Chapter 6

THE SERVICING OF FOREIGN CAPITAL INFLOWS BY UNDER-DEVELOPED COUNTRIES

BY

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I. INTRODUCTION

An under-developed country wishing to secure foreign capital to accelerate its economic development faces various tests by potential investors. These tests — whether they relate to the likelihood of war, revolution, civil strife, expropriation without compensation, the availability of suitable investment projects, or the future balance of payments position of the country — stem from the fact that the ordinary investor expects to receive a return on the funds committed to a country. The entity receiving such funds, if it is a private enterprise or a public corporation operating along business lines, is willing to pay the required return when the use of such funds in a specific project is expected to yield the required surplus over cost directly. If the receiving entity is the government, a specific project may or may not be expected to yield the required surplus over cost directly. The government requires, however, that the overall yield to the whole economy from employing the funds should in some sense justify payment of the return required by the investor.

The fact that both parties to the use of regular investment funds must find it mutually and directly rewarding is well recognized, both in the domestic and in the international sphere. In the international sphere, however, investors recognize special risks which are associated in their minds with the transmissibility of the return they require. These risks induce investors to appraise the future balance of payments position of the country to which they commit their funds. The individual enterprise in the capital-importing country wishing to secure funds from abroad may be able fully to demonstrate...
that the employment of funds will yield the necessary surplus, at least at present exchange rates, and such a surplus may indeed be earned. Yet, the future balance of payments of the country may be such that interest, dividend, or principal payments due the investor cannot be transferred, or can only be transferred, if denominated in local currency, at a greatly depreciated exchange rate. Similarly, a government borrowing abroad may be able to give adequate assurance that the country's real income will be sufficiently increased by the employment of additional investment resources to justify a payment to the foreign lender. Yet serious obstacles to the transfer of service payments on such loans may be encountered when such payments are to be made.

The economic conditions which must be fulfilled if foreign debt service payments (interest, dividends, or principal) are to be met can be stated in terms of the familiar equation on total resource availabilities and uses. If an economy is to make service payments in any year equal to $X$, the output produced plus capital inflow, including any net use of foreign exchange reserves, must exceed domestic consumption and investment by $X$. This proposition may also be put in terms of the saving and investment equation. Domestic saving plus foreign capital inflow must exceed domestic investment by the volume of service payments.

In addition to these equations relating to total resource availabilities and uses, there is the equation relating to foreign exchange availabilities and uses. Total foreign exchange receipts, including gross capital inflow and net use of foreign exchange reserves, must exceed imports of goods and services by the volume of service payments. It is obvious that the payment of debt service requires the fulfilment of all three conditions: other claims on total resources, other claims on savings, and other claims on foreign exchange resources must be less than availabilities by the amount of debt service.

These elementary equations can also be reformulated in terms of increments and decrements. If, for example, there is a decline in national income, no change in capital inflow, and no decline in required debt service payments, domestic consumption and investment must decline by the amount of the decline in national income. Further illustrations are unnecessary. They only serve to emphasize the point that the fulfilment of debt service obligations is dependent on the economy's capacity to adjust the claims on total resources, saving, and foreign exchange in any given year and over time so as to release the amount required for debt service.

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foreign debt
is dependent upon its ability to employ additional capital
effectively. In this case an upper limit is imposed on external
servicing obligations by a case-by-case examination of the projects
and programmes proposed or considered for foreign financing. In
between these two extremes there is a third alternative: the con-
ditions under which these claims will be resolved in favour of debt
service may involve a complex relationship between the amount of
debt service payments which are owed and the overall economic
performance of the country. In this case some appraisal must be
made of the country's future economic performance, taking into
account varying levels of capital inflow and associated debt service
payments.

With respect to the first alternative, it is clear that there is
nothing in the economic mechanism as such which makes it impos-
sible to adjust the claims on total resources, on saving, and on foreign
exchange, so that debt service payments can be met. This is true
either under the assumptions of the gold standard and the classical
adjustment mechanism, or under the modern panoply of fiscal and
monetary policy with or without direct controls. But such a formal
solution has only limited significance. The environment of policy
objectives in which the economic system must operate and the
economic performance which is in fact achieved necessarily condition
the process through which competing claims on resources are
adjusted.

Under the gold standard and the classical adjustment mechanism
it can be taken for granted that so long as the system is adhered to
and the government sticks to the rules of the game, competing
claims on resources will, under all conditions, be adjusted in favour
of debt service. Very few countries today are willing to accept the
implications of the classical adjustment mechanism as a primary
principle of economic management. Its unconditional acceptance is
often believed to be in conflict with many of the primary objectives
of modern governments, including the objective of relatively full
employment, accelerated economic development, more equitable
income distribution, and so forth.

Let us, therefore, consider the conditions under which competing
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claims are likely to be resolved in favour of debt service and whether in the modern day such conditions can ever be taken for granted.

Discussion of the major situations giving rise to balance of payments difficulties in which the priority of debt service is likely to be challenged and of the problems which may be encountered in adjusting competing claims may conveniently be divided into two parts. The risk of a world depression and the problems posed by short-term variations in the real value of exports will be considered first. Most of the subsequent discussion will deal with the risks that arise in the longer-term context of economic growth and with the relationship between debt service capacity and overall economic performance in the long term.

II. Importance of Short-term Disturbances

The balance of payments problems which led to a suspension of service payments in the past were frequently associated with worldwide depressions. While some countries continued to service external debts even in the depression of the thirties, many countries did not. Since the thirties governments have become more intent on maintaining high levels of economic activity, consumption, and investment, and if a depression of similar magnitude and duration should occur in the future the balance of payments problems initiated in the first instance by a decline in exports are likely to be compounded by an even more active domestic compensatory policy. Debt service is unlikely to be given a high priority in such circumstances unless the capital resources available to debtor countries are increased substantially by governmental and inter-governmental action. This might provide an incentive to maintain debt service. Of course, to the extent that debt service consists of dividends paid out of current earnings, debt service claims are likely to decline, particularly when a foreign-owned enterprise is producing primarily for the export market.

Thus, the risk of a major world depression, if such an occurrence is deemed highly probable, severely limits the international flow of private capital, particularly fixed-interest capital. At the time that the International Bank for Reconstruction and Development was established it is clear that such a contingency was taken into account. The Bank, in effect, considers that it was authorized to bear the risk of suspension of debt service payments in a world depression and the Bank has stated that it assumes this risk.1 The risk of a major

A country which experiences great variability in its real export receipts—and this is characteristic of most of the Latin American countries—has a special problem in adjusting claims on total resources, saving, and foreign exchange. The performance of the country in meeting this problem is significant in judging its capacity to service foreign debt in two senses. First, a country which succeeds in maintaining some degree of stability (preferably along a rising trend) in domestic consumption and investment is likely to enjoy a sounder and more rapid growth over the longer term than a country which alternates between periods of rapidly increasing consumption and investment and periods of enforced curtailment of consumption and investment. Second, a country which is forced to curtail domestic consumption and investment rapidly is likely to experience difficulty in reconciling all of the competing claims on resources, including the claims of foreign creditors.

In the face of a considerable fluctuation in real export earnings, some degree of stability in consumption and domestic investment can be achieved by building up foreign exchange reserves and repaying external debts in periods when real export receipts are above the longer-term trend and by reducing reserves and incurring external debts in periods when real foreign exchange receipts are below the long-term trend. The policies that are required to pursue this course and the practical difficulties that may be encountered are
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well known. The adoption of such compensatory policies is, nevertheless, advisable in countries eager to accelerate development and particularly so in countries wishing to attract foreign capital for this purpose.

Of course, if a country is willing to permit a reduction in export receipts to exert its full deflationary effect on domestic income and if foreign suppliers of capital expect such a policy to encounter no opposition in the future, creditors need not fear that a temporary reduction in foreign exchange receipts will jeopardize debt service claims. Only to the extent that extreme variability in domestic consumption and investment leads to an environment unfavourable to long-term development will such a non-compensatory policy be interpreted as an unfavourable course.

There is, moreover, a third method of dealing with fluctuations in real export earnings. This is the practice, if not policy, of stretching available resources to the limit, and beyond. This practice involves, in the extreme case, an expansionary fiscal and monetary policy in periods of abnormally high and rising export receipts, accompanied by the drawing down of international reserves and, in some cases, by the indiscriminate incurring of short- and medium-term external debts. Expansionary fiscal and monetary policies are continued when export receipts decline, but every effort is made to limit the decline in consumption and investment by rationing foreign exchange resources. Such a practice, experience has shown, strains to the utmost the policy-making and administrative capacities of even the best-equipped government. Consumption, investment, and all direct claims on export receipts are ultimately reduced, but in an inflationary environment in which all claimants to a share of the income produced fear that their share is in constant jeopardy. It is no wonder that the suppliers of foreign capital share this fear. Fortunately, there is evidence that this extreme policy of straining resources to the breaking point in economies where export receipts are subject to considerable fluctuation is being rejected by one country after another.

It must, however, be conceded that the policy of straining resources to the limit, if not beyond, is particularly attractive to, and it is widely practised by, countries enjoying a fast rate of growth and by countries aspiring to a fast rate of growth. This policy will now be considered as a part of the problem of the rôle of foreign capital in accelerating economic development, and of the conditions which determine the capital inflow in.

III

The analysis of payments claims, particularly the gross national claims, particularly the gross national claims, is subject to some of an economy's competing claims on resources in the one part of the year. The increased for productive increased income be concerned with resources, savings.

The economy may be disposed unwillingness envisaged by shifts in income. It is which development. The economy in which external and able to handle shifts in income must also should find guides for government must not respond. When we are dealing with classical methods of products, it is not frequently considered the conditions which determine the capital inflow in.

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1 See Bruno Brovedani, 'Latin American Medium Term Import Stabilization Policies and the Adequacy of Reserves', International Monetary Fund, Staff Papers, February 1955, vol. iv, No. 2.
determine the capacity of under-developed countries to service capital inflow in the long term.

III. DEBT SERVICE AND LONG-RUN GROWTH

The analysis so far has been restricted to the short-term balance of payments difficulties that may jeopardize external debt service claims, particularly in economies where exports are high relative to the gross national product and where the real value of export receipts is subject to substantial variation from year to year. The performance of an economy which is subject to volatile changes in adjusting competing claims on total resources, saving, and foreign exchange resources in the short term is important in judging its capacity to reconcile such claims over the long term. This is, however, only one part of the picture. While debt service claims do not vary with year to year changes in resources there is at least a presumption that the increased debt service claims arising out of capital inflows used for productive investment can be met over the long term from the increased income which the investment produces. Why should one be concerned over the long term with the competing claims on total resources, savings, and foreign exchange resources?

The economist, educated in the tradition of classical economics, may be disposed to argue that the problem arises simply from the unwillingness of countries to follow the classical blueprint. On the other hand, he recognizes that the automatic adjustment process envisaged by the classical system may involve unemployment and shifts in income distribution which governments are today loath to tolerate. It may also require reductions in the volume of investment which development-minded governments accept with great reluctance. The automatic adjustment process also presupposes an economy in which capital is invested in a manner which will promote external and internal equilibrium. While the classical blueprint was able to handle with ease the principles which private investment will, and should follow to secure this result, it never developed operational guides for government investment or for the policies which government must adopt in the economic sphere if private investment does not respond properly to the guide-posts of changing relative prices. When we add to all this the short-term instabilities which the classical mechanism imposes on countries exporting a few primary products, it is no wonder that the classical adjustment mechanism is regarded with distrust. Thus, the classical adjustment mechanism frequently conflicts with some primary objectives of government
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...economic policy and the blueprint for action which it provides is inadequate in several respects. At the same time, the experience of the last ten years, particularly in Latin America, indicates that a country which violates completely the doctrines of financial responsibility and the guide-posts of a functioning price system does so at its own peril, simultaneously increasing the risks faced by foreign creditors.

Thus deprived of the fully automatic adjustments of the classical economic system, how can we appraise the capacity of a country to reconcile the competing claims on total resources, saving, and foreign exchange resources? What conditions must be fulfilled in order to develop a margin for debt service, and under what conditions can this margin be substantial?

A minimum condition for developing even a small sustainable margin for debt service over the long term would appear to be some increase in per capita income. Even for countries where neither the populace nor the political leaders have experienced the revolution of aspirations which characterizes so many under-developed countries today, it may be assumed that the revolution is highly contagious. In countries where the revolution has not occurred and where it is not expected to occur for some time, the claims of foreign debt service may be met even in the absence of a rise in per capita income if the yield on the foreign capital invested is sufficient to permit complete repayment of debt in a relatively short period or to permit a very high rate of return on an equity investment. Additional assurance is provided if the foreign capital finances a project which itself produces not only the necessary surplus in local currency but also in foreign exchange. In such a case one need not even rely on the classical adjustment mechanism.

In countries where the revolution of aspirations has occurred — and I suspect this is true in varying degrees of virtually all Latin American, most South-east Asian, and some Middle Eastern countries — some increase in per capita income over the long term appears to be a necessary condition. Unless per capita income rises it will become increasingly difficult to reconcile the claims of some economic groups to a larger share of the national income and the aspirations of the populace for higher consumption levels. Debt service payments, particularly if they increase relative to national income, saving, or exports, are likely to be jeopardized. It seems clear that where the basic conditions for economic development and for a rise in per capita income are absent — even if investment is stepped up — either the rising aspirations will be frustrated or grants must be made available by other countries. The risks facing a supplier of foreign capital expecting a return are too great.

This case, that despite the Latin America continue in virtue post-war growth in the Latin America per capita income, one betw. Even if some p. enjoyed is dir. favourable turn per capita income concerned, the One can assume continue at a revolution is strength policies which continues.

What then service payments, term? To wit: in case by case ex. for foreign fin. analysis of fut...

Starting with the output for rising living available res. must be fulfill income growth target is in ex. domest. saving or capital inflow which yields the...

The math. primarily the saving in the foreign exchange explicitly, altho that follows.

The follow model:
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This case, however, need not detain us, for it seems quite evident that despite the high rate of population growth now prevailing in Latin America some growth in national per capita income will continue in virtually all countries in the area so long as the economic growth in the outside world continues. In seventeen countries in Latin America for which some data on growth are available for the post-war period it appears that six have enjoyed a rate of growth of per capita income of over 3 per cent., five of between 2 and 3 per cent., one between 1 and 2 per cent., and only five below 1 per cent. Even if some part of the growth of income which Latin America has enjoyed is directly and indirectly attributable to the effects of a favourable turn in the terms of trade, which may not last, growth in per capita income is likely to continue. In so far as Latin America is concerned, therefore, one is justified in being relatively optimistic. One can assume that in most countries economic growth will continue at a rate in excess of population growth. This conclusion is strengthened if the current trend towards modification of policies which have hampered the growth of the external sector continues.

What then imposes an upper limit on the amount of external service payment obligations which can be incurred over the long term? To what extent can these limitations be determined by a case by case examination of the projects and programmes proposed for foreign financing and to what extent must they be determined by analysis of future economic prospects along aggregative lines?

Starting with the assumption that a given rate of growth of per capita output is required to satisfy the aspirations of the populace for rising living standards and to resolve the competing claims on available resources, it is possible to set forth the conditions which must be fulfilled in order that both debt service claims and the income growth target be met. Assuming that the income growth target is in excess of what the country can achieve on the basis of domestic savings and that in order to achieve the target foreign capital inflows are necessary for a period, a model was constructed which yields these conditions.

The mathematical model provides a method for considering primarily the availability of, and claims on, total resources and saving in the context of economic growth. The availability of foreign exchange and the claims on foreign exchange do not enter explicitly, although we shall consider this aspect too in the discussion that follows.

The following variables were incorporated into the mathematical model:
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$p$—projected rate of growth of population, assumed to be constant.
$r'$—target rate of growth of per capita real income, or output.
$r$—target rate of growth of aggregate real income or output.
$K$—projected incremental capital-output ratio, assuming a one-year lag between investment and income.
$S_0^a$—initial average savings ratio.
$i$—projected rate of return on foreign capital, for interest and dividends.
$n$—year after start of process in which foreign debt must be completely repaid, or alternatively reach a maximum, or alternatively year in which rate of growth of debt rises no faster than rate of growth of national income.
$s'$—required marginal savings ratio, with required growth of per capita savings in the numerator and target growth of per capita income in the denominator.

Formulae have been derived employing these variables which permit us to appraise the conditions under which a country can develop a margin for debt service, and to determine how much the margin for debt service and the corresponding volume of capital inflow is influenced by the values which are assigned to the variables. Certain characteristics of the definitions, assumptions, and structural relations incorporated in the model should be noted.

The following variables — the projected rate of growth of population, the target rate of growth of per capita and aggregate income, the incremental capital-output ratio, and the rate of return on foreign capital — are treated in the model as constants over time. This was done solely in the interests of mathematical simplicity. It is quite evident that they might well be expected to vary substantially over time. The values assigned to these variables may thus be looked upon as weighted averages of values which in fact vary over time. The values assigned to these variables may thus be looked upon as weighted averages of values which in fact vary over time.

The incremental capital-output ratio is an admittedly broad concept since it carries within it all of the factors affecting growth of output, not only investment. Included, for example, are the effects of the growth of the labour force (even though population growth as such is introduced as a separate variable for other purposes), the abundance or scarcity of national resources, technological progress, the availability of labour and managerial skills, and even changes in the terms of trade! Our only excuse for using such a concept is that we have been unable as yet to develop any simple yet more appropriate mathematical concept in which the influence of investment is clearly separable from the influence of the other factors.

The marginal savings variable or the dependent variable is derived after assigning well projected the marginal variables, such as the independent. An important ratio is that it is defined to be argued that the growth determined primarily by corporate the growth of aggregate income. If this is the case, On the other hand, the $p$ better account of the possibility and governments.

Let us now consider applying the formula which to meet debt service claims with different rates of income, compared with other things being equal, volume of foreign capital inflow, income, compared with the rate of growth of aggregate income.

(1) the marginal savings ratio
(2) the incremental capital-output ratio
(3) the rate of population growth
(4) the required rate of return on foreign capital
(5) the degree of income growth achieved within a period of time
(6) the time period in which either the margin for debt service or the corresponding volume of capital inflow is to be achieved is long.

Some word of explanation is needed on the inter-relation of the variables. The independent formula to reconcile these two variables, if foreign capital inflows are available to any one and for an indefinite period.

This is not universally true.

$Kp$, which is equivalent to the higher rate of growth of foreign capital inflow, the marginal savings ratio.
The marginal savings ratio is treated in the formula as the derived variable or the dependent variable, that is, the variable whose value is derived after assigning values to the other variables. We could as well project the marginal savings ratio and treat one of the other variables, such as the incremental capital-output ratio, as derived or dependent. An important characteristic of the marginal savings ratio is that it is defined in per capita terms, as noted above. It can be argued that the growth of savings, to the extent that it is determined primarily by corporate savings, is more likely to be related to the growth of aggregate income than to the growth of per capita income. If this is the case, the concept employed here is awkward. On the other hand, the per capita concept is useful because it takes better account of the possibilities for saving by individual households and governments.

Let us consider some of the implications to be derived in applying the formula which yields the marginal savings ratio required to meet debt service claims and investment requirements associated with different rates of income growth. It is perhaps obvious that all other things being equal, the target rate of increase of per capita income, compared with the rate that can be achieved in the absence of foreign capital inflow, may be put at a higher level and a larger volume of foreign capital inflow is permitted when:

1. the marginal savings ratio is higher;
2. the incremental capital-output ratio is lower;
3. the rate of population increase is lower;
4. the required rate of return on foreign capital inflow is lower;
5. the degree of independence of foreign capital that must be achieved within a given time period is lower;
6. the time period in which a given degree of independence must be achieved is longer.

Some word of explanation may be required on the last two points and on the inter-relationships which may in fact exist among these variables. The independence criterion was introduced into the formula to reconcile two propositions on capital inflow. First, foreign capital inflows must be available on a net basis for some period of time if they are substantially to accelerate development. Second, it is impossible to assume that new capital inflows will be available to any one under-developed country in unlimited amounts for an indefinite period. Both of these propositions are incorporated

1 This is not universally the case. When the initial savings ratio is less than \( Kp \), which is equivalent to the rate of investment required to maintain per capita income, a higher rate of growth of income may actually permit some reduction in the marginal savings ratio.
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into the model by judging the capacity of a country to service a series of additions to its external indebtedness extending over a number of years and by imposing the requirement that the country must, within a prescribed period, achieve a complete or partial independence of foreign capital inflow. The proviso that a country must be capable of achieving complete independence of capital inflow within a defined period of time is, in a sense, analogous to the repayment requirement on a specific loan. While individual loans may have to be repaid, equity investment and the total of loans may not. Therefore, formulae have also been derived to show what is required to achieve a situation where net capital inflow is no longer required or where the rate of increase of net capital inflow is progressively reduced. It is particularly interesting to note that all three criteria — complete repayment of external debt, achievement of independence of further net capital inflow, and progressive reduction of the rate of net capital inflow — require exactly the same performance, except for the time period. To put it more exactly, a country which is capable of repaying debt completely in twenty-five years will have reached a maximum volume of external indebtedness somewhat earlier and will have reduced the rate of net capital inflow even earlier. In other words, one can state a more liberal repayment requirement either in terms of complete independence to be achieved over a long time period or a lesser degree of independence to be achieved over a shorter time period.

An additional note on the possible inter-relations among the variables is in order. In countries with abundant natural resources relative to the present size of population, a high rate of growth of population and consequentially of the labour force may contribute to a low capital-output ratio. But with a high rate of population growth the growth of income must also be high in order to increase per capita income, and it may be necessary to undertake investments which tend to raise the capital-output ratio in order to maintain this high rate of growth of income. Moreover, the terms on which external capital is available may become less favourable if a greater volume of foreign capital, associated with a higher rate of growth of income, is to be attracted. Most important, the feasibility of achieving a required marginal savings ratio is likely to be positively associated with the rate of growth of per capita income.

Given the political pressures contributing to a rise in the government's current expenditures, and the economic pressures leading to a demand for increased real wages and increased levels of personal consumption; and assuming that the capital-output ratio and the projected rate of return on foreign capital do not increase with

higher rate of growth of per capita income, it is clear that the likelihood that the required additional capital inflow will be obtained, even in the requirement that the rate of growth of per capita income is increased by 1 percent. To make the required additional capital inflow possible, the marginal rate of growth of per capita income must be increased by 4 percent.

Target Rate of Growth of per capita Income

<table>
<thead>
<tr>
<th>Rate</th>
<th>Target Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>2%</td>
</tr>
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</table>

Under these assumptions, the rate of growth of per capita income can be serviceable at a rate of 0.23 to 0.31, with the feasible range of the rate of growth of per capita income being a high rate of growth of per capita income. The rate of growth of per capita income is determined by the marginal savings ratio and is affected by the capital-output ratio. Given the constraints of the savings ratio and the capital-output ratio, the rate of growth of per capita income is determined by the marginal savings ratio and the capital-output ratio.

1. Also, we assume that the required additional capital inflow can be obtained at a rate of growth of per capita income of 4 percent.
2. Since a country where the rate of growth of per capita income is increased by 1 percent, the required additional capital inflow is feasible.
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higher rate of growth of income — it can be shown with this model that the likelihood of being able to service a larger volume of foreign capital is greater than the likelihood of servicing a smaller volume of capital inflow. This follows from the fact that very small increases in the required marginal savings ratio are associated with very large changes in per capita income, particularly in countries where population is increasing at a rapid rate. This is illustrated in the model where the required marginal savings ratio has been calculated for a country in which population is growing at a rate of 2½ per cent. per year, the initial average savings ratio is 8½ per cent., and the incremental capital-output ratio is 3·5 : 1 and is invariant with respect to the rate of growth of income.¹

**Marginal Savings Ratio Required to Service Capital Inflow on Certain Assumptions**

<table>
<thead>
<tr>
<th>Target Rate of Growth of per capita Income</th>
<th>Required Marginal Savings Ratio</th>
<th>Capital Inflow as ratio of</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Initial National Aggregate Net Investment</td>
<td></td>
</tr>
<tr>
<td>1½%</td>
<td>0·23</td>
<td>0·23</td>
</tr>
<tr>
<td>1½%</td>
<td>0·28</td>
<td>0·61</td>
</tr>
<tr>
<td>2½%</td>
<td>0·31</td>
<td>1·42</td>
</tr>
</tbody>
</table>

Under these assumptions capital inflows over six times as large can be serviced with an increase in the marginal savings ratio from 0·23 to 0·31. Moreover, with the incremental capital-output ratio invariant with respect to the growth of income, the rate of growth of per capita consumption goes up from less than ½ per cent. to 1½ per cent.,² with a higher rate of growth of income and larger capital inflows. Clearly in this case it should be much easier for the country to reconcile the conflicting claims on resources, including both the claims represented by debt service payments, and investment required to maintain a continued rate of growth, with larger capital inflows than with smaller capital inflows. This case illustrates the highly favourable savings effect which a big push makes possible.

Now let us consider the risks which have been removed by our assumptions. If we assume that with a rate of growth of per capita

¹ Also, we assume that the required return on foreign capital is 4½ per cent. and that external debt will reach a maximum in twenty-five years.

² Since a constant per capita savings ratio over time is assumed, the rate of increase in per capita consumption at the beginning is equal to \( t\left(\frac{l-r}{l-s}\right) \). The rate of growth of per capita consumption accelerates over time and approaches the rate of growth of per capita income.
income of 2 per cent. it will be possible to save 0.31 and no more of the increments, debt service claims of the magnitude associated with a 2 per cent. growth of per capita income will be met only if the capital-output ratio does not rise above 3.5. If the incremental capital-output ratio should rise to 4:1, more than a third of the increments in per capita income must be saved. Also, the model assumes that net foreign capital inflows will be available to the country in question over a twenty-five-year period. If they were actually available for a shorter period and debt had to be completely repaid, for example, in twenty-five years, the required marginal savings ratio would exceed one-half. A still higher marginal savings ratio would be required if population growth was accelerated, or if the required rate of return on capital were increased. Clearly, the risks facing the supplier of capital in this highly artificial model are formidable!

This model demonstrates that it is possible to define — albeit in a highly mechanical way — the upper limits of debt service capacity in an environment where debt service claims are not necessarily given the highest priority. The practical significance of this model is limited by the difficulty of assigning realistic values to the variables, small but lasting changes in which are found to produce substantial differences in the final outcome. Nevertheless, the model illustrates that a creditor secures some assurance that debt service claims will be met if per capita income can be expected to increase at a fairly high rate. If, in addition, an environment is created which is favourable to a high marginal savings rate in the private sector and if government tax systems can be adapted to contribute to a high marginal savings rate in the public sector, the stage is set for accelerating economic development through foreign capital inflow. On the other hand, the model also indicates the great risks which the creditor faces wherever the politically, socially, and economically determined targets of income growth are set in an unrealistic fashion and then inflexibly adhered to.

The creditor's expectation of a high rate of growth of income is a favourable factor. If, however, the debtor country rigidly insists on maintaining — in the interests of a higher target rate of growth — a rate of investment which is beyond its capacity to finance, this frequently results in a lower capacity to service foreign debt and may even raise doubts as to whether the country will be willing to service foreign debt in times of strain. Even in this case, if the

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1 It should be noted that the incremental capital-output ratio in the post-war period has averaged close to 3:1 in Latin America. An increase to 4:1 is not likely in the short term but cannot be excluded if we look ahead twenty-five years.
higher rate of investment desired by the debtor country is associated
with attainable income targets, why should not foreign capital inflows
fill the gap as an alternative to eliminating the gap by reducing
investment? Whether the adjustment is more appropriately accom-
plished by increasing capital inflow or reducing investment depends
on whether the income target associated with the higher rate of
investment is feasible.

It is particularly in judging whether a target rate of growth of
income is reasonable that it becomes important to consider the
growth of foreign exchange availabilities and claims in the context
of long-term growth. This model subsumes but does not illuminate
these foreign exchange aspects of debt servicing capacity. It is, of
course, clear that a country must produce sufficient additional goods
for export or sufficient import substitutes, so that as income rises
the increase in demand for imported goods (or for goods that used
to be imported) plus the service on debt can be met from the available
flow of foreign exchange. This directional aspect of economic
growth has many dimensions, not just the foreign exchange dimen-
sion. Thus, form of investment and the composition of output
must be adapted to the structure of demand sector by sector, if any
given rate of increase of output is to be maintained over time. The
foreign sector, however, can play a crucial rôle because foreign
exchange is a highly flexible resource. It can be used to fill any
temporary gaps in the adaptation of the domestic supply to changing
domestic demand, gaps arising in some cases from improper direc-
tional policies. It can also be used to secure any of the goods and
services which income growth requires but which the domestic
economy can produce, at a given stage of development, only at a
high or even prohibitive cost. A tight foreign exchange situation
may arise because such a temporary gap has occurred or because of
a structural deficiency, that is, the rate of growth of the economy is
being pushed so fast that the economy cannot produce all of the
particular kinds of goods and services, including exports, which the
economy requires at this rate of growth.

The balance of payments deficits which recur periodically in
countries seeking to accelerate their development rapidly may thus
reflect not only the difficulties encountered in adjusting to year to
year variations in the real value of exports; they may reflect, not
only the inability or unwillingness of the country to live within its
means over the long term, they may also reflect an inability or
unwillingness to produce within its means.

In this last case, the main problem is to determine whether a
gap in the adaptation of domestic supply to changing domestic
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demand is temporary so that the target rate of growth of income can be achieved if foreign capital inflows are increased, or whether the gap reflects deficiencies in national resources, labour skills, and management abilities upon which the projected rate of growth also depends. If the gap is temporary and will be corrected fairly quickly by market forces without government action, there is no reason for concern. If, however, the gap is itself attributable to government policies which, for example, penalize the growth of the export sector, or if the gap reflects the inability of the economy to produce the types of goods and services which are required to sustain the rate of growth, corrective action is required. The country must reconcile itself to a lower rate of growth or, if the gap is attributable to government policy, it must change those policies which influence the direction of resource use. It has no alternative but to reduce the rate of growth if the more fundamental limitation is present.

IV. CONCLUSION

Let us now return to our original question. To what extent are the limitations on the amount of external debt service obligation which can be assumed over the long term subject to determination by a case by case examination of the various investment projects and programmes proposed for foreign financing and to what extent must these limitations be determined by some kind of aggregate analysis of future economic prospects?

It seems clear that in countries where the revolution of aspirations has already occurred or where it may be expected to occur the case by case approach is not sufficient. Some type of aggregative analysis of future economic prospects is essential.

In the case of many Latin American countries, where a rapid rate of growth has been achieved in recent years, it may, however, be possible to move towards greater reliance on case by case examination of projects and programmes. The dynamic character of these economies is being demonstrated and case by case examination of investment projects and programmes should itself reveal to some extent potentialities for future economic growth. However, unless many of the countries in this area show a better capacity to adjust to short-term variations in available resources by the use of appropriate monetary and fiscal policy, foreign investors will tend to discount heavily the potentialities uncovered by investigations of investment projects and programmes. Perhaps part of the difficulty of adjusting to short-term variations will be removed as tax structures are improved and governments become able to discharge their modern-day responsibilities.
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responsible without inflationary excesses. Moreover, in some countries there is already a growing appreciation of the damage produced by inflation, and the example of growth with stability may prove even more attractive than the example of growth with inflation. The continued expansion of the world economy is already producing a revaluation of government policies on the use of resources, particularly as between exports and the home market. Reliance upon improving terms of trade to increase real export earnings is giving way to a search for ways to increase the volume of exports.

If a greater degree of financial responsibility is firmly established as a conscious policy and if positive measures, including proper exchange rate systems, are taken to encourage the economy to produce the types of goods and services which are required to sustain growth rates, it may be possible to secure some of the advantages of the classical mechanism of foreign investment. Foreign investors may feel less compelled to centre their attention on general uncertainties concerning the debtor country's economy and more able to concentrate on the merits of the projects and programmes proposed for financing.

APPENDIX I

DERIVATION OF DEBT FORMULA (FORMULA A)

Derivation of $S_n$

Symbols:

Primes (') denote per capita. Subscript (,) refers to time-period; first period denoted by subscript (0).

$S_n$ — aggregate domestic savings.

$S_0$ — initial average savings ratio.

$Y_n$ — national income (geographical).

$P_n$ — population.

$p$ — rate of increase of population, a constant.

$r$ — target rate of increase of aggregate income, a constant.

$r'$ — target rate of increase of per capita income, a constant.

$s'$ — per capita marginal savings ratio, a constant.

Thus by definition:

$Y_n = Y_n'P_n$, $S_n = S_n'P_n$.

$r' = \frac{Y_n' - Y_{n-1}}{Y_{n-1}}$.

1 The author wishes to acknowledge the assistance of Mr. Charles Goor and Mr. Kenneth Bohr.
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or \( r'Y_{n-1} = Y'_n - Y''_{n-1} \).

Then, substituting the above in the denominator,

\[
s' = \frac{S'_n - S''_{n-1}}{r'Y''_{n-1}}.
\]

From compound interest formula:

\[
Y'_n = Y'_0 (1 + r')^n.
\]

Then, from 1.1:

\[
s'Y''_{n-1} = S'_n - S''_{n-1}.
\]

For initial period by definition \( S'_n = S'_0 Y'_n \).

From definition for \( S'_n(1.0) \) and from 1.2:

\[
S_n = S'_n Y'_0 P_0 = S'_n + s'Y''_0 (1 + r')^n.
\]

After factoring out \( Y'_0 P_0 \), the general expression \( S_n \) becomes,

\[
S_n = Y'_0 (1 + P) (1 + P)^n S'_n + s'Y''_0 (1 + r')^n - 1.
\]

Using formula for summing geometric progression and substituting \( Y'_0 \) for \( Y'_n P_0 \),

\[
S_n = Y'_0 (1 + P)^n (S'_n + s'Y''_0 (1 + r')^n - 1).
\]

By definition,

\[
(1 + r') (1 + P) = 1 + r.
\]

Thus, in 1.3,

\[
(1 + P)^n (1 + r')^n - 1 = 1 + r' - (1 + P)^n.
\]

Substituting 1.4 in 1.3, we obtain:

\[
S_n = Y'_0 (1 + P)^n S'_n + s'Y''_0 (1 + r')^n - 1.
\]

**DERIVATION OF \( I_n \)**

\( I \) — Net domestic investment required to secure target rate of increase of income.

\( K \) — Incremental capital-output ratio.

1.6 Since \( Y'_0 = 1 \),

1.7 \( I \).

\( F \) — Excess debt (interest rate of investment required to secure the geometric sum).

Substituting 1.8:

\[
F = Y'_0 P_0 - 1.
\]

1.8

\( D \) — Foreign investment.

\( i \) — Interest rate.

\( X \) — Interests.

We assume year and that the sum of interest payments on capital and the volume of investment is computed from the general equation.

Since debt payments on capital and the volume of investment is computed from the general equation.

1.9 It is assumed that all foreign investment in the year. Hence,

1.0
By definition: \[ K = \frac{I_n}{Y_{n+1} - Y_n} \]
\[ I_n = K(Y_{n+1} - Y_n). \]

1.6 Since \( Y_n = Y_n(1 + r)^n \), from 1.6,
\[ I_n = KY_n[(1 + r)^{n+1}(1 + r)^n] = KY_n(1 + r)^n(1 + r - 1). \]

1.7 
\[ I_n = KY_n(1 + r)^n. \]

**DERIVATION OF \( F_n \)**

\( F \) — Excess of gross capital inflows over all service payments on foreign debt (interest, dividends, and amortization) required to secure target rate of increase of income. \( F \) is thus the gap between domestic investment requirements and domestic savings, equivalent to the required surplus in the balance of payments on capital account, under the geographical concept of national income.

\[ F_n = I_n - S_n. \]

Substituting 1.7 and 1.5, we get
\[ F_n = KY_n(1 + r)^n - Y_n \Big[ (1 + p)^n S_n + s'[(1 + r)^n - (1 + p)^n] \Big]. \]

1.8
\[ F_n = Y_n \Big[ (Kr - s')(1 + r)^n - (S_n + s')[(1 + r)^n - (1 + p)^n] \Big]. \]

**DERIVATION OF \( D_n \)**

\( D \) — Foreign debt at the end of each year.
\( i \) — Required rate of return on foreign debt, a constant.
\( X \) — Interest and dividend payments on foreign debt.

We assume that interest and dividend payments begin in the second year and that interest and dividend payments for any given year are computed from the debt at the end of the preceding year — or \( X_n = iD_{n-1} \).

Since debt is the sum of the required surplus in the balance of payments on capital account in the present year, interest and dividend payments on the volume of debt outstanding at the end of the previous year, and the volume of debt at the end of the previous year, we get

\[ D_n = F_n + X_n + D_{n-1}. \]

1.9
\[ D_n = (1 + i)D_{n-1} + F_n. \]

It is assumed that no debt is outstanding at the beginning of the first year. Hence, given 1.9:

\[ D_n = F_n. \]
\[ D_1 = F_1(1 + i) + F_1. \]
\[ D_2 = F_2(1 + i)^2 + F_1(1 + i) + F_2. \]
\[ D_3 = F_3(1 + i)^3 - F_2(1 + i)^2 + F_2(1 + i) + F_3. \]

2.0
\[ D_n = F_n(1 + i)^n + F_{n-1}(1 + i)^{n-1} + F_{n-2}(1 + i)^{n-2} + \ldots + F_n. \]

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From 1.8, \( F_n = Y_o[(Kr - s')(1 + r)^n - (S_o - s')(1 + p)^n] \).

Let: \( Kr - s' = A; \ S_o - s' = B \).

Therefore, from 2.0, we get

\[
D_n = Y_o[A(1 + r)^n - B(1 + p)^n].
\]

\[
D_1 = Y_o[(1 + i)[A(1 + r)^n - B(1 + p)^n] + A(1 + r) - B(1 + p)].
\]

\[
D_2 = Y_o[(1 + i)^2[A(1 + r)^n - B(1 + p)^n] + (1 + i)A(1 + r) - B(1 + p)^2] + A(1 + r)^2 - B(1 + p)^2).
\]

2.1 \( D_n = Y_o[(1 + i)^n[A(1 + r)^n - B(1 + p)^n] + (1 + i)^{n-1}[A(1 + r) - B(1 + p)]
\]

\[
+ (1 + i)^{n-2}[A(1 + r)^2 - B(1 + p)^2] + \ldots + A(1 + r)^n - B(1 + p)^n]n.
\]

Thus, we have in 2.1 two geometric progressions, the first, with the 'A' term is added, and the second, with the 'B' term is subtracted; each term in turn has two geometric series which are multiplied.

\[
2.2 \ D_n = Y_o[A((1 + i)^n(1 + r)^n + (1 + i)^{n-1}(1 + r)^{n-1} + \ldots + (1 + i)^{n-1}(1 + r)^2 + \ldots + (1 + i)^{n-1}(1 + r)^n) + B((1 + i)^n(1 + p)^n + (1 + i)^{n-1}(1 + p)^{n-1} + \ldots + (1 + i)^n(1 + p)^2 + \ldots + (1 + i)^n(1 + p)^n)].
\]

In both progressions the first term is \((1 + i)^n\); in the first progression the common ratio is \(1 + r\) and in the second progression the common ratio is \(1 + p\).

We assume here that \( r \) is not equal to \( i \). Thus, from the formula for summing a geometric progression, when \( i + r \), 2.2 becomes

\[
2.3 \ D_n = Y_o \left[ A(1 + i)^n \left( \frac{(1 + r)^{n+1}}{1 + r} - \frac{1}{1 + i} - 1 \right) \right] - B(1 + i)^n \left( \frac{(1 + p)^{n+1}}{1 + p} - \frac{1}{1 + i} - 1 \right) - B(1 + i)^n \left( \frac{(1 + p)^{n+1}}{1 + p} - \frac{1}{1 + i} - 1 \right).
\]

Simplifying, we obtain,

\[
D_n = Y_o \left[ A(1 + i)^n \left\{ \frac{(1 + r)^{n+1}}{r - i} \right\} - B(1 + i)^n \left\{ \frac{(1 + p)^{n+1}}{p - i} \right\} \right].
\]

Substituting for \( A \) and \( B \),

\[
= Y_o \left( Kr - s' \left\{ \frac{(1 + r)^{n+1}}{r - i} \right\} - (S_o - s') \left\{ \frac{(1 + p)^{n+1}}{p - i} \right\} \right).
\]

Or, if the first year is denoted by the subscript 1 instead of \( o \),

2.4 Formula A

\[
1 \text{ If } i = r \text{ the 'A' term becomes } nA(1 + r)^n.
\]

\[
2 \text{ If } i = r \text{, we use the above for the 'A' term and get}
\]

\[
D_n = Y_o(1 + i)^n[(Kr - s')(1 + r)^n - (S_o - s')(1 + r)^n].
\]

\[
\text{Simplifying, we obtain,}
\]

\[
D_n = Y_o \left[ n(1 + i)^n[(Kr - s')(1 + r)^n - (S_o - s')(1 + r)^n] \right].
\]
**APPENDIX II**

**DERIVATION OF REQUIRED MARGINAL SAVINGS RATIO**

The required marginal savings ratio is derived by imposing a prescribed constraint upon the volume of debt in a future year and solving Formula A, subject to this constraint, in terms of $s'$. The following solution is for the common case, where $i + r$.

From Appendix I we have Formula A (2.5):

$$D_n = Y_1 \left( (Kr - s') \left[ \frac{(1+r)^n - (1+i)^n}{r-i} \right] - (S_o - s') \left[ \frac{(1+p)^n - (1+i)^n}{p-i} \right] \right).$$

(When first year is denoted by subscript 1.)

**A. Debt to reach zero in $n$th year:**

Denoting the first year by $1$, if debt is to reach zero at the end of $n$ years, $D_n$ must equal zero. Placing $D_n = 0$, we solve for $s'$.

$$Y_1 \left( (Kr - s') \left[ \frac{(1+r)^n - (1+i)^n}{r-i} \right] - (S_o - s') \left[ \frac{(1+p)^n - (1+i)^n}{p-i} \right] \right) = 0.$$

Simplifying and rearranging terms, we get

**Formula I:**

$$s' = \frac{S_o \left[ \frac{(1+p)^n - (1+i)^n}{p-i} \right] - Kr \left[ \frac{(i+r)^n - (1+i)^n}{r-i} \right]}{\left[ \frac{(1+p)^n - (1+i)^n}{p-i} \right] - \left[ \frac{(1+r)^n - (1+i)^n}{r-i} \right]}.$$

**B. Debt to reach absolute maximum in $n$th year:**

Denoting the first year by $1$, for debt to reach a maximum at the end of $n$ years, the increase debt between the year $n$ and $n+1$ must equal zero. Placing $D_{n+1} - D_n = 0$, we solve for $s'$.

$$Y_1 \left[ \frac{Kr - s'}{r-i} \left[ \frac{(1+r)^{n+1} - (1+i)^{n+1}}{r-i} \right] - \frac{S_o - s'}{p-i} \left[ \frac{(1+p)^{n+1} - (1+i)^{n+1}}{p-i} \right] \right] - \left[ \frac{Kr - s'}{r-i} \left[ \frac{(1+r)^n - (1+i)^n}{r-i} \right] - \frac{S_o - s'}{p-i} \left[ \frac{(1+p)^n - (1+i)^n}{p-i} \right] \right] = 0.$$

Simplifying and rearranging terms, we get
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Formula II:

\[ s' = \frac{\left[ \frac{(1+p)^n - (1+i)^n}{p-i} \right] + (1+p)^n - Kr \left[ \frac{(1+r)^n - (1+i)^n}{r-i} \right]}{\left[ 1 + \left( \frac{(1+p)^n - (1+i)^n}{p-i} \right) \right] + (1+p)^n} \]

C. Ratio of external debt to national income to reach maximum in \( n \)th year.

For ratio of debt to national income to reach maximum at the end of \( n \) years, the rate of increase of debt between the \( n \)th and the \( n+1 \) year must equal the rate of increase of national income.

Thus \( \frac{D_{n+1}}{D_n} = 1 + r \). From Formula A (2.5),

\[ Y_1 \frac{(Kr - s')}{(1+r)^n - (1+i)^n} \frac{(1+p)^n - (1+i)^n}{p-i} - \frac{(S'_0 - s')}{1 + \left( \frac{(1+p)^n - (1+i)^n}{p-i} \right)} = 1 + r. \]

Simplifying and rearranging terms, we get

Formula III:

\[ s' = \frac{S'_0 \left[ (1+p)^n(p-r) + (1+i)^n(r-i) \right] - Kr \left[ (p-r)(1+i)^n \right]}{(1+p)^n(p-r) + (1+i)^n(r-i) - (p-r)(1+i)^n} \]

COMMENTS ON DR. ALTER'S PAPER

BY

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I. TRANSFER RISKS AND THE GOLD STANDARD

In my opinion, it is essential to make it clear that, although the gold standard guarantees the transfer of the returns on foreign capital invested in under-developed countries, it by no means ensures the profitability of foreign investment. I cannot, therefore, understand why the author lays so much stress on the gold standard as a means of guaranteeing the foreign capital invested in a given country. At the end of the nineteenth and the beginning of the twentieth century, a series of loans were floated in London, Paris, and New York, under which borrowers bound themselves inflexibly. This inflexibility had no connection whatsoever with the gold standard. The various borrowing governments undertook a solemn, legal obligation to pay their various foreign creditors in the latter's own currencies, whether sterling, francs, or dollars.
II. Case by Case Examination A Sufficient Guide to Investment

The history of finance also reveals that a good many such loans were not guided by any productive criterion. Their purpose was either to cover the increase of consumption, to balance budgetary deficits resulting from current expenditure, or, alternatively, to support the price of export products as in the case of the coffee valorization loans contracted by Brazil. When the World Bank was founded at Bretton Woods, an attempt was made to prevent borrowing for unproductive purposes by linking investments directly and exclusively to economic activities. Hence the policy of associating each loan with a specific project.

From the investor's point of view, individual analysis of each projected enterprise with a view to determining its profitability is in itself an adequate guarantee because interest and amortization represent a small fraction of the aggregate return which the enterprise will produce. Even when the projected enterprise for which a loan is needed calls for substantial financing, as is the case with external economies, the same criterion is relevant since the social marginal income will exceed the amount of debt service.

III. Transfer Risks and Monetary Policy

It may be argued that while such a guarantee may be adequate for domestic investors, it is insufficient for foreign creditors because, in addition to the usual risks, foreign creditors run the risk that there will be a depreciation in the foreign exchange rate of the borrowing country. Balance of payments disequilibria stem rather more frequently from monetary policy than from any other cause. Nowadays one frequently observes a propensity to import which is excessive compared with the amount of foreign exchange provided by the export of goods. One often sees, also, a substantial outflow of foreign exchange to meet expenses incurred by tourists abroad and an equally substantial outflow of saving to be invested in foreign countries. Such situations reflect the lack of a proper monetary policy and by no means imply that foreign borrowing has been excessive in relation to the growth of marginal income. Balance of payments difficulties have not arisen from past foreign investment, nor is there any reason to believe that in the near future the inflow of capital from abroad is likely to reach a level that will make its service excessive in relation to national income.

The author does not make a direct analysis of transfer risks. In other words, he considers that this is a matter of secondary importance, provided that there is a continuous increase of national per capita income, and provided further that an adequate ratio between foreign debt service and the increase in national per capita income is maintained. Now to attain such a ratio or proportion it is not essential to examine saving as a whole. Case by case examination of specific projects provides the most desirable formula. The only overall study needed is that of the monetary and
financial situation of the borrowing country. This is fundamentally a short period analysis which falls within the sphere of the International Monetary Fund. It is not a problem of long term financial agencies, such as the International Bank.

IV. PRODUCTIVITY THE RELEVANT GUIDE FOR INVESTMENT

The rate of growth of national income is obviously incapable of extrapolation over the long run, particularly when the initial phase is characterized by marked inflation. During such a phase, numerous investments may be made, each of which increases national income without strengthening the all-important foundations for the country's progress. Statistics may reveal an increase in real income without a corresponding increase in capital formation. On the contrary, past investments may be being wasted.

During a prolonged inflationary process, one observes not only a decline of net investment but even disinvestment in railways, ports, canals, and many other public utilities, particularly in those fields where profits can only be reaped in the distant future such as, for example, the building of laboratories, the execution of research programmes, and education. Concomitantly, one notes a substantial upward trend of investment in buildings, houses, factories for production of consumer goods, and the provision of urban services, such as hotels, insurance companies, and innumerable other activities which increase the national income but which fail, for the most part, to stimulate any improvement in productivity. There can be no question that it is the raising of productivity that enables the rate of growth of the national income to surpass the rate of growth of population. An increase in productivity should be the main guide of the case by case examination of projects seeking foreign loans.

FURTHER COMMENTS ON DR. ALTER'S PAPER

BY

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To my mind the most interesting part of Alter's paper is the section on debt service in the context of long-run growth. The models developed there can play a most useful rôle in allowing one to isolate and relate correctly the variables relevant to the problem of debt service in a growth context. I think the use of the models could have been more fruitful, however. Specifically, it would be interesting to trace out the probable directions which the variables may be expected to take through time as a function of the development process. The importance of this problem is obvious. From the standpoint of ease of debt service, some values of
the variables are more desirable than others. It is important to know, therefore, what values the variables are likely to take over time, and what their interrelations are likely to be under varying policy conditions and at different stages of development. It is important to know also which of the variables, if any, are subject to policy manipulation. These would provide leverage for guiding the development process so that the relatively non-manipulable variables will follow optimum paths. While Alter could not be expected to go into this problem to any great extent, recognition of its importance and some tentative discussion of its dimensions would be desirable.

It is worth pointing out that Alter's models do not include one of the crucial variables in the saving-investment equation, namely replacement investment. Alter states that his model 'provides a method for considering primarily the availability of, and claims on, total resources and savings in the context of economic growth'. Now the gross national product represents the availability of total resources. The claims against it consist of consumption, net domestic investment, replacement investment and the net export balance. Alter takes account of all of these except replacement investment. This lack is, perhaps, not fatal since in under-developed areas the capital stock is small and replacement requirements correspondingly slight relative to the need for net additions to the stock. As development proceeds, however, and the capital stock grows, replacement requirements are of increasing relative importance. In a developed economy like that of the United States, replacement takes over 60 per cent. of total gross investment. If the capital stock is to be maintained, replacement investment has a first priority claim on the resources of an economy. Therefore, it cannot be ignored, particularly in the context of Alter's problem.

The explicit introduction of replacement investment into Alter's model would, of course, change the numerical results yielded by the model, all other things equal. In general this change would tend to raise the saving required to provide for a given amount of debt service. But, perhaps more important, it could also change the ordering of optimum paths of development. This follows from the fact that replacement requirements and required net additions to the capital stock (determined by the marginal capital-output ratio and the rate of income growth) may be moving in opposite directions. Thus a development path which appears most favourable when looking only at net savings may seem less favourable when replacement requirements are taken into account.

I have one final, and minor, criticism. Throughout this paper Alter refers to dividend and interest payments as though they were identical from the standpoint of debt service. Of course they are not, and the differences are sufficiently great to make their separate treatment important.
DISCUSSION OF DR. ALTER'S PAPER

The discussion of Dr. Alter's paper developed initially around the issue of project analysis v. overall analysis. Later it branched out to include questions relating to the transfer problem, the importance of per capita income growth as an index of debt service capacity, and the internal consistency of Dr. Alter's model.

PROJECT ANALYSIS

Dr. Bulhões led the attack upon the overall analysis proposed by Dr. Alter with a strong argument in favour of single project analysis. The rate of income growth, he said, had little to do with whether or not a project was credit-worthy. If it was, the only adverse circumstance that could be discovered by overall analysis was the existence of a balance of payments problem. If this existed, however, it was a short-run phenomenon attributable to faulty monetary and fiscal policy. It could be eliminated by a change in policy, much as a sound balance of payments situation existing at the time of the loan could later be destroyed by bad policies. Project analysis therefore was all that could and should be undertaken.

Dr. Alter commented that, in view of the difficulty of any kind of lending to countries with balance of payments problems, Dr. Bulhões' approach tended to create two groups of countries: those with sound balances of payments, which were eligible for loans subject to project examination, and those with weak balances of payments, which were ineligible for any sort of loan. This criterion appeared to be more rigorous with respect to the ineligible countries than any he himself had meant to apply.

Professor Hirschman likewise sought an escape from the simple alternative of overall v. project approach. Neither seemed satisfactory to him, yet he doubted the value of old-fashioned credit rules of thumb, such as that debt service should not exceed 10 per cent of external earning. He concluded that a lending agency like the International Bank should try to identify potential ‘growing-points’ and place its funds there, leaving other matters to ‘a wise and salutary neglect’.

Professor Brahmananda, on the other hand, felt that the analysis ought to be expanded to comprise the condition not only of the borrowing country, but also that of the countries with which it maintained close economic relations. Only in that way, he argued, could the economic outlook of the borrowing country really be established.

Some of the comments on this topic seemed sceptical more of Dr. Alter's detailed analytical model than of the principle of overall appraisal as such. Dr. Alter seemed to be in agreement with this more generalized approach.
Transfer Problem

Dr. Bulhões had implied that the transfer problem was a matter of good monetary and fiscal policy. Various other speakers, on the other hand, stressed the possibility of a structural transfer problem. It was agreed that conceptually a country living within its means, i.e. maintaining a surplus of total resources over domestic uses, and of saving over investment, was bound to generate a corresponding surplus for debt service. But this did not, of course, dispose of the concrete problem. Dr. Campos and Dr. Domingues referred to the case of Brazil and Argentina, respectively, as demonstrating the existence of transfer problems in countries with strong domestic economies. Dr. Kafka reminded the group that this discussion seemed to lead back to the classical debates between Keynes and Ohlin on reparation problems, when Ohlin had forgotten the price effect and Keynes the income effect.

Dr. Alter questioned the propriety of saying that a country was doing well incomewise and savingwise, when its balance of payments position was fundamentally bad. In the short run, such a contrast might exist, and the country in question might appear to be suffering from nothing worse than a balance of payments difficulty within an otherwise healthy economy. In the longer run, this would reveal itself as fallacious. If the balance of payments problem was structural, it would show itself to be also an income problem. For either the lack of foreign exchange would begin to affect adversely the country's general economy, or desperate measures would have to be taken to push exports, deteriorating the terms of trade and otherwise affecting income. In the longer run, therefore, his income criterion included the balance of payments criterion.

Importance of Per Capita Income Growth as a Loan Criterion

Various speakers pointed out that Dr. Alter's entire model hinged upon the concept of a minimum per capita income growth as a criterion of credit worthiness, and questions were raised whether the concept could bear this burden. Professor Brahmananda asked whether per capita income or per capita consumption was the more relevant criterion. This distinction might become important in countries where the government was imposing forced saving upon the population. Income growth might be quite satisfactory, but the temper of the people still not favourable to the fulfillment of loan contracts.

Professor Wallich noted that ideally the criterion ought to be not absolute income growth, but growth in relation to the increase in expectations. During a process of industrialization, expectations sometimes rose faster than income. He also observed that in view of the many circumstances that affected a country's loan performance, it seemed doubtful that per capita income growth could account for more than a modest fraction of the total complex of causation. In the past, countries with little
or no per capita growth had met their obligations because that was the climate of the times, or because they expected new loans.

Dr. Adler suggested that the income growth criterion would in practice have to be replaced by an appraisal that took into account a large variety of factors. Among these he listed: (1) the nature of the project; (2) the general prospects of the debtor country, including factors like the saving ratio and capital-output ratio which figured prominently in the Alter model; (3) the fiscal and monetary policies pursued which reflected the 'competing claims on resources' emphasized by Dr. Alter; (4) the balance of payments outlook, and (5) the past debt record, especially performance during difficult periods.

Dr. Kafka argued that a quantitative approach in such matters was doing it the hard way and probably doomed to failure. As a practical matter, the lender would do well to limit himself to qualitative analysis. Such analysis, however, was implicit in good project analysis, so that there was no need for overall analysis in addition to project analysis.

Professor Schultz stressed the importance of political factors and pointed to the great difficulty of linking them up with an economic analysis.

Dr. Alter, in replying to those points, agreed that many factors other than income growth were important, and might counsel against a loan. But he upheld his criterion on the grounds that without some evidence of prospects for income growth, even a whole range of otherwise favourable factors would not offer a sound basis for lending, and that with a high rate of income growth in prospect the capacity, though not necessarily the willingness, of a country to service external debt was higher.

CONSISTENCY OF THE MODEL

Opinions were divided about the internal consistency of the model. Professor Hirschman observed that minor changes in the variables employed by the model produced large variations in indicated loan capacity. In practice, a lender could never hope to reach firm conclusions with respect to even the approximate magnitude of a country's borrowing capacity by use of the model which, therefore, could not be regarded as having operational value.

Professors Schultz and Ellis countered that Dr. Alter had stated all the necessary qualifications, and that after all this was a model and not a statement of fact. Professor Ellis nevertheless expressed concern over the possibility that a large volume of foreign loans, such as indicated by the model under certain favourable conditions, might prove inflationary. The resulting high rate of investment, moreover, might increase the lender's risk because it increased the danger of misallocation.

Dr. Alter clarified the rôle of the capital-output ratio in the model by saying that a low ratio was 'favourable' only in so far as it applied to the entire economy. With regard to a particular project, or sector, the ratio depended upon many factors and nothing could be said about its being good or bad.
good or bad. Moreover, even for the entire economy a low ratio was desirable only over a long period of time, but not at any particular moment.

Professor Wallich questioned the consistency of the model by pointing to the conclusion which emerges from it that debtors are creditworthy only if they reduce their rate of borrowing over time. This, as Dr. Alter had said, meant that all borrowers sooner or later were moving towards a position of net exporters of capital. The logical implication of this trend seemed to be that today's creditor countries, principally the United States, must eventually reduce their rate of lending and later become net importers of capital. While such a condition might come about as a result of some catastrophe, it could scarcely be envisaged as the logical end of a normal evolution. In fact, the behaviour of a borrowing country's debt level depended not only on its own evolution, but also on that of others, and was subject to the familiar conditions governing demand and supply in the capital markets.

Dr. Alter and Dr. Adler rejected this allegation of internal inconsistency of the model on the grounds that while today's debtor countries might eventually become creditors, this did not mean that today's lenders would have to become debtors. There would always be new countries which would begin to borrow.