1^{II} =	$-532 + 0.16\,Y$ (563) (0.05)	$R^2 = 0.63$	$-834 + 0.19\,Y$ (610) (0.03)	$R^2 = 0.80$
4. S_2^{II} =	$-804 + 0.18\,Y$ (600) (0.05)	$R^2 = 0.67$	$-1514 + 0.24\,Y$ (741) (0.03)	$R^2 = 0.91$

Note: Figures in parentheses are standard errors. Refer to the text for explanation of the regressions.
Source: *India,* op. cit., Table 16-2.

A. Private (Long-term) Capital Flows

A few basic arguments relating exchange control regimes to private capital flows may be set out here.

1. With exchange control regimes leading to sheltered markets—under varying degrees of automaticity of protection furnished thereby—it is evident that private investment in these import-competing activities could become profitable. Indeed, "tariff-jumping" investment is among the best known forms of private foreign investment. There is little doubt, though no econometric way of supporting this assertion, that much of the foreign investment in Phase II of the countries in the Project was of this variety, although its magnitude and composition would have reflected other factors such as the overall host country policies toward such investments.

2. On the other hand, as compared with tariffs and an equilibrated exchange rate without exchange controls, the exchange control system may be considered to be less effective as an inducement to invest. The repatriation of profits and the principal may be suspended, and this risk may be greater in the investor's calculus than the risk of exchange depreciation.[66] Furthermore, as Michaely has noted, exchange control is likely to lead to "a large measure of bureaucratic intervention in capital flows from abroad and in investment decisions" and may also result in uncertainty about the degree of protection granted to the industry in which investment is intended.[67]

3. The difficulty of reaching overall judgment on this issue is well illustrated in the Israeli case where Michaely describes both the tenuous character of private investment data and the judgment concerning the possibly adverse effect of the exchange control regime on such inflows.

Thus, Michaely could not test directly the proposition that QRs attract foreign capital to the protected industries because of lack of data about the allocation of foreign investment by industries. However, he noted that in the mid-1950s (and presumably in earlier years as well), the total size of foreign private investment was very small—about $10 million to $20 million annually or roughly 5 percent of total investment in the economy. He therefore concluded that even if the grant of QR protection attracted foreign investment, the amount could not have been large enough to have had a significant impact on growth.

Foreign investment did start rising, and assumed substantial proportions, in the late 1950s. In both absolute size and as a ratio to total investment, it was many times larger in the 1960s than in the 1950s. This could perhaps be explained by the process of liberalization, since the effect of the largely liberalized exchange system of the 1960s was to reduce the obstacles to private capital inflow presented by the exchange control system of the earlier period. However, Michaely thought that various other explanations could be given for the phe-

nomenon. Thus, for instance, the size of private foreign investment is without any doubt correlated with the country's security position. In the early and mid-1950s Israel's position was considered insecure; only since late 1957 or early 1958 did expectations of relative peace start to prevail. Moreover, the greater heterogeneity of the economy as time progressed, the higher income level, larger and more varied supply of skills, and so on, may all have induced greater inflow of foreign investment. Michaely concluded therefore that: "(a) during the era of stringent exchange controls and QRs, private foreign investment was negligible; and (b) in later years, private capital inflow increased very substantially, an event which may be explained by several economic factors and circumstances, one of which is the policy of liberalization."[68]

Among the countries in the Project for which there is systematic information on the volume of inflow of private foreign investment is South Korea. Indeed, the inflow of such capital into South Korea has partially taken over, since the mid-1960s, the critical role that official aid played until then in maintaining high rates of gross investment, the share of foreign saving being as great as almost 40 percent of gross investment and over 10 percent of GNP on the average during 1966-1970.[69] There is little doubt that continued liberalization of the exchange control regime has been associated in South Korea with a sizeable increase in the inflow of private long-term investment and that the relationship between liberalization and such capital inflow has been of a two-way variety.

For Chile, the relationship between phases in the trade regimes and variations in the inflow of capital has been extensively analyzed by Behrman.[70] He shows that, for net *direct* investment, there are indeed striking associations, such that the mean net inflows increased in every more liberal phase and decreased in each more restrictive one. A substantial share of these investments went into large-scale mining; but, even in recent years when other sectors have come to play an increasing role in this inflow, the flows have shown the strong association just noted. Behrman notes that this relationship was in response to both "the perception of a 'favorable investment climate' caused by the overall stabilization *cum* liberalization programs" *and* the fact that such programs were accompanied by loosened restrictions on capital entry and repatriation. Even when the outflow of income from direct investments is subtracted from the net direct investment, Behrman finds that "for all but one of the recent phases, the short-term command over foreign exchange rose in liberalization and fell in more restrictive periods."[71] However, *other* private *long-term* investment shows little phase association.[72]

4. The Korean case also suggests qualification to the argument that exchange control, through its protective effect, may be an inducement to inflow of foreign investment for yet another reason: foreign, direct investment may well be attracted into *exporting* industries, essentially to take advantage of the

presence of cheaper factors (mainly labor) under a regime that discriminates less against exports than an exchange control regime. The QR or tariff-jumping investment for domestic markets is only one major "type"; local raw material using investment for exporting intermediates or finished goods is another; local cheap factors using investment is yet another.[73] Aside from the effect on total inflows, it is likely therefore that foreign trade regimes that are more "liberalized" will also attract relatively more of the export-oriented foreign direct investment. It might even be contended, as discussed later in Chapter 8, that such inflow may be more sizeable than that induced by the protection of the domestic market, though evidence on this is difficult to come by. In any event, the export orientation of the foreign investment may, in turn, affect the political and cultural effects of the capital inflow, a hypothesis for which there is little evidence so far.

5. We may next consider the possibility, discussed in Chapter 4, that the exercise of exchange control may induce capital flight—a reverse outflow of private capital. Evidence of such a phenomenon was considered at length there,[74] indicating rather strongly that capital flight from several LDCs was evident from the partner country, trade-data comparisons that implied faked invoicing of transactions. More detailed and careful analysis, as of Turkey and Pakistan, has also indicated serious underinvoicing that seems related to QRs and, to some extent, to tariffs.[75]

Can we argue that exchange control regimes necessarily lead to greater capital flight than regimes under which the exchange rate is adjusted more freely? It would seem that this can be asserted insofar as exchange control regimes create high incentives for holding foreign exchange, beyond that legally available, by leading to high import premiums. But this may only lead the illegal foreign outflow to come back to finance the underinvoiced imports (induced by the import premiums) and does not necessarily result in net flight of capital. The argument has finally, it would seem, to turn on the fact that the high premium attached to the access to foreign exchange creates an inducement to hold portfolio investments in the form of (*illegal*) foreign exchange that would not obtain equally under an alternative system with more ready *legal* access to foreign exchange. Against the inducement, if any, provided for private foreign capital inflow by exchange control regimes, we would thus be wise to put the inducement likely to be provided for capital flight by such regimes to arrive at the *net* effect on private capital flows.[76]

6. We may finally note the question of the optimality of the capital inflow. Thus, even if exchange control regimes, on balance, reduce such inflow and liberalized regimes increase it, can we argue that the "more the inflow, the better for the economy"? This is a much-debated question, indeed. While the monotonicity of the relationship between capital inflow and economic welfare generally tends to be accepted without question by international monetary

economists, and interference with the free flow of capital among the countries constituting the international economy is generally considered as inefficient,[77] there is a clear absence of such a consensus among developmental economists and also the "pure" theorists of international trade. Since the arguments for and against the unrestricted (by level and composition) inflows of private foreign capital are well known,[78] we merely remind the reader about them and note here two arguments that are not so commonly encountered, while referring the reader to further discussion of the issue in Chapter 8.

First, if private foreign investment can affect foreign aid flows, this may be considered a benefit or a loss, depending on the view taken of the effect of foreign aid on the recipient countries. Thus foreign investors may become a lobby for increasing aid so that they are treated better by the host country. Alternatively, they may be a lobby against foreign aid because they think that the latter enables the host country to continue restricting inflow of private capital. On the other hand, it may be that, like trade, investment follows the flag. Hence investment may follow where foreign aid, and presumed political influence therefrom, flows. As it happens, Papanek's cross-section regression analysis, using eighty-four observations for the 1950s and 1960s, indicates that aid flows and private investment flows are not substantially correlated.

Second, private foreign investment may be held to substitute for domestic saving and thus impair the domestic effort at reaching "self-sustaining take-off." This argument is examined, with evidence, in subsection B below.

B. Substitution Between Foreign Capital and Domestic Saving

We must now consider a question of some importance, which links the present analysis of foreign capital with the preceding analysis of domestic saving. Can the two be treated as exogenous to each other; or are there any functional links between them?

Although the net result of the latter possibility would be to compound the difficulty of assessing the impact of foreign trade regimes on domestic saving and on overall investment, it must be admitted that there *are* possible links here and that some evidence is also available in support thereof. Note, at the outset, that the links between foreign capital and domestic savings can, in principle, be in both directions.

1. AID INFLOW AS A FUNCTION OF DOMESTIC SAVING.

A rising domestic saving ratio may be "rewarded" by aid donors with greater aid inflows on a "matching" principle of the kind often discussed by aid agencies. It may equally lead, at higher saving ratios, to lower aid flows as

aid agencies may feel that aid is no longer "necessary" to supplement domestic savings effort. One may therefore hypothesize a reverse U-shaped curve, linking the (independent variable) domestic saving ratio to the (dependent variable) foreign savings (either as ratio to GNP or in absolute magnitude).[79] While there is some evidence in the literature on the pronouncements of donor agencies and aid proponents for the "matching" principle in aid "awards," and some supporting evidence in the aid deceleration to South Korea and Taiwan (which were relatively "successful" in achieving an economic take-off) for the other half of the postulated argument, it should be noted that little support for this type of aid-allocational decision-making process has been found in the cross-sectional analysis of the *ex-post* aid flows among different recipients.[80]

On the other hand, evidence for this bell-shaped relationship may well be detected through a time-series analysis that introduces additional explanatory variables such as shifts in political alliances, growing availability of private foreign capital, and so on. Alternatively, such a relationship may be, not between domestic saving *in toto* and foreign aid, but rather between public savings or tax effort (which are far more reliably measured than total savings and are also a more direct, if incomplete, measure of recipient-governmental effort at raising domestic resources for investment) and foreign aid, at least for the recipient countries with lower saving ratios. Further econometric analysis may thus well rescue some of the hypothesized effect of domestic saving performance on foreign aid inflow.

2. PRIVATE CAPITAL INFLOW AS A FUNCTION OF DOMESTIC SAVING

It is rather more difficult to argue a relationship between domestic saving and private inflow. It may be argued, however, that a higher domestic saving rate, *ceteris paribus*, would imply a higher growth rate (in a Harrod-Domar framework) and that the latter may induce greater private capital inflow. This would yield a monotonic increase in capital inflow with rising saving rates, contrary to the possibly U-shaped relationship that we just discussed for foreign aid.[81] Again, however, as with the latter, there seems to be little supporting evidence for any such systematic relationship between private capital inflow and domestic savings.

3. DOMESTIC SAVING AS A FUNCTION OF CAPITAL INFLOW.

The most influential hypothesis recently has however been that postulating that domestic saving is rather the dependent variable and foreign

capital inflow the independent variable, and that foreign capital substitutes for domestic saving. Thus, we may write:

$$S = a + bY + cF \tag{6.10}$$

where S is saving, Y income, and F the foreign capital inflow, the parameters having the following "normal" signs: $a < 0$ (the Keynesian assumption), $b > 0$, and $c > 0$.[82] The underlying rationale for this hypothesis is that, as an economy gets more foreign capital, this supplements its available resources, so that it is reasonable to assume that part of this will be expended on increasing current, and part on augmenting future, consumption. With current consumption rising, at given income, the current domestic saving would then fall.[83]

A voluminous amount of cross-country and time-series statistical analysis has been turned up on this issue, essentially regressing domestic saving (as the dependent variable) on income, foreign capital inflow (rarely distinguishing between private and official capital),[84] and at times, supplementary independent variables (e.g., exports, as already discussed in the previous section).

The results of several regression studies are summarized here in Table 6-7 and indicate strongly the recurrence of a negative impact, of varying magnitudes, of foreign inflows on saving. The signs are almost always negative. What are we to conclude from this mass of regressions? First, as Papanek has correctly stressed, some caution is necessary in interpreting these results. While it is true that no systematic regression can be fitted that explains low saving ratios as a cause of higher aid flows, this is not the same as ruling this out for some countries (e.g., South Korea after the Korean War's devastation) as a complicating factor that *alternatively* may account for the inverse association between external capital inflows and domestic saving ratios.

Next, the method of computing domestic saving is usually the "residual" type whereby the payments deficit is subtracted from the estimated investment. If therefore the payments deficit (and hence capital inflow) is overestimated, the saving will be underestimated. Thus the bias in errors of estimation runs systematically in favor of supporting the negative relationship that emerges from the regressions.

But major doubts and difficulties in interpretation also come from other directions. In particular, we could reformulate the saving equation:

$$S = a + b(F) \cdot Y + cF$$
$$b = d + eF \quad (b, e > 0)$$

so that

$$S = a + dY + cF + eFY \tag{6.11}$$

Table 6-7. Results of Major Analyses Regressing Saving on Foreign Capital Flows

Author	Cross-Country (C) Time Series (T) Pooled (C, T)	Number of Observations	Form of Equation	Deflated Variables (D) Nominal Variables (N)	Effect of Foreign Inflow on Saving
Griffin and Enos	C C	32 13	$\frac{S_d}{Y} \cdot 100 = a + b\,\frac{S_p}{Y} \cdot 100$	N N	−0.73 −0.82
Griffin	T	13	$\frac{S_d}{Y} \cdot 100 = a + b\,\frac{S_b}{Y} \cdot 100$	N	−0.84
Rahman	C	31	$\frac{S}{Y} = a + b\,\frac{F}{Y}$	D	−0.2473
Areskoug	T	(22 countries) ≈13-14 observations per country	$I = aB + bY + cF$	D	−1.53 to +4.30
Weisskopf	T, C	(17 countries) 9-12 observations per country	$S = a\,bY + c\,\frac{E}{Y} + dF$	D	−0.227
Chenery	T	(16 countries) 13-14 observations per country	$S = a + bY + c\,\frac{E}{Y} + dF$	D	+.64 to −1.15[a]
Chenery	C	90	$\frac{S}{Y} \cdot 100 = a + b \log Y + c(\log Y)^2$ $+ dN + cT + fF$	D	−0.4894
	C		$\frac{I_d}{Y} \cdot 100 = a + b \log Y + c(\log Y)^2$ $+ dN + eT + fF$	D	−0.8892
Papanek	C	85	$S = a + bA + cI_p + dF_0 + eE_p + fE_0$	N	$\quad b \quad c \quad d$ −1.00, −0.65, −0.38

Clark	C, T	$S = a + b \log \frac{Y}{N} + d \log N + eF$	-0.64
		$\quad + fEp + gE_0$	
		$S = a + b \log \frac{Y}{N} + c \log N + dF$	-0.73
	(33 countries)	$\frac{S}{Y} \cdot 100 = a + b \log \frac{Y}{N} - c \frac{F}{N} \cdot 100$	D	-0.58
		$\quad + dP + eW + fD$	

[a]12 of 16 negative.

List of Variables:

Y = GDP.
S_d = Domestic saving.
S_f = Foreign saving.
S = Gross domestic saving.
i = Investment.
B = Net government external borrowing.
F' = Net private capital outflow *plus* change in government foreign reserves *minus* net transfer receipts from abroad.
F = Net foreign inflows.
N = Population size.
T = Time.
I_d = Gross domestic investment.
A = Net transfers received by government plus official long-term borrowing.
I_p = Private investment.
E_p = Primary exports.
E_0 = Other exports.
F_0 = Other capital inflows.
P = Decadal rate of population growth.
W = War damage expressed as multiple of 1938 NNP at factor cost.
D = Dummy variable: 0 pre-1955; 1 post-1955.

Sources: Griffin, K.B. and J.L. Enos. "Foreign Assistance: Objectives and Consequences," *Economic Development and Cultural Change* (April 1970). Griffin, K.B. "Foreign Capital, Domestic Savings and Economic Development," *Bulletin of the Oxford University Institute of Economics and Statistics* (May 1970). Rahman, A. "Foreign Capital and Domestic Savings: A Test of Haavelmo's Hypothesis with Cross-Country Data," *Review of Economics and Statistics* (February 1968). Areskoug, K. *External Borrowing: Its Role in Economic Development* (New York: Praeger, 1969). Weisskopf, T. "The Impact of Foreign Capital Inflow on Domestic Savings in Underdeveloped Countries," *Journal of International Economics*, 2, 1 (February 1972). Chenery, H.B. "Development Alternatives for Latin America," (w/P. Eckstein) *Journal of Political Economy* (July/August 1970). Chenery, H.B. "A Uniform Analysis of Development Patterns," (w/H. Elkington and C. Aims), *Economic Development Reports*, Nos. 148, Harvard University Center for International Affairs. Papanek, G.F. "Aid, Foreign Private Investment, Savings and Growth in Less Developed Countries," *Journal of Political Economy*, 81, 1 (January/February 1973). Clark, C. *Population Growth and Land Use* (New York: Macmillan, 1967).

and it is being postulated now that, while the recipient government indeed consumes $(1 - c)$ units out of unit inflow of capital, it also increases its domestic saving effort *via* taxation, and so on, so as to yield a higher parameter '*b*'—the marginal propensity to save out of income. This formulation would appear to yield estimates that dampen the adverse effect of foreign capital on saving.

Next, we must also note that the adverse impact being discussed is only the primary impact. However, even if foreign capital substitutes for domestic saving, at given income, it will (as long as it adds net to investment) increase (future) income and hence saving on that account. Hence to evaluate fully the effect of foreign capital on the domestic saving ratio, the estimated saving functions need to be "fed" into a growth model. Grinols and Bhagwati have shown that, if we do this in a simple Harrod-Domar model, the impact effect *can* get reversed for a reasonable number of cases in simulation experiments using plausible parametric values.[85]

Among the studies in the NBER project containing an analysis of the issue of the impact of foreign inflows on domestic saving is that on India.[86] Its conclusions, even on the limited issue of the primary impact effect, are far less conclusive than the results of the more ambitious (in terms of countries covered) studies discussed so far. The authors of the India study begin with the equation:

$$C_t = \beta_0 + \beta_1(Y_t + F_t) \tag{6.12}$$

where F_t is the foreign capital inflow, defined as the negative of the balance on current account. They then estimate the following form of the equation:

$$S_t = \alpha_0 + \alpha_1 Y_t + \alpha_2 F_t + u_t \tag{6.12a}$$

Clearly, when $\alpha_1 = (\alpha_2 + 1)$, this equation will correspond to Equation (6.12a). A positive (negative) value for α_2 would be consistent with the hypothesis that external resources complement (substitute) domestic resources.

The following version of Equation (6.12a) with F_t lagged by one year, is also estimated:

$$S_t = \alpha_0 + \alpha_1 Y_t + \alpha_2 F_{t-1} + u_t \tag{6.12b}$$

The idea underlying Equation (6.12b) is that if indeed consumption is related to expected volume of resources available, then it may be reasonable to presume that such expectations for any year are formed on the basis of the actual resources in the previous year. This would suggest that S_t should be related to Y_{t-1} and F_{t-1}. Given that the correlation between Y_t and Y_{t-1} is very high (while that between F_t and F_{t-1} is not), Equation 6.12b is assumed however to do just as well as one with Y_{t-1} instead of Y_t.

The results for both Equations 6.12a and 6.12b are shown in Table 6-8. It turns out that the explanatory power of contemporaneous external resource flow when used in conjunction with income in explaining saving is virtually nil: the coefficients on F are statistically insignificantly different from zero. The lagged response equations also perform uniformly badly; with one exception, the coefficients on F_{-1} are also not significantly different from zero. The authors thus infer that domestic saving does not seem to be influenced by external resources.

On the other hand, they also caution in favor of a mild skepticism relating to this conclusion. For one thing, the introduction of F_{-1} generally seems to lead to higher (*not* lower) coefficients on Y than, for comparable periods, in the other regressions that they have reported that do *not* use F as an explanatory variable at all. In contrast, a different test suggests an opposite in-

Table 6-8. Alternative Saving Regressions for India: 1951-1970

1951-1952 to 1969-1970	(a)	$S_1^{II} = -1241 + 0.22\,Y - 0.08\,F$ $(0.02)\quad\ (0.30)$	$R^2 = 0.94$
	(b)	$s_1^{II} = -1487 + 0.24\,Y - 0.57\,F_{-1}$ $(0.02)\quad\ (0.33)$	$R^2 = 0.95$
1951-1952 to 1965-1966	(a)	$S_1^{II} = -1611 + 0.25\,Y - 0.18\,F$ $(0.03)\quad\ (0.45)$	$R^2 = 0.93$
	(b)[a]	$s_1^{II} = -1976 + 0.28\,Y - 0.78\,F_{-1}$ $(0.03)\quad\ (0.38)$	$R^2 = 0.95$
1951-1952 to 1959-1960	(a)	$S_1^{II} = -553 + 0.16\,Y - 0.02\,F$ $(747)\ (0.06)\quad\ (0.49)$	$R^2 = 0.63$
	(b)	$s_1^{II} = -1262 + 0.22\,Y - 0.70\,F_{-1}$ $(665)\ (0.06)\quad\ (0.42)$	$R^2 = 0.75$
1960-1961 to 1969-1970	(a)	$S_1^{II} = -641 + 0.19\,Y - 0.29\,F$ $(741)\ (0.04)\quad\ (0.57)$	$R^2 = 0.81$
	(b)	$s_1^{II} = -862 + 0.21\,Y - 0.49\,F_{-1}$ $(626)\ (0.04)\quad\ (0.62)$	$R^2 = 0.82$

Notes:

1. Figures in parentheses are standard errors.

2. To estimate (real) saving by the "residual" approach, investment was deflated by the Perspective Planning Division deflator. The entire current account surplus was deflated by the unit value index of imports to arrive at the real capital, inflow which, in turn, was subtracted from real investment to arrive at the estimated real saving used here.

3. The lower-case saving regressions refer to *per capita* saving.

[a] The coefficient on F_{-1} is significantly different from zero at 5 percent level; other coefficients on F_{-1} are not significantly different from zero, in this table.

Source: *India,* op. cit., Chapter 15, Table 15-3.

ference: that is, that domestic saving is a function of $(Y + F)$ rather than (Y). Thus, recall that if Equation (6.12) is rewritten as follows:

$$C = \beta_0 + \beta_1(Y + F) \qquad\qquad (6.13)$$

and

$$S = Y - C \qquad\qquad (6.14)$$

one then has:

$$S = \beta_0 + (1 - \beta_1)Y - \beta_1 F$$

so that one has the relationship that the coefficient on Y is equal to one plus the coefficient on F (or F_{-1}, if we put in lagged response). One can therefore test whether the coefficients on Y are indeed significantly different from one plus the coefficients on F and F_{-1} in Table 6-8. This test by the authors indicates that the hypothesis of Equation (6.12) is *not* rejected by the data in Table 6-8. Thus they cannot rule out *altogether* the possibility that external resources substitute for domestic saving. On balance, therefore, they conclude that there is not enough evidence, and at best conflicting evidence, on the issue as to whether the absorption of external resources has adversely affected India's domestic saving effort.

It is also worth noting here the argument, advanced by Bhagwati and Srinivasan in the India study, that the impact of external capital inflow in the form of aid may be felt primarily on public saving, rather than aggregate domestic saving.[87] This is because the pressure to reduce domestic effort in response to aid inflow is likely to be felt mainly in tax effort and hence in public saving. Table 6-9 sets out the relevant regressions that use national income (Y) rather than public revenues and private income as an explanatory variable because the latter are correlated with it. The authors then conclude that:[88]

> As in the case of total savings, the explanatory power of contemporaneous capital inflow is nil in explaining either public or private savings. The lagged capital inflow, however, has a significant negative coefficient in the case of private savings but the marginal propensity to save in the lagged relationship is higher than that in the unlagged one. These results, however, are difficult to interpret, as we would normally have expected the external resource inflow to work primarily through the budget—in view of the larger component of foreign aid—by reducing *public* savings: the significance of the lagged foreign resource inflow in influencing private savings seems to us therefore to be mainly spurious.[89]

Table 6-9. Private and Government Saving Regressions for India: 1951-1952 to 1965-1966

$$S_{1p}^{II} = -1135 + 0.19\ Y - 0.28\ F \qquad R^2 = 0.91$$
$$\phantom{S_{1p}^{II} = } (304) \quad (0.03) \quad\ (0.36)$$

$$S_{1p}^{II} = -1433 + 0.22\ Y - 0.77\ F_{-1} \qquad R^2 = 0.94$$
$$\phantom{S_{1p}^{II} = } (245) \quad (0.02) \quad\ (0.28)$$

$$S_{1g}^{II} = -476 + 0.06\ Y - 0.10\ F \qquad R^2 = 0.84$$
$$\phantom{S_{1g}^{II} = } (158) \quad (0.01) \quad\ (0.19)$$

$$S_{1g}^{II} = -543 + 0.06\ Y - 0.01\ F_{-1} \qquad R^2 = 0.84$$
$$\phantom{S_{1g}^{II} = } (160) \quad (0.01) \quad\ (0.18)$$

Notes: Figures in parentheses are standard errors. S, Y, and F represent real savings, national income, and external inflow of capital. F_{-1} is a one-period lagged variable. The subscripts p and g denote, respectively, private and public savings. Refer to the source for further explanations.

Source: *India,* op. cit., Table 16-4.

Thus we conclude that our analysis contradicts the thesis that incoming foreign resources have seriously interfered with the domestic savings effort. This is probably not surprising since the planning mechanism has, by and large, served to make the domestic tax-and-savings effort keep in step with the aid flow, both because of internal clarity on this objective and external (aid-donor-induced) pressure-cum-ethos in this regard.

On the other hand, basing himself on econometric results (reported above in Table 6-3), Behrman concludes the opposite for Chile and, citing the evidence in support of the substitution hypothesis, he states:[90]

In one sense, in fact, the support is too strong because the total of the relevant coefficients implies that a permanent increase in real net foreign savings of one unit *ceteris paribus* results in a decrease in real net domestic savings of at least the same order of magnitude. If it were not for the problem of multicollinearity, therefore, one might conclude that in the Chilean case there is support for a rather extreme version of the hypothesis. However, given that the relevant coefficient estimates for the real private domestic savings functions are probably biased upward in absolute value because part of the effects of price and possibly of real monetary balances are incorporated, any deduction about at least the size of the substitution must be qualified. Nevertheless, the conclusion seems warranted that the impact of net real foreign savings on Chilean real domestic savings may be quite significant.

V. CONCLUDING REMARKS

In conclusion, it would seem that the problem of the interrelationship between trade regimes and *domestic* saving generation is fairly complex, having numerous possible dimensions. And the evidence on these issues is also fairly diverse in the country studies in the Project and elsewhere. The matter becomes even more unclear if we consider the linkages between trade regimes and *foreign* saving so that the relationship between trade regimes and overall *investment* is, in turn, complex as well.

We *can*, however, argue that much of the theoretical argument and the relevant empirical evidence demonstrate persuasively that the proponents of restrictionist exchange control regimes are clearly in error when they assert that such regimes—while they are inefficient on static grounds (as discussed in Chapters 5 and 7)—will, or are likely to, contribute to increased domestic saving and/or to augmented capital formation. If anything, much of our evidence—at least on the domestic saving issue—suggests an opposite relationship.

In conclusion, we should also note of course that, *in theory* at least, more saving is not necessarily better than less saving. However, for policy purposes, in LDCs of the type studied in the Project, trade regimes that encourage greater domestic saving would surely be regarded by most analysts as better on that account.[91]

NOTES

1. It should also be emphasized that saving data are typically subject to wide margins of error and are often unavailable by broken-down components necessary for sophisticated analysis: all this handicaps the analysis greatly.

2. Cf. Bhagwati, *The Theory and Practice of Commercial Policy*, op.cit.; and P. Pattanaik, "Trade, Distribution and Saving," *Journal of International Economics* 4 (April 1974): 77-82. The possible link between the efficacy of a devaluation (requiring absorption) and its income distributional effect, which parallels in many ways the argument in the text, has also been noted by international trade economists: a particularly cogent contribution here is Carlos Díaz-Alejandro's analysis of Argentina: *Exchange Rate Devaluation in a Semi-Industrialized Country* (Cambridge, Mass.: M.I.T. Press, 1965).

3. We should note that a problem with the Cambridge school's argument is that the theories of consumption developed by F. Modigliani and R. Brumberg "Utility Analysis and the Consumption Function: An Interpretation of Cross-section Data," in K. Kurihara, ed., *Post-Keynesian Economics* (New Brunswick, N.J.: Rutgers University Press, 1954) and M. Friedman (*A Theory of the Consumption Function*, Princeton, N.J.: Princeton University Press, 1957) suggest that the marginal propensity to consume might vary by income bracket but there is no suggestion that it will vary according to whether the income accrues in the form of interest, rent, or wages. One possible rationale for the Cambridge approach, however, may be that distribution by functional shares might be a proxy for the size distribution of income, so that an increase in wage

income may be equivalent to a distribution from higher to lower income brackets. As it happens A. Blinder's recent work ("Distribution Effects and the Aggregate Consumption Function," *Journal of Political Economy*, 83 June 1975): 447-476, shows that, for the United States at least, the distribution of national income between capital and labor bears only a loose relationship with size distribution; moreover, it is not clear whether wages or non-labor incomes are more unequally distributed.

4. Pattanaik, op.cit. Also see the extension of the theoretical analysis to a model incorporating one non-traded good by K. Okuguchi, "Trade, Savings and Non-traded Goods," *Journal of International Economics* 7 (November 1977): 379-384.

5. See, however, Chapter 2 where the limited character of this identification has been discussed at greater length.

6. *Chile*, op.cit., page 284; reference to columns 11 and 12 in Table 6-3 above.

7. At the same time, given the structure of Behrman's short-run modeling of Chile's economy, it follows that QRs, by increasing in the short and medium run the share of labor and agriculture in total income, would increase saving whereas devaluation has the counteracting effects of increasing the share of agriculture but reducing that of labor. Cf. ibid., pages 284-285.

8. Note, however, that several of these partially overlap with one another. For example, the urban sector propensity to save may be different from the rural sector's for the reason, among others, that it has a larger corporate sector, or it may be lower because it has a lower export sector, and so on. In each of the four sector-specific arguments, however, the macro-analyst is assuming that the particular sectoral saving propensities are stable and most fruitful for analysis and prediction.

9. Cf. A. Maizels, *Exports and Economic Growth of Developing Countries* (Cambridge: Cambridge University Press, 1968), pp. 58, 69, and 95, in particular; T. Weisskopf, "The Impact of Foreign Capital Inflow on Domestic Savings in Underdeveloped Countries," *Journal of International Economics*, 2, 1 (February 1972); and G. Papanek, "Aid, Foreign Private Investment, Savings and Growth in Less Developed Countries," *Journal of Political Economy*, 81, 1 (January/Februry 1973): 120-130.

10. Maizels, op.cit., p. 58. He carefully adds, however, that: "Equally, in other countries, in which relatively little revenue is derived from duties on foreign trade and in which the savings ratio does not differ markedly from one sector to another, a close relationship between exports and savings would not be expected to exist" (p. 58).

11. Cf. The model was discussed elegantly in an early classic paper by Trevor Swan, "Longer-Run Problems of the Balance of Payments," in *The Australian Economy: A Volume of Readings*, edited by H.W. Arndt and W.M. Corden, (Melbourne, 1963); and discussed rigorously in another classic paper by Ivor Pearce, "The Problem of the Balance of Payments," *International Economic Review* 2 (January 1961): 1-28. In her survey of balance of payments theory, in the *Journal of Economic Literature* (March 1969), Anne Krueger cites the conduct of balance of payments analysis in terms of models allowing for a non-traded good as one of the two important developments in the theory of devaluation.

12. It is assumed, of course, that outputs equal values added. If there are interindustrial transactions, one would have to adjust the argument in the text to ensure that expanding regional production also implies expanding value added.

13. As we will see below, this argument has some relevance to a discussion of Pakistan's experience, since clearly there were considerable income differentials among the two wings of Pakistan and the foreign trade regime can be argued to have favored the richer wing (which is presently Pakistan) at the expense of the poorer wing (which is now Bangladesh), the latter having been the exporting region.

14. Cf. J. Bhagwati, "The Case for Devaluation," *Economic Weekly* (June 6, 1965); and R.N. Cooper, "Devaluation and Aggregate Demand in Aid-Receiving Countries," in Bhagwati et al., eds., *Trade, Balance of Payments and Growth, Essays in Honor of C.P. Kindleberger* (Amsterdam: North-Holland Co., 1971). A systematic theoretical analysis of different factors that may lead to a deflationary impact is provided in the elegant paper of Paul Krugman and Lance Taylor, "Contractionary Effects of Devaluation," *Journal of International Economics* (August 1978).

15. Cf. Bhagwati, *The Theory and Practice of Commercial Policy*, op.cit.

16. This formulation is based on S. Chakravarty, *The Logic of Investment Planning, Contributions to Economic Analysis Series* (Amsterdam: North-Holland Co., 1956).

17. The time path of the average savings ratio I_t/Y_t is given by dividing the equation for I_t by the equation for Y_t in the text.

18. For further analysis of this simple model, see J. Bhagwati, "The Nature of Balance of Payments Difficulties in Developing Countries," in *Measures for Trade Expansion of Developing Countries*, Proceedings of a Japanese Economic Research Center Conference, Tokyo, October 1966; and the elegant piece by R.E. Findlay, "The 'Foreign Exchange Gap' and Growth in Developing Economies," in Bhagwati et al., eds., *Trade, Balance of Payments and Growth*, 1971, op.cit.

19. The case for foreign aid can also be made more effectively in this case since foreign aid, aside from supplementing any given domestic savings, would then help break the foreign exchange constraint.

20. Cf. Ronald McKinnon, *Money and Capital in Economic Development* (Washington, D.C.: The Brookings Institution, 1973).

21. There is some empirical evidence on this issue in Lester Taylor, "Price Expectations and Households' Demand for Financial Assets," *Explorations in Economic Research*, 1, 2 (Fall 1974), and David H. Howard, "Personal Saving Behavior in Five Major Industrialized Countries," International Finance Discussion Paper No. 90, Board of Governors of the Federal Reserve System, November 1976.

22. H.S. Houthakker, "On Some Determinants of Savings in Developed and Underdeveloped Countries," in E.A.G. Robinson, ed., *Problems in Economic Development* (London: Macmillan, 1965).

23. The figures in brackets are standard errors.

24. Jeffrey Williamson, "Personal Saving in Developing Nations: An Intertemporal Cross-Section from Asia," *Economic Record*, 44, 106 (June 1968): 194-210.

25. Ibid., p. 199.

26. *Turkey*, op.cit., p. 243. One footnote has been omitted.

27. J. Williamson, "Determinants of Personal Saving in Asia: Long-Run and Short-Run Effects," *Discussion Paper No. 67-11* (Department of Economics, University of the Philippines, September 15, 1967), Appendix B.

28. *Chile*, op.cit., Chapter 12, pp. 284-285. The anti-Kaldor effect has been noted for Chile in Chapter 5 as well.

29. Cf. *Exchange-Rate Devaluation in a Semi-Industrialized Country*, (Cambridge, Mass.: M.I.T. Press, 1965); especially Chapters 2 and 5.

30. Cf. T. Weisskopf, op.cit.

31. Cf. Papanek, op.cit., and Table 6-7 below.

32. *India*, op.cit., Chapter 15. The discussion below is almost a quote from that study, with minor stylistic changes to adapt it to the present context.

33. The *t* values were:

Form of Equation	Degrees of Freedom	t
3a	168	−5.23
3b	158	−0.84
3c	158	−0.19

34. The "*F*" values were:

Form of Equation	Traditional		Non-Traditional	
	Degrees of Freedom	F	Degrees of Freedom	F
3a	364	1.57	596	2.18
3b	360	5.92	590	2.26
3c	360	7.74	590	0.32

35. *Turkey*, op.cit., pp. 240-241.

36. *Chile*, op.cit., Chapter 12, p. 284. However, as Behrman notes, this conclusion probably did not hold under the Allende regime as the government did not remain a high, marginal saver: for example, in 1971, real saving became negative while real revenues rose!

37. *South Korea*, op.cit., Chapter 8, p. 137.

38. Ibid., Chapter 9.

39. *India*, op.cit., Chapter 16, pp 238-239; two footnotes are omitted from the quote.

40. However, they note that:

. . . higher savings rates may still imply lower growth rates if the investment needed to sustain unit growth of income increases sufficiently in the process owing to inefficiencies or misallocation of resources. In particular, in relation to the urban expansion, note that such an outcome of the economic policies, even if it leads to an increase in the savings rate, may well require additional investments in high cpaital-output ratio activities such as housing and related infrastructure in the cities and thus slow down economic growth on that account (p. 239).

41. Agriculture-based exports from many other countries in the Project—for example, Colombia, Turkey, Philippines, Korea, and Egypt—were *not* significantly in oligopolistic markets, however.

42. Cf. A. Bergan, "Personal Income Distribution and Personal Savings in Pakistan," *Pakistan Development Review* 7 (Summer 1967). Also see T.M. Khan, "Some Reflections on Planning Experience in Pakistan," *Pakistan Development Review* 8 (Autumn 1968): 391-398.

43. The precise calculations of such income distributional shifts (discussed in Islam, *Pakistan*, op.cit., Chapter on "Mobilization of Domestic Resources") do not allow for impact on income itself of the shift to a liberalized regime and on the international prices themselves, given the lack of perfect competition internationally in markets for tea, cotton textiles, and jute, in particular. They should not be taken literally, therefore, but are useful in establishing directional changes.

44. *Chile*, op.cit., Chapter 12, page 284. We may note that the rural saving propensity may be a function of the extent to which a capital market is developed in the rural areas.

45. The estimates in Bergan, op. cit., however, refer to average, rather than marginal, saving propensities.

46. Ibid., p. 220.

47. However, we should not forget that the two sets of coefficients are for different data; and that Williamson uses only direct taxes.

48. *Chile*, op.cit., Chapter 11, page 261. Footnotes have been deleted from the quote.

49. Cf. *India*, op.cit., Chapter 16, p. 240.

50. However, the authors note also that, whenever these premiums were "cashed" in the market by *illegal* transactions, they escaped the tax net. Also, in contributing to the large amount of "black" money in circulation, the exchange control regime that made transfers of AU licenses illegal but not infrequent was itself a major force in making the tax effort of the Indian fiscal authorities less effective.

51. *Pakistan*, op.cit., Chapter on "Mobilization of Domestic Resources," pp. 2-3.

52. Turkey, op.cit., page 178. Note that this windfall gain is *net* of duties and surcharges, of course.

53. *Israel*, op.cit., pp. 155-56. Four footnotes from the original have been omitted in this quotation. Table 6-3 in the quote has been renumbered here as Table 6-5.

54. Michaely notes however that "a calculation such as that presented in Table 6-5 based as it is on arbitrary assumptions—could not yield more than a general impression. Moreover, even such a tentative conclusion must be hedged by recalling that it is based on a mechanistic assumption regarding the government's method of operation, namely, that changes in the government's receipts from abroad are fully reflected in the development budget without any offsetting, discretionary changes by the government. To what extent such a mechanistic view of the government's decision-making process in this matter is correct would not be easy to determine."

55. Or, as Krueger has noted for Turkey, shift the saving to investment in activities such as construction which have high incremental capital-output ratios, thus retarding growth.

56. Cf. Luis Landau, "Saving Functions for Latin America," in H. Chenery, ed., *Studies in Development Planning* (Cambridge, Mass.: Harvard University Press, 1971); and T. Weisskopf, "An Econometric Test of Alternative Constraints on the Growth of Underdeveloped Countries," *Review of Economics and Statistics*, 54, 1 (February 1972). The reader must consult these papers for details of the tests.

57. Op.cit., p. 217.

58. Op.cit., pp. 204, 208-209.

59. Other explanations can also be provided, as in Section 1 where the capital-markets hypothesis was discussed by us.

60. Leith, *Ghana*, op.cit., also cites some evidence relating to this issue, but it is less than persuasive because it relates to all, rather than personal, saving and to inflation rather than the real interest rate. He finds a negative coefficient on the inflation rate, indicating that the saving rate responds negatively to inflation: "an increase of 5 percentage points in the rate of inflation is met by a decrease of about 1.6 percentage points in the percentage of GNP saved. Cf. Leith, ibid., pp. 86-87, footnote 1.

61. For details, see *South Korea*, op.cit., Chapter 8, especially the estimates of Equations 8.14 and 8.15 therein.

62. Ronald McKinnon, "Saving Propensities and the Korean Monetary Reform in Retrospect," submitted to the Conference on *Money and Finance in Economic Growth and Development* (April 18-20, 1974), Stanford University, p. 3.

63. Cf. *South Korea*, op.cit., Table 11-4.

64. *India*, op.cit., Chapter 16, pp. 2-3.

65. The authors also note that if one believes that the marginal propensity to save rises with per capita income (e.g., Landau, op.cit.), its failure to do so in the 1960s, relative to the 1950s, may imply a failing of the QR regime on the saving front (p. 285).

66. Both the risks must be adjusted, of course, to allow for anticipated, endogenous changes in price level and profits.

67. *Israel* op.cit., Chapter 6, p. 151.

68. *Israel*, op.cit., page 153.

69. *South Korea*, op.cit., Chapter 7, pp. 106-108. Note that *public borrowing* has been the major element here rather than direct foreign investment.

70. *Chile*, op.cit., Chapter 8, pp. 209-211.

71. *Ibid*, p. 210. The single exception was the liberalization under President Frei.

72. Short-term flows are also discussed by Behrman but are more directly relevant to the short-run liberalization analysis of the type undertaken in the companion synthesis volume of Krueger.

73. Raymond Vernon's "product-cycle" hypothesis, which relates essentially to manufacturing abroad a differentiated product that was earlier exported, overlaps with "tariff-jumping" investment but Vernon also invokes other cost-reducing advantages abroad. In direct contrast to Vernon's product-cycle type of theory, Bhagwati has developed a theory of mutually penetrating investment (MPI) whereby, within an industry with differentiated products (e.g., radial tires and standard tires; compacts and large cars), the response to competition in each other's markets is for each country's industry to invest in the other's. Thus, if Dunlop is skilled in conventional cross-ply tires and Pirelli in radials, their response to competing with each other in both types of tires could be for Dunlop to go easy on radials but buy equity into the Pirelli radials and for Pirelli to give up on cross-ply tires and buy equity into the Dunlop cross-ply. This, in fact, has happened: For details, see J. Bhagwati's review of R. Vernon, *Sovereignty at Bay: The Multinational Spread of U.S. Enterprises* (New York: Basic Books, 1971), in *Journal of International Economics* (September 1972). Thus, whereas the firm goes abroad in the Vernon model to manufacture its own differentiated product, thus *de facto* "exporting" and investing in its research and development, in the Bhagwati model it goes abroad to invest in its competitor's organization, to take an equity interest in the production of the differentiated product where its *competitor* has an advantage and hence *de facto* the firm is "buying" and investing in the *competitor's* research and development. The Bhagwati theory of MPI (mutually penetrating investment) represents thus a radically new type of investment phenomenon, in contrast to the Vernon PC (product-cycle) investment model. However, the MPI model, more likely, applies to investment among countries with similar industrial structures and hence product-differentiated advantages in different products in the same industry group.

74. Chapter 4, Section III.

75. Chapter 4, Section II.

76. For obvious reasons, we have not considered here the interaction of foreign trade regimes with swings in trade credits. The classic analysis of this phenomenon is by Bent Hansen, *Foreign Trade Credits and Exchange Reserves, Contributions to Economic Analysis* (Amsterdam: North-Holland Co., 1963).

77. Cf. Franco Modigliani, "International Capital Movements, Fixed Parities and Monetary and Fiscal Policies," in J. Bhagwati and R.S. Eckaus, eds., *Development and Planning: Essays in Honor of P.N. Rosenstein-Rodan* (London: Allen and Unwin, 1973), p. 239: "There is a broad measure of agreement among professional economists on the proposition that the free movement of long-term international capital, just like the free movement of commodities, is highly desirable since it contributes to a more efficient use of resources. . . ."

78. For an account, somewhat favorable to capital inflows, see C.P. Kindleberger, "Restrictions on Direct Investment in Host Countries," in J. Bhagwati and R.S. Eckaus, eds., *Development and Planninng*, ibid. Also, for theoretical analysis of optimal tax-cum-subsidies on trade and capital flows, see the papers of R.W. Jones, "International Capital Movements and the Theory of Tariffs and Trade," *Quarterly Journal of Economics* 81 (February 1967): 1-38; and M.C. Kemp, "The Pure Theory of International Trade," 56 *American Economic Review*, (September 1966): 788-809.

79. The figure in this footnote illustrates such a relationship between domestic saving and foreign aid flows. The variable F/Y (foreign aid to income) can be replaced by F if the hypothesis is modified to refer to absolute aid flows.
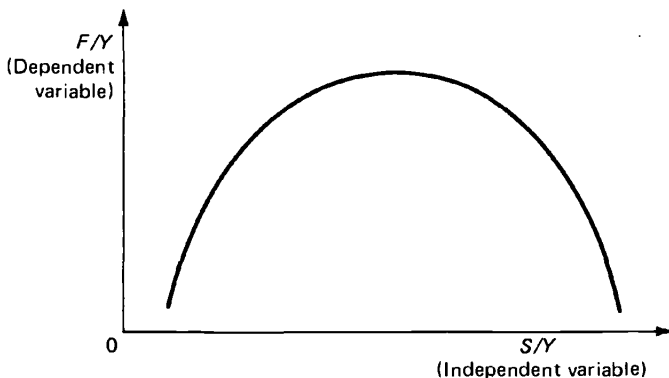

80. Nor, for that matter, has cross-sectional analysis of aid-flow distribution among recipients, using other variables such as per capital income, been notably successful. For a review of these analyses and regression estimates, see J. Bhagwati, *Amount and Sharing of Aid* (Washington D.C.: Overseas Development Council, 1970), Appendix II.

81. The relationship would be as in the illustration in this footnote.
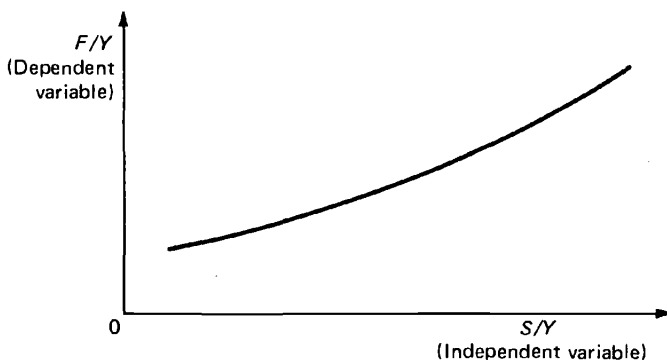
The net effect of merging the two capital flows, as is done in many of the empirical analyses shortly to be reviewed, would be to moderate (and could even reverse) the decline in F/Y at higher S/Y ratios where the aid curve turns down.

82. Thus, the figure in the preceding note modifies to the diagram (where, for simplicity, we assume a negligible 'a') in this footnote.
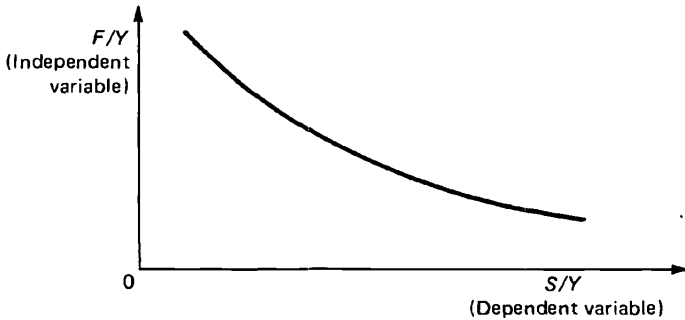
83. On the other hand, if we assume that the country decides on an optimal time path, given an intertemporal utility function, it is not necessarily true that aid will not be *more than offset* by current consumption. For such "counterintuitive" results, I am indebted to an unpublished paper of Richard Freeman.

84. Among the exceptions is G. Papanek, *Journal of Political Economy*, op.cit.

85. Cf. E. Grinols and J. Bhagwati, "Foreign Capital, Savings and Dependence," *Review of Economics and Statistics*, 58 (November 1976): 416-424. They do not make any adjustment for the assertion sometimes made that foreign inflows *reduce* the efficiency of factor use and thus increase the marginal capital-output ratio. There is no evidence of any value that indicates that aid is utilized any more or less well than average capital use in the developing countries.

86. Cf. *India*, op.cit., Chapter 15 on "Savings and the Foreign Trade Regime."

87. Cf. *India*, op.cit., Chapter 16, pp. 234-235. Note that public saving is usually measurable more reliably than aggregate saving.

88. *India*, ibid., Chapter 16, pp. 234-235; footnotes have been omitted but footnote 5 has been turned into a comment footnote to this quote.

89. In fact, the authors mention the possibility that the resource inflow could have improved investment opportunities—and, in India, the inflow of private foreign investment also leads to the same result as joint ventures are promoted actively by governmental policy—and led to increased private saving *a la* Hirschman to utilize these opportunities! The only "weak" argument in support of the negative coefficient on F_{-1} is that consumption is a function of available imports that, in turn, reflect foreign aid inflow: PL480 imports would sustain that argument somewhat.

90. *Chile*, op.cit., page 285.

91. Whether *foreign* inflows of aid or private (direct and portfolio) long-term investment are good or bad is however a complex issue that is rather more open to debate. Hence, arguing that restrictionist exchange control regimes, on balance, reduce such inflows is *not* the same as arguing that therefore such exchange control regimes are inefficient. The arguments for and against unrestricted (levelwise and compositionwise) inflows of private foreign capital are too well known to be recounted here; this is also the case for the debate on the productivity of foreign aid in recipient countries. However, the reader would do well to consult the South Korea study by Frank et al. that develops a rather novel argument on the suboptimality of foreign capital inflow into Korea along Fisherian lines.