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ECONOMIC GROWTH AND EXTERNAL DEBT

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Chapter I Introduction

1. Terms of Reference

1. This volume had its origin in a study prepared in response to a request from the Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD), Paris. The request was for ". . . a paper . . . discussing the factors which determine a country's debt servicing capacity . . ."[1]

2. Similarly, the Secretary-General of the United Nations Conference on Trade and Development requested the assistance of the International Bank for Reconstruction and Development on a number of topics for consideration at the Conference, including the "methods for relating the terms and conditions of aid to the long-term needs of developing countries."[2] It was felt that a study concerned with the problems of assessing the servicing problems of developing countries, and with the limits of external indebtedness which these countries could assume, would be germane also to the deliberations of the Conference on the above topic. This volume is an outgrowth of the staff work done for the two above-mentioned international bodies.

3. The question of limits to external indebtedness is relevant to the terms on which aid is provided to developing countries. The terms on which aid can appropriately be provided will depend on the circumstances of individual developing countries. Three questions immediately arise. First, what circumstances are relevant? Secondly, what kind of analytical assessment of these circumstances would be helpful to the decision makers when they judge what the appropriate terms of assistance should be? And thirdly, how grave should these circumstances, e.g., debt servicing difficulties, be and what should be their origin to

[1] Resolution on the Terms and Conditions of Aid, DAC(63)10, April 4, 1963.
[2] Letter from the Secretary-General of the United Nations Conference on Trade and Development, dated 17th July 1963.

justify a modification in the conventional terms of international capital flows?

4. This study is concerned with the first and the second questions. It discusses the ways of recognizing the circumstances which may be considered relevant, and it also attempts to provide a conceptual framework within which particular data and forecasts may be conveniently analyzed. Although the study discusses the debt servicing difficulties and their causes and magnitude, it does not make any operational recommendations regarding appropriate terms of assistance. The latter depend, among other factors, on the volume of funds which the international community is prepared to provide for development finance and on the standards of risk which the capital-supplying countries and lending agencies consider appropriate to accept. These subjects are outside the terms of reference of a study which is primarily methodological in nature.

2. Factual Background

5. Since the war international capital flows have taken a variety of forms, ranging from grants and free provision of technical assistance at the "soft" end to short- and medium-term loans at fairly high rates of interest at the "hard" end. The provision of capital on soft terms has a marked advantage for the borrowing countries as it does not give rise to debt servicing obligations. On the other hand, the capital-supplying countries find it much easier to make loans on conventional terms, since they can be financed by savings voluntarily provided from private sources, even though temporary budgetary expenditures may be incurred where lending is done through public lending agencies. A further characteristic of hard loans is that they impose a certain pressure on the borrower to use the proceeds efficiently in strengthening his economy, although it may be argued that the same end could also be achieved in other ways, particularly in the case of a developing country which is likely to need a continuing net capital inflow for a fairly long time.

6. An inevitable consequence of provision of capital on hard terms is that debt service obligations increase over time. It has been estimated that public and publicly-guaranteed debt of a sample of 37 developing countries increased from $7.0 billion at the end of 1955 to $18.2 billion at the end of 1962, i.e., two-and-a-half times. Amortization and interest payments on this debt rose from $0.7 billion in 1946 to $2.4 billion in 1963, almost a four-fold increase in seven years.[3] Given the substantial role of hard loans in total capital flows at present and in the

[3] See Volume II of this study—*A Statistical Presentation*—Chapters II and III.

immediate future, the process whereby this occurred is likely to continue, although not necessarily at the same rate.

7. Increases of external indebtedness and of debt service liabilities even when large, do not necessarily imply difficulties for borrowers. Increases of service payments have to be measured against the strengthening which has occurred in the borrowers' economy.

3. Theoretical Background

8. The basic problem in estimating debt servicing capacity is to give substance to the vague formulation expressed in para. 7 above. What is meant by "strengthening of the borrower's economy"? Is there any precise way in which this strengthening can be measured? What are the respective roles of quantitative analysis and judgment in the measurement? To the best of our knowledge, no one has yet succeeded in developing a set of rules which will determine, in a generally acceptable manner, the permissible limit of indebtedness of *individuals* or of *business firms* even in the domestic economy. If such rules had been developed, bankruptcy would already have been banished, and the job of banking reduced to the operations of punch-card machines or of a computer. Even more controversial is the problem of what are the limits of internal borrowing of *governments* or of aggregate private credit. Many economists would say that the only thing which matters is the relationship of total debt service to total product and that the absolute size of either the debt or of the debt service is irrelevant. Most people would agree with this statement, but it must be admitted that its operational significance is limited. The question arises: up to what point is the relationship "sound" and when does it become "excessive" and "dangerous"? Again, if there were a unanimously accepted answer to this question, much of the disagreement with respect to proper fiscal and monetary policies either in the poor or in the rich countries, would by now have been laid to rest.

9. The problem of permissible limits to *external* borrowing is still more complicated. The government of the borrowing country cannot print international money in order to pay its debts; the solution to which the debtor governments have occasionally resorted in the past with respect to their internal debts cannot be of help in meeting international financial obligations. If anything, domestic inflationary financing makes the fulfillment of external debt obligations more difficult, certainly over the short run and possibly over the long run. The borrowing country must lay its hands on international currency in order to pay its debts.

10. The transfer problem is one of the most controversial issues of economic theory. In the 1920's, much thought was given to the problem of whether the debtor country, in addition to the burden of accumulating domestic currency in order to meet external debt service, also faced an additional burden in transferring these domestic savings into foreign exchange. The great discussion regarding whether a country making the transfer inevitably experiences a deterioration in its terms of trade has remained unresolved, although Keynes who maintained that there was no additional burden, probably had the better of the argument, at least under certain conditions.[4] Does or does not a country which makes the transfer *have* to sell abroad at lower prices than would otherwise prevail?

11. The Great Depression of the 1930's has served to direct attention to another very significant aspect of the problem. If new capital inflow dries up suddenly and if the value of world trade collapses in a span of a few years, considerable and widespread debt servicing difficulties are likely to arise, and it matters little whether this is called a transfer or a savings problem.[5]

12. In the postwar period, on the one hand, there has been an absence of violent fluctuations in the imports and capital outflows of industrialized countries. On the other, the general problems of economic growth of the developing countries have attracted considerable attention. As a result, the discussion of international indebtedness has been directed into new areas. During the last ten years, probably the most debated single question has been the rate of capital accumulation needed for accelerated growth of the less developed countries. The external capital requirements of these countries and the related issues of ade-

[4] J. M. Keynes, *The German Transfer Problem; The Reparations Problem; Views on the Transfer Problem* (Economic Journal, March 1929, June 1929, September 1929); *The Treatise on Money,* 1930. Bertil Ohlin, *The Reparations Problem* (Index, Svenska Handelsbanken, April 1928); *Transfer Difficulties, Real and Imagined* (Economic Journal, June 1929); *Interregional and International Trade,* 1935. F. Terhalle, *Die Theorie des Transfers* (Wirtschaftsdienst, Mai 1924). Walter Eucken, *Das Uebertragungsproblem* (Jahrbuch fuer Nationaloekonomie und Statistik, 1925). Fritz Baade, *Das Reparationsproblem,* Berlin 1929. Jacques Rueff, *Les idées de M. Keynes sur le probleme des transfers* (Revue d'Economie Politique, July–August 1929); *A Criticism* (Economic Journal, September 1929). Ragnar Nurske, *Internationale Kapitalbewegungen,* Wien 1935. This is only a small sample of representative views in the controversy.

[5] For the experience during the 1930's, see United Nations, *International Capital Movements in the Inter-War Period,* 1949; Royal Institute of International Affairs, *The Problem of International Investment,* London 1937; Societé des Nations, *Le Cours et les Phases de la Depression Economique Mondiale,* 1931; Peterheinz Werhahn, *Kapitalexport und Schuldentransfer im Konjunkturverlaut,* Jena 1937.

quacy of domestic resource mobilization and resource use have been the major issues of contemporary economic theory and economic and political debate.[6]

13. Recent discussions of the capacity to service external debt—and of debt servicing difficulties which may be called the pathology of international capital flows—have been a natural extension of the discussions of capital requirements. Furthermore, the mere fact that debt service has increased as indicated in para. 6 above, has inevitably led to an increase in attention paid to debt servicing problems. It was only to be expected that as the process of meeting capital requirements evolved, the return flow would take place, after a time lag, and that it would then necessarily raise a number of very difficult and analytically most interesting questions.

4. Limitations

14. This study does not pretend to answer all such questions. Furthermore, we may have even failed to raise some of the important questions. The fundamental difficulty is that the theory of debt servicing capacity has not yet been formulated, despite the fact that some aspects of the problem have been fairly thoroughly explored. The theory of capacity to service external debt is unlikely to be developed until the basic issues in the theory of economic growth have been resolved. The capacity to service debt of a country, just like that of a business firm, is inexorably linked with its performance in output (sales), savings (plough-back of earnings) and developmental returns to capital (rate of profit). But while believing, rightly or wrongly, that we know something about the factors that help explain financial success or failure of a firm, one is much less certain when asked to explain why certain nations show an amazing rate of growth while others lag behind.

15. There is another serious limitation which is inherent in the subject itself. The appraisal of creditworthiness of anybody—be it an individual, a business firm or a country—is a mixture of facts and judgments. Even if we had the theory of debt servicing capacity, and could satisfactorily explain the likely behavior of major variables and their

[6] The literature is enormous. One of the first representative analyses was contained in United Nations, *Measures for the Economic Development of Under-Developed Countries*, 1951. The debate has culminated at the United Nations Conference on Trade and Development, held in the spring of 1964. For the major issues involved, see Raoul Prebisch, *Towards A New Trade Policy for Development*, Report of the Secretary-General of the United Nations Conference on Trade and Development, 1964.

time-path, we would still be facing the uncertainties arising from current economic and financial policies which the decision makers in the borrowing countries may choose to adopt, be it at their own initiative or in response to all sorts of pressures. Any country, can very quickly get into a balance of payments crisis: just a few wrong moves in fiscal, monetary or foreign exchange fields will suffice. If such a crisis is accompanied by an accumulation of unpaid commercial bills or by an unilateral postponement of service payments on long-term debt, the lender has little choice but to stop further lending. To make such a decision is not difficult. What is much more difficult is to judge whether the policies which the borrower pursues *today* are likely to produce a payments crisis *tomorrow*. The lender has to visualize not only whether payments troubles are likely to emerge and not only how serious they are likely to be, but also how the debtor will react and what priority he will attach to fulfillment of his obligations. Some of these questions may be answered by economic analysis; the question of priority cannot. The past pattern of behavior in crises might serve as an indicator for the future, but history does not always repeat itself. Lending is an art and not a science. And this art is perhaps today made more difficult than ever. A banker or a government engaged in financing international economic development has to take into account not only whether a balance of payments crisis is likely or not; he must also consider, and attach great weight to, the underlying economic growth trend in the borrowing country. The problem is easy to resolve if a government's financial difficulties coincide with stagnation of the economy or if financial prudence goes hand in hand with buoyant economic growth. But what if very high developmental returns to capital stand side-by-side with serious disturbances in government's financial accounts? If the balance of payments is insulated from domestic inflationary pressures through an effective management and therefore no exchange crises occur, it can be argued that government's fiscal practices do not really matter and that it is the developmental returns to capital which ought to be considered decisive. There will always be views, however, that a deficit fiscal policy is inevitably accompanied by a reduction in the economic growth rate; and also, that even if the balance of payments were successfully insulated from domestic inflationary pressures for some time, this situation could not be sustained forever and that exchange difficulties would occur, sooner or later. And the dilemma is even more severe if in practice the balance of payments management was indeed ineffective in the face of inflationary pressures and as a result unpaid bills accumulated, although the empirical evidence shows beyond reasonable doubt that the economic growth rate was indeed high despite these inflationary pressures

and exchange difficulties. Lending to finance international economic development is a continuing problem of difficult choices.

16. Therefore, this study does not cover the following two points.

(a) A continuing service on external indebtedness depends not only on debt servicing capacity, but also on willingness to do so. The two are not unrelated, but willingness is a broader concept resting on a combination of subjective and objective factors; it depends not only on economic circumstance, but also on political pressures and strategy and even bargaining tactics. Appraisals of willingness are a matter of judgment which can be discussed but for which no conclusive proof can be demonstrated.

(b) A country can have an impressive record of economic growth, and it may also have good long-run growth prospects because developmental returns to capital are high even though fiscal, monetary and foreign exchange policies may not be considered conducive to balance of payments stability. Views will differ on how severely these current financial policies should be judged, and what weight should be attached to them as opposed to the economic growth rate. This question of weights in decision making is also a matter of judgment, although economic analysis can make a substantial contribution in illuminating and appraising the risks involved in different courses of action.

17. Results of this study are inevitably circumscribed by the weakness of statistical series that have been used. Despite considerable advance which has been made in recent years, these weaknesses still exist. However, it is not believed that they impair the general findings of the study, although particular statistics may do considerable injustice to particular countries.

18. Several choices were open in presenting the findings of the study. They could be presented in terms of the savings and transfer aspects of debt servicing capacity. In this case, the distinction between short and long period analysis would be subordinated to the chief theme, i.e. the savings and transfer problems. Alternatively, the main classification could be based on time periods, while savings and transfer aspects of servicing foreign capital would provide a sub-classification. Either approach has its advantages and drawbacks. We have chosen to adopt the framework of period analysis. Within this framework, we could start with short period analysis and then move to discuss long-run problems or vice versa. We have adopted the conventional practice of starting with short-run analysis, although in retrospect, the logical sequence appears to be from the long-run growth problem to the temporary deviations, which occasionally interrupt the trend.

Chapter II Conceptual Framework

19. Debt servicing capacity of a developing country may conveniently be discussed in terms of benefits and cost of foreign capital in the process of economic growth. Foreign capital supplements national resources and thus helps raise the rate of capital formation. By making possible a higher rate of investment than would otherwise be feasible, foreign capital raises the rate of income growth.

20. Against this benefit to the national economy, there is the cost of foreign capital in terms of payment of debt service. This payment implies that the borrower country has to forego a certain amount of purchasing power, which could otherwise be used for consumption or investment. Debt servicing capacity depends on the ease with which a country can reconcile competing claims on its resources; on the one hand there is the demand for higher domestic consumption and investment, on the other there is the obligation to foreign creditors. A default implies the undermining of confidence, denial of foreign long-term loans in the future and at the extreme, isolation from the major world centers of finance and commerce. Debtor countries have to balance what may appear to be immediate advantages of higher home consumption and/or investment against the adverse impact on future economic growth of being isolated from international finance.

21. The problem of reconciling competing claims on resources has a different complexion, depending on the time horizon under consideration. At a point of time, or in the short period, debt servicing difficulties take the form of a liquidity crisis. Disequilibria in the balance of payments are the heart of the matter. Whether a debtor can make both ends meet depends on the relative strength of elements of rigidity (i.e., the contractually fixed external obligations, minimum tolerable level of imports) and countervailing elements of flexibility (i.e., availability of compensatory finance and inessential imports). It also depends on the skill of the authorities of the debtor country in managing the balance of payments.

22. Difficulties in transferring debt service payments at a point of time may result from cyclical or accidental fluctuations in exports, capital inflow and imports, or from capital flight or a bunching of repayment obligations. Alternatively, the liquidity crisis may be a symptom of structural weaknesses of the economy. Frequently, but not in all cases, it is a combination of purely transitory disturbances and long-term factors.

23. In real life, debt servicing difficulties almost always manifest themselves in liquidity crises in the balance of payments. However, a thorough appraisal of creditworthiness cannot be based on short-period analysis only. Debt servicing capacity cannot be divorced from the general problem of economic growth, particularly when the main focus of attention is a low-income country. Reconciliation of competing claims on resources is easier when total resources are growing than in a stationary economy.[1] As long as the incidence of debt service falls on a part of the increment in per capita income, it is possible for consumption and nationally financed investment to rise *pari passu* with service payments. And if the rate of increase in real income and savings, remaining available after the claims of foreign capital have been met, is reasonably high, if growth occurs in a continuous fashion, and if its benefits are widespread, it can plausibly be argued that debt service payments will also be made smoothly.[2] In this case, the opportunity cost of fulfilling external obligations is less obvious and presumably less burdensome, than in a situation in which service payments impinge on existing living standards and employment levels. Therefore, it can be argued—and this is the fundamental judgment on which this study rests —that continuing growth in per capita production and the underlying process of rapid accumulation of productive capital is the basic long-run condition of debt servicing capacity.

24. The main task of long-run analysis is to define the conditions under which the economic growth process, which is partly financed by foreign capital borrowed on conventional fixed terms, can succeed; and which can thus provide a basis for continuing servicing of external debt, and, if necessary, for its ultimate retirement. Relationships between several crucial variables—return on capital, savings, investment, growth

[1] This was the basis of the growth-cum-indebtedness model developed in 1953 by Mr. Gerald M. Alter of the Bank staff. The study was published in 1961, under the title "The Servicing of Foreign Capital Inflow by Underdeveloped Countries," in: *Economic Development for Latin America,* Proceedings, International Economic Association, New York, 1961.

[2] This was the model developed in the Bank in 1956 and implicit in a study published in 1958 (Dragoslav Avramovic, *Debt Servicing Capacity and Postwar Growth in International Indebtedness,* The Johns Hopkins Press, 1958).

of output, required foreign capital inflow and the associated cycles of debt service ratios—should be formulated and their time-paths followed. Values for the variables can then be chosen on the basis of available evidence and the implications of such choices explored. What are the conditions for a successful outcome of the growth-cum-debt process? If the values of the variables in particular countries appear such that a successful outcome cannot reasonably be expected within a certain period, then the external financing of the growth process should either be postponed until the variables have attained the values at which the conventional terms of borrowing can operate without excessive risks; or the growth process, if it is to be financed externally at all, should be financed at "soft" terms, provided the governments-suppliers of external capital are willing, and find it possible, to subsidize, out of tax proceeds, such "soft" terms transactions. It is the purpose of long-run analysis to develop a framework within which alternative developments of the growth-cum-debt process can be projected over specified periods of time under different assumptions regarding the values of the major growth variables, the assumptions themselves being initially derived from empirical evidence of the past and then projected for the future in accordance with trend movements that can plausibly be expected.

25. Since national economic growth occurs in the framework of the world economy and since we are concerned with debt service obligations to external creditors, the discussion cannot be limited to domestic variables only. For growth to materialize, it is not sufficient just to raise the rates of savings and investment. The pattern of production, and its international competitiveness, must be such as to enable the debtor country to purchase abroad goods that it cannot produce efficiently, and also to translate the surplus of domestic savings over domestic investment requirements into foreign exchange without much difficulty. If international demand for the products of the debtor country rises only sluggishly, or if domestic production is not competitive, or if export sales fluctuate persistently, this country will experience limits on the rate of real income growth that it can sustain over time and hence on the savings surplus that is needed for debt servicing abroad. The task of analysis is to identify the factors determining the foreign exchange constraint, to depict the ways in which it is or can be removed, and to show the implications for debt servicing both of the constraint itself and of the various ways in which the developing countries attempt to cope with it.

26. This is the conceptual framework within which debt servicing capacity can be appraised. The main problem is to develop a method of analysis for assessing liquidity and elements relevant to long-term growth.

Chapter III The Liquidity Aspect of Debt Servicing Capacity

1. Variables

27. The present chapter considers methods of judging the size and gravity of the payments problem which debtor countries may encounter if their external receipts suddenly fall, while they have to maintain their fixed, contractual service instalments.[1] From the point of view of the present chapter, debt servicing difficulties are one element among others in the general picture of balance of payments vulnerability. The discussion thus moves closely parallel to a discussion of, e.g., the adequacy of reserves, but with special attention to debt service liabilities as a special element of rigidity in the situation.

28. The factors which affect the balance of payments and hence a country's capacity to service debt in the short- and medium-term can be classified as:

1. Fluctuating variables
(a) exports
(b) capital flows
(c) emergency and inflation-induced imports
2. Offsetting variables
(a) reserves
(b) compensatory finance
(c) compressible imports
3. Rigid variables
(a) minimum tolerable imports
(b) debt service—interest
(c) debt service—amortization

29. The economic policy of the borrowing country affects the behavior of many of these variables in a significant manner. In particular,

[1] The actual experience in the cyclical downturn of 1957–1958 was analyzed in: Dragoslav Avramovic and Ravi Gulhati, *Debt Servicing Problems of Low-Income Countries 1956–1958*, The Johns Hopkins Press, 1960.

the external financial situation may be aggravated if fiscal and monetary practices are inflationary and their effect on external accounts is not offset by an adequate balance of payments management, e.g., through flexible foreign exchange policies.

30. The process of economic growth is one of profound economic change. This change affects, among other things, the behavior of the variables enumerated above. Some of them assume greater flexibility while others tend towards rigidity. These changes, in turn, influence the way an economy responds to a liquidity crisis.

2. Fluctuating Variables (Disturbance Variables)

(a) Export declines

31. A major element of balance of payments vulnerability of many developing countries arises from instability of export earnings. Short-term declines in export earnings have in the past originated largely in cyclical declines in international demand. In addition, there have been falls in export receipts caused by occasional natural failures in supply. Further, a number of developing countries have experienced reduced earnings over the medium-term, originating in excess production of primary products in relation to demand. Finally, export declines may be caused by domestic policies which adversely affect the incentives to produce for exports or to sell on the international market.[2]

32. The first and obvious approach to the question of the possible future severity and length of periods of depressed export earnings is to look at the behavior of aggregate export earnings in the past. However, an overriding problem is the shortness of the period from which it seems relevant to draw conclusions for the future. History before 1939 is no longer very illuminating. The abnormalities of the war and immediate postwar years were immediately followed by the further untypical experience of the Korean commodity boom. Therefore, it is only fruitful to consider the behavior of exports over the last decade or so, and in so short a period, few countries may have experienced as great a short-term fall of export earnings as may occur in the future.

33. Another question arises of how to measure declines in export earnings, whether from the trend or from the preceding high point. Deviations from a downward trend show the fall from an average. However, this conceals the full impact of the decline, counting from the peak to the trough. If a country experiences a persistent contraction of its

[2] For a detailed appraisal of factors causing export declines and export instability generally, see IBRD, Economic Department, *The Commodity Problem*, 1964.

exports over a number of years, it will be in a difficult situation, even though the percentage of the yearly decline may appear quite small.

34. In countries where export receipts fluctuate over a relatively short period, if the government of a country conducts an anti-cyclical policy and has perfect foresight, it may take advantage of a period of above trend exports to build up reserves, and pay off short-term debts, and would thus be prepared to face a period of below trend exports. In such cases it would be justifiable to think in terms of decline from the trend. However, this policy behavior is not evident in most less developed countries. Periods of above trend exports are also periods of high consumption and investment expenditure and there is little set aside for a period of below trend exports. In such cases and in case of countries experiencing fluctuations over the medium-term, a measure of decline in export earnings based on maximum decline from a peak would portray the situation more accurately than would a measure based on decline from a trend.

35. Table 1 shows relative amplitudes and duration of maximum decline in export earnings, measured from a peak. Table 2 shows relative amplitudes and durations of periods of low export earnings from a linear trend of exports.

TABLE 1. RECENT SHORT-TERM DECLINES IN EXPORT EARNINGS FROM PEAK TO TROUGH, AND COMMODITY CONCENTRATION OF EXPORTS

Country	Period of Decline	Percentage Decline	Share of Two Principal Commodities in Total Exports
Uruguay	1956–59	54	77
Bolivia	1956–58	38	60
Sudan	1956–58	35	62
Turkey	1957–58	28	42
Colombia	1956–61	27	86
Pakistan	1955–58	25	64
Thailand	1957–58	22	57
Nicaragua	1955–58	22	58
Ethiopia	1957–58	21	64
Dominican Rep.	1957–59	19	63
Brazil	1956–62	18	60
El Salvador	1957–59	18	74
Costa Rica	1958–59	16	76
Honduras	1956–59	14	63
Ecuador	1960–61	13	77
Argentina	1960–61	11	70
Philippines	1958–60	11	52
China (Taiwan)	1955–56	4	49
Spain	1959–60	2	25
Venezuela	1957–58	2	91

Source: International Monetary Fund, *International Financial Statistics,* various issues.

TABLE 2. MAXIMUM PERCENTAGE SHORT-FALLS OF MERCHANDISE EXPORT EARNINGS FROM EXPORT TRENDS (1 TO 4 YEARS, CUMULATIVE), AND COMMODITY CONCENTRATION OF EXPORTS

	Maximum Percentage Short-Falls Below Trend					Share of Two Principal Commodities in Total Exports
	one year	2 years cumulative	3 years cumulative	4 years cumulative		
Uruguay	34	23	21	19	Venezuela	91
Sudan	26	17	8	7	Colombia	86
Turkey	23	8	7	5	Uruguay	77
Bolivia	22	13	12	9	Ecuador	77
Thailand	18	14	9	4	Costa Rica	76
Pakistan	16	14	10	8	El Salvador	74
Spain	15	13	10	7	Argentina	70
Costa Rica	15	5	2	2	Ethiopia	64
Dominican Rep.	15	10	1	2	Pakistan	64
Honduras	15	6	4	2	Dominican Rep.	63
Nicaragua	15	12	9	7	Honduras	63
Ethiopia	12	11	7	5	Sudan	62
Argentina	11	6	4	3	Bolivia	60
Colombia	9	6	5	4	Brazil	60
Ecuador	9	5	1	—	Nicaragua	58
China (Taiwan)	9	7	5	3	Thailand	57
Brazil	8	6	5	3	Philippines	52
Venezuela	8	4	1	1	China (Taiwan)	49
Philippines	8	4	2	1	Turkey	42
El Salvador	6	5	5	4	Spain	25

Note: Maximum cumulative short-falls were computed for consecutive 2, 3 or 4 years. Thus actual exports may not have fallen below the trend line for all the years considered.

Sources: Merchandise exports from IMF, *International Financial Statistics*, various issues. Trend computed from data from 1955 through 1962.

36. Fluctuations in export earnings over the *short term* are related to the commodity concentration of exports: other things being equal, the aggregate export value is likely to fluctuate more frequently and more sharply in a country whose exports consist mainly of one or two commodities than in a country with a diversified export structure. But the correlation is far from perfect, since other things are not equal. A petroleum exporting country with a 90% degree of concentration on one product, shows smaller fluctuations than an economy where two agricultural products account for 50% of total exports. It is necessary to consider not only how highly concentrated a country's exports are, but also the specific commodities involved, and how supply, demand and price of these particular commodities are likely to behave. The evidence shows that for many primary producing countries there has been a tendency for export earnings to fluctuate markedly and sometimes violently.

37. An example of *medium-term* export declines is provided by the postwar development in the export earnings of the countries depending on coffee, the second largest commodity, after petroleum, moving in international trade. The fortunes of the world coffee market decisively determine the flow of export income, and thus the capacity to import of some dozen countries in the tropical belt, including half of Latin America and a large part of Africa. The latest coffee cycle started early after the war, when supply was short and demand was recovering. The price of coffee rose sharply from the disastrously low level that had prevailed in the preceding two decades. Since there is a time lag between investment and output, supply lagged behind. The period of rising prices lasted until 1954, and then, as supplies caught up with and overtook demand, prices began to decline. For the last eight years, earnings from production and exports of coffee have been falling year-in year-out. In 1962, the value of world coffee exports amounted to $1.7 billion, compared to the postwar peak of $2.5 billion, in 1954. The tragic paradox of primary products economies is exemplified by the fact that the coffee countries produced and sold in 1962 a quantity which was 50 per cent greater than in 1954; and yet, their exchange earnings in 1962 were one-third smaller than eight years earlier. The cumulative loss of real income and foreign exchange sustained by the producing countries during these eight years was enormous, whichever way measured. The persistent pressures on their balances of payments led to severe strains on internal finances and inevitably had an adverse impact on the rate of capital formation and economic growth. The complete breakdown of the balances of payments was prevented only by the decision of the leading producing countries to withhold some of the excess supplies from the market. Table 3 shows world exports of coffee, by value, from 1950 to 1962. The data for 1963 are not yet fully available; over the last twelve months, coffee prices have staged a recovery and this will be reflected in the export earnings of the producing countries. It is far from certain how long the recovery will last.

38. How far does the experience of the recent past provide a guidance to the future? The problem of medium-term supply-induced fluctuations still exists in all its intensity, and it is unlikely to be solved until an advance is made in the systematic diversification of the production and export structure of countries heavily dependent on products experiencing medium-term production cycles and until these countries undertake some measure of international coordination of their investment programs and achieve further progress in their joint export sales strategies. Falls in exports caused by breakdowns of supply are likely

TABLE 3. COFFEE: WORLD EXPORT VALUES

(in millions of U.S. $)

	Brazil	Other Latin America	Africa	Others	World
1950	850	568	162	15	1,595
1951	1,039	666	240	28	1,981
1952	1,026	745	208	23	2,002
1953	1,090	915	386	59	2,450
1954	948	1,042	476	74	2,540
1955	844	957	349	30	2,180
1956	1,030	923	393	64	2,410
1957	846	945	424	75	2,290
1958	688	862	378	72	2,000
1959	774	766	374	46	1,960
1960	713	730	359	40	1,842
1961	710	671	317	52	1,750[a]
1962	643	743	(285)	(50)	1,721[a]

[a] Preliminary

Sources: International Coffee Study Group, Pan American Coffee Bureau, IBRD Economic Department.

TABLE 3A. EXPORT INDICES, QUANTITY AND VALUE, FOR COFFEE AND MAJOR COMMODITY GROUPS

(Base: 1950 = 100)

	Coffee[a]		Primary Commodities[a]		Manufactured Goods[a]	
	(quantity)	(value)	(quantity)	(value)	(quantity)	(value)
1950	100	100	100	100	100	100
1951	109	124	104	126	120	144
1952	110	126	102	108	119	144
1953	119	154	108	109	127	147
1954	99	159	112	119	132	149
1955	115	137	121	122	146	168
1956	131	151	131	134	161	193
1957	123	144	138	142	171	210
1958	125	125	135	131	169	206
1959	144	123	144	135	183	221
1960	147	115	155	146	207	255
1961	149	110[b]	164	151	213	264
1962	156	108[b]	n.a.	n.a.	225	284

n.a. Not available.

[a] Coffee figures cover the world; primary commodities' figures and manufactured goods' figures exclude centrally planned economies.

[b] Preliminary.

Source: Various issues of the United Nations Statistical Bulletin.

to continue. Similarly, unless developing countries' policies differ from the past, there will continue to be cases of export declines resulting from measures having a restrictive effect on export sales. On the other hand, violent business fluctuations, so significant in the prewar period, are not likely to recur.[3] Consequently, the intensity and duration of demand-induced declines of export earnings will most likely be less than they used to be. This does not mean however, that the problem has been solved. Cyclical variations in demand and in business activity in the major world industrial countries still exist, although their amplitude has been dampened; and these cyclical swings lead to alternating upward and downward multi-year price movements which affect all or most primary commodities simultaneously.[4] Considerable fluctuations in prices and in values of primary product exports, whether supply- or demand-induced, persist: so far, only moderate advance has been made in stabilizing world commodity markets.

39. In the context of the long-term relationship of various factors in the growth process, it is suggested in Chapter V that in a number of developing countries exports are likely to grow at a slower pace than income and investment. As a result, there is a tendency for imports to be concentrated increasingly on the most essential items. Also, demand for imports is very strong as a result of income growth targets. This is further intensified by expansionist domestic fiscal and monetary policies which are frequently pursued irrespective of the phase of the price cycle and of the state of external accounts. The classical adjustment mechanism such as that under the gold standard is no longer permitted to operate. Thus, although export fluctuations now may be less intense by themselves than in some periods in the past,[5] they occur in a situation in which the balances of payments of the developing countries are already fairly strained and where the automaticity of the adjustment process has ceased.

[3] At least, IBRD, IDA and IFC operations are based on the assumption that they will not recur. (IBRD, *World Bank, IFC and IDA Policies and Operations,* April 1962.)

[4] In the postwar period, a commodity price cycle can clearly be established. The Commodity Boom lasted from the end of the war through the mid-1950's. It was followed by the Commodity Slump in the years 1956–1962. The Price Recovery started in late 1962. (See *The Commodity Problem, op. cit.*)

[5] The postwar fluctuations in prices and in values of primary product exports were considerably smaller than in the interwar period. They were more comparable to the experience before the First World War. (J. Marcus Fleming and Gertrud Lovasy, *Fund Policies and Procedures in Relation to the Compensatory Financing of Commodity Fluctuations,* IMF Staff Papers, Vol. VIII, November 1960.)

(b) Swings in capital flows

40. Writing in 1927 of international capital flows, F. W. Taussig described their ebb and flow in these words:[6]

> In fact, however, the loans from the creditor country, so far from being made at the same rate year by year, begin with modest amounts, then increase, and proceed *crescendo*. They are likely to be made in exceptionally larger amounts toward the culminating stage of a period of activity and speculative upswing, and during that stage become larger from month to month so long as the upswing continues. With the advent of a crisis, they are at once cut down sharply, even cease entirely. The interest payments on the old loans thereupon are no longer offset by any new loans; they become instantly a net charge to be met by the borrowing country. A sudden reversal takes place in the debtor country's international balance sheet; it feels the consequences abruptly, in an immediate need of increased remittances to the creditor country, in a strain on its banks, high rates of discount, falling prices. And this train of events may ensue not once only, but two or three times in succession. After the first crisis and the first overturn, the debtor country is likely to recover. Within a few years loans from the creditor country may be resumed, another period of activity and speculative investment sets in, the old round repeated, until finally another crisis comes and another sudden overturn in the balance of international payments. The final outcome, when this long period of irregular movements has run its course, is that the debtor country has more to remit on interest account than to receive on principal account, and that the remittance is effected by an excess of merchandise exports over imports. The history of the United States and of Argentina, both of which were typical borrowing countries at similar stages in their economic development, shows these successive waves of international borrowings, repeated crises, deviations from the simplified process. . . .

41. The history of international capital flows up to the Second World War suggests two important characteristics of such flows. First, a considerable proportion of capital inflow into developing countries was speculative in nature. Private investors in the major capital markets were not always aware of conditions in distant lands and invested in numerous ventures which did not have a sound basis. Secondly, these capital flows were extremely sensitive to the ups and downs of the business cycle. During a recession, the liquidity problem was further aggravated by cessation or even the reversal of capital flows.

42. The flow of foreign capital into developing countries presents a

[6] F. W. Taussig: *International Trade*, New York, 1927 (reprinted 1941).

different picture today. Private direct investment abroad is based on much more information than in the earlier periods, and investment decisions are much better prepared. National and international lending agencies are now large suppliers of foreign investible funds and these are lent mainly for productive purposes.[7] While downward swings in capital inflow into individual developing countries have not been absent in the postwar period, by and large such capital inflows have tended to compensate for declines in export receipts or, at a minimum, they have maintained a fairly stable trend in the majority of countries.

43. It is true by definition that a country would have no debt servicing problem if capital inflow were always sufficient to allow it to meet its debt servicing obligations while at the same time maintaining imports at a level which the country considers the minimum acceptable. However, despite the stability in the aggregate flow of capital recorded thus far, for the great majority of countries it is not in present circumstances possible to forecast for a longer period the prospective levels and fluctuations of capital imports and the range of terms on which they will be available.

44. There are, however, some forms of capital inflow on which a developing country can rely with a fair degree of assurance, at any rate for the near future. For example, disbursements on project loans will continue so long as work on the project goes forward and any other conditions of the loan are complied with. Suppliers' credits are usually available unless the country is considered to be in very severe balance of payments difficulties; but the terms may become progressively disadvantageous as the liquidity crisis approaches. On the other hand, private direct investment will necessarily tend to fluctuate in response to changing conditions in both the capital importing and the capital exporting countries. But since a considerable fraction of foreign private capital in developing countries is now invested in manufacturing for the domestic market, this will exercise a stabilizing influence: the domestic markets for manufactures in the developing countries tend to expand at a rapid and fairly steady pace whenever the over-all growth rate is satisfactory. Above all, investment loans from international agencies are not sensitive to short-run fluctuations in the balances of payments. Loans and grants provided by governments in the capital exporting countries behave in an anticyclical fashion. But there are other causes of instability in government-to-government flows, largely political in nature.

45. The preceding paragraphs have dealt with possible downswings in

[7] Excluded from consideration in this study are resource flows which are not directed to financing economic development.

the inflow of foreign capital. Yet another source of disturbance, which can be of great importance in some countries in particular periods, is sudden outward movement of domestic capital. This phenomenon is caused by a number of factors, primarily of political and monetary nature. Countries which have experienced bursts of inflation and successive devaluations would be particularly exposed to capital flight. Despite the fact that these perverse capital movements from the less developed countries to the developed ones have been frequent, not enough is known about their magnitude. But it is highly likely that this outward flow has been substantial and that the assets held abroad are very large.[8] This potential source of finance of capital formation in the developing countries has not yet been tapped.

(c) *Emergency or inflation-induced import increases*

46. Irregular increases of imports may be destabilizing to the balance of payments. Such variations may be caused by a number of factors.

47. Crop failures and bad harvests may lead to significant increase in the import of food and other agricultural commodities. While, in terms of the domestic consumption of these commodities, these increased imports may be marginal, in the balance of payments they may lead to large swings. And such swings have been an important feature of the balance of payments of a number of developing countries during the postwar period.

48. Public Law 480 of the United States Congress authorizes the sale of surplus agricultural commodities in exchange for local currencies of the importing country and, in certain cases, outright grants. Supply of agricultural commodities under this law has, in effect, provided an insurance against balance of payments crises induced by bad harvests. It is an important form of compensatory financing and a partial substitute for reserves of foreign exchange and gold. Had the U.S. agricultural supplies not been available to many developing countries on easy terms, the balances of payments of these countries would have been much more strained than was actually the case. Furthermore, their whole growth process would have been seriously undermined.

49. Another important source of import increases may be domestic inflation, within the framework of pegged exchange rates. This has been

[8] See, for instance, the study submitted by the International Monetary Fund to the United Nations Conference on Trade and Development: *Flow of Private Capital from Developing to Developed Countries* (E/CONF/46/20 dated January 9, 1964).

a familiar and fairly widespread phenomenon in the developing countries during the last two decades.

50. There is little indication that these causes of import increases will not recur in the future. Agricultural production has in many developing countries lagged behind domestic demand which has risen rapidly in response to growth in income and in certain cases as a result of subsidized food prices. Consequently, the frequency and magnitude of import increases may well become greater in the future unless measures are taken to increase domestic output by applying as modern and efficient methods of production as possible. Similarly, although there is an increasing awareness in the developing countries of the consequences of inflationary finance, it would be too optimistic to expect that inflationary pressures will not recur. It is becoming increasingly recognized, however, that fixed exchange rates in the face of continuing inflation are bound to give rise to excessive imports, and therefore flexible exchange rate practices may have to be applied. Even if some such mechanism is used, it is unlikely to work efficiently unless the rate of domestic monetary expansion is kept within limits. Also, unless flight of capital abroad is reduced (para. 45), this by itself would greatly disturb the foreign exchange markets.

3. Offsetting Variables (Compensating Variables)

(*a*) *External reserves*

51. During the postwar years, use of foreign exchange and gold reserves has been one of the ways of adjusting to a period of depressed export earnings or short-term increases in imports. A familiar rough indicator of their adequacy is the ratio of reserves to the value of a year's imports. Ideally these ratios should be net of short-term claims. In practice such an attempt frequently runs into many statistical difficulties.

52. Reserves comprise gross official gold holdings, convertible foreign exchange and the country's gold tranche position with the International Monetary Fund. So defined present reserves are shown, expressed as a percentage of current imports, in Table 4 under the title Unconditional Liquidity.

53. Two fundamental changes in the level and complexion of reserves have taken place in the postwar period. First, with emphasis on economic development and growing need for investible resources, the opportunity cost of maintaining foreign currency and gold reserves has

TABLE 4. CONDITIONAL AND UNCONDITIONAL LIQUIDITY AS A PERCENTAGE OF IMPORTS

Country	Unconditional Liquidity[1]	Country	Conditional Liquidity[2]
Thailand	100	Bolivia	27
Malaya	94[3]	Afghanistan	26
Israel	86	Pakistan	25
Burma	77	India	24
Ethiopia	72	Mexico	20
Spain	66	Ethiopia	18
Sudan	64	Brazil	17
China (Taiwan)	61	Burma	17
Nigeria	60[4]	Honduras	15
Jordan	57	Morocco	15
Ghana	52	Argentina	14
Afghanistan	47[5]	Ceylon	13
Pakistan	45	Iran	13
Mexico	39	Costa Rica	12
El Salvador	38	Ecuador	12
Morocco	37	Nicaragua	12
Nicaragua	37	Spain	12
Iran	36	Turkey	12
Ecuador	34	El Salvador	11
Turkey	30	Ghana	11
Ceylon	29	Nigeria	11
Tunisia	29	Philippines	11
UAR	29	Yugoslavia	11
Korea	27	Chile	10
India	26	Thailand	10[10]
Peru	21	Colombia	8
Colombia	20	Jordan	8
Honduras	20	Peru	8
Costa Rica	17	Sudan	7
Chile	15	Israel	5
Philippines	13	Malaya	5
Argentina	12	UAR	3
Brazil	11[8]	China	[9]
Bolivia	8	Ivory Coast	[7]
Yugoslavia	8	Korea	[7]
Ivory Coast	[6]	Senegal	[7]
Senegal	[6]	Tanganyika	[7]
Tanganyika	[6]	Togo	[7]
Togo	[6]	Tunisia	[7]

[1] *Monetary Reserves and IMF Gold Tranche Position as % of Imports:* Gross official gold, convertible foreign exchange reserves and the country's gold tranche position with the IMF (generally as of June 1963) as a proportion of imports, c.i.f. for 1962. Reserves are gross in the sense that no allowance is made for short-term liabilities. Reserves of non-official entities are not taken into account. IMF gold tranche position is added to the country's reserves on the theory that drawings within the gold tranche are almost automatic. It is not possible to segregate non convertible reserves in many countries.

[2] *Unutilized IMF Credit Facilities as % of Imports:* In addition to limitations on the amounts which the IMF can permit to be drawn in any given year without waiver, there is an over-all limit of 200 per cent of quota on the amount of any member's currency which the Fund can hold without a waiver. In February 1963, the IMF decided to provide a drawing facility, normally up to 25 per cent of quota, to compensate temporary short falls in total export receipts of primary producing countries. The Fund has stated its willingness to waive the limit on Fund holdings of 200 per cent of quota, where appropriate, to implement this recent decision. The new facility can be regarded as increasing *pro tanto* the total amount that can normally be drawn under suitable circumstances. The calculation of "unutilized IMF credit facilities" has been made on the basis that holdings can rise to 225 per cent of quota. Existing currency holdings and the gold tranche position are subtracted from 225 per cent of quota. This is a partial measure of discretionary compensatory finance available under specified conditions. These conditions become progressively rigorous for transactions in successively higher tranches. It is a partial measure because it does not take account of borrowing from foreign commercial banks and bilateral public sources of compensatory finance, possible for some countries.

[3] This computation refers to the old Federation of Malaya as distinct from the present Federation of Malaysia. We have assumed that 65 per cent of the monetary reserves of the Currency Board belong to the Federation of Malaya.

[4] Gold and Foreign Exchange Reserves at March 1961 and Imports 1960. Source: IBRD Economic Report.

[5] Source: IBRD Economic Report.

[6] Participant in currency arrangement involving pooled reserves.

[7] Subscription to IMF not yet complete.

[8] Excluding gold pledged to foreign commercial banks.

[9] Quota originally established for all China i.e., including the Mainland.

[10] Thailand is exempted from the general requirement that an initial par value be established before drawing on IMF. Drawings are permitted under conditions determined by IMF. The agreed accounting value is used in these transactions.

risen. A number of countries have partly run down such reserves for financing economic development, while others have spent their reserves on excessive imports caused by inflationary pressures. Secondly, provision of liquidity through the International Monetary Fund has to a certain extent reduced the need to maintain large reserves of gold and convertible foreign currency. The lack of flexibility introduced by the first development has been partly compensated by the second.

54. Like other variables discussed here a country's own reserves by themselves are not a complete indicator of its ability to weather a liquidity crisis. Specifically, in this context one has to consider the compensatory finance available from international agencies and private sources. This is discussed below.

(b) Compensatory finance

55. The operations of the International Monetary Fund have been of great importance in assisting developing countries to cope with their balance of payment disequilibria. Recently, the Fund introduced a new compensatory facility to offset fluctuations in export earnings. The last column in Table 4, "Conditional Liquidity," shows the scope of potential IMF operations, calculated on the basis that Fund holdings of country currencies cannot exceed 225% of quota. Such dawings are conditional and require substantial justification, the conditions becoming increasingly stringent the greater the existing drawings in relation to quota.

56. The most important source of compensatory finance in some cases since the war has been lending by public agencies in the developed countries, particularly the United States. This balance of payments support has been provided both to offset short-run difficulties and to meet situations where depressed earnings have lasted longer (see paras. 31 and 37).

57. Another form of compensatory financing is short-term borrowing in the private market. Such borrowing facilities were readily available up to 1929 to many countries in balance of payments difficulties. Short-term capital movement between developed countries has, of late, reappeared as a device of adjusting to short-term fluctuations in the balance of payments. Among the developing countries, the case of a developing country is known which has on several occasions, during the postwar period, succeeded in borrowing from the private market to weather temporary difficulties.

58. Compensatory financing is an effective substitute for the maintenance of large reserves of gold and foreign exchange. As a general rule,

countries which enjoy close and harmonious relations with the major financial centers may be regarded as having a second line of reserves. Although the drawing facilities provided by the International Monetary Fund are a definite advance in the provision of greater liquidity, most developing countries do not at present have ready access to the private short-term capital market.

59. The flow of short-term private capital from developed to developing countries has had two features. First, in many cases it has flowed from a developed country to a present or a former dependent territory, largely through the branches of the developed countries' financial institutions. These institutions have during the course of time built up an expertise in such transactions. Secondly, where such conditions did not prevail, lenders charged a high premium for risk. Such lending, in effect, added to the possible future threats to liquidity. And when compensatory finance, whether from this or from other sources, has been contracted on short term, while the export declines later proved to last a number of years (e.g., para. 37), an overhang of debt with short maturities was created. This overhang is today the major threat to liquidity in several very important developing countries.

(c) *Compressible imports*

60. The compressible part of the import bill serves as an offsetting variable. It has not been possible in this study to classify uniformly the imports in order of their compressibility. Which imports can be reduced? This depends largely on the pattern of production and demand in each country. Some countries may produce most of their manufactured consumer goods domestically but import food and raw materials. Others may be largely self-sufficient in food and some raw materials but import consumer goods. Can the imports of the latter be regarded as compressible and not those of the former? And how much hardship is a government able and prepared to impose on the population? These questions have yet to be answered. The historical approach would require the study of any correlation that may have existed in the past between fluctuations in extenal receipts and in imports—either concurrently or with a time lag. Furthermore, an investigation will have to be made of the patterns of import reductions in times of difficulty and whether these patterns tend to change in the process of economic development.[9] Judgment could then be made as to whether the import

[9] An attempt in this direction for a small sample of countries was made in the earlier study. (Dragoslav Avramovic, *Debt Servicing Capacity and Postwar Growth in International Indebtedness, op. cit.*, p. 140.)

policy in the future would be similar or different. A rough indicator which may be used to indicate the degree of compressibility is the proportion of consumption goods, other than food, in total imports. The assumption—not yet confirmed—is that developing countries would rather cut down on this item, at least over the short term, than resort to a reduction of imports of food, raw materials, fuels and capital equipment. Table 5 summarizes this information for a sample of countries.

TABLE 5. IMPORTS OF NON-FOOD CONSUMER GOODS, 1961
(selected countries)

	As % of total merchandise imports 1961
Honduras	35
Thailand	31
Ethiopia	29
Ecuador	28
Costa Rica	27
Nicaragua	25
El Salvador	25
Venezuela	25
Dominican Republic	25
Sudan	24
Bolivia	21
Colombia	18
Uruguay	16
Turkey	12
Argentina	12
Philippines	12
Pakistan	9
Brazil	6
Spain	6

Sources: Imports (c.i.f.) data: IMF, International Financial Statistics. Imports of non-food consumer goods: U.N. Yearbook of International Trade Statistics; country's own trade statistics; OEEC Foreign Trade by Commodities (exports), Supplement January–December 1961; and FAO Yearbook of Forest Products Statistics 1962.

61. An alternative approach to the problem of import compressibility is to focus on the inter-relationship of the major income flows in the economy and their likely behavior in periods of export declines. It can plausibly be argued that a certain compensatory effect on the demand for imports will occur automatically as exports decline. Consequently, the higher the proportion of income generated in the export industries, the greater should be the spontaneous reduction in the demand for imports as exports fall. (Table 5a shows the proportion of

TABLE 5A. INCOME GENERATION IN EXPORT INDUSTRIES

(selected countries)

	Exports as a percentage of gross domestic product, around 1960 (1)	Population as a percentage of the population of all developing countries (2)
Malaya	50.2	.6
Rhodesia and Nyasaland	42.8	.6
Venezuela	32.5	.5
Ceylon	30.4	.7
Panama	27.0	.1
Peru	24.3	.7
El Salvador	23.4	.2
Costa Rica	22.5	.1
Honduras	20.6	.1
Ghana	19.0	.4
Guatemala	19.0	.3
Paraguay	18.8	.1
Sudan	17.9	.8
Ecuador	17.3	.3
Thailand	16.1	1.9
Colombia	16.0	1.0
Chile	14.6	.5
Mexico	14.2	2.5
Nigeria	13.7	2.4
Israel	13.4	.1
China (Taiwan)	12.6	.7
Argentina	11.9	1.4
Philippines	10.5	2.0
Ethiopia	9.8	1.4
Turkey	7.9	1.9
Brazil	7.3	5.1
Pakistan	6.9	6.5
India	5.7	30.8

1. Percentages in Column (1) are exports of goods and services in 1960–61 or 1959–60 as a proportion of gross domestic product at current market prices in the same period except in the following cases:

India: exports of goods and services in 1959–60 as a percentage of net domestic product in 1959–60.

Mexico: exports of goods and services in 1960–61 as a percentage of gross national product in 1960–61.

Nigeria: exports of goods and services in 1957 as a percentage of gross domestic product in 1957.

Ethiopia: exports of goods and services in 1959 as a percentage of gross national product in that year.

Peru: figures relate to 1959 only.

Figures for domestic and national production are based on data from U.N., *Yearbook of National Accounts Statistics, 1962*, and IBRD Economic Reports.

Figures for exports are from the U.N. document and IMF *Balance of Payments*.

In certain cases dollar values of exports had to be converted into local currency. This has been done at the average exchange rate for the year shown in IMF, *International Financial Statistics*.

2. Percentages in Column (2) are based on population estimates for mid-1962 from U.N., *Population and Vital Statistics Report, data available as of July 1, 1963* (Statistical Papers, Series A, Vol. XV, No. 3).

exports in total income for a sample of countries.) The assumption is that the affected countries will not attempt to offset the impact of the export decline by expansionary fiscal, monetary and price-support policies; if they attempt to do so, the automatic adjustment will not take place and instead selective import cuts will have to be made as indicated in the preceding paragraph. In reality, both processes of adjustment are likely to take place, and their relative importance will vary from country to country; but it is probably safe to say that the majority of the developing countries, and certainly those with larger populations and smaller export/GDP ratios, now prefer to resort to selective import reductions as a method of adjustment to export falls.

62. It may be argued that the process of economic development tends to introduce an element of rigidity in the import structure of developing countries. Expansion of the industrial base requires expanded imports of fuels, raw materials and capital goods. Reduced imports of these goods may cause unemployment and affect the momentum of growth. Reduced imports of staple foods is rendered extremely difficult; imported food, in most cases, serves to supplement local supplies to urban centers whose population has grown rapidly in the postwar period. Experience suggests that there are severe limitations to the possibilities of reducing food supplies to these centers.

4. Rigid Variables

(*a*) *"Minimum tolerable" level of imports*

63. The preceding analysis has touched on various aspects of the inflexibility of the import structure. What degree of inflexibility will be present in particular cases will depend not only on the shape and pattern of development, but also on the degree of rigidity with which income growth targets are pursued. While these factors will necessarily vary from case to case, an insight into their effects would be obtained if a detailed analysis was made of the patterns of adjustment of particular countries to declines in the capacity to import (see para. 60). It is in deciding the composition of minimum required imports that developing countries encounter most serious problems of choice.

(*b*) *Debt service—interest*

64. Interest on foreign debt is the most rigid element of a country's balance of payments. Interest is contractually fixed and is a recurring charge on the economy regardless of the borrower's fortunes. Fixed-

interest debt in most countries consists today largely of public and publicly-guaranteed debt. Consequently, any failure to pay this recurring charge adversely reflects on a government's ability to save and to transfer savings, and thus inevitably undermines its credit standing.

65. The question arises whether service on public and publicly-guaranteed fixed-interest debt is the only rigid element in the flow of service payments. Equally rigid, from the viewpoint of the balance of payments, is the service on loan capital borrowed by private parties in the debtor country. On the other hand, it has been a fairly widely accepted assumption that returns on equity capital fluctuate with export earnings.

66. If foreign capital is invested in export industries, one would expect that profits and dividend remittances would fluctuate *pari passu* with, and in the same direction as, the country's export earnings. As a matter of fact, these fluctuations should be even more intense, since profits generally show wider amplitude of movement than gross sales. This hypothesis was tested on a sample of developing countries.[10] The results indicate that in the majority of countries in the sample there was no such automatic tendency for profits and dividends to fluctuate with fluctuations of export earnings. This is an unexpected and yet logical result. A partial explanation seems to be a change in the pattern of foreign investment. The major concentration of foreign capital in the earlier periods of economic history was in production for exports (so-called *enclave* investments). Consequently, profits moved parallel with export earnings. Today, foreign direct investment in less developed countries flows into two distinct directions. First, there are still countries where foreign private capital is invested in extractive industries, e.g., petroleum, aluminum, other minerals. This flow continues to account for a major part of private direct investment in the less developed countries. In these cases, profits fluctuate as exports fluctuate. There is, however, a second set of countries which are establishing industries producing import substitutes or completely new goods that are sold on the domestic market. Foreign private investment has been playing a considerable role in this development, not only with respect to consumer goods, but also in the fields of capital goods and basic chemicals. Domestic demand for these products is increasing rapidly and without much fluctuation. Consequently, profits also tend to increase as the volume of domestic sales expands; and the less fluctuations there are in

[10] See Essay I in Volume III of this study—*Essays*—(S. Shahid Husain: *Relationship between the Fluctuations in Export Earnings and Direct Investment Income Payments—A Statistical Test*).

this rising domestic market, the smaller will be the fluctuations in the profits earned by foreign-owned companies.

67. The implication of this development is that a change in the economic structure, which will have favorable long-term effects, has been accompanied by an increase in the short-run rigidities in the balance of payments of these countries. Their exports still consist of primary products which continue to fluctuate, while profits of foreign-owned companies, some of which are liable to be transferred to the parent organizations, originate in a rising and barely fluctuating market. And the problem is further complicated if inflationary pressures operate in the developing country while its exchange rate is kept overvalued. Profits earned on sales on the domestic market increase as a result of inflation; the dollar value of profit remittances also rises *pari passu* with inflation since the exchange rate is overvalued; and these remittances have to be paid out of export earnings which are depressed partly as a result of such overvalued rate.

68. But apart from distortions introduced by peculiarities of policy as indicated above, there is the structural problem. In Chapter V it will be shown that the proportion of interest and dividend payments to export earnings will increase during the initial stages of economic development of many countries if this development is financed by capital inflow to any considerable extent and if there are limits to the expansion of exports they can attain in the intermediate term. The net effect of this would be increased significance of a relatively rigid factor in the balance of payments of developing countries. And the higher is the proportion of loan capital in the total capital inflow; the greater is the proportion of domestically-oriented industries in the total equity stock held by foreign investors; and the greater are the constraints on international demand for primary products and the greater are the fluctuations in prices of these products—the more significant will be this element of rigidity. This "rigidity phase" is temporary if the growth-cum-debt process succeeds: sooner or later, the developing country which industrializes will develop exports of manufactures for which international demand rises rapidly and without sharp fluctuations. In the meantime, however, the rigidity of interest obligations (and of other similar flows) contrasts sharply with the volatility of external earnings of developing countries.

(c) Debt service—amortization; "cash squeeze" case

69. There has been considerable dispute as to whether the amortization element in debt service should be counted as part of the debt serv-

ice "burden" of a developing country. On the one hand, it is the exception rather than the rule that the less developed countries are expected to reduce the absolute level of their debt in the near future, which would happen in the case of net repayment. The industrialized countries have shown a continuing interest in economic development of the less developed countries. Furthermore, as growth accelerates, the profit rate in the developing economies should surpass that in the countries that are already industrialized, as organization, management, infra-structure facilities and skills improve. This upward shift in the marginal efficiency of capital in the developing countries should lead to an expansion of capital inflow into these countries. On the other hand, capital providing countries and institutions are under no obligation to extend new loans offsetting or more than offsetting payments due on the loans of the past. Similarly, private capital flows are liable to fluctuate. Thus, a less developed country may from time to time find itself making net repayment of external debt, even though the general tendency is for the debt to rise.

70. For purposes of assessment of balance of payments vulnerability to short-run crises, the question of whether existing debt will or will not be rolled over at all times should be considered as part of the general problem of predicting foreign capital inflow. The contractual obligation to pay amortization exists irrespective of what happens to other items in the balance of payments. While, in general, new capital inflows may tend to outweigh amortization liabilities, the irony of the situation is that precisely when a country is facing liquidity difficulties, creditors, faced by unpaid or delayed bills, may be compelled to refrain from rolling over old debts and extending new credits.

71. The most severe liquidity crises are caused by the concentration of maturities in a short period. If the debtor country has to repay a large proportion of its debt within a few years; if no foreign exchange reserves have been accumulated to enable the retirement of the debt; and if the creditors are not willing to undertake the refinancing of the debt—liquidity difficulties will be acute. A vicious circle of a sort exists. Creditors may be reluctant to reschedule the debt over a longer period because of their past experience: rescheduling would not help much if the debtor were to pile up new short term debts as soon as the existing ones have been funded. On the other hand, the debtor country, if it is unable to space over time the maturities, is almost compelled to resort to more short-term borrowing, frequently at prohibitive interest rates. Its debt structure worsens further. Breakdown is avoided if the debtor country drastically curtails its imports and thus releases resources for

the liquidation of short-term debts; this helps restore its credit abroad, but in the meantime the process of economic growth is arrested. Alternatively, creditors may agree to postpone collections, and this provides a breathing spell. But if the postponement is only for a few years, a new liquidity crisis occurs in short order. This succession of crises inevitably affects the flow of long-term capital that is needed for development. And it may happen that developmental returns to new investment are high, but these investment opportunities cannot be exploited because the debt servicing problem at present is acute. The debtor country may be an excellent credit risk over the long term, and at the same time an extremely poor risk today.

72. The number of countries where unfavorable debt structure is the main reason for debt servicing difficulties is limited, half a dozen or so. On the other hand, this group includes several very important international debtors, some of which, judging by their postwar record of economic growth and structural change, may be in the forefront of development tomorrow. The solution of their "cash-squeeze" problem would help remove a major obstacle which stands in the way of a possible rapid accumulation of capital in these countries assisted by new capital inflow. But the solution is unlikely to prove lasting unless an advance is made in controlling the factors responsible for the financial crises that have been experienced.

73. The causes of unfavorable debt structures are complex and interrelated. Four of them can easily be singled out:

(a) In cases where export declines occurred, the affected countries usually resorted to borrowing abroad, mostly on short-term, to compensate for the fall in exchange receipts. If a quick recovery of exports followed, these short-term loans could be repaid on time. But when the export decline was more persistent (e.g., in the case of coffee producing countries—see para. 37), quick liquidation was much more difficult. Creditors usually agreed to extend the repayment terms, but only for a few years. Consequently, a heavy overhang of such "compensatory" indebtedness has remained in several cases.

(b) Paradoxically, an overhang of short-term debt was incurred in some cases in the periods of export booms. Too optimistic expectations regarding the duration of high prices, coupled with imperfections of the monetary mechanism and of monetary policies, have occasionally led to excessive spending and thus to excessive imports.

(c) Much of postwar financing of purchases of capital equipment,

particularly industrial machinery, was, and still is, contracted at medium term. These medium-term credits have been extended generously by the industrialized countries, concerned with the promotion of their export trade in competition with each other. Since the capital-importing countries were unable to finance the purchases of equipment out of long-term money borrowed in the world capital markets, they resorted to contracting medium-term credits as an inferior but easily available alternative. These medium-term credits account for a large part of international indebtedness today, and they weigh particularly heavily in the debt structure of those developing countries which have undergone a structural change since the war by expanding substantially their stock of fixed capital in the industrial sector.

(d) A number of developing countries have at one time or another experienced inflation-induced increases in imports (see paras. 49 and 50), and some of them are still in the midst of most serious inflationary pressures. Unless these pressures are accompanied either by ruthless import controls or by flexible exchange rate practices, excess demand inevitably spills over into extra imports. If sufficient foreign exchange reserves are not available, imports are bought on credit, frequently short- and medium-term. Furthermore, if monetary expansion has been accompanied by acceleration of investment—quite frequent phenomenon in the early stages of inflation—additional imports of capital goods join the stream of additional imports of consumer goods and raw materials. After the inflationary spurt is over, the country finds itself saddled with much short- and medium-term debt. And, of course, all the four causes tend to reinforce each other in certain periods. But whatever the precise causative links and interactions, the problem of unfavorable debt structure is there with its consequent impact on a country's creditworthiness over the short term.

74. Table 6 shows, for a selected sample of countries, the proportion of public and publicly-guaranteed debt[11] repayable over the next five years. Also shown are the proportion of external earnings absorbed by debt service (amortization as well as interest)[12] in a recent year, the ratio of foreign exchange reserves to imports in a recent year and the recent rate of export growth. The reasoning underlying the table is as

[11] Original maturity of one year and over.

[12] On public and publicly-guaranteed debt with original maturity of one year and over.

TABLE 6. DEBT STRUCTURE, PUBLIC DEBT SERVICE RATIOS, EXCHANGE RESERVE RATIOS AND EXPORT GROWTH RATES (SELECTED COUNTRIES)[a]

Country	(1) Scheduled amortization over the next five years as percentage of outstanding debt as of 1962	(2) Public debt service as percentage of exports of goods and services 1962	(3) Foreign Exchange Reserves as percentage of imports, 1962		(4) Annual Rate of Growth in export volume, 1950's and recent years
			Unconditional Liquidity	Conditional Liquidity	
Latin America					
Brazil	n.a. (very high)	20[b]	11	17	0.4– 4.2
Argentina	n.a. (very high)	22[b]	12	14	1.3– 3.9
Costa Rica	47	9	17	12	3.6– 7.9
Chile	44	25	15	10	6.9– 4.1
Colombia	44	11	20	8	1.4– 3.1
Peru	41	7	21	8	6.7– 6.8
El Salvador	40	3	38	11	n.a.– 9.9
Nicaragua	38	5	37	12	7.4– 1.5
Ecuador	36	8	34	12	8.6– 6.1
Honduras	21	3	20	15	0.5– 3.0
South Asia and Middle East					
Israel	57	29	86	5	16.3–19.0
Iran	56	9	36	13	n.a. (high)
India	24	9[b]	26	24	1.4
Pakistan	23	7	45	25	n.a.
East Asia					
Philippines	56	3	13	11	4.6– 3.1
Burma	43	n.a.	77	17	3.2– 0.4
Ceylon	43	1	29	13	1.9– 1.5
China (Taiwan)	40	5	61	n.a.	9.4–10.6
Thailand	38	3	100	10	4.4– 6.4
Malaya	18	1	94	5	3.5– 5.0
Africa					
Ethiopia	42	4	72	18	6.9– 2.6
Nigeria	30	2	60	11	3.7– 4.3
Sudan	28	9	64	7	4.5– 5.2
Southern Europe					
Turkey	59	17	30	12	n.a.
Spain	50	2	66	12	5.5– 9.1

[a] Countries are ranked within regions according to how unfavorable their debt structure is (Column 1). This is not necessarily a ranking which indicates the gravity of the liquidity problem.

[b] Substantially higher in 1963.

Sources: Column 1: IBRD, Economic Department, Statistics Division
Column 2: Table 7, Chapter IV of this study
Column 3: Table 4, Chapter III of this study
Column 4: Table 9, Chapter V of this study

follows. The higher the proportion of debt repayable over the next five years (Column 1) and the higher the absorption of current exchange earnings by debt service (Column 2), the more difficult is the liquidity problem. But if the exchange reserve ratio is high (Column 3), some cash for meeting the maturities is available; and if exports grow rapidly (Column 4), there is some elbow-room for handling the liquidity problem and also, the creditors may be more ready to roll-over the maturities when they know that the flow of foreign exchange is increasing rapidly. Although the table may help identify the most obvious "cash-squeeze" countries, no definitive conclusions with respect to individual countries' liquidity position should be drawn from the table. Not only are the statistics too rough and incomplete, but even the methodological framework for analysis of individual country cases ought to be different. An estimate of all prospective debt service liabilities for the next few years should be worked out, to include, in addition to public debt service, commercial arrears as well as other private obligations for which public authorities have approved a transfer guarantee. Against this, all prospective cash availabilities in foreign exchange should be estimated. Only such a comparison would indicate the severity of the "cash squeeze," since only then would it be possible to analyze what level of imports the country could finance after it has met its debt service. Would such imports be above or below the "minimum tolerable level"? The next step in the analysis could consist of estimating what additional imports would be required if the process of capital formation were to be resumed in accordance with the country's capacity to carry out good investment projects. At this point the liquidity and the growth analyses would merge into one whole. This two-step analysis is not illogical in view of the fact that we are dealing with a developing debtor country.

5. Inter-Relationships among the Liquidity Variables

75. The preceding review shows the complexity of the liquidity problem. The number of variables is large and our knowledge of their likely behavior is still inadequate. No single variable by itself is sufficient to permit a complete analysis. Conceptually, it is possible to combine relevant variables into a meaningful framework. A simple framework for handling the "cash-squeeze" cases is given in the preceding paragraph 74; a somewhat more comprehensive attempt which permits a simultaneous assessment of various factors for all cases is suggested in one of the essays in Volume III of this study.[13] Behavior of the variables, how-

[13] Jan de Weille: *A Short-Term Liquidity Indicator,* Essay II.

ever, needs further investigation, and hence the quantitative formulation in the essay is restricted to illustrations. The present state of knowledge does not permit satisfactory handling of all variables, particularly of the compressible part of imports, and their obverse, the minimum tolerable level of imports. The final choice of a country facing liquidity difficulties is between the minimum tolerable level of imports and debt servicing. In this, as in many other respects, there is an analogy between an individual and a country. For the individual also, when his income falls, the choice is between paying his debts and meeting minimum subsistence expenses. The question for him, as for a country, is how far the belt can be tightened. And the analogy can be extended further. Most developing countries are primary product exporters; and in the majority, most of their primary exports consist of agricultural products. Demand for these products fluctuates, and so do prices; while supply exhibits, in response, continuing sequences of over- and underproduction, which in turn aggravate the tendencies towards instability of prices and of incomes.[14] Among individuals, threats to liquidity are most frequently encountered by those engaged in agricultural production, since their sales fluctuate most while their borrowing requirements are greatest because their initial income level is lowest. Among nations, it is the developing countries—primary producers—which are most exposed to the liquidity problem, and for the same reason.

[14] *The Commodity Problem, op. cit.*

Chapter IV Debt Service Ratio

1. Rationale

76. The preceding chapter has already made use of the debt service ratio (para. 74 and Table 6), this familiar and most frequently used rule of thumb in appraising creditworthiness of borrowing countries. The ratio signifies the proportion of foreign exchange earnings on current account (i.e., exports of goods and services) absorbed by public debt service (i.e., both interest and amortization). The higher this proportion—that is, the higher the ratio—the greater is considered to be the pressure of debt service on the debtor's economy. The use of this concept has been criticised, even by those who have been using it, as an inadequate measure of debt servicing burden. And yet, the ratio has shown strange powers of survival. The reasons are many, but three stand out. First, it is a seemingly simple and easily understandable relation—debt service against exports. Secondly, it can be computed on a firm statistical basis—it does not require the use of national accounts with all the guesses involved in their compilation. Thirdly, economic analysts who have been aware of the imperfections of the ratio have failed to suggest an alternative. In the absence of a comprehensive indicator of debt servicing capacity, whether from the short or long-run viewpoint, lending institutions have had to resort to the use of partial indicators—and the debt service ratio has been a very convenient one.

77. This chapter discusses some of the features of the debt service ratio, but the final judgment regarding its validity as a measure of debt servicing burden has to be postponed until the very end of this study. Only after the long-term aspect of debt servicing capacity has been explored in Chapter V, will it be possible to come fully to grips with this elusive concept. Statistical material showing recent debt service ratios calculated according to various definitions of debt service are presented in Table 7 which is attached to this chapter. A fairly representative group of countries is included.

78. The merits of the ratio as an indicator of short-run rigidity are substantial. An earlier study prepared in the Bank explains this aspect of the ratio as follows:

> The magnitude of the ratio of debt service to foreign exchange earnings is . . . relevant to appraising the burden of debt obligations in the context of cyclical or other short-term declines in external receipts . . . A higher ratio of fixed service commitments to external earnings implies a considerable short-run rigidity in the debtor country's balance of payments . . . the ratio . . . indicates the pressure to which debtor countries may be exposed in periods of downward movements of their foreign exchange earnings.[1]

79. These pressures may be extremely strong. During the Great Depression of the 1930's, the ratios of public debt service to exports reached extremely high levels: while export values collapsed, the fixed-term burden remained unchanged. In Chile, debt service obligations at the depth of the Depression were higher, in absolute terms, than the total value of exports (see Table 8 attached to this chapter). Liquidity difficulties proved insurmountable and several countries defaulted.

2. Limitations

80. There is no doubt that debt service pressures exist also today, and they may well be exemplified by the size of the ratio. Recently, the finance minister of a debtor country was quoted as saying that next year there would be a most serious debt servicing problem since debt service falling due amounted to 43% of expected export earnings. It is not difficult to spot liquidity problems, actual or potential, once such numbers are reached. But from both the analytical and the operational points of view, more interesting is the question whether a debt service ratio which is substantially lower than the one quoted above, may in some way point to the emergence of debt servicing difficulties at some future date; and if such "critical" level of the ratio exists, what is it? Is it 5%, 10%, 15% or 20%? And why?

81. It is only natural to attempt to identify this critical level by referring to the past experience. But how relevant is past experience? As mentioned in Chapter III, fluctuations in receipts, either on current or on capital account are less now than they used to be, while rigidities on the import side have increased. The net effect of these changes will vary greatly from country to country. Further, one may argue that the

[1] Dragoslav Avramovic, *op. cit.*, pp. 101–3.

"opportunity cost" of default is greater now than in the earlier periods of financial history, since capital flows are now both larger and more stable, so that the "typical" debtor would think twice before he went into default. But here again, some countries get more foreign loans and some less, and therefore the "opportunity cost" will vary. Perhaps most important, policy responses to balance of payments pressures inevitably differ from one period to another and from country to country. For these reasons, if for no other, attempts to identify the critical level of the ratio, at which breakdown of the balance of payments is likely to occur, have been largely unsuccessful. A recent essay on the capacity to service debt[2] concludes that:

> History provides little guide for determining the maximum [debt service] ratio which countries can sustain without default or without interference with the transfer of earnings. Argentina maintained investment service in the late 1890's with an investment payment-current receipts ratio of over 40 per cent; but the country defaulted on public debt obligations in 1933 with a ratio of 36 per cent,* and restricted transfers after 1947 with a ratio of only 10 per cent (in 1945). In 1889, Argentina's ratio rose to 66 per cent, highest ratio in recorded history, but she was forced to renegotiate her debts in 1891. Australia managed to avoid defaults during the 1930's with an investment service-exchange income ratio ranging from 35 to 44 per cent during the 1930–1934 period; and Canada's ratio reached 37 per cent in 1932 without defaults on government obligations or the introduction of exchange controls on current transactions. . . . The degree of tolerance varies considerably from country to country with the breaking point in most countries during the 1930's at 25 to 30 per cent. On the other hand, it was a sharp rise in the ratio resulting from the precipitous fall in export earnings that brought about the defaults.[3]

82. The basic reason for failure to identify the critical level of the ratio is the fact that the debt service ratio combines only two variables out of nine discussed in Chapter III. It is true that the variables that are related in the debt service ratio are crucial—debt service as a charge against the major flow of transferable resources, exports. Nevertheless,

[2] Raymond F. Mikesell, *"The Capacity to Service Foreign Investment,"* in: U.S. Private and Government Investment Abroad, University of Oregon, 1962, pp. 382–83.

* Defaults were confined to obligations of provincial and municipal governments; the Argentine government did not default on its obligations. [Ed. note.]

[3] Sources quoted are: David Finch, *"Investment Service of Underdeveloped Countries,"* Staff Papers, International Monetary Fund, September 1951; and Dragoslav Avramovic, *op. cit.*

the remaining seven variables are disregarded, and some of them may on particular occasions be of decisive significance. In other words, even if the analysis is restricted only to the liquidity aspect of debt servicing capacity, that is the short-run end of a more general problem, the debt service ratio is an incomplete measure of the debt servicing burden, however crucial may be the variables which are incorporated in it.

83. In some cases, the application of the ratio as an indicator of rigidity may be inappropriate for special reasons, and other partial indicators may be more relevant. The two types of cases where this holds are listed below.

84. There are countries in which the relationship of public debt service to public revenue portrays more accurately the liquidity problem. The extreme case is countries which do not have control over their own money supply—for example, countries covered by the East African Currency Board. It is characteristic of such cases, roughly speaking, that monetary arrangements ensure that balance of payments problems do not arise: the public authorities cannot print money or borrow from a central bank in order to cover deficits, and therefore cannot spend more than they receive from revenues and from genuine borrowing, internal or external. In such cases, the burden of servicing debt is in terms of curtailment of public expenditures (or borrowing from the public in the country), and only *via* that, of curtailment of imports.

85. In other countries where trade is large in relation to total economic activity, and particularly in countries which are also poor and small, institutional freedom to create money often does not give much additional flexibility, since such inflationary financing is likely to have immediate repercussions on the balance of payments. Additional demand spills almost in its entirety into additional purchases of imported goods since almost no additional domestic resources can be activated over the short run. In such countries, present debt service liabilities and the prospective increase of service liabilities may not appear large in relation to their external earnings. But they may be large in relation to, e.g., the public revenues, and strains on the fiscal system may have immediate adverse repercussions on the balance of payments. In these countries, then, although debt servicing difficulties are in fact operative at the level of the balance of payments, nevertheless more sensitive indicators of impending difficulties may appear at the level of the public finances or of the internal savings-investment balance. Consequently, the analysis of the liquidity problem in such cases has to include both the pressure on the fiscal system and on the balance of payments.

3. Long-Run Relevance

86. But notwithstanding the limitations set forth in paras. 80–85 above, the ratio of debt service to exports has continued to be used most frequently. The basic reason is that it is a versatile instrument. It is an incomplete and imperfect indicator of short-run rigidity; but as though to offset these handicaps, it has certain relevance for the "psychological" or "willingness" aspect of creditworthiness (see paras. 15, 16 and 20). Foreign exchange is one of the scarcest, if not the most scarce, inputs for the developing debtor countries both over the short-run and over a longer period. The debt service is a continuing charge against this scarce resource. It is an indicator, if again an incomplete one, of the strength of the temptation to default. As an indicator of temptation, the debt service ratio does not explicitly take into account the disadvantages of default in terms of reduction of borrowing facilities or deterioration of the terms on which it would be possible for the country to borrow after default. Implicitly, however, both the borrowers and the lenders presumably tend to compare the size of debt service liabilities with that of the likely capital inflow. In this sense the debt service ratio is a convenient yardstick of the "sacrifice" or "benefit foregone" of maintaining service. As long as debt service is low, it clearly does not "pay" to default; if it becomes very high, then it is natural to compare the gain from default with prospective capital inflow. But the question again arises: what is "low" and what is "high"? And whatever "low" and "high" may be, are they the same for everybody and under all circumstances?

87. The significance of the debt service ratio for long-run analysis of debt servicing capacity is virtually nil. It has already been shown, in Chapter III, that the size of the debt service, and thus of the debt service ratio, is heavily influenced by maturities. Where the debt service ratio is unduly high owing to bunched medium-term maturities, it does not indicate the extent of the charge on the balance of payments in the long run.

88. The fundamental difficulty goes deeper. The debt service ratio is a cash flow concept rather than a profitability or productivity concept. Because it is a cash flow concept, it includes amortization as a charge. But debt, whether of a corporation or of a country, is normally rolled over; and whenever it is repaid, it cannot be expected that a very large part of the total debt be repaid out of a year's income. The same cash flow element is apparent in the choice of the other variable in the debt service ratio—exports. Exports are gross sales abroad; but they are only one segment of total sales of the country; and certainly they are not

the economy's profits. The concept which charges amortization against yearly gross sales may be a good indicator of the potential cash squeeze to which the economy may suddenly be exposed. But it is certainly not an indicator of the ability of the economy to sustain over the long run the debt servicing burden, which is interest.[4] For such an indicator, or a combination of indicators, we have to look elsewhere. When investors lend long-term money to a corporation, they look at the fundamental factors bearing on its future profitability: its potential rate of growth, its net earnings and their behavior over time, its ability to apply innovations and to adapt to technological change, how diversified its output is or may become, how much the borrower puts up out of its own money into the expansion in relation to the borrowed funds (the debt-equity ratio). To be sure, the investors also look at the current cash position and they are not particularly happy if the corporation currently has troubles with its short-term debts. But once these troubles have been settled, one way or another, the investors are less concerned with cash flows at some future date. What the long-term lenders are concerned with are the fundamental factors which make for success or failure. If these factors are favorable, it may reasonably be expected that the cash flows will also work out favorably: if the corporation is profitable and well run, it will not have difficulties in rolling over its debts. Similarly, in the case of a developing country, the decisive factors are whether debt has been incurred for productive purposes and whether both the loan money and the country's own resources have been invested in a way which maximizes total output and savings and which makes the economy more dynamic and resilient. The ratio of amortization and interest to exports is an indicator of the cash-squeeze today and in the immediate future; it has little relevance, if any, for long-run analysis. In fact the next chapter shows that the ratio will very likely increase for some time in the process of growth and that, from the long-run viewpoint, there is nothing necessarily alarming about it.

[4] The debt service ratio sounds as though it has some resemblance to the rules of thumb used in corporate finance when appraising creditworthiness of business firms. The similarity is superficial. The nearest concept in corporate finance we could find is the ratio "Times Interest Earned." This concept signifies the relationship between net earnings of a company (before interest) and interest on its long-term debt. This is a perfectly logical concept: a charge on profits is related to aggregate profits. The proper application of the same concept for a national economy would be the relationship between its net savings (before debt service) and interest on external debt. Another ratio which is sometimes used in corporate finance relates debt service (including amortization) to cash generation. This is closer to the debt service ratio, but suffers from the same defects as indicated in the text if used in long-run analysis.

TABLE 7. DEBT SERVICE RATIOS, 1961 AND 1962, WITH VARYING DEGREES OF COVERAGE OF DEBT SERVICE TRANSACTIONS

Ratio of Public Debt Service to Export of Goods and Services				Ratio of Service Payments on all Fixed Interest Debt to Export of Goods and Services				Ratio of Service Payments, Including Profits and Dividends on all Foreign Capital to Export of Goods and Services			
1961		1962		1961		1962		1961		1962	
Israel	27	Israel	29	Brazil	31	Turkey	24	Iran	38	Iran	38
Chile	23	Chile	25	Mexico	30	Yugoslavia	19	Brazil	36	Mexico	28
Turkey	20	Argentina	22	Turkey	28	Mexico	19	Turkey	28	Turkey	24
Argentina	20	Brazil	20	Argentina	18	Colombia	14	Ecuador	23	Ecuador	21
Brazil	17	Turkey	17	Colombia	14	Argentina	13	Argentina	22	Colombia	19
Colombia	13	Mexico	16	Paraguay	14	Ecuador	9	Mexico	22	Yugoslavia	19
Mexico	11	Yugoslavia	14	Ecuador	9	Iran	6	Colombia	20	India	19
Yugoslavia	9	Guatemala	12	Spain	9	Nicaragua	3	Rhodesia & Nyasaland	15	Argentina	16
Ecuador	8	Colombia	11	Iran	7	Philippines	3	Paraguay	15	Pakistan	9
Iran	8	India	9	Costa Rica	6	Brazil	n.a.	India	13	Nicaragua	5
Paraguay	7	Iran	9	Nicaragua	5	Israel	n.a.	Spain	10	Philippines	5
Peru	7	Costa Rica	9	El Salvador	3	Bolivia	n.a.	Costa Rica	7	Brazil	n.a.
Philippines	7	Sudan	9	Uruguay	2	Chile	n.a.	Honduras	6	Israel	n.a.
India	6	Ecuador	8	Honduras	1	Rhodesia & Nyasaland	n.a.	Nicaragua	6	Bolivia	n.a.
Costa Rica	6	Pakistan	7	Israel	n.a.	Paraguay	n.a.	El Salvador	5	Chile	n.a.
Rhodesia & Nyasaland	5	Paraguay	6	Chile	n.a.	India	n.a.	Pakistan	4	Rhodesia & Nyasaland	n.a.
Pakistan	5	Nicaragua	5	Rhodesia & Nyasaland	n.a.	Spain	n.a.	Uruguay	3	Paraguay	n.a.
Sudan	5	Uruguay	5	India	n.a.	Pakistan	n.a.	Israel	n.a.	Spain	n.a.
Nicaragua	5	China	5	Pakistan	n.a.	Peru	n.a.	Chile	n.a.	Peru	n.a.
Uruguay	5	Venezuela	4	Peru	n.a.	Guatemala	n.a.	Peru	n.a.	Guatemala	n.a.
Honduras	4	Ethiopia	4	Guatemala	n.a.	Costa Rica	n.a.	Guatemala	n.a.	Costa Rica	n.a.
Venezuela	4	Honduras	3	Sudan	n.a.	Sudan	n.a.	Sudan	n.a.	Sudan	n.a.
Spain	3	El Salvador	3	Philippines	n.a.	Honduras	n.a.	Philippines	n.a.	Honduras	n.a.
Guatemala	3	Philippines	3	Venezuela	n.a.	El Salvador	n.a.	Venezuela	n.a.	El Salvador	n.a.
China	3	Thailand	3	China	n.a.	Venezuela	n.a.	China	n.a.	Venezuela	n.a.
Thailand	3	Spain	2	Panama	n.a.	Uruguay	n.a.	Panama	n.a.	Uruguay	n.a.
Ethiopia	3	Panama	2	Dominican Republic	n.a.	China	n.a.	Dominican Republic	n.a.	China	n.a.
Burma	3	Dominican Republic	2	Thailand	n.a.	Panama	n.a.	Thailand	n.a.	Panama	n.a.
El Salvador	2	Nigeria	2	Ethiopia	n.a.	Dominican Republic	n.a.	Ethiopia	n.a.	Dominican Republic	n.a.
Panama	1	Rhodesia & Nyasaland	n.a.	Burma	n.a.	Thailand	n.a.	Burma	n.a.	Thailand	n.a.
Ceylon	1	Peru	n.a.	Ceylon	n.a.	Ethiopia	n.a.	Ceylon	n.a.	Ethiopia	n.a.
Malaya	1	Burma	n.a.	Malaya	n.a.	Burma	n.a.	Malaya	n.a.	Burma	n.a.
Nigeria	1	Ceylon	n.a.	Nigeria	n.a.	Ceylon	n.a.	Nigeria	n.a.	Ceylon	n.a.
Dominican Republic	0	Malaya	n.a.			Malaya	n.a.			Malaya	n.a.
						Nigeria	n.a.			Nigeria	n.a.

Notes: 1. *Ratio of Public Debt Service to Exports of Goods and Services:* Public debt includes external obligations of all levels of government as well as private debt guaranteed by public agencies. Debt with an original maturity of less than one year is excluded. Commercial arrears are also excluded. The numerator includes interest and amortization on all such debt. The denominator is annual average exports of goods and services during 1960-62 or in some cases 1960–61.

2. *Ratio of Service Payments on all Fixed Interest Debt to Exports of Goods and Services:* Conceptually, the numerator includes debt service or public and private, including non-guaranteed private, borrowing from abroad. Interest payments on non-guaranteed debt are drawn from item called "Investment Income Other" in IMF Balance of Payments Yearbook. In some cases, this item is recorded on a net basis. Amortization on non-guaranteed debt is calculated on the crude assumption that the ratio of amortization to interest is the same as for public debt. It should be recognized that in many countries this ratio is distorted by the common practice of capitalizing interest charges in the case of suppliers credits. The denominator is the same as in Note 1.

3. *Ratio of Service Payments, including Profits and Dividends, on all Foreign Capital to Exports of Goods and Services:* The numerator includes investment income payments on private direct investment as well as debt service, as defined in Note 2. Figures may include profits which are reinvested rather than remitted abroad. In some cases, investment income payments are recorded on a net basis. No attempt is made to include repatriation of private capital. The denominator is the same as in Note 1.

Sources: IBRD, Statistics Division.
IMF, Balance of Payments Yearbook.

TABLE 8. RATIOS OF PUBLIC DEBT SERVICE TO EXPORTS IN EIGHT LATIN AMERICAN COUNTRIES IN THE 1920's, 1930's AND 1950's

(in percentages)

Year	Argentina[a]	Bolivia	Brazil	Chile[a]	Colombia[a]	Peru	Uruguay
			A. PREWAR				
1926	10.0	7.3	13.2	5.5	2.7	2.6	7.6
1927	7.9	6.1	14.4	8.7	4.4	3.2	9.2
1928	8.9	8.5	14.6	9.5	8.1	6.0	8.5
1929	10.4	7.8	16.5	9.2	11.9	7.4	9.5
1930	18.2	13.5	23.5	18.0[c]	14.0	9.5[c]	9.7
1931[b]	22.5	24.5	28.4	32.9	15.6	16.3	22.4
1932[b]	27.6	50.0	41.0	102.6	21.8	21.4	36.3
1933[b]	30.2	38.5	45.1	81.9	29.6	21.7	31.3
			B. POSTWAR				
1953	1.3	12.7	4.8	7.0	4.7	4.3	3.1
1954	2.1	19.7	8.4	7.7	4.3	3.8	4.1
1955	2.5	5.3	20.8	8.7	7.4	6.5	6.4
1956	1.9	4.1	12.2	10.3	6.0	9.4	5.5
1957	7.4	2.2	16.4	11.7	12.1	8.4	8.5
1958	12.5	12.4	20.2	12.2	24.1	9.4	8.4
1959	16.0	7.1	17.9	12.1	25.1	8.8	11.7
1960	23.5	11.2	21.8	15.0	17.0	11.4	8.0
1961	26.1	24.7	17.6	28.5	16.0	7.6	6.1
1962	22.8	7.1	24.2	27.6	13.8	7.8	6.8

[a] In the 1920's and 1930's, debt service of national mortgage banks is included.

[b] Scheduled public debt service as a proportion of exports. Bolivia, Peru, Chile, Brazil and Uruguay defaulted during 1931; Colombia during 1932; Argentina and Cuba partially in 1933.

[c] Probably underestimated.

Sources: Debt service in the 1920's and 1930's from Peterheinz Werhahn, *Kapitalexport und Schuldentransfer im Konjunkturverlauf*, Jena 1937. Subsequent debt service from International Bank for Reconstruction and Development, Economic Department, Statistics Division. Export data in the 1920's and 1930's from League of Nations, *Review of World Trade*. Subsequent export data from International Monetary Fund, *International Financial Statistics*, various issues.

Chapter V The Long-Term Aspect of Debt Servicing Capacity

1. Level of Analysis

89. The long-term aspect of debt servicing capacity should focus on the benefit and cost of foreign capital to a country in the growth process. Conceptually, the cost-benefit analysis can be in terms of specific projects financed by foreign capital or in terms of macro-economic magnitudes, such as savings, investment, income, exports, and imports.

90. Ideally, benefits of foreign-financed projects should take account of direct and indirect effects, external and internal economies as well as the proportion of the income stream generated by the initial investment which is saved and reinvested. The calculation should be in terms of equilibrium prices which reflect the scarcity of various factors of production. Merely to define the nature of the calculation is to suggest that probably it is not fully operational at the present time. The experiences in this field indicate the difficulties of dealing with indirect effects and external economies, not to speak of variables such as the extent of income plough-back. In any case, equilibrium factor prices (shadow prices) cannot be determined at the project level; they are a function of developments in the over-all economy. In addition to these difficulties of measuring benefits at the micro-economic level, there is the problem of how to interpret the cost of foreign capital. For a particular enterprise, as a rule the cash cost is measured by the amount and time sequence of debt service payments, i.e., interest as well as scheduled amortization in the case of foreign loans. However, from the standpoint of the whole economy, the net charge of foreign capital depends on the behaviour of future gross capital inflow. If maturing loans for particular projects are rolled over to finance other projects, amortization payments are not an immediate cost to the economy.

2. Macro-Economic Benefits

91. For these as well as other reasons, it is convenient to analyse long-term debt servicing capacity in terms of the behaviour of macro-economic magnitudes. In this context, the role of foreign capital is to supplement national resources in raising the rate of capital formation and/or certain kinds of expenditure (e.g., education) akin to investment. Given the level of per capita income and the pressure of population growth, there is a considerable gap between national savings and a desirable rate of investment in many developing countries. In some cases, the gap is widened by the phenomena of capital outflow from these countries. Not all national savings are available to finance domestic investment.

92. By making possible a higher rate of investment than would otherwise be feasible, foreign capital raises the rate of income growth. The magnitude of this acceleration depends on the size of capital inflow and on the productivity of capital. The size of capital inflow, in turn, is determined by a number of factors; among the economic ones, decisive are the amount of resources which the borrowing country itself is ready to put up for its economic development, and the rate of return, i.e., the productivity of capital. In macro-economic terms, the latter is indicated by the numerical relationship between capital investment and the output generated. This relationship, in turn, is also determined by a number of factors: the availability of human skills, the capacity to combine and organize the factors of production in an optimal fashion, natural resource endowment, the sectoral distribution of investment, the rate of capacity utilization, the durability of assets created by investment. In a way, the incremental capital-output ratio, used as a link between investment and product increase, is an index of the strength of the dynamic sectors in relation to the stagnant or slow moving sectors, and also, it is an index of the efficiency with which resources are used.[1] The higher the return on investment—i.e., the lower the incremental capital-output ratio—the faster the increase in real income and the greater the availability of resources for new investment and for servicing foreign capital. The return on investment is one of the two key variables determining the rate of economic growth: not only does it determine the size of the

[1] The incremental capital-output ratio of 3:1 gross indicates that one unit of gross investment is associated with an increase of 0.33 units of gross income, i.e., gross value added (wages plus profits, including interest, plus depreciation); the ratio of 5:1 indicates a value added return of 0.20.

income increment derived from a unit of capital input, but it also influences how large is the capital input itself, in our case how much capital will foreign lenders be prepared to lend.

93. The other key variable is the marginal savings rate, i.e., the proportion of the income increment which is saved and which is thus available for plough-back into new investment. The higher the marginal savings rate, the greater the flow of resources into capital accumulation and, other things being equal, the higher the rate of income growth. Furthermore, the higher the marginal savings rate, the greater the likelihood that the borrower can service foreign capital and simultaneously reduce the savings-investment gap. Surely, the absolute value of the gap is not likely to decrease and even a relative reduction (foreign-financed investment as a per cent of total investment) may not materialize immediately. But if the growth process is successful, then there should be a relative narrowing of the gap within a certain foreseeable period, say, the lifetime of a generation. The savings-investment mechanism is at the center of the growth process; and the marginal savings rate is an index of the capacity of the borrowing country to mobilize its own resources for economic development, to service capital it has borrowed, and ultimately to reach a stage in which its growth is self-financed.

94. It is the essence of the development problem that there have been forces in the less developed countries which have held back, historically, either the national average return on investment or the national marginal savings rate, or most likely, both. Had such forces not been at work and had they not been powerful, growth would have taken place already and the per capita incomes would have been much higher than today. The obstacles have been, and still are, numerous and of varying gravity in different developing countries. Their gravity depends on the stage of development which different developing countries have already attained and on the kind of developmental policies—in terms of resource mobilization and resource use—which these countries choose to pursue. For instance, the lower the per capita income and the higher the rate of population growth, the more difficult the attainment of a high marginal savings rate; the higher the proportion of "politically chosen" investment projects in total capital formation, the lower the national average return on investment; the more backward the institutional structure in agriculture, the less the incentive to experiment with new crops and new production techniques. The problem of acceleration of the growth rate in the developing countries reduces to the problem of identifying and removing the obstacles to a higher productivity of capital and to a

higher plough-back of income increment into new investment. The essential benefit of foreign capital is that it augments the resources available for investment and also, that it helps in the transmission and absorption of new technology and of organizational techniques, thus helping to raise the rate of investment and the rate of return in the initial, and most difficult, phase of the process of accelerated growth of a developing country.

3. A Digression: The Foreign Exchange Constraint

95. Hitherto, the discussion has been in terms of "domestic" growth variables, in particular the savings-investment balance. The savings-investment gap is equal to the foreign exchange gap, by definition. However, this is no more than an *ex-post* accounting equality. More interesting is the mechanism by which this equality is brought about. The capacity to transfer savings abroad may be undermined by a deterioration in terms of trade. The foreign exchange gap, allowing for the movement of export and import prices may be much larger than the savings-investment gap at constant prices. The equality is restored *ex-post,* by a reduction in the "international value" of domestic savings[2] and, also, by an actual reduction in the domestic savings rate as income growth decelerates under the impact of the deterioration of the terms of trade. What analytical significance should be attached to this divorce of saving and transfer aspects of debt servicing capacity depends on the period under consideration. In the short-term or cyclical context, such an adverse movement in world demand or supply conditions may underlie the liquidity crisis discussed in Chapter III above. However, the deterioration in terms of trade may have a more permanent quality if it is the result of structural or policy changes in the pattern of world consumption or production. For example, the major export commodity of a borrower may be the victim of Engel's Law of Consumption; the demand for it may be declining, relatively or even absolutely, as income of consumers increases. A primary commodity may be displaced by techno-

[2] Suppose that a country which is a large supplier of the world market in a particular product realizes a savings surplus which is reflected in an expansion of its exports of that product. If international demand is price-inelastic, the value of aggregate exports may fall, at least over the medium term. The export surplus disappears, although the export volume has expanded: "the international value" of aggregate domestic savings falls as export prices fall. This phenomenon occurs whenever the material content of domestic savings is such that the domestic goods surplus cannot be sold abroad or can be sold only at declining prices.

logically superior or cheaper synthetic substitutes. New and more efficient suppliers of the same primary commodity may enter the world market and displace existing exporting countries.

96. Countries affected by such development in the world economy ought to be able to compensate for them in the long run. Various avenues of compensation are possible. The threat of competition from synthetics may to some extent be met by productivity changes in primary production. The case of natural rubber, where it may be possible to secure substantial cost reductions by replanting with improved materials, is an example. Factors of production can be shifted, at least at the margin, from traditional export activities to new primary exports. However, it is highly unlikely that the developing countries as a group can solve their long-run transfer problem only by cost reduction of existing primary exports or by developing new ones. International demand for many primary products increases at a slower rate than imports of materials and equipment required to sustain a satisfactory growth in income.[3] Consequently, these countries have to develop exports of manufactured products and of service activities (e.g., tourism) for which international demand rises relatively rapidly; alternatively, and for a number of reasons, import substitution, chiefly in the industrial field, is the typical pattern of adjustment (see para. 125).

97. The problems of adjusting to the country's own growth requirements, as reflected in growing demand for imported goods, as well as the problems of adjusting to structural changes in the world economy, are not confined to less developed countries. The British economy is still in the process of responding to new textile producers. The United States is at present adjusting to the regained competitive strength of Europe. The countries of Europe are beginning to feel the impact on the international market of the recent growth of Japan. The difference between the dilemma of primary producers and that of industrialized countries is in respect of the required period of adjustment. Factors are much more mobile, institutions are much more adaptable and skills are much more widespread in advanced, diversified and industrialized countries than they are in the under-developed world. Indeed, one can say that the relative absence of resilience and dynamism is one of the important characteristics of primary producing countries.

98. The domestic resource gap (savings-investment gap—see paras. 93–95) and the foreign exchange gap (exports-imports gap—see paras.

[3] *The Commodity Problem, op. cit.*

95–96) are, in a sense, the product of relative rigidities (or flexibilities) of savings, investment, exports and imports. If the foreign exchange gap *ex-ante* is frequently larger than the savings-investment gap; and if in practice, most of the fundamental problems of growth and of errors of planning and of policy find their expression in the strain on the balance of payments, the essential reason is that the rigidities are particularly severe in exports while the demand for imports is virtually unlimited, just as demand for personal consumption is. Exports of many developing countries are rigid because of their heavy dependence on exogenous factors: there is the constraint on international demand for primary products, and there are also persistent fluctuations in prices and in the value of export sales.[4] If on the other hand it is assumed that investment levels in many of these countries are relatively rigid in view of commitment to maintain a particular rate of growth; and if it is further assumed that there is a rigid relationship between investment and imports owing to the requirements of imported capital goods and materials for capital goods industries, and also, between consumption and imports owing to the imports of essential consumer goods and of raw materials for processing into consumer goods, then the entire burden of adjustment rests on savings—or the foreign exchange gap widens. Foreign capital inflow, in addition to filling the domestic resource gap, helps in alleviating the foreign exchange constraint on growth: and in both aspects, it relaxes the strain on savings. But unless the period of capital inflow is used to accomplish a structural change of the economy by developing new, rapidly rising and less fluctuating exports, the foreign exchange scarcity will continue to hamper growth of income and of savings and it will also continue to interfere with the transfer of savings abroad for the purpose of debt servicing.

99. Import substitution in the industrial field will be successful if the economies of scale are satisfied and if the industries are efficiently run. Import substitution will then be accompanied by a satisfactory rate of return on investment, which will in turn make possible a high rate of plough-back of the newly generated income. But there are limits to which the import substitution process can be pushed. If the export structure continues to consist of lagging and fluctuating products, this will limit the rate of growth of income that can be attained, since it will limit the capacity to import investment goods and materials needed to expand

[4] Further difficulties arise because of occasional inefficiencies and insufficiencies of export production in the low-income countries in competition with primary producers in the developed countries, notwithstanding the constraint on international demand (cf. *The Commodity Problem, op. cit.*).

the capacity to produce, and also, it will limit the rate of capacity utilization of the existing industries and thus depress the rates of return and of plough-back. For the great majority of developing countries, a successful growth process will require that import substitution be followed by an expansion of diversified exports, and in a fairly swift sequence. On the other hand, there are forces which hold back such an expansion. Industries have to be established and they have to go through their infancy. When they finally emerge on the world market in competition against existing producers, one may say that they have matured. And only then will the developing countries have fully solved their transfer-cum-growth problem.

100. Developments in income, structural change and trade policies of industrialized countries exercise a pervasive influence on the ease or difficulty with which the long-run adjustment problem of the borrowing countries can be resolved. The more rapid the total growth of the world economy and the more liberal the trade policies of creditor countries, the easier it will be for borrowers to grow and to service foreign capital.

4. Macro-Economic Costs and Their Time-Sequence

101. To recapitulate, benefits of foreign capital depend on: (a) the efficiency with which resources, including foreign capital, are translated into income, (b) the extent to which the additional income stream is saved and used to finance domestic investment and/or public development expenditure, and (c) the rapidity with which internal structural adjustments are made and then reflected in the composition of imports and exports.

102. These benefits should be compared with the cost of foreign capital. This cost, in macro-economic terms, is determined by the conditions (interest rate, grace period, period of repayment) on which external capital is made available.

103. The behavior of gross capital inflow varies in different stages of what may be called the debt cycle; and this cycle, in turn, is closely linked with the course of economic development.

104. Major stages in the growth-cum-debt sequence may be illustrated by the following highly simplified reasoning. In the *first stage* of the development process, as investment increases, savings, starting from a low level, are inadequate to finance domestic investment requirements. A country has to borrow not only to finance part of the investment, but also to meet amortization charges and to pay interest on the debt that is

accumulated in this process.[5] In this way it obtains a net addition to its domestically generated resources available for investment. During this stage the burden of servicing foreign capital to the national economy is zero, or, more precisely, the burden is continuously postponed. But the consequence is that external indebtedness increases rapidly; since interest on debt incurred previously is paid out of new borrowing which also carries interest, the familiar law of compound interest operates in all its force. And the longer the first stage lasts, the stronger are the effects of the law of compound interest. However, if an adequate proportion of the newly generated income can be saved, the country would, during the course of time, meet an increasing share of its investment requirements from its own domestic resources.

105. The *second stage* of development begins when the savings have grown sufficiently to provide for all the domestic investment requirements. In this stage, savings would not, however, be sufficient to meet the entire additional burden of interest and amortization payments on accumulated debt.[6] At the beginning of this stage, debt would continue to grow, but at a slower pace than in the first stage: since savings continue to increase, a part can be used to pay interest on the debt accumulated hitherto. And as the second stage proceeds, an increasing part of the interest cost is paid out of domestic savings. No net repayment takes place yet; but as borrowing at interest to pay interest becomes smaller and smaller, external indebtedness rises at a pace which is continuously diminishing. And at the very end of the second stage, the apogee of the curve of the debt cycle has been attained. Borrowing is undertaken only for rolling over and refinancing operations, i.e., to cover amortization. Debt has reached the peak and has ceased to grow.

106. As the second stage ends, the *third stage* begins. Domestic savings are sufficient to finance all domestic investment, and in addition they are enough to pay for the entire interest cost of accumulated debt. Furthermore, during this stage, the country begins to generate a surplus of savings above domestic investment *and* interest payments abroad. The country can start amortizing its debt, while maintaining a satisfactory momentum of economic development. The law of compound interest

[5] This is one way of expressing the relationship between domestically generated savings, current foreign capital inflow and debt service on inflow that had occurred in the past. Another way of expressing the same relationship would be to say that capital inflow continues to finance a part of domestic investment while a part of domestic savings is used to service foreign capital.

[6] Alternatively, this can be formulated by saying that incremental savings are sufficient to pay for interest, but that aggregate investment requirements continue to exceed the national savings so that net inflow of capital is still needed.

now works in reverse and outstanding external debt diminishes rapidly. The country now pays back all the cost that it has postponed in earlier periods. The debt cycle has been completed; foreign capital has helped the country to enter the continuously rising upward curve of economic growth; and foreign capital has been repaid after earning interest throughout the period of its employment in the borrowing country.

5. The Extremes

107. There is nothing inevitable or automatic about this progression of debt from the first to the third stage, because there is nothing automatic about the process of economic growth. Many things can go wrong, and the country may never leave the first stage, i.e., the stage in which its debt continuously tends to increase. Where poverty or a continuing deterioration in the terms of trade make it difficult to achieve high marginal savings rate; or where capital-output ratio becomes prohibitively high because the efficiency in resource use is handicapped by the scarcity of skills and paucity of natural resources, there the growth-cum-debt sequence will not work, because there is no growth. If the rate of return on investment is lower than the rate of interest on borrowed capital, and if the marginal savings rate is low, the borrower will experience viciously rising indebtedness and, by definition, an unmanageable debt burden.[7]

108. Are there countries in which the rate of return is lower than the international conventional rate of interest, of, say, 6 per cent? We do not know. However, the possibility cannot be excluded that such cases exist. Among countries which are today engaged in attempts to raise the standard of living of their peoples—and the number of countries is around one hundred—there are bound to be some where natural obstacles are so severe that the returns on capital are very low. If international transfer of resources is considered necessary in such cases, such flows must not be provided at conventional terms if virtually certain debt failures are to be avoided.

109. At the opposite end are countries where conditions are extremely favorable: output grows fast, the plough-back is large and increasing, the rate of return on investment is high, the composition of output responds quickly to external demand conditions and to the country's growth requirements. In such a lucky country, the stage sequence of the

[7] The case of unmanageable debt burden is analyzed in detail in Essay IV, Volume III (J. P. Hayes, *Projection of Debt Servicing Burdens and the Conditions of Debt Failure*).

debt cycle may not take place because the borrower is *too* successful. Foreign investors are eager to employ their funds in this country, whether the country wants it or not, because returns are large and secure. A country which has fully succeeded in the growth process may not reduce its indebtedness at all, i.e., it may never enter the third stage. Its situation is analogous to that of a successful corporation whose debt grows with its own growth. This is a well known and perfectly logical case of "Unto everyone that hath shall be given."

110. Instead of reducing debt, such a country starts exporting capital, while at the same time continuing to borrow abroad. Economic history has a number of such examples. The most recent experience is that of Japan and Italy. Fifteen years ago, economic forecasts for these countries were not too exuberant, in view of the structural problems whose solution seemed to require a very long time. The forecasters certainly did not envisage the impressive record of growth and structural change which has been attained in less than one-half of the lifetime of a single generation. The marginal savings rate must have gone up more, and the capital-output ratio must have been less than we had anticipated; and these countries' breakthrough in the world market with an ever increasing variety of products, competitively produced and sold, has surpassed all expectations. These countries have become an increasingly attractive field for foreign investment. There are perhaps today several developing countries whose position is not dissimilar to that of Japan and Italy at the beginning of the 1950's.

111. If a phenomenon such as a "typical" developing country existed at all, it would probably stand somewhere in between the two extremes outlined in paragraphs 107–110. The difficulty is that "somewhere" still encompasses an uncomfortably wide span. Given our present state of knowledge, our insecurity prevents us from dividing the "somewhere" into more precisely defined subgroups. To do this, we would have to identify the specific countries which would fit a shorter or a longer time path of the growth-cum-debt sequence. And while we have some suspicions that division may have in fact already occurred within the developing world we would still prefer to dodge this issue in the present study.

112. Consequently, the exposition which follows is a great simplification of reality. We have constructed a mathematical model to portray the possible behavior of the key variables relevant for long-run growth, partly financed by foreign capital. The model is simple; it can be refined by introducing multi-sector relationships. Furthermore, there is an infinite choice of values for the variables included in the present model:

consequently, numerous variants can be constructed at will to fit various situations by using different values for particular variables. Two additional variants are attached to this chapter, in graphic form (Charts VIII–XI). In the text, in order to simplify the exposition, we are manipulating essentially only one variant, the "Single Generation Case" (see para. 113). The choice of values for the variables is necessarily arbitrary and the findings are subject to severe limitations. Nevertheless, we have felt that even a very simple numerical illustration of the growth-cum-debt sequence may throw light on some of the critical problems facing the borrowers and the lenders at the present juncture of economic history.

113. The purpose of this piece of algebra is to show what conditions must be met for a developing country to be able to leave behind the period of growing debt in the not too distant future. The benchmark of a quarter of a century has been chosen on the assumption that the developing and the developed countries, in making their present decisions to borrow and lend, respectively, want to have some idea, however hazy, of whether they can see the light at the end of the tunnel within the lifetime of a generation. The other purpose of the model is to show what happens to the relationships of the variables in the process of economic growth. In particular, attention is focussed on the relationship between net and gross capital inflow, on the ratios of debt service to total output and to domestic savings, and above all, it is focussed on that king-pin of the conventional analysis of creditworthiness, the debt service ratio.

6. The Model and Its Assumptions— "Single Generation" Variant

114. The hypothetical country, which we want to analyze, has these characteristics:

(*a*) *Income Growth Target.* The desired rate of increase in gross domestic product (GDP) is five per cent per annum compound and remains constant over time. This is fairly representative of growth targets of the developing countries. Also, the Alliance for Progress has fixed a target of 2½ per cent annual increase in per capita income, which implies a total income increase of at least five per cent p.a. This is also the goal of the U.N. Development Decade, recommended by the General Assembly. A sample of 33 countries shows that 14 of them actually attained a growth rate of 5 per cent or higher during the latter 1950's. Another 16 countries experienced rates of growth between 2 per cent and 5 per cent p.a. Only

three economies failed to realize even a 2 per cent p.a. increment. (See Table 9, attached to this chapter.)

(*b*) *Savings Rates.* Initial gross domestic savings rate is assumed at 10 per cent of GDP. This assumption compares with the finding that 29 countries in the sample apparently have savings rates above 10 per cent, other 9 countries below 10 per cent. The countries excluded from the sample because of inadequate statistics, most likely have gross savings rates under 10 per cent.

Marginal savings rate is assumed at 20 per cent and remains constant. This target is below what many national programs postulate but is probably higher than many countries have actually achieved. It is not entirely implausible, given national determination. In a recent study, Prof. Rosenstein-Rodan has suggested that developing countries should be able to generate marginal savings rates double the average. The implication is that if we start from an initial savings rate of 10% and if the marginal savings rate is 20%, it will take about 15 years to achieve an average savings rate of 15%.

(*c*) *Capital-Output Ratio.* The ratio of 3:1 is assumed, and it remains constant. This implies that a unit of gross capital input yields to the national economy 33 per cent in terms of gross value added (wages, profits and depreciation). Although considerable analytical work has centered around this concept, statistical studies have not yet been able to determine its precise behavior in different countries and at different stages of growth. Since the assumed target income growth rate is 5% p.a. (see *a* above) and capital-output ratio 3:1, the required investment rate is 15% of GDP. Since the initial savings rate is 10%, the gap to be financed by foreign capital inflow amounts to one-third of total investment. Many developing countries have investment rates centered around 15%.

(*d*) *Export Coefficient.* Initial proportion of export earnings to total income is 10%. The size of the export sector varies greatly among developing countries. In many cases exports are 20–30% of GDP. We have deliberately chosen to illustrate the case of a more closed economy. The most populous among the developing countries have an export coefficient below 10%. Examples are India, Pakistan, Brazil (see Table 11).

(*e*) *Export Growth Rate.* Export value is assumed to grow at 4% p.a. This is somewhat more optimistic than the actual experience of the developing countries in the postwar period, but it seems to be

an attainable rate, assuming the international demand conditions continue roughly the same as in the last decade or so, but further assuming a somewhat better international coordination of export sales strategies of the primary producing countries than in the past. ("It is likely that for primary producers as a group the upper limit on demand growth in export markets in the postwar period was in the neighborhood of 4% per annum. This seems to be the implication of the fact that the value of primary product exports grew at 3–4% despite an increase in volume of 4–5%: prices fell as volume was pushed beyond the 4% rate." Cf. *The Commodity Problem, op. cit.*)

The choice of the export growth rate of 4% does allow for the possibility that countries like Brazil, Mexico, Colombia, India, Pakistan, and the Philippines, moderately succeed in the near future in expanding their exports of manufactured goods, on the basis of structural changes which have already taken place or are currently under way.

The model variant does not apply to countries whose growth is essentially based on exports of primary products for which world demand rises very rapidly, e.g., petroleum or aluminum. Nor does it apply to a group of developing countries—Israel, Yugoslavia, Taiwan—which have recently attained substantial growth in total exports based on exports of manufactures (over-all export growth rate more than 10% p.a.). This group may have already broken through the foreign exchange constraint as imposed by demand conditions.

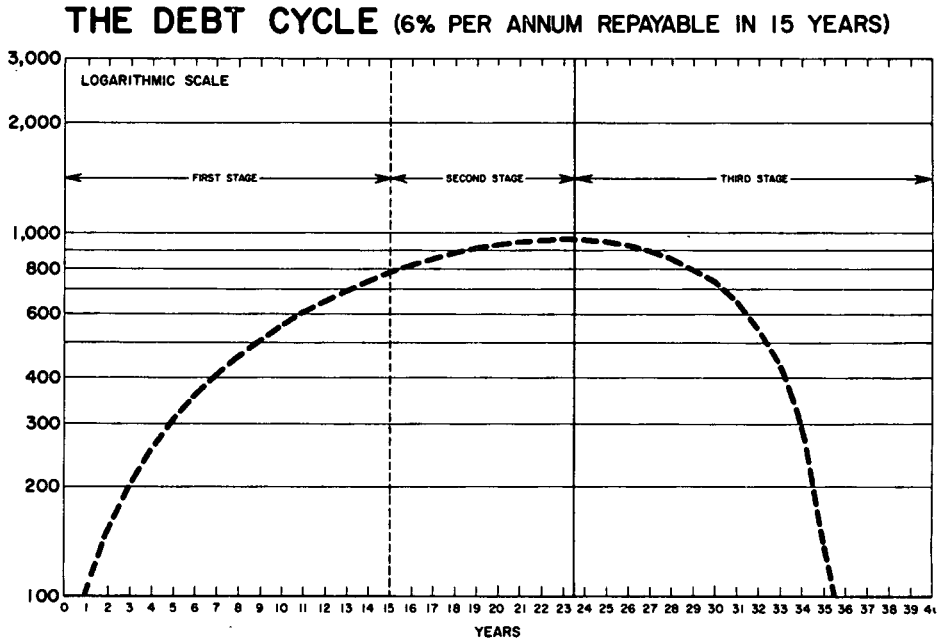
(*f*) *Foreign Capital.* Initial debt is assumed to be zero. This is not a representation of reality. It is an analytical device which facilitates the presentation, at the expense of painting the picture nicer than it is. Further assumption is that gross borrowing takes place without interruption in amounts required to bridge the savings-investment gap and to cover debt service payments.

(*g*) *Debt Service.* Foreign capital is borrowed at an average interest rate of 6 per cent per annum and average maturity of 15 years, terms fairly representative of conventional lending.

7. Findings

115. On these stylized assumptions, the debt cycle spans 36 years. The phase in which indebtedness rises lasts about 25 years. This is

CHART 1



followed by a decline over ten years. Debt returns to zero in the 36th year (Chart I).[8]

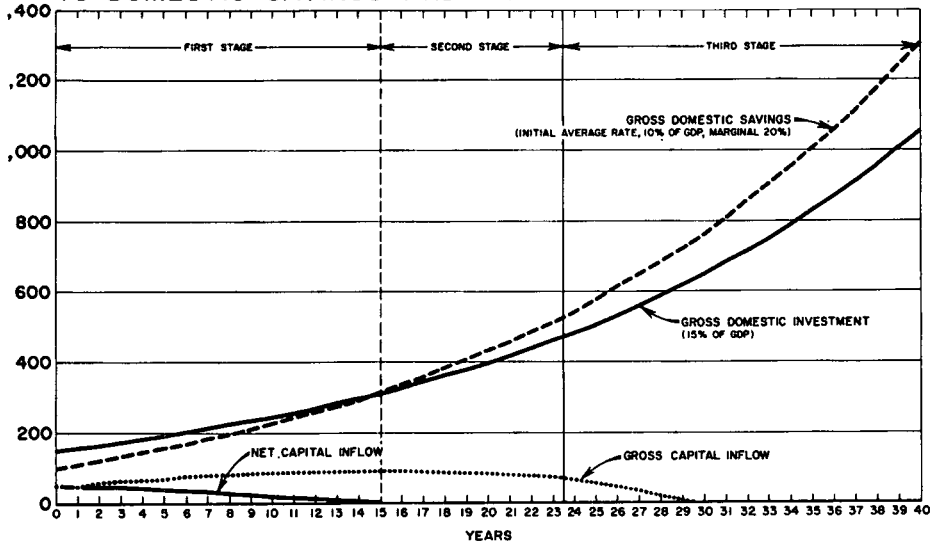
116. The 25-years period of rising indebtedness has two stages (Chart II). During the first 15 years, capital inflow supplements domestic savings to finance part of domestic investment and at the same time provides funds for servicing previously borrowed capital. Debt installments, as they fall due, are paid out of new debts that are contracted. But precisely, because this is done, the country obtains a net addition to resources, on top of repayment and on top of interest due. Chart III shows the relative contribution of foreign capital to investment.

117. The second stage of rising indebtedness covers the rest of the 25 year period (see para. 116). Domestic savings, under the impact of high plough-backs out of rising output equal, and then overtake, domestic investment requirements. The gradually growing surplus is used to cover part of the debt service, and the balance is met out of new

[8] The underlying computations are in the files of the Bank's Economic Department. See also S. Shahid Husain, *The Mathematical Appendix,* Essay IV, Volume III.

CHART II

REQUIRED LEVEL OF CAPITAL INFLOW IN RELATION TO DOMESTIC SAVINGS AND INVESTMENT



NOTE: ALL DATA ARE ANNUAL.

borrowings. This leads to further increases in indebtedness, although at a decelerating pace, until the debt ceases to grow in the 25th year.

118. In the third stage, growing domestic savings are sufficient to finance domestic investment, to pay interest on debt outstanding and to enable net retirement of debt. The 36-year cycle is a bridge between poverty and self-sustained growth.

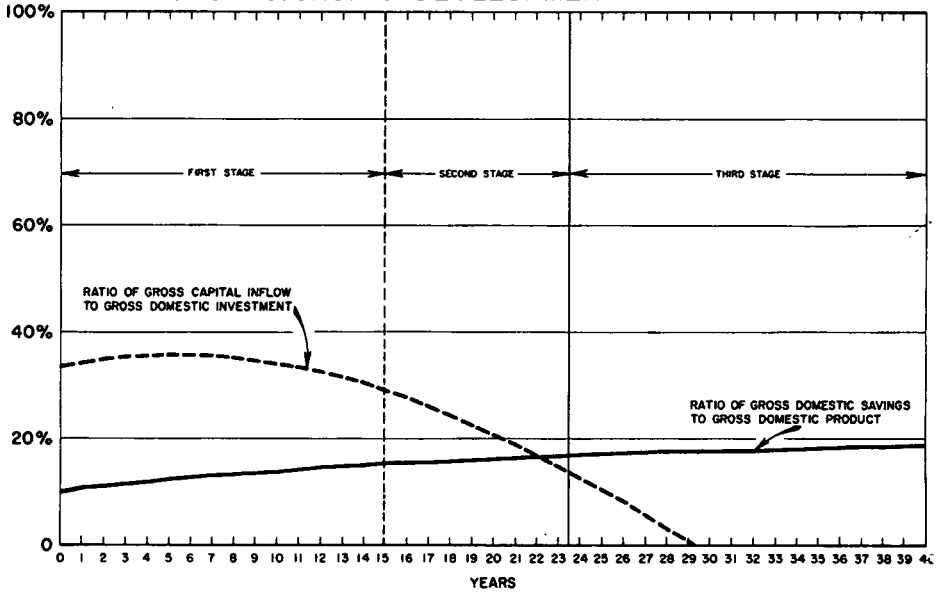
8. Qualifications

119. Numerous qualifications apply to the simplified picture portrayed on the charts.

(a) The quick retirement of debt shown on the charts is just one reflection of the rigidity of mathematical models. Only individuals and corporations afraid of the future retire their debts; no country liquidates its liabilities completely. The implication of non-liquidation of the debt would be that after the 25th year, the borrowing country could raise its growth and investment targets and its imports, instead of repaying its debt in entirety.

CHART III

INVESTMENT, SAVINGS AND CAPITAL INFLOW IN THE PROCESS OF ECONOMIC DEVELOPMENT



(b) Only a very few countries today start from zero debt; most of them are already in debt, and its size varies greatly from country to country.[9] Consequently, the actual debt development will be more unfavorable than depicted in the charts, in the sense that the debt cycle will last longer and the peak level will be higher than indicated.

(c) The model does not handle explicitly the foreign exchange constraint: it is assumed that exports and imports will adjust in accordance with the postulated behavior of savings and investment. As indicated in paras. 95–100, the foreign exchange constraint will cause additional problems. In fact, the relationships in this model variant imply a very slow growth in imports, i.e., a substantial import substitution effort. Now, there have been cases in economic history where past growth in output has not been associated with rapid import increases; some of these cases have occurred since

[9] See Volume II—*A Statistical Presentation.*

the war. But such cases have not been numerous.[10] Difficulties in containing the demand for imports would imply either a longer period of borrowing or more borrowing, or most likely, both.

(d) Whether the model variant is representative of reality crucially depends on whether the values for the return on capital and for the income plough-back are properly selected. The debt cycle would last considerably longer if the return on capital is lower than implied in the capital-output ratio of 3:1 and if the initial average and the marginal savings rates are below 10% and 20% respectively, and vice-versa. (With certain values for the variables, debt continues to increase to infinity if there are lenders to lend.) While the values for the variables have been drawn from the existing country statistical material, the defects of this material are well known. Only country studies in depth, focussed on these variables, on their past behavior and on their likely future values under plausible alternative assumptions, can enable us to properly project the likely shape and duration of the debt cycle and the related magnitudes of capital flows and of outstanding indebtedness.[11]

(e) Related to the qualification under (d), the assumption in the model variant that the values of the variables remain constant throughout the 36-year period is artificial. If the country decides to raise its income growth target above 5% p.a., the resource gap will widen and the amount of needed borrowing will increase. The opposite would happen if the income plough-back rate (marginal savings rate) is raised above 20%. Perhaps most important, when the growth process is truly successful, the rate of return on capital shifts upwards (the capital-output ratio falls). Once the increasing returns start to come in, all bets are off: the postwar experience of Japan and Italy is repeated (see para. 110). Foreigners will want to invest in the debtor country; the return on foreign capital, instead of being taken out of the country, will be reinvested in productive assets and will contribute to further increases in domestic income. The law of compound interest, instead of strangling the debtor, now works in his favor in the form of the law of growth of productivity. The debt cycle does not run full course because the country has become an attractive field for investment. We thus come back

[10] The relationship between income growth and demand for imports is analyzed in Essay III, Volume III (Johan Froland, *Demand for Imports in the Process of Growth and Structural Change*).

[11] See Essay V, Volume III for outstanding issues in country analyses (Dragoslav Avramovic, *Points to Ponder*).

to the qualification under (a): debt does not fall off because the debtor has succeeded.

120. The range of variations is infinite. And yet, despite all the imperfections and uncertainties of predicting the future, the approach embodied in the growth model may be perhaps better than alternative approaches to the analysis of long-term debt servicing capacity. Partial indicators, such as shown in Tables 9 and 10 (attached), give us a picture which is necessarily incomplete. Only by relating the relevant variables in some functional pattern, is it possible to deduce, however roughly, the shape of things to come. We cannot determine the precise time periods of the debt cycle but we can form an impression of the direction in which a country can be expected to move. And by varying the values of the critical variables we can form an impression of alternative developments which are possible.

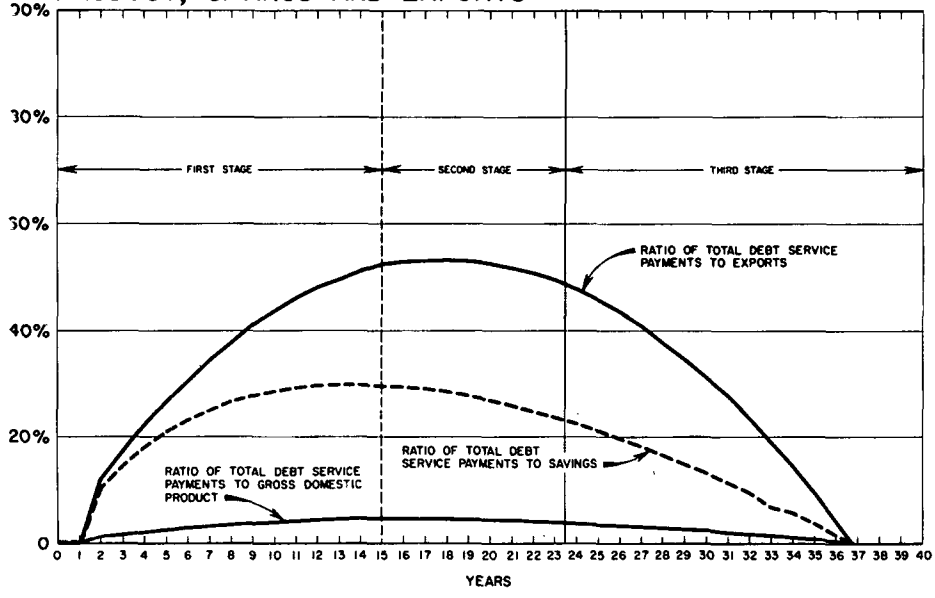
121. Furthermore, there are certain general conclusions to be derived from the preceding analysis, which may be applicable to a "typical" developing country. The nature of the debt cycle and its relationship to economic growth would be as depicted in the model, unless return on investment is below the cost of borrowing or domestic savings never exceed domestic investment. In these latter two cases—or even under conditions which are somewhat less restrictive but still relatively unfavorable—the growth-cum-debt process which is based on the conventional rate of interest of 6%, will not work. We shall return to this issue at the end of this chapter, after having disposed of the remaining methodological problem regarding debt burden measurement.

9. Debt Service Ratio Revisited

122. The spotlight can accordingly be turned on the debt service ratio (Chart IV). On the assumptions of the model variant which, it will be remembered, assumes that the outstanding debt starts declining in the 25th year and the whole growth-cum-debt sequence is completed during the lifetime of a single generation, the debt service ratio, starting from zero, attains a peak value of more than 50% in the middle years of the debt cycle, and declines thereafter. Whatever the rate of growth of exports, the ratio of debt service to exports would be always higher than the ratio of debt service to total product, since exports are only a fraction of domestic product. What particular peak the debt service ratio attains depends on the initial ratio of exports to product and the rate of growth of exports.

CHART IV

RATIOS OF DEBT SERVICE PAYMENTS TO GROSS DOMESTIC PRODUCT, SAVINGS AND EXPORTS



123. The pattern of movement of the ratio depicted by the model variant is not without historical precedent. Canada had a peak investment service ratio of 35% in 1914 and Australia's ratio in the 1920's was 24%.[12] Both these countries successfully effected the transition to low debt service ratios as the economy grew and the production base expanded. In 1961/62, Canada's investment service ratio was only 9% and Australia's 11%.[13]

124. So far as the initial ratio is concerned, the model variant assumes a relatively closed economy; ratio of exports to income at the beginning of the debt cycle is taken to be 10%. If the assumption had been, for example, 20% (see Table 11, below), the height of the top line in Chart IV (ratio of debt service payments to exports) would be reduced by half. However, it may so happen that in particular periods the most

[12] Ratios of investment income payments to external earnings. The ratios exclude amortization, because data are not available. If amortization could be included, the ratios would be considerably higher. Source: D. Finch, *op. cit.*, pp. 77–79.

[13] I.M.F., *Balance of Payments Yearbook, 1962.*

difficult long-run problems of international financing are encountered in relatively closed economies. If their population is large and income fairly low, the need for external capital will be very large. If this need is financed predominantly on hard terms and if exports do not grow rapidly, the rising debt service may cause a threat to liquidity which will be critical, and the debt service ratio may be even much higher than 50%. Furthermore, if savings grow only sluggishly, so that indebtedness continues to grow, we would be facing a situation in which an extremely tenuous financial position would last decades. This would be the situation in very poor countries with low savings rates (average and marginal), whether closed economies or not, unless the average rate of interest on total capital inflow is reduced substantially below 6%, or interest is not charged at all for several decades, or, at the limit, financing takes place in the form of grants.

125. Furthermore, the model depicts an economy where relative emphasis is on import substitution, rather than on rapid expansion of exports. This is a reasonable approximation of reality. Rapid expansion of exports can be based on increasing exports of primary products or of manufactured goods. The growth of world demand for primary products is only moderate. The range of manufactured goods which the less developed countries can develop quickly and produce efficiently for exports is limited. They consist mostly of products of the light industries in which at least some of the developing countries have a natural comparative advantage. Apart from other problems the newly emerging manufacturers have had to resolve, they have also faced the trade obstacles in the industrialized countries, some quite severe.[14] Problems of adjustment in the latter, or the fears that these problems may be severe, have thus far prevented any massive increase in exports of light manufactures from the less developed areas.

126. Many developing countries find the most promising prospect of expansion in the field of import substitution. It is not mere accident that the sectoral distribution of foreign loans to finance industrial production in the developing countries is overwhelmingly weighted in favor of production for the domestic market. It is somewhat ironical that at the project appraisal level the emphasis is on import savings, while in the aggregative analysis of debt servicing capacity, the emphasis shifts to exports. In countries where best projects are found in sectors that will predominantly produce for the home market, exports are bound to de-

[14] For the range of products to which import restrictions (quotas and tariffs) apply, see United Nations, *World Economic Survey 1962,* Part I, pp. 66–70.

velop slowly; and if foreign capital has helped with finance, the debt service will rise in relation to exports. It is a mathematical certainty that the debt service ratio will increase and, other things being equal, the rate of increase and the ultimate level will be determined by the size of the capital inflow.

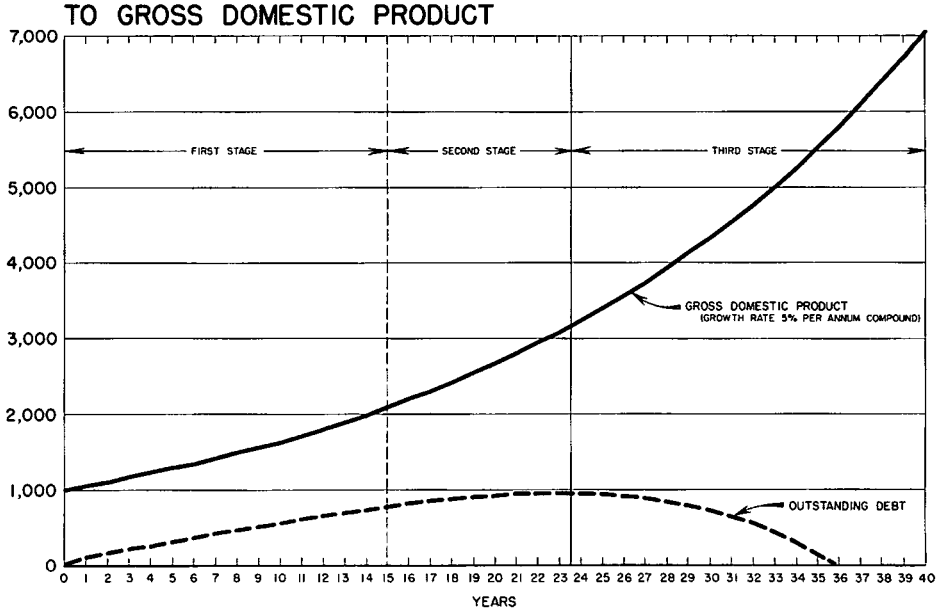
127. Sooner or later, however, the change in the economic structure will have its effect on the composition and growth of exports. There are already several postwar cases where domestic industrial expansion has been followed, after a relatively short time, by an equally rapid expansion of industrial exports. In other cases, the lag may be longer, and in some it may be quite long. But as the domestic industrial expansion proceeds and production becomes more competitive and distribution systems more smooth, manufactured exports will also increase. As they expand and as the relative role of foreign capital in the domestic economy diminishes under the impact of the rise of domestic savings, the debt service ratio will assume a declining trend. This is also bound to happen if the growth process succeeds.

128. The debt service ratio lacks any theory that would support it as a meaningful indicator of the *long-run* aspect of debt servicing capacity. The only important factor from the long-run point of view, is the rate of growth of production (Chart V). In the process of maximizing benefits and minimizing costs, individual sectors may go forward or lag behind. Exports are one of the many sectors of the economy. And while over the long run they have to expand if the economy is to grow, there will be periods in which the law of comparative advantage dictates otherwise. It is only in the interest of the borrowers as well as of the lenders that output and savings be maximized, since they are the only real source from which debt service is paid. Additional foreign exchange earnings or foreign exchange savings are only an outward expression of the deeper process of growth and of capital accumulation which underlies growth. If the rate of return on capital, domestic and foreign, is high; if the flow of good investment projects is large and increasing; if the plough-back of profits is substantial; and if the production structure adapts quickly to the requirements of growth, the long-run debt servicing capacity should increase. The rise and fall of the debt service ratio are peripheral phenomena to the process of growth and capital accumulation.

129. Does this mean that the ratio is a useless concept under all circumstances? If this were so, it would not have survived this long. Despite all its imperfections, it does serve as a convenient yardstick for passing *short-term* creditworthiness judgments, that is to say, judgments of the risk that default may be provoked by liquidity crises. While the

CHART V

MOVEMENT OF OUTSTANDING DEBT IN RELATION TO GROSS DOMESTIC PRODUCT



debt service ratio is an incomplete and imperfect indicator of present or potential liquidity problems and should never be used in isolation of all other variables relevant to the appraisal of these problems, it does draw attention to the cash flow squeeze to which an economy in the process of growth may be exposed.

130. It has been stated several times in this study that growth largely based on import savings rather than on export expansion, implies more rigidity in the balance of payments over the medium term. The composition of imports steadily shifts in the direction of inflexible inputs, as purchases of raw materials, fuels and in some cases, even essential foodstuffs increase. Exchange reserves are kept low because domestic opportunities for fixed investment outlays expand, and also, frequently because of policy errors. On top of these inflexibilities comes the debt service which, at the peak of the debt cycle in our model, runs up to as much as 50% of export earnings. Even if the import substitution process is perfectly successful in curtailing, relatively, the demand for foreign exchange; and even if the flow of export earnings remaining available after debt service is sufficient to meet the most essential imports needed for economic growth, the vulnerability of the balance of payments to dis-

turbances remains formidable. The debt service ratio may not be an entirely satisfactory measure of vulnerability; but the problem is no less formidable for being imperfectly measured.

10. Gross vs. Net Borrowing

131. The threat to liquidity builds up inevitably when the process of growth is financed by debt for a long period; and since the growth problem is a long-run problem, long periods of borrowing, and high levels of debt and debt service, can hardly be avoided. This is a function not only of the need to finance the resource gap, but also of the need to finance the service payments on the debt accumulated in the process. Indeed one significant aspect of the growth-cum-debt sequence depicted in the model variant is the relationship between gross and net capital inflow. While capital inflow is a net addition to domestic resources for the first 15 years, borrowing continues and debt increases for another 10, because domestic savings are still insufficient to pay *both* for the domestic investment requirements and for debt service abroad. Alternatively, one may say that borrowing continues simply to meet service payments on previously incurred debt. And this is largely the result of the capitalization of interest during the period when the borrower is unable to pay interest charges from its own resources. Had the capital been more productive, had the economy generated a higher rate of savings, and had the rate of interest been lower, this extra period of borrowing could be shortened. And conversely, a less productive capital, a lower rate of savings, or a higher rate of interest, would significantly extend the period over which debt continues to increase simply to enable payment of interest. Stated slightly differently, the length of the period of gross borrowing, the size of the gross capital inflow that would be needed to yield any given net inflow of resources, and the level of outstanding indebtedness that would result, would all be very much in excess of the magnitudes shown in the charts, with respect to those countries which need net additions to their domestic resources for a considerably longer period than 15 years.

11. The "Long-Haul" Case

132. We can now return to the issues raised in para. 121: cases where the sequence depicted by the model variant of the growth-cum-debt sequence is unlikely to work. One of these cases has already been described: if the rate of return on investment is below the international rate of interest, such investment cannot be financed with funds lent at

such a rate of interest (see paras. 107–108). This is a simple case. The other case, to be described below, is more complicated.

133. Several times in this study we have referred to very low-income countries which may have great difficulties in raising their savings rates to match their investment requirements in the foreseeable period. While all the developing countries face serious problems in their attempts to attain a satisfactory rate of growth and close the resource gap in the not too distant future, the limitations to obtaining a high productivity of capital and rate of plough-back are likely to be especially severe in those that have remained extremely poor for centuries, where the ratio of population to resources is very high and where there are no obvious comparative advantages in developing specialized exports to the world market. For these countries, the distinction between net addition to resources and gross borrowing requirements is particularly relevant (see para. 131), since they are likely to be in the market for external funds for a very long time to come. In such countries the process of narrowing, and ultimately closing, the domestic resource gap is likely to be long and painful. The potential gravity of the indebtedness problem in such "long-haul" cases is exemplified by the mathematical certainty that debt incurred at 6% p.a. doubles every twelve years if interest is capitalized and no retirement takes place. It is not difficult to compute the size of indebtedness and of debt service nor to imagine the associated problems of liquidity, if net addition to resources were needed for 30 or 50 years, instead of for 15 years as assumed in the model variant already described and if loans were to be contracted at 6% p.a. interest.

134. Chart VI portrays the situation of a country whose marginal savings rate is 16% compared to 20% in the earlier model variant. This variation more than doubles the period required to close the domestic resource gap. Further, in the "long-haul" case, the build-up of interest payments and external debt is so rapid that gross capital inflow is a continuing phenomenon and never ceases. In fact, after the 37th year all borrowing is merely for the purpose of servicing the accumulated external debt and debt continuously increases, through the annual capitalization of interest. The country has become self-contained, in the 37th year, in terms of the basic relationship between its domestically generated savings and domestic investment requirements; but it has remained a dependent economy in terms of continuously rising debt to infinity, as long as the conditions defined on Chart VI prevail. The margin between ultimate self-sustenance and continued dependence is a narrow one—and this reflects the uncertainty of the outcome of the growth-cum-debt process in "long-haul" cases.

CHART VI

MOVEMENT OF CAPITAL INFLOW AND OUTSTANDING DEBT IN RELATION TO GROSS DOMESTIC PRODUCT

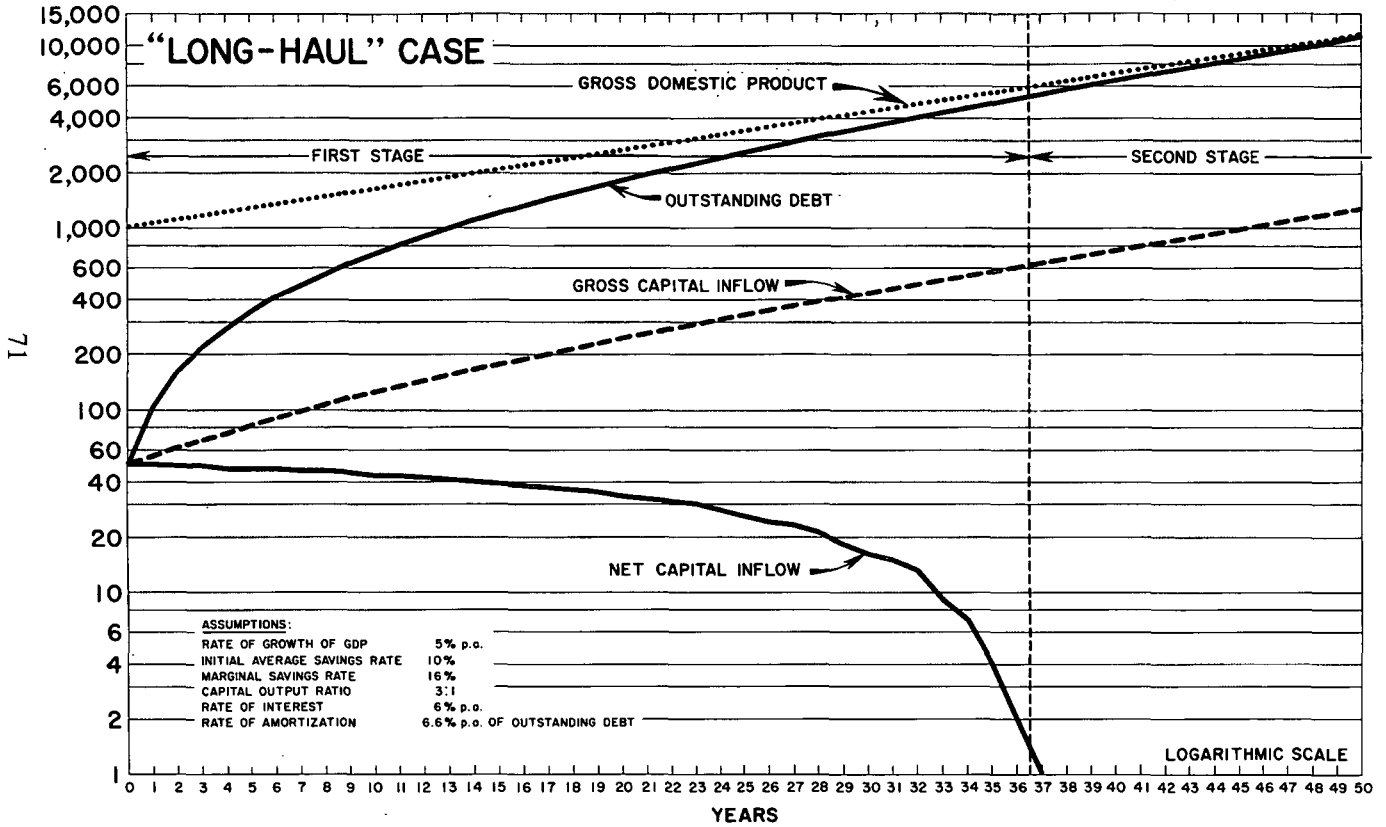
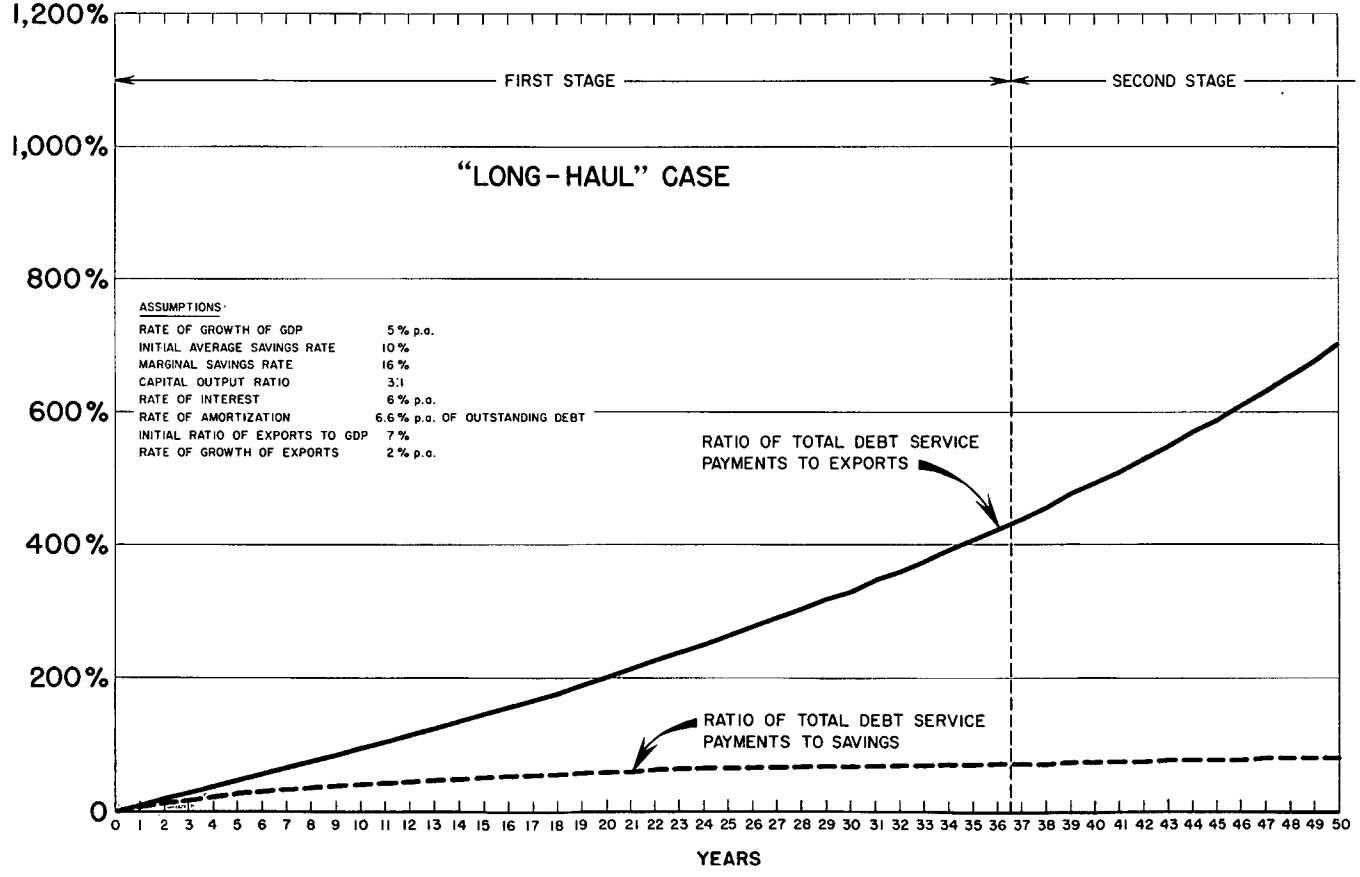


CHART VII

RATIOS OF DEBT SERVICE TO EXPORTS AND SAVINGS



135. Conceptually, a distinction can be made between the "low return" case (para. 132) and the "long-haul" case (para. 133). In the "low return" case, the average weighted return on investment is below the international conventional rate of interest. In the "long-haul" case, the return on investment that is undertaken is higher than the rate of interest, but the plough-back rate (marginal savings rate) in the *economy as a whole* is too low; and the plough-back is too low either because the extra income that is generated as a result of the current rate of investment is absorbed into additional consumption in too high a proportion, or because the return on investment, while higher than the international rate of interest, still falls short of the level that is needed. In reality, the distinction between the two cases gets blurred: when an economy is poor and its growth rate sluggish, it is quite difficult to establish the extent to which this is due to low returns on capital, to low aggregate input of capital or to the foreign exchange constraint. Most frequently, all three factors will be at work, although in different proportions; and sometimes all the three will tend to reinforce each other.

136. If there are limits beyond which the rate of savings in a low-income country cannot be pushed during a certain period; if the obstacles to high returns—natural and sociological—are admitted to be severe; and if external accounts are subject to disturbances around a growth trend which is sluggish, then a relatively high-income growth target will lead to widening resource and foreign exchange gaps, for quite a length of time. This is the fundamental rationale for foreign assistance on "soft" terms: for a certain period, the length of which will vary from case to case, a large number of low-income countries may go through a process in which relatively high-income growth targets are not matched by sufficiently rapidly rising savings, by sufficiently high returns on capital and by sufficient flexibilities in their external accounts. Under these conditions, the risks of debt failure must be judged considerable. If they are so judged by the governments—suppliers of capital; and if these suppliers of capital consider that the case of development should be subsidized out of their tax proceeds—and this will increasingly depend on the growth record and growth prospects of the receivers of funds—then external finance should be provided on "soft" terms, i.e., at a lower than the prevailing international rate of interest.

137. The "long-haul" countries can *prima facie* be identified as those with very low per capita income, large population and relatively poor natural resources. They are likely to be dependent on foreign funds for quite some time to come.

138. The reality does, however, provide some redeeming features.

Not all foreign capital consists of hard loans. Part of the flow of resources is in the form of grants or loans repayable in local currency. Even loans repayable in foreign exchange do not in all cases bear conventional terms. A part of resource flow consists of equity foreign investment and part of its earnings is reinvested in the country in productive assets. The long-haul cases are no doubt there, and they are very important. The way in which their growth process can be helped is known.

12. Growth Problem and Liquidity Problem

139. It has occasionally been argued that as long as the lenders are prepared to lend from year to year, amounts sufficient to cover the domestic resource gap, as well as the external debt service obligations, the terms of such lending are not important. This argument holds in the case of countries where the productivity of capital and the rate of ploughback are high, or can be raised in a short period. Even in such cases, however, flexibility may be needed in determining grace periods and repayment periods. Some countries where the long-term trends of savings and investment are consistent with self-sustained growth in the foreseeable future may, from time to time, face liquidity difficulties on account of factors like export declines and unfavorable debt structures (see Chapter III). Conceptually, gross lending sufficient to cover debt service obligations and import surplus, can take care of liquidity problems in such cases. The difficulty is that precisely at the time when the "cash squeeze" problem may be most acute, funds may be most difficult to raise, and this may then aggravate the liquidity problem; and an acute liquidity problem may in turn become a major obstacle to further advance of the economy towards the goal of self-sustained growth and full debt servicing capacity.

140. The debt servicing difficulties in "pure" cash squeeze cases as described in para. 139 can be handled through an extension of grace and maturity periods on new loans and through rescheduling of maturities on the existing debt. In contrast, in "low return" and "long-haul" cases, these measures may not be sufficient, since the source of debt servicing difficulties goes deeper. The cash squeeze also occurs here, but it is primarily a function of continuously rising interest payments on a continuously increasing debt, rather than of bunching of maturities in a short period.

141. By now our analysis has run the full circle. We have started with the examination of the short-run aspect of debt servicing capacity, and then moved on to a review of factors determining the long-run growth

aspect. The reverse side of the latter, however, is increased vulnerability to liquidity difficulties, at least for some time, which brings us back to the analysis of short-run factors. The contribution of long-run analysis has been to show different origins of liquidity difficulties, the likely differences in the duration of these difficulties and, above all, the possible alternative developments in the growth-cum-debt process. The concluding chapter of this study brings together the different threads of the argument and lists some of the implications for the policies of the creditors and debtors, which emerge from the growth and liquidity analyses considered as one whole.

Notes to Table 9 (pages 76, 77): Some Indicators of Economic Growth

General: Where compound annual rates of growth and percentage levels have been calculated, the terminal points are an average of—generally—three-year periods selected to avoid undue bias. The period "Fifties" generally refers to 1950–1960, except for some countries where data for 1961 and 1962 were available and for trade data where the years 1948 and 1949 have in most cases been included. The period "Recent Years" is generally an average of the last four or five available years, except for taxation estimates which refer to two or three years only. Growth in output and rates of savings and taxation refer to the whole economy, including estimates of the subsistence and/or non-monetized sector. It may be argued that in some cases it would be better to exclude this sector.

1. *Growth in Output* is indicated by compound percentage annual change in Gross Domestic Product at constant market prices. Where such data are not available, the most appropriate alternative concept has been used. Sources for data are IBRD Reports and the UN Yearbook of National Accounts Statistics.
2. *Growth in Export Volume* data has been obtained from the IFS and from data made available by the IMF and which is to be published in the IFS; from the UN Yearbook of International Trade Statistics. Projections are derived from IBRD reports and involve a fair amount of guesswork.
3. *Export Growth Relative to Import Growth* is the ratio of the rate of growth of volume of exports to the rate of growth of the volume of imports.
4. *Output Growth Relative to Import Growth* is the ratio of the rate of growth of total output to the rate of growth of the volume of imports.
5. *Rate of Savings,* i.e., Gross Domestic Fixed Capital Formation and Changes in Stocks minus (or plus) the trade and services deficit (or surplus) calculated as a percentage of Gross Domestic Product—both in current prices. In some countries changes in stocks comprise not only normal inventory accumulation but also involuntary stocks of commodities in surplus, e.g., coffee stocks in Brazil. Another weakness of savings estimates arises from distortions caused by the existence in some cases of overvalued exchange rates or multiple exchange rate practices. See also note to "Resource Gap" on Table 10.
   Symbols: Level recent years is indicated by A, i.e., 18% or over; B, i.e., 15%–18%; C, i.e., 10%–15%; and D, i.e., below 10%. Direction of change of the savings rate is shown by ++, i.e., a marked increase; +, i.e., a mild increase; 0, i.e., no significant change; and —, i.e., a decline.
   Sources used are the UN Yearbook of National Accounts Statistics; IBRD Reports; and CSO publications for India.
6. *Rate of Taxation* is measured by the ratio of tax revenues—or, where this is not available, total revenues—to GDP in current prices. Tax revenues are preferred because data is more readily available on a comparable basis. However, exclusion of net profits of agricultural marketing boards and/or margins derived from differential exchange rates may understate the fiscal effort of some countries.
   Sources are the UN Yearbook of National Accounts Statistics and IBRD Reports.
7. *Rate of Price Increase* during 1958–1962 is measured by the cost of living index.
   Symbols: The average annual rate of increase in prices is indicated by:
   A: up to 4%
   B: between 4% and 10%
   C: greater than 10%
   The source used is the IFS and IBRD Reports.
8. *Debt structure* is measured by the percentage of external public debt outstanding at the latest date available which is scheduled for repayment during the succeeding five years.
   Sources are IBRD Reports and the Statistics Division of the Economic Department.

TABLE 9. SOME INDICATORS OF ECONOMIC GROWTH

Country	Resource use indicators						
	Growth in output		Growth in export volume			Export growth relative to import growth	
	Fifties	Recent years	Fifties	Recent years	Projected	Fifties	Recent years
Afghanistan	n.a.	n.a.	n.a.	[r s]	[p]	n.a.	n.a.
Argentina	1.5	0.8	1.3	3.9	n.a.	2.17	1.08
Bolivia	0.2	n.a.	[h]	[h]	n.a.	[b]	[b]
Brazil	n.a.	6.0	0.4	4.2	n.a.	[b]	[b]
Burma	6.1[q]	3.5[q]	3.2	0.4	n.a.	[b]	[b]
Ceylon	3.2	3.4	1.9	1.5	2.9	0.41	0.39
Chile	3.3	3.4	6.9	4.1	n.a.	[b]	0.67
China (Taiwan)	7.5	7.5	9.4	10.6	7.0	n.a.	n.a.
Colombia	4.6	3.9	1.4	3.1	6.3	0.54	[i]
Costa Rica	5.0	3.8	3.6	7.9	5.0	0.52	3.95
Ecuador	5.0	4.2	8.6	6.1	3.3	[b]	[b]
El Salvador	5.0	3.2	n.a.	9.9	4.5	[h]	4.30
Ethiopia	n.a.	3.4	6.9	2.6	n.a.	[b]	0.54
Ghana	n.a.	5.0	3.2	7.6	n.a.	0.34	0.88
Greece	6.2	5.0	10.2	4.7	n.a.	1.82	0.65
Honduras	4.7	5.1	0.5	3.0	n.a.	[b]	[b]
India	3.5	3.4	1.4	[c]	5.6	0.40	n.a.
Iran	n.a.	6.0	n.a.	n.a.	4.2[o]	[b h]	[b h]
Israel	10.0	9.3	16.3	19.0	15.0[o]	4.29	2.68
Ivory Coast	n.a.	6.0	n.a.	n.a.	n.a.	n.a.	n.a.
Jordan	n.a.	7.0	n.a.	n.a.	n.a.	n.a.	n.a.
Korea	4.4	3.6	n.a.	n.a.	n.a.	n.a.	n.a.
Malaya	n.a.	4.5	3.5	5.0	3.3	0.83	0.77
Mexico	4.9	4.6	4.8	3.0	3.7	2.40	0.67
Morocco	1.5	0.7	4.4	2.0	6.5[o]	3.38	[i]
Nicaragua	3.6	3.9	7.4	1.5	3.5	0.79	1.88
Nigeria	3.9	2.1	3.7	4.3	8.8	0.31	0.60
Pakistan	1.6	n.a.	0.4	n.a.	4.4	[b]	[b]
Peru	4.0–5.0	n.a.	6.7	6.8	3.5[o]	[b]	[b]
Philippines	5.0–6.0	4.0–5.0	4.6	3.1	4.5	1.53	[i]
Senegal	n.a.	4.0	9.9[r]	10.2[r]	n.a.	[b]	[b]
Spain	4.5	[m]	5.5	9.1	8.0	0.96	0.85
Sudan	n.a.	4.5	4.5	5.2	4.5	0.90	0.73
Tanganyika	n.a.	5.0	n.a.	n.a.	3.5	n.a.	[b h]
Thailand	5.0	6.2	4.4	6.4	4.4	0.5	0.9
Togo	n.a.	[r s]	5.4[r]	12.4[r]	n.a.	0.59	1.08
Tunisia	n.a.	3.0	4.4	7.3	n.a.	1.69	1.59
Turkey	6.1	6.4	1.6	22.4	0.7[o]	[b]	[b]
U.A.R.	n.a.	5.0	[k]	4.6	8.5	[k j]	0.44
Yugoslavia	8.9	7.5	8.1	13.3	8.0–10.0[l]	0.88	1.12

Footnotes

[a] Adjusted to GDP basis.

[b] Volume of imports not available.

[c] Probably slightly increased.

[d] Mid-fifties.

[e] Total revenues.

[f] Excludes oil revenue; total revenue including oil royalty is 15.3% of GNP at end of decade.

[g] One year estimate only.

[h] Volume of exports not available.

[i] Imports declined.

[j] Imports did not increase.

[k] Exports declined.

[l] Tentative estimate.

[m] Virtual stagnation 1958-1960 followed by strong upswing recently.

[n] Very high.

[o] Assumed to be equal to projected increase in value.

[p] The volume of exports is expected to increase.

[q] Per capita output in recent years appears to be below the prewar level.

[r] IBRD Report.

[s] Little or no growth.

(Table 9 continued)

Output growth relative to import growth		Resource mobilization indicators: Rate of savings			Resource mobilization indicators: Rate of taxation		Financial indicators: Rate of price increase	Financial indicators: Debt structure
Fifties	Recent years	Level recent years	Change during fifties	Change recent years	Early fifties	Recent years		
n.a.	n.a.	D[r]	n.a.	n.a.	n.a.	6.0[r]	A	18
3.0	0.22	A	0	+	10.7[e]	10.6[e]	C	n.a.[n]
[b]	[b]	D	−	−	n.a.	n.a.	B	25
[b]	[b]	B	n.a.	0	9.5[b]	10.0[a]	C	n.a.[n]
[b]	[b]	B	−	−	18.0[e]	19.5[e]	A	43
0.70	0.90	C	n.a.	−	16.5	18.5	A	43
[b]	0.56	C	0	+	11.2	14.0	C	44
n.a.	n.a.	C	+	++	15.2	15.5	B	40
1.77	[i]	A	n.a.	++	9.2	11.1	B	44
0.72	1.90	C	−	−	9.6	11.1	A	47
[b]	[b]	B	0	0	12.9	15.2	A	35
0.83	1.39	A	0	−	n.a.	n.a.	A	40
[b]	n.a.	n.a.	n.a.	n.a.	n.a.	7.0	n.a.	44
n.a.	0.58	A	n.a.	++	9.9[d]	9.9	B	n.a.
1.11	0.69	C	++	+	12.7	13.6	A	n.a.
[b]	[b]	C	−	−	7.0	8.7	A	21
1.00	0.97	B	+	n.a.	6.9	9.8	A	25
[b h]	[b h]	C	n.a.	++	6.4[d f]	8.2[f]	B	56
2.63	1.31	D	++	+	21.8[d e]	23.6[e]	B	57
n.a.	n.a.	A[g r]	n.a.	n.a.	n.a.	16.1[g r]	A	n.a.
n.a.	n.a.	D	n.a.	n.a.	n.a.	2.1	n.a.	n.a.
n.a.	n.a.	D	n.a.	0	n.a.	12.2	B	19
n.a.	0.69	A	n.a.	0	13.8[d]	15.4	A	18
2.45	1.02	B	+	0	9.8[d e]	10.2[e]	A	64
1.15	[i]	C	0	−	10.6[d]	11.8	A	n.a.
0.38	4.88	n.a.	n.a.	n.a.	n.a.	9.0	A	38
0.33	0.29	D	0	n.a.	6.4[d]	6.0	A	30
[b]	[b]	D	n.a.	0	7.7[d e]	9.4[e]	A	23
[b]	[b]	A	0	−	14.1[e]	15.1[e]	B	40
1.83	[i]	C	+	0	10.1	10.1	A	56
n.a.	[b]	D	n.a.	0	n.a.	20.0[e]	A	n.a.
0.79	n.a.	A	n.a.	++	10.3	12.8	B	50
n.a.	0.63	C	n.a.	0	n.a.	9.5	A	28
n.a.	[b h]	A	n.a.	0	9.8[d]	9.0	A	n.a.
0.57	0.9	B	+	+	10.5[d]	11.7	A	38
n.a.	n.a.	D	n.a.	n.a.	n.a.	10.0[g r]	n.a.	n.a.
n.a.	0.65	C	−	n.a.	n.a.	17.7	A	24
[b]	[b]	C	++	+	9.7	10.6	B	59
[j]	0.58	B	+	−	14.2	13.7	A	n.a.[n]
0.97	0.63	A	++	+	n.a.	23.3[a]	B	75

TABLE 10. SOME DATA BEARING ON CREDITWORTHINESS OVER THE MEDIUM AND LONG RUN
(In addition to indicators shown on Table 9)

Country	Change in terms of trade			Growth in export value		
	Fifties		Recent years	Fifties	Recent years	Projected
	Early	Mid				
Afghanistan	n.a.	n.a.	n.a.	n.a.	0.0[b]	9.0
Argentina	137	117	103	—	1.8	n.a.
Bolivia	[133	119	112]	—	—	n.a.
Brazil	[121	130	86]	0.8	—	n.a.
Burma	[100	101	93]	—	0.8	n.a.
Ceylon	102	108	96	1.7	—	0.8
Chile	n.a.	n.a.	n.a.	4.6	0.3	6.8
Colombia	101	131	86	2.9	—	4.7
Costa Rica	113	131	75	4.6	1.6	3.5
Ecuador	124	122	86	9.3	3.0	3.0
El Salvador	n.a.	123	80	6.8	—	3.3
Ethiopia	99	122	89	8.6	1.4	n.a.
Ghana	74	105	57	4.2	5.9	0.0
Greece	93	92	95	7.0	1.5	n.a.
Honduras	107	119	88	2.3	2.7	n.a.
India	116	105	115	0.5	0.4	3.7
Iran	n.a.	n.a.	n.a.	3.0	12.6	4.2
Israel	98	97	91	14.1	17.3	15.0
Ivory Coast	n.a.	n.a.	n.a.	n.a.	7.7[b]	n.a.
Jordan	n.a.	n.a.	n.a.	11.6	—	n.a.
Korea	n.a.	n.a.	n.a.	1.3	9.0	n.a.
Malaya	n.a.	109[k]	97[k]	0.3	2.8	—
Mexico	107	96	76	4.6	—	4.0
Morocco	87	94	96	5.9	0.9	6.5
Nicaragua	113	136	85	10.0	1.5	3.0
Nigeria	97	111	99	5.1	6.3	4.8
Pakistan	[170	108	120]	—	0.3	2.0
Peru	n.a.	113	96	8.6	8.3	3.5
Philippines	109	106	92	5.1[g]	5.5[g]	3.6[g]
Senegal	n.a.	n.a.	n.a.	9.8[b]	n.a.	n.a.
Spain	113	102	105	5.0	7.2	8.0
Sudan	n.a.	113	104	5.4	3.2	4.5
Taiwan	n.a.	n.a.	n.a.	6.0	9.9	6.0
Tanganyika	n.a.	100	86	6.9	5.5	3.0
Thailand	[96	103	101]	3.9	6.0	2.0
Togo	n.a.	n.a.	n.a.	4.7	1.8	n.a.
Tunisia	n.a.	n.a.	n.a.	3.1	0.2	4.5
Turkey	n.a.	n.a.	n.a.	3.4	1.5	2.3
U.A.R.	151	99	100	—	3.5	6.5
Yugoslavia	n.a.	n.a.	n.a.	8.5	13.4	8.0–10.0[e]

Footnotes

[a] Average 1955 and 1958.

[b] Source IBRD Report.

[c] Crude estimate from IBRD Report based on 1959 investment data and 1961 trade deficit.

[d] Crude estimate for 1958 based on data in IBRD Report.

[e] Tentative estimate.

[f] Published figures underestimate the actual import values, especially in recent years. Allowing for this, growth rate may be 2.0% for Fifties and 9% for Recent Years.

[g] The growth rates for export values do not take account of identifiable unrecorded shipments and services. If these are allowed for, the respective rates would be 4.1% for Fifties, 4.3% for Recent Years and 2.6% for Projected.

[h] May be affected by heavy imports in 1949. Imports increased by 8% p.a. between first and second plan periods.

[k] Indices are based on the average of period 1952–60.

[m] Refers to late 1950's; Resource Gap diminished in 1961 and 1962.

— = negative.

n.a. not available.

Notes to Table 10: Some Data Bearing on Creditworthiness over the Medium and Long Run

General: The period "Fifties" generally refers to 1950–1960, except for some countries where data for 1961 and 1962 were available and for export and import value data where in most cases the years 1948 and 1949 were included. The period "Recent Years" is an average of the last four or five available years.

1. Changes in Terms of Trade are measured by annual indices with 1958 = 100. Two-year averages are used. Figures in brackets are rough estimates. The average Asian Sterling countries import price index is used for Burma. Average import price index for Latin America is used for Brazil and Bolivia.

(Table 10 continued)

Growth in import value		Resource gap —Average	Population growth rate	Investment income payments as % of external earnings		Investment income payments as % of GNP
Fifties	Recent years	Recent years		Fifties	Recent years	Recent years
n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
0.0	0.6	8	1.8	1.3	6.2	0.8
—	—	54[a]	2.4	n.a.	2.4	0.4
2.3	1.6	4	2.4	8.4	12.2	1.5
5.1	0.5	20[m]	1.1	1.6	3.4	0.4
3.3	3.7	14	2.8	4.5	3.6	1.5
5.6	6.4	+	2.5	15.4	12.2	2.5
4.0	—	+	2.8	6.5	6.6	1.0
8.4	3.3	22	4.3	18.2	4.2	1.0
6.6	—	+	3.1	13.3	15.0	4.3
8.9	1.4	+	3.5	2.4	3.4	0.8
9.0	7.4	n.a.	(1.5)	1.3	7.0	0.5
8.9	8.9	+	3.0	n.a.	5.0	1.7
2.8	9.7	45	1.0	2.5	1.0	n.a.
5.6	2.1	10	2.6	26.5	7.4	2.0
2.8[h]	5.0	13	2.4	3.8	5.9	0.3
9.9	14.2	23	2.5	63.5	47.2	11.9
6.2	7.2	73	3.0	n.a.	14.6	3.6
n.a.	11.1	+	2.0	n.a.	n.a.	n.a.
9.8	10.0	242	2.8	n.a.	n.a.	n.a.
5.2	—	63	2.7	n.a.	0.2	n.a.
4.5	6.0	+	3.1	n.a.	10.7	4.6
7.5	1.7	8	3.1	8.0	12.5	1.5
0.9	—	+	2.7	n.a.	4.0	n.a.
9.6	2.1	n.a.	3.5	12.6	2.8	0.8
10.9	8.7	34	2.0	n.a.	n.a.	n.a.
3.1	9.5	36	2.2	1.4	3.2	0.2
7.5	1.7	11	2.9	6.7	12.9	3.0
2.5	1.1	13	3.3	5.9	11.9	2.3
6.3[b]	n.a.	50[e]	2.3	n.a.	n.a.	n.a.
6.4	3.8	11	0.8	n.a.	2.0	0.2
7.7	5.8	1	2.8	3.7	2.0	0.5
6.7	11.0	39	3.0	0.6	0.9	0.1
1.6	—	+	1.8	n.a.	n.a.	n.a.
8.6	6.3	10	3.1	0.5	1.4	0.2
9.6	6.6	50[d]	[2.0]	n.a.	n.a.	n.a.
1.4	0.1	50	2.1	n.a.	0.6	n.a.
3.4	2.7	8	2.9	1.9	5.8	0.4
0.8[g]	6.6[f]	8	2.7	6.4	n.a.	0.3
9.3	11.4	7	1.3	2.0	1.8	0.2

Source—IMF published and unpublished data, for Mexico data is drawn from National Bank of Foreign Trade, and for some Far East countries estimates prepared by IBRD.

2. Growth in Export and Import Values (merchandise only) is in terms of a compound rate per year. Base and terminal periods are generally three-year averages. Projected growth in export value is based on IBRD economic reports.
   Source—IMF: International Financial Statistics. For some Far East countries estimates prepared by IBRD.
3. Resource Gap is measured by the current account deficit (excluding factor income and Private Donations) as a % of Gross Investment. Averages for the last four or five years are shown. Countries having current account surpluses are marked +; this does not rule out occasional deficits. Net factor income payments abroad are excluded partly because the concept includes reinvested profits and partly because the data turn on a legal definition of "national" and "foreign." However, there may be a good case for including them in calculating the Resource Gap, in some cases. Similarly, where private remittances and donations are regular items, there may be a case for taking them into consideration.
   Source—UN Yearbook of National Accounts and/or IBRD Reports.
   For India—Central Statistical Organization.
4. Growth in population is in terms of compound rates per annum.
   Source—IBRD Reports.
5. Investment Income Payments as % of external earnings i.e., Current Account Receipts are averages for 1950–1952 and 1959–1960. Investment Income Payments as % of GNP refer to payments in 1959–1960 and GNP in 1958–1960. GNP figures are adjusted for gross under or over valuation of national currencies. Investment Income Payments conform to the IMF balance of payments definition i.e., they include total interest payments and dividends and profits, whether re-invested or not.
   Source—IMF: Balance of Payments Yearbook (various issues).

TABLE 11. EXPORTS AS A PROPORTION OF GROSS DOMESTIC PRODUCT

	Exports as a percentage of gross domestic product	Population as a percentage of the population of all developing countries	Exports as a percentage of the exports of all developing countries
	(1)	(2)	(3)
India	5.7	30.8	4.5
Pakistan	6.9	6.5	1.3
Brazil	7.3	5.1	4.5
Mexico	14.2	2.5	2.7
Nigeria	13.7	2.4	1.6
Philippines	10.5	2.0	1.8
Thailand	16.1	1.9	1.5
Turkey	7.9	1.9	1.1
Korea	19.4	1.7	.1
Burma	5.2	1.5	.8
Argentina	11.9	1.4	3.4
Ethiopia	9.8	1.4	.3
Colombia	16.0	1.0	1.5
Sudan	17.9	.8	.6
Ceylon	30.0	.7	1.3
China (Taiwan)	12.6	.7	.6
Peru	24.3	.7	1.5
Malaya	50.2	.6	3.0
Rhodesia & Nyasaland	42.8	.6	1.9
Chile	14.6	.5	1.7
Venezuela	32.5	.5	8.1
Ghana	19.0	.4	1.0
Ecuador	17.3	.3	.5
Guatemala	19.0	.3	.4
El Salvador	23.4	.2	.4
Costa Rica	22.5	.1	.3
Honduras	20.6	.1	.2
Israel	13.4	.1	.7
Panama	27.0	.1	.1
Paraguay	18.8	.1	.1

Source: See Table 5a.

CHART VIII

MOVEMENT OF CAPITAL INFLOW AND OUTSTANDING DEBT IN RELATION TO GROSS DOMESTIC PRODUCT

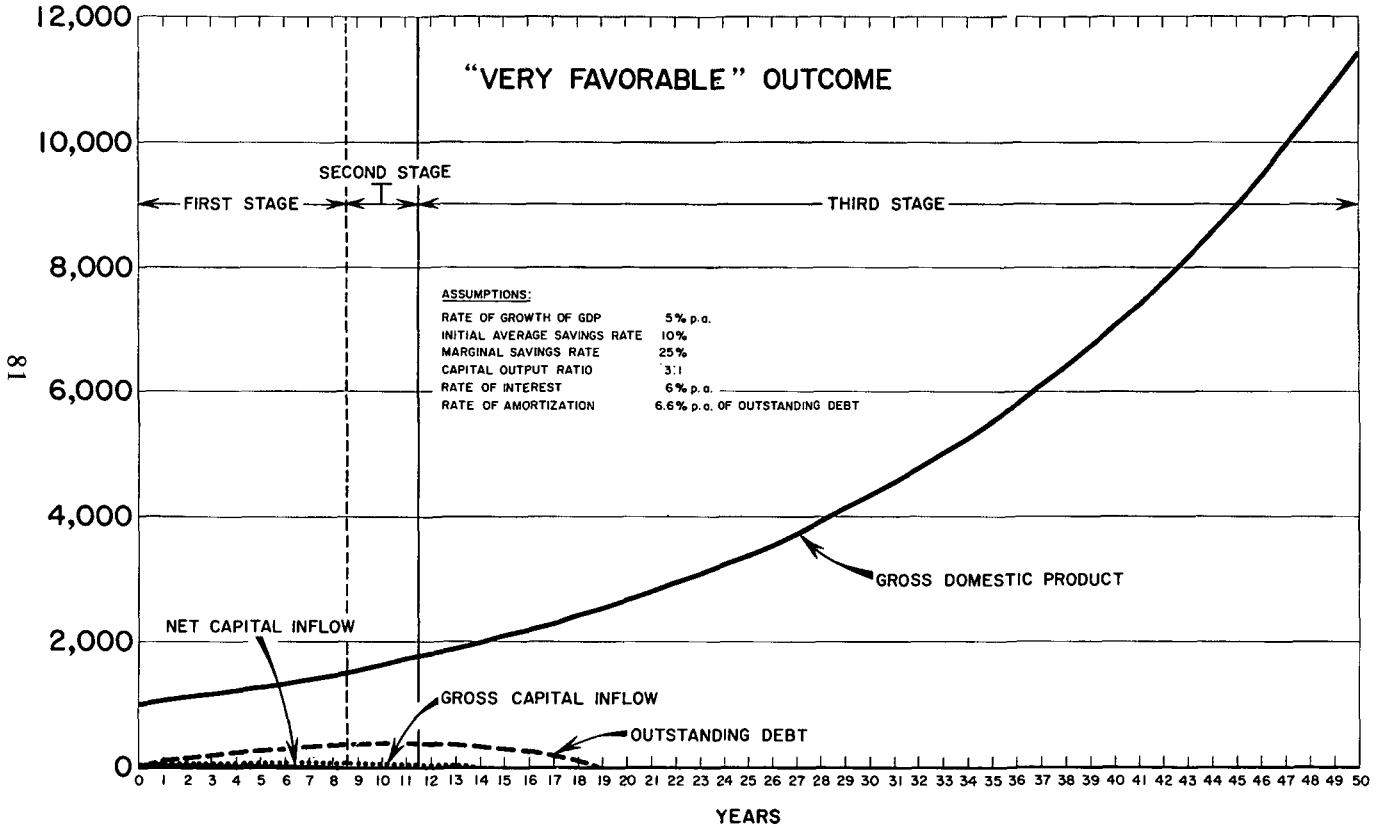


CHART IX

RATIOS OF DEBT SERVICE TO EXPORTS AND SAVINGS

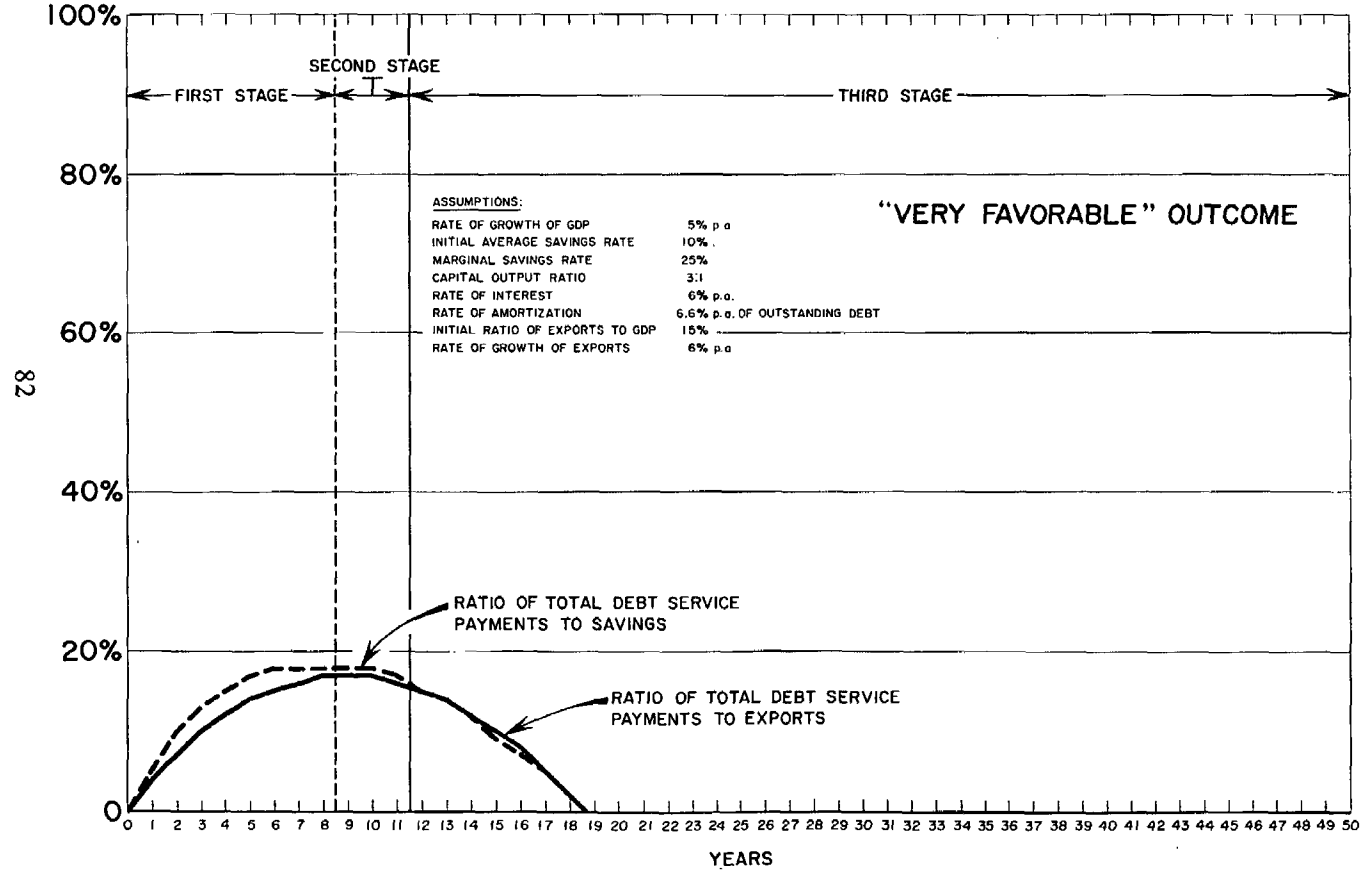


CHART X

MOVEMENT OF CAPITAL INFLOW AND OUTSTANDING DEBT

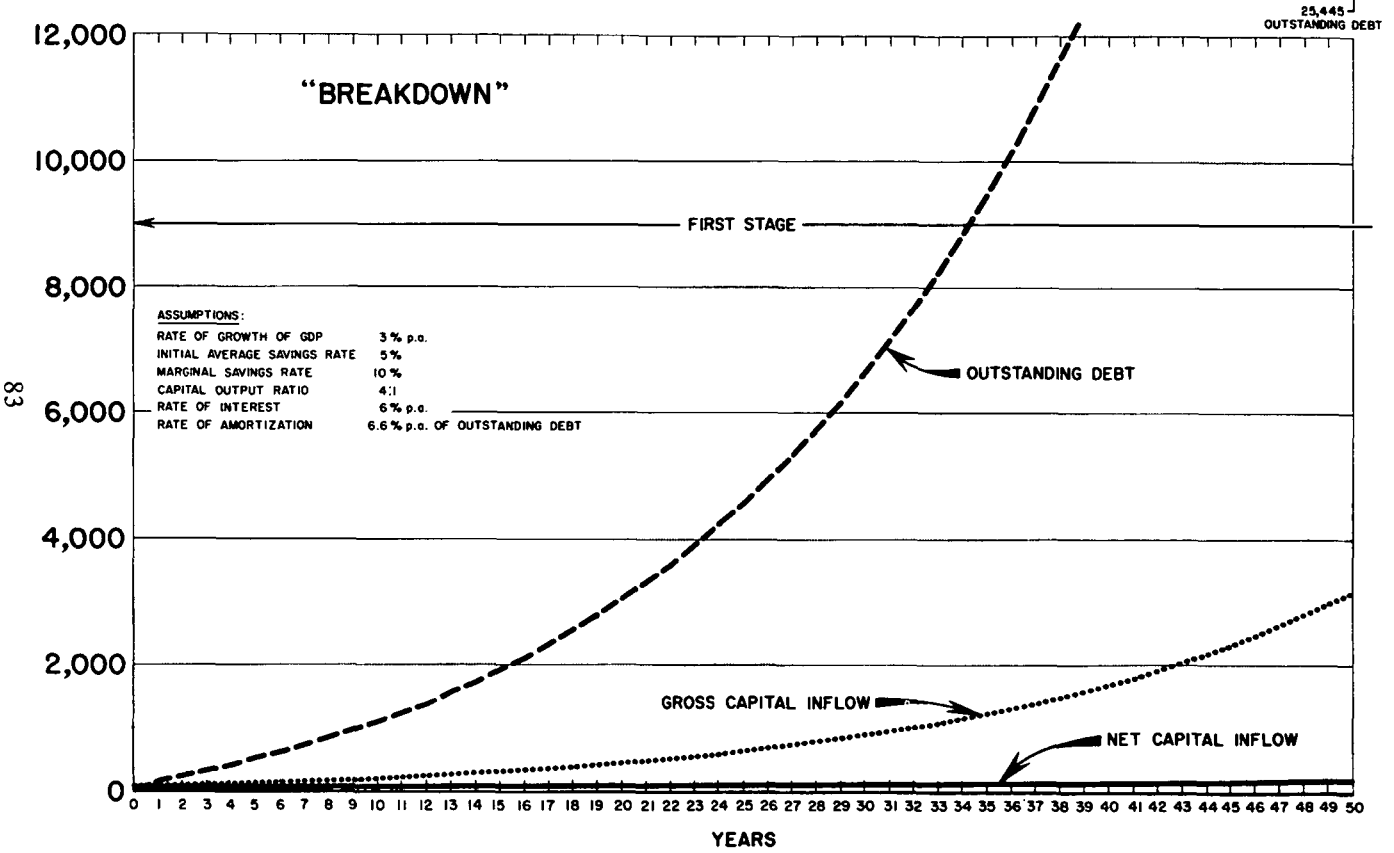
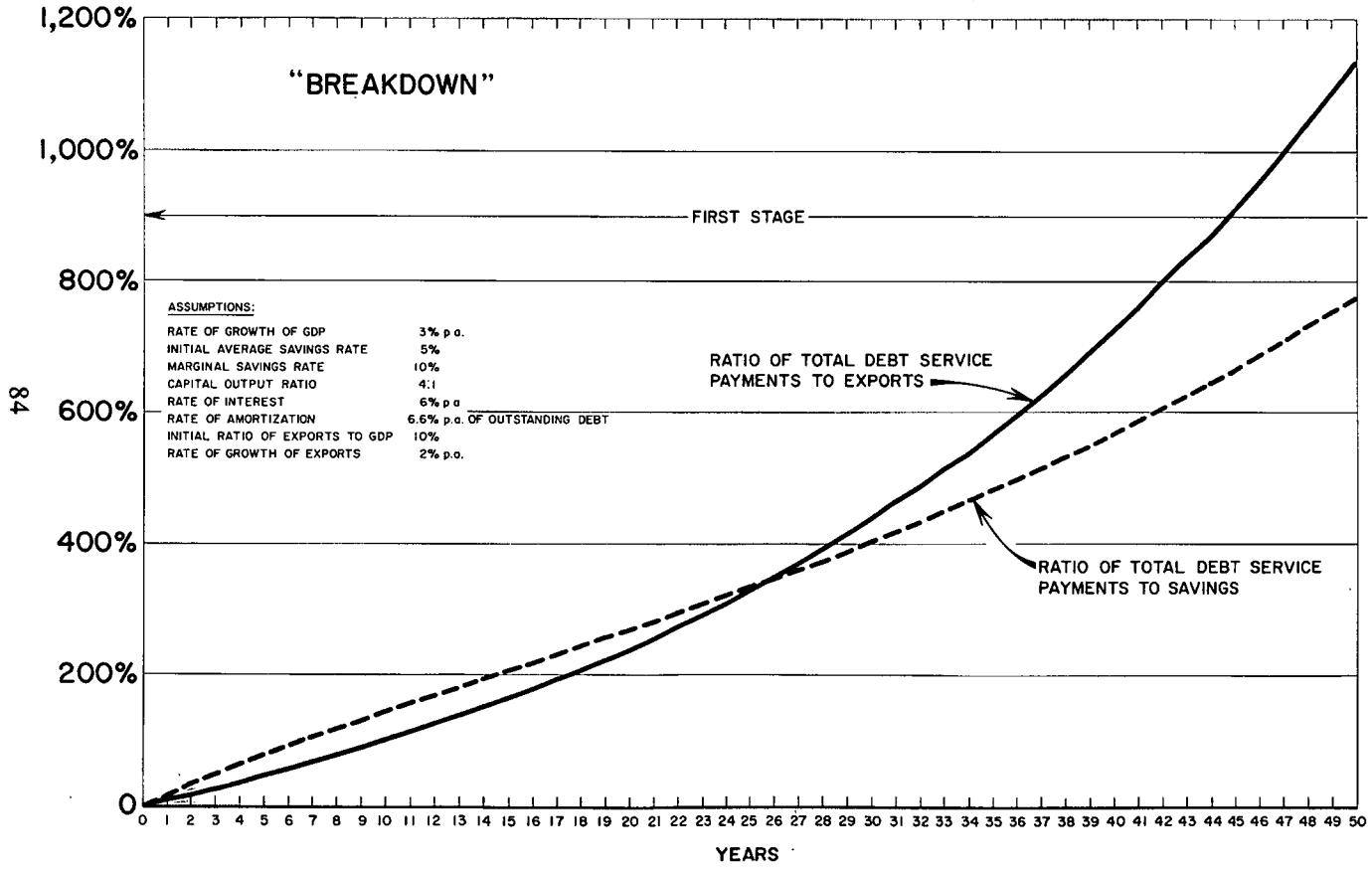


CHART XI

RATIOS OF DEBT SERVICE TO EXPORTS AND SAVINGS



Chapter VI Conclusions

142. This study has attempted to provide an analytical framework for the discussion of problems of debt servicing capacity of the developing countries, which are the major international borrowers today. While the framework can be applied to any one case, we have concentrated on studying debt servicing problems of a hypothetical primary producing country which has a reasonably ambitious income growth target; which relies on foreign loans at conventional terms for financing a considerable portion of its investment program; which has a relatively closed economy and cannot rapidly expand its exports of primary commodities or of "light" manufactures, due to world market conditions.

143. Any borrowing on conventional terms results in a return flow of interest and amortization in fairly rapid succession. In the case of foreign borrowing, debt service payments are a charge on domestic real income and savings. These payments have to be transferred abroad either by expanding exports, by curtailing imports, or by further borrowing abroad. Capital inflows, and particularly exports of primary producing countries are fluctuating. On the other hand, debt service on public and private loans is contractually fixed.

144. Inflexible obligations are potentially dangerous under any circumstances. This danger was present even in the classical system of foreign investment in earlier periods of economic and financial history. The unmitigated violence of the international business cycle, at that time, frequently created havoc in international investment. There were, however, two redeeming features. Foreign private direct investment which accounted for a considerable share of total flow, was concentrated largely in activities producing primary products for exports; and as export sales fluctuated, so did profits in the export industries. The other redeeming feature was the complex inter-relationship of interest rates, risk premia and the anticipated behavior of debtors in periods of crisis. It was expected that borrowing governments would default occasionally on their fixed-term loans, when a depression reduced exports and budgetary

income or when budgetary policies were highly questionable. To offset this, debtors were charged an interest rate which included a risk premium high enough for the lenders to feel that chances of repayment were even or better than even. Probably the risk premium also included an insurance against wars and international inflations. Who was the winner in this game, played by creditors and debtors, we do not know. What is relevant for this study is the fact that a mechanism to cope with fluctuations did exist and in its own way it helped to accomplish the major function of international investment: transfer of resources from countries with plentiful supply of capital and correspondingly low rates of interest to countries needing capital and ready to pay higher rates of interest.

145. The present situation is different from that described above. A major part of private direct investment still flows to export industries in less developed countries, although the products that are developed are new: instead of tea, cocoa and rubber plantations, foreign capital now finances aluminum smelters, iron ore mines, and above all, oil fields. The return flow of profits from these "enclave" investments fluctuate *pari passu* with export sales. But another part of foreign direct investment in the developing countries now goes into industries that produce goods to replace imports, be it fertilizer or steel. The profit rate in these industries is high enough to offset the heavy risks accompanying foreign investment and still yield a surplus above what can be earned in the major financial centers. Sales of these goods on the domestic market are rising rapidly and steadily. Since fluctuations in sales are minor, profits also tend to show an uninterrupted upward trend. A large part of profits is reinvested in productive assets and therefore serves to expand further the productive base of the economy. But the share of profits that is not reinvested becomes a charge which does not vary in response to export fluctuations.

146. The above is one illustration of a much wider problem. Most developing countries now consider the acceleration of economic growth a major task facing the present generation. Growth targets are ambitious compared to resources that can be mobilized domestically for financing investment needed to achieve these targets. The responsibilities of governments in promoting more investment and faster growth are certainly greater today than they were, on the average, in earlier periods of economic history. Therefore, there is demand for massive capital inflow from abroad, and the major channels through which this inflow is transferred are governments in developing countries, which either borrow on their own account or guarantee loans made to private parties. To

the extent that this capital inflow occurs on "hard" terms, a rigid block is built into their economic systems, consisting of contractually fixed debt service obligations. And as capital inflow proceeds, these contractually fixed obligations also increase. True, the debtors are in a much better position today than in earlier periods, because they are now charged less than 6 per cent for "hard" money and even less for some other forms of capital transfers. The lenders, or more accurately, their governments have assumed the risk of default. A new concept of international financial morality has developed. Debtors should not default, precisely because they are charged moderate rates of interest and sometimes no interest at all. Nevertheless, the debt service charges do increase over time, since capital flows are expanding.

147. The percentage share of exports absorbed by debt service will rise under any circumstances. However, if world demand for primary products rises only moderately; if possibilities to expand exports of light manufactures are circumscribed by restrictions resulting from concern with domestic employment in the importing countries; and if it takes time to develop competitive exports of heavy industrial goods, it is virtually inevitable that the ratio of debt service to exports will increase quickly and will attain a high level. This rigidity of the balance of payments will be further aggravated by a likely shift in the composition of imports of the industrializing country, as purchases of raw materials, fuels, spare parts, and sometimes even basic foodstuffs, rise rapidly. In short, if the return of capital, borrowed and domestic, is maximized by concentrating on activities catering to the domestic market, economic growth and structural change of the economy will be accompanied by increased rigidity in external accounts.

148. We do not know how long it takes a developing country to overcome the worst phase of the strains on its balance of payments. In particular, we do not know at what speed an industry which has been built initially to supply the domestic needs, can be made sufficiently competitive to penetrate the international market. There are industrializing countries which have accomplished the transition from domestic to export orientation swiftly, in about a decade or so. It is impossible to say how representative or accidental their experience is. Sooner or later, if economic growth is a success, the structural change of the economy will inevitably lead to a structural change in external accounts, with a consequent rapid rise in exports and the relaxation of rigidities. But in the meantime and for the foreseeable future, debt service as a proportion of exports will be very high and the sensitivity of the economy to

declines in its capacity to import will be very great. Under these conditions, even minor fluctuations in exports and minor policy errors of the borrower may have major repercussions.

149. The problems of rigidities and fluctuations and of financial danger that they imply, are only one aspect of the debt servicing capacity of the developing countries. From the long-run point of view, there are three other factors that are of fundamental importance. *First,* the rate of return on projects must be higher than the international rate of interest. Otherwise, no basis exists for successful servicing of foreign capital on conventional terms. *Secondly,* the savings out of newly-generated income must be sufficient to enable the economy to finance an increasing proportion of its own investment requirements out of domestic resources. At some point of time, aggregate domestic savings must exceed aggregate domestic investment by a margin that is sufficiently large to meet at least interest charges on the previously incurred debt. If that point is never reached, funds would have to be continuously borrowed and indebtedness would have to increase continuously just to meet interest; and as new borrowings would also carry interest, the debtor—and the creditors—would face a spiral of steadily rising debt and debt service obligations. *Thirdly,* the total flow of investment projects in the economy must be sufficient to yield an increase in aggregate national output at a rate in excess of population growth. Otherwise, it may be presumed that the popular pressures would interfere with debt servicing; and also, the flow of domestic savings is unlikely to expand sufficiently unless aggregate real income rises reasonably fast.

150. The developed countries have three choices in financing the economic growth of the developing countries. *First,* they may decide that in some countries day-to-day financial dangers are so serious (para. 147) and the long-term prospects for growth so uncertain (para. 149), that the only safe way out is to provide most of the needed funds on "soft" terms. This device is, of course, already being employed on a large scale (including the disposition of surplus foodstuffs on concessionary terms), although there is some tendency for countries that have made extensive use of this device to harden up their terms, partly because other leading capital-exporting countries have continued to provide development assistance wholly or predominantly on a "hard" basis. If "soft" funds cannot be mobilized adequately, and if it is thought that it would be risky to expand "hard" lending, *the second choice* is to put arbitrary ceilings on the flow of funds that are made available to countries where the situation looks precarious. Depending on where the ceilings are fixed, the consequence may be that a number of profitable projects would not

be undertaken because of the lack of finance, and the actual rate of economic growth in many developing countries may fall short of the technically and economically feasible rate. *The third choice* is to try to live with the dangers and with the risks and to finance growth predominantly at "hard" terms.

151. In practice, of course, all three alternatives are present. The mixture has varied and will continue to vary, depending on the judgment of the circumstances of particular countries and on the actual availability of "soft" funds. For analytical purposes, however, it might be useful to state, in somewhat more formal terms, the conditions which would have to be met for the mechanism of international lending at "hard" terms to work reasonably successfully. The assumption is that no arbitrary ceilings on lending are set and that all projects whose yield exceeds, with a reasonable margin, the international rate of interest (say, 6%) are financed.

152. The conditions are as follows:

(*a*) *Financial*

(i) The creditors agree to lend continuously despite high debt service ratios (very high in some countries) and despite the general rigidities in the balance of payments of their debtors. The length of the period of lending depends on how far particular debtors are from the point of "self-sustained" growth. Self-sustained growth is defined to mean a rate of income increase of, say, 5% p.a., financed out of domestically generated funds and out of foreign capital which flows into the country because it wants to do so;

(ii) The debtors manage their external accounts in a way which enables them to pay their bills as they fall due, no questions asked;

(iii) The fluctuations in export earnings of the debtors are greatly moderated, thus facilitating the fulfillment of conditions (i) and (ii);

(iv) Some way is found to solve the "cash squeeze" problem of those countries which have to repay an extremely large proportion of their debt, over the next few years. For the solution to be lasting a number of very difficult issues would have to be satisfactorily handled.[1]

(*b*) *Growth*

(v) The return on capital is higher than the international rate of interest;

(vi) The plough-back of profits is high enough so that at some

[1] This is a special condition in the sense that it refers to a limited number of countries and arises from past financial practices.

point, however distant, domestically generated savings exceed domestic investment requirements and thus leave a surplus which can be used to meet service payments; and

(vii) The number of investment projects that are undertaken and that meet the condition (v) is sufficient to enable the total output to grow at a "satisfactory" rate. A reasonably high-income growth rate will also help in meeting the condition (vi).

153. The condition (i)—readiness of lenders to provide funds continuously and for a fairly long time despite liquidity dangers—has already been discussed. It is in the hands of the creditors. The only point which may be added is that as time goes on, gross capital exports would have to become very large if they are to yield a net addition to resources of the borrowing country. Such net addition takes place only when gross borrowing is in excess of repayments *and* in excess of interest due on the debt already outstanding. And since new borrowing also carries interest, the outstanding debt compounds and this in turn increases the debt service that is due. The practical implication is that in many countries the mechanism of "hard" lending could not work properly unless at some point a substantial part of capital exports were put on a non-project basis.

154. The condition (ii) is in the hands of the debtors. Difficulties in servicing debts have always been experienced, and they will continue to be experienced, whether we deal with debts of individuals, corporations or governments, and whether debts are domestic or international. The problem which concerns us here is how such difficulties can be reduced to a minimum. The massive transfer of resources from the rich to the poor countries which will have to last decades and which is needed to enable the developing countries to create the basis for self-sustained growth, could not be undertaken on "hard" terms unless the paramount condition of any loan is respected: loans have to be serviced, no matter what. Moreover, all other bills—for imports, services, etc.—must be paid on time as well. Only if this is done, can the bankers in good conscience mobilize capital from savers in the rich countries and send it to distant lands, in excess of the service flows received. Only then can they look with leniency at the rigidities in the balance of payments structures of their debtors and at the risks that these rigidities entail. Unless confidence is created that bills do get paid on time, the lenders would have to charge a rate of interest which would incorporate a premium to cover the risks. Such an interest rate might be much higher than the majority of debtors would be able to afford. Even more likely, the required flow of capital would simply not take place.

155. The task of managing the balance of payments in a developing country is formidable. It is so because effective demand within the country is great—investment activity is high and accelerating. This does not mean that maintaining a desirable rate of economic growth necessarily conflicts with balance of payments equilibrium. Cases still exist where the propulsive force in economic growth is expansion of exports and where conservative fiscal and monetary policies are the best policies to pursue. Politically courageous policies can extract through taxation resources needed for development, and it is also possible to resist the temptation to finance fixed investment with short-term credit. Where these circumstances do not prevail—and this applies to a large number of the developing countries—it will be necessary to attempt to insulate the balance of payments from domestic inflationary pressures. In any case, the limits within which governments of the developing countries, which are heavily indebted abroad, can act have become very narrow and the tolerances very fine. If creditors are asked to live with liquidity dangers, the debtors should be asked to exercise restraint and act courageously.

156. Neither lenders nor borrowers, will be fully able to handle the liquidity problems unless export earnings of the developing countries attain some measure of stability (condition iii). It is true that the international business cycle today is something quite different than it used to be. Violent downswings in prices and quantities, so typical of earlier international financial history, have been absent in the two decades since the end of the war, and there is no present indication that they will recur. Downward fluctuations in export earnings of the less developed countries, however, still occur. Much advance has been made in mitigating the impact of these fluctuations, both by the actions of the International Monetary Fund and by public lending agencies of the industrialized countries. But it is generally agreed that the problem is still with us and that much remains to be done. The fact is that price instability in primary products persists and it leads to continuing fluctuations in exchange earnings of the developing countries. Neither the debt servicing mechanism nor the mechanism of continuing international capital flows can function properly unless sizeable fluctuations in export income are eliminated or at least greatly moderated. The ratios of debt service to export earnings are already quite high in a number of debtor countries. It is an accepted dictum in business finance, based on long experience, that high debt service does not go together with fluctuations in sales and earnings. This dictum is even more applicable in international financial affairs, where the importance of maintaining regular service payments is paramount if international capital flows are to expand and thus pro-

vide an effective assistance to the poor areas. This condition is in the hands of the international community.

157. Even if conditions (i), (ii) and (iii) are met, the process of "hard" lending cannot be expected on a large scale in countries whose existing debt structure is extremely unfavorable, until some solution to their liquidity problem is found (condition iv). In several countries, which are large international debtors, pending payments are extremely high. No solution of their present liquidity problem is likely to prove lasting, however, unless advance is made in coping with the root causes of the present difficulties. And it may be that developmental returns to capital in some of these "cash-squeeze" countries are high despite inadequate financial policies; but these investment opportunities cannot be exploited unless the liquidity crisis is resolved.

158. From the long-run point of view, the developmental returns are decisive. If there are countries in which these returns are below the international rate of interest, it does not make sense to transfer capital to these countries on conventional terms (condition v). We do not know whether such cases exist, but it is quite possible that among the 100 countries currently engaged in the developmental process there are some where natural obstacles and lack of skills are such as to keep the rate of return below the rate of interest, at least for some time to come. If it is considered that these countries ought to be helped to develop, it would seem that lending to them on "soft" terms is the only solution.

159. It is not sufficient, however, that the rate of return on individual projects be in excess of the international rate of interest to justify lending at "hard" terms. The plough-back out of increased income must be sufficiently high to make it possible for the country to reach a stage in which it can pay out of its own resources for all its investment that is needed to attain a satisfactory rate of growth (vi). This condition—the marginal savings rate sufficiently above the average savings rate—can be met only if fiscal and monetary policy is conducive to generation of public savings and if private entrepreneurs are optimistic enough to plough back a large proportion of their profits into domestic activities rather than in investing abroad. The achievement of a sufficiently high savings rate is the responsibility of the borrowing country. In meeting this responsibility, the developing countries face many obstacles of different intensity. If there is a basis for judgment that domestic savings will not equal domestic investment requirements in the foreseeable future, even distant, lending on "hard" terms cannot do the job. Whether creditors, under these conditions, want to help the country by providing "soft"

money is a decision which they have to make taking into account whatever obstacles stand in the way of progress of the borrowing country.

160. There are countries where the present level of income is very low, population large and natural resources limited in relation to population. In these cases, return on particular investments may be high and yet the aggregate rate of savings may remain low. If, despite being low, the aggregate rate of savings is increasing gradually, it is possible that ultimately domestic savings will exceed investment. The time span may, however, be extremely long and consequently, the gross capital inflow that will be needed, and the indebtedness which would result from financing the country predominantly on hard terms, may be extremely high. These are so-called "long-haul" countries.

161. In raising the savings rate and in transferring resources abroad, most developing countries are facing the foreign exchange constraint: since the absorptive capacity of the world market for many primary products expands only at a moderate rate, and since it takes time to expand exports of manufactures, the resulting slow growth in the capacity to import impinges on the growth of income and of savings and, also, the capacity to transfer savings is impaired. The severity and duration of this constraint will vary from case to case, depending on the export structure of the borrowing countries and on their capacity to develop an efficient import substitution or an efficient export trade in manufactures. These factors also determine whether a borrowing country can be safely financed at "hard" terms, or if it will require an extension of grace and amortization periods, or if it will also need a reduction in the rate of interest.

162. For growth in income and in savings to materialize, there should be a sizable number of investment projects started yearly (condition vii). In other words, the aggregate investment rate must be at a sufficiently high level. Unless this is accomplished, the whole process may never "get off the ground," because population growth may continually be catching up with income growth. It is primarily the responsibility of the debtor country to develop profitable projects, but the industrialized countries can provide help which may prove decisive.

163. It may be argued that the conditions set forth above, with the exception of condition (iv), can be reduced to only one; the argument to that effect is developed in the last essay in Volume III.[2] In the present context, however, it is still convenient to handle separately the different aspects of the problem as they face the makers of policy. From this view-

[2] *Points to Ponder, op. cit.*

point, it appears that the successful growth-cum-debt process essentially depends on four variables: the size of the investment activity which a developing country succeeds in undertaking, the rate of return on investment, the rate of plough-back of the increment in income generated by the new investment, and the international rate of interest charged on borrowed loan capital. It is a matter of policy which one of these variables will be chosen as a target of policy action. In some developing countries it will suffice to raise the absorptive capacity and thus attain a higher rate of investment consisting of high yielding projects. In all of them, it is necessary to attain a high rate of plough-back, and thus raise the average rate of savings which is the ultimate determinant of self-sustained and independent national economic growth. And for some of them, the international rate of interest—that key variable in the process of growth-cum-debt—will have to give in if the international investment system is to function with tolerable smoothness.

164. The policy questions which are posed by this study are serious. They are whether full interest will be charged everywhere, how the present liquidity crises in several countries can be successfully overcome so that the growth process can be resumed, how the fluctuations in foreign exchange earnings of the developing countries can be moderated and how the absorptive capacity for high-yielding projects can be increased. It may be very difficult to find a solution to these issues, and, in any case, they probably require the concerted effort of both lenders and borrowers on a scale and in harmony, which would be without precedent. But the task, itself, is also without precedent.

165. This study has not solved the debt servicing problems, nor has it succeeded in identifying one or a few statistical indicators which would conclusively show that the limits of indebtedness at conventional terms have been reached. Rather, it has arrived at a negative conclusion that such indicators probably do not exist. The study has developed, however, an analytical framework which may be of some help. By using the methodology suggested in the study it is possible, by attaching values to different factors, to arrive at a picture, however hazy, of how external indebtedness of particular countries might grow over time. The choice of values depends on existing quantitative knowledge and on judgments regarding the future. These judgments are necessarily subjective in character.

VOLUME II

A STATISTICAL PRESENTATION

Chapter I Introduction

1. Volume I—*An Analytical Framework*—views international capital flows and indebtedness as an aspect of the process of economic development. On the one hand, the inter-relationship between growth, capital flows, productivity, savings, foreign trade, and debt service payments has been analyzed with the help of a growth model. On the other, a framework has been set up for the identification of countries where service payments in the near future may pose serious liquidity problems. The relationship between the long-run growth factors and the liquidity problems is a complex one; it has been elaborated at length in the *Analytical Framework*.

2. This volume—*A Statistical Presentation*—is a supplement to the earlier work. It contains statistical data on international public indebtedness and on debt service payments. No attempt has been made to draw conclusions regarding the debt servicing burden. This can be done only in the context of individual country studies, taking into account the significant variables mentioned in the above paragraph.

3. Chapter II presents data on the level and growth of external public indebtedness during the last half a decade and Chapter III presents the public debt service payments during this period.

Chapter II Indebtedness: Level and Changes

4. International indebtedness, its level and its growth, reflects the cumulative resource gap, changes in it over time and the terms on which external funds needed to fill the gap were made available. Foreign funds have flowed into the developing countries since the war in a variety of forms: grants and quasi-grants, private direct investment, other purely private flows, loans to governments and loans to private parties guaranteed by governments in the recipient countries. Only the latter two categories represent obligations of public authorities. These categories represent a large proportion of the total capital inflow and the major proportion of that inflow which has carried servicing obligations: governments in the developing countries have been major international borrowers for their own account and major guarantors of loans to private borrowers in the postwar years.

1. Definitions

5. The Bank collects data on such external public and publicly guaranteed debt of its member countries. These data cover debt, disbursed and undisbursed, with an original maturity of one year or more, payable to creditors residing outside the country in foreign exchange, goods or services, by:

(a) the national government, a political subdivision, an agency of either or an autonomous public body;

(b) a private person or a private body, provided that the repayment of the debt or the provision of foreign exchange is guaranteed by an organ of government or an autonomous public agency of the recipient country.

6. Excluded from public debt as defined above are:

(a) private debts that are not guaranteed;

(b) other external obligations, for which the amount and the terms are not agreed (e.g., unsettled claims);

(c) debts repayable in local currency;

(d) obligations arising from transactions with the International Monetary Fund; and

(e) debts with an original maturity of less than one year.

7. As a result of the exclusions of items under (d) and (e) above, the Bank's public indebtedness data cannot be considered complete. Technically, country obligations to the International Monetary Fund are not debts. Yet, the repurchase obligations imply in effect external indebtedness. Also, obligations with an original maturity of less than one year and arising in the ordinary course of trade, are normally considered deferred cash payments. However, if these short-term transactions have not been liquidated on time, commercial arrears arise, and in economic terms, they are not different from medium-term external debt.

8. The following section is confined to a review of indebtedness as defined in paragraph 5. In the subsequent section, an attempt will be made to expand the coverage and include the items (d) and (e) mentioned in paragraph 6 (*e* only insofar as commercial arrears have occurred).

2. Growth in Indebtedness 1955–1962, Thirty-seven Countries

9. The Bank data on the public and publicly guaranteed debt of the developing countries permits the construction of a continuous series for the years 1955–1962 (end of the year) for 37 countries,[1] accounting for 73 per cent of the population of all the developing countries.[2] Chart I and Table 1 show the level and growth of debt in these countries, classified into geographic regions.

10. In this group of 37 countries the outstanding debt increased two-and-a-half times in the seven years 1955–1962. This represented an average annual rate of increase of about 15 per cent.

11. The aggregate numbers conceal a variety of rates at which debt increased in different countries. In some countries debt increased very slowly, e.g., Uruguay. India, Pakistan and Argentina are the examples of countries which increased their debt very rapidly in recent years. Table

[1] *Latin America:* Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela. *South Asia and Middle East:* India, Iran, Israel, Pakistan. *East Asia:* Burma, Ceylon, Malaya, Philippines and Thailand. *Southern Europe:* Spain, Turkey and Yugoslavia. *Africa:* Sudan, Ethiopia, former Federation of Rhodesia and Nyasaland, Kenya, Nigeria, Tanganyika and Uganda.

[2] Excluding the centrally-planned economies.

CHART I

GROWTH IN EXTERNAL PUBLIC INDEBTEDNESS - 37 COUNTRIES

(DEBT OUTSTANDING AT END OF YEAR IN BILLIONS OF U.S. DOLLAR EQUIVALENTS)

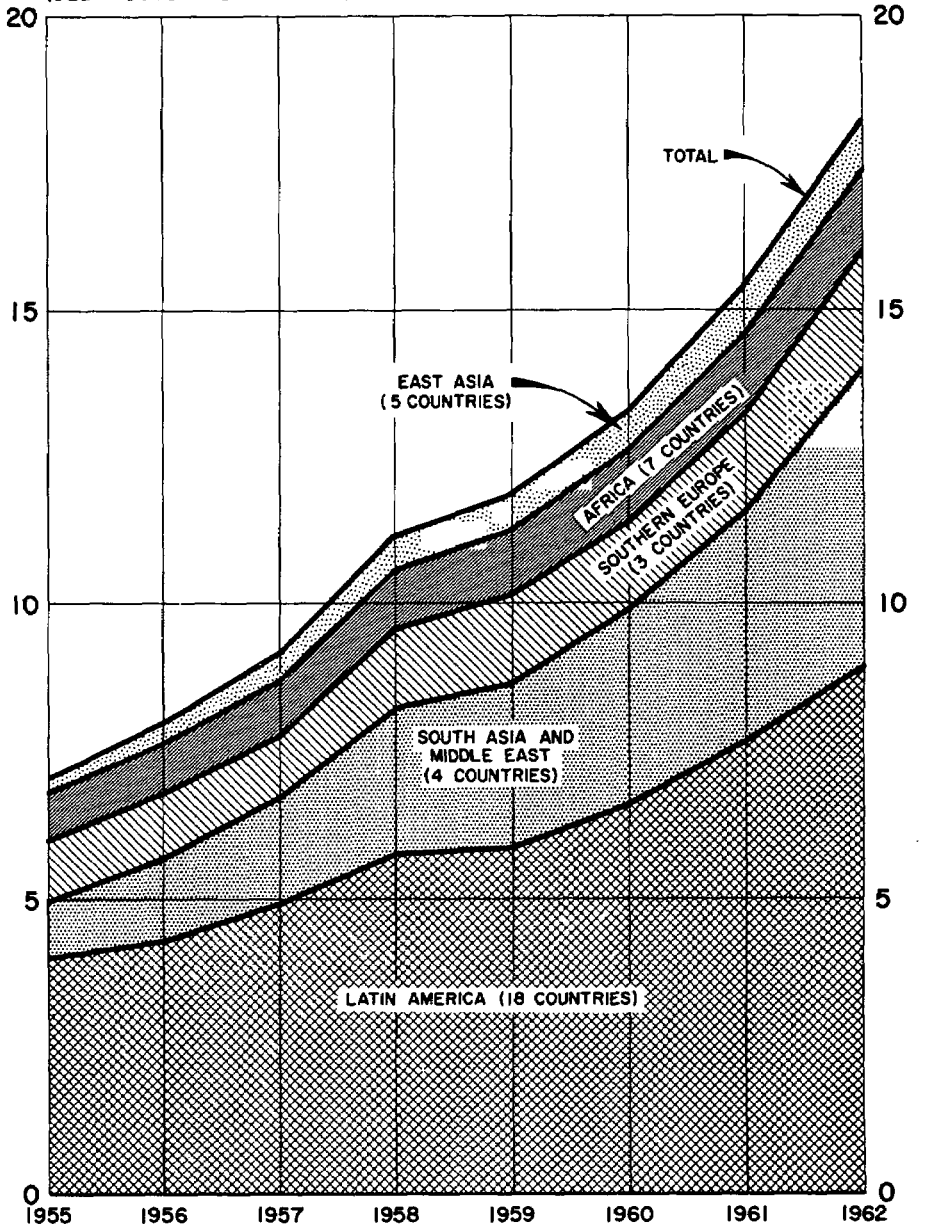


TABLE 1. GROWTH IN PUBLIC INDEBTEDNESS, THIRTY-SEVEN COUNTRIES, END 1955 TO END 1962

(in millions of U.S. dollars equivalent)

	1955	1956	1957	1958	1959	1960	1961	1962
Latin America	3,996.1	4,277.2	4,921.5	5,710.6	5,816.3	6,573.4	7,614.7	8,913.0
South Asia and Middle East	989.6	1,398.5	1,756.1	2,527.5	2,810.7	3,322.5	3,914.4	5,072.9
East Asia	306.7	350.3	440.3	571.8	643.1	655.2	729.0	850.1
Africa	733.2	875.4	926.0	996.7	1,079.4	1,224.8	1,347.0	1,437.4
Southern Europe	1,004.5	1,079.4	1,081.7	1,304.0	1,517.0	1,482.0	1,695.5	1,957.7
Total	7,030.1	7,980.8	9,125.6	11,110.6	11,866.5	13,257.9	15,300.6	18,231.1

TABLE 2. AVERAGE ANNUAL RATE OF INCREASE OF PUBLIC DEBT, 1955–1962

Region	Average annual rate of increase %
Latin America	12
South Asia and Middle East	26
Southern Europe	10
East Asia	15
Africa	10
Total	15

3 shows the level and growth of debt in a sample of countries with large debts.

12. With the rapid increase in indebtedness, the data for end-1962 are already out of date. More recent information is available for some major debtors (see Table 4).

13. The recorded increase in indebtedness is a result of both real and statistical factors. The real factor at work has been the net actual inflow of resources provided on loan terms. Germane to this acceleration in indebtedness is the recent liberalization in creditor lending policies and the widening of fields for external financing.

14. In addition, there are reasons more of a statistical nature:

(a) The comprehensiveness of the Bank data has improved through the years;

(b) During the period under consideration, certain debtor governments took over the debts previously contracted by private parties without the guarantee of their government;

TABLE 3. SELECTED DEBTORS: PUBLIC DEBT OUTSTANDING, 1955–1962, END OF THE YEAR

(in millions of U.S. dollars)

	End 1955	End 1962	Average annual percentage increase
India	310	2,926	38
Brazil	1,380	2,349	8
Argentina	(600)	2,067	19
Mexico	479	1,360	16
United Arab Republic	(150)	968	30
Turkey	(600)	935	7
Israel	(360)	868	13
Pakistan	147	829	28
Yugoslavia	332	778	13
Chile	351	742	11
Colombia	276	639	13

Notes: (a) Both the level of debt and the rate of increase would be different in some countries if commercial arrears and other similar obligations had been included (see Table 6).

(b) Figures in parentheses are crude estimates.

TABLE 4. SELECTED DEBTORS: PUBLIC DEBT OUTSTANDING, END OF 1962 AND END OF 1963

(in millions of U.S. dollars)

	December 31, 1962	December 31, 1963
India	2,926	4,398[a]
Mexico	1,360	1,451
Pakistan	829	1,126
Colombia	639	715[b]
Yugoslavia	778	872[b]
Chile	742	818[b]
Iran	450	566
Thailand	250	297
Philippines	222	373
Nigeria	170	246
Malaya	171	224

[a] Forecast for April 1, 1964, by Indian Government based on loans authorized and committed as of December 31, 1963. The 1964 data are not comparable to those shown for 1962 because of differences in definition and treatment of loans. The 1964 data do not show sufficient detail to reconcile the differences.

[b] June 30, 1963.

(c) Debt contracted but not disbursed appears to have increased more rapidly than disbursements. Of the total estimated indebtedness of the developing countries at the end of 1962 approximately one-fifth was undisbursed.

15. It is, therefore, reasonable to infer that our figures may somewhat over-estimate the growth of public indebtedness. However, there is no doubt that a substantial real increase did occur in the late 1950's and the early 1960's. This has resulted from an increase in foreign exchange requirements for an expanded capital formation and for other import increases in the developing countries, as well as from borrowings undertaken to supplement the sluggish or even declining exchange earnings in some countries during the last seven years.

3. Level of Public Indebtedness, end of 1962, Seventy-four Countries

16. Table 5 shows the outstanding public and publicly guaranteed debt of seventy-four developing countries at the end of 1962. It also shows debt outstanding at the end of each of the seven preceding years 1955–1961, wherever data are available. For many countries the entries represent very crude estimates: this refers in particular to new members of the Bank in Africa. All data are provisional and subject to revision.

TABLE 5. PUBLIC AND PUBLICLY GUARANTEED EXTERNAL DEBT, INCLUDING UNDISBURSED: SEVENTY-FOUR COUNTRIES OUTSTANDING AS OF DECEMBER 31

(in million U.S. dollars)

	1955	1956	1957	1958	1959	1960	1961	1962
Latin America								8,913.0
Argentina	600.0	686.5	1,072.8	1,375.1	1,492.6	1,478.1	1,670.1	2,067.1
Bolivia	93.1	91.0	147.9	153.0	159.8	198.9	187.5	198.3
Brazil	1,379.5	1,542.6	1,471.1	1,778.4	1,556.1	1,823.9	2,237.8	2,349.0
British Guiana	n.a.	n.a.	n.a.	25.0	n.a.	n.a.	n.a.	n.a.
Chile	350.7	358.2	396.0	410.5	537.5	549.3	734.4	741.9
Colombia	276.2	280.8	448.6	458.9	395.1	376.8	466.1	638.8
Costa Rica	36.0	41.3	38.2	39.9	40.3	56.1	78.8	79.1
Dominican Republic	n.a.	n.a.	n.a.	6.2	6.0	5.7	5.2	36.6
Ecuador	67.6	74.2	90.1	96.7	102.2	100.8	111.1	121.5
El Salvador	28.4	27.3	26.5	25.5	31.5	33.3	51.4	51.3
Guatemala	22.2	22.2	22.2	22.2	33.5	53.5	68.8	64.2
Honduras	4.7	4.8	8.2	13.8	15.8	23.6	30.1	39.8
Mexico	478.9	489.8	557.1	642.8	812.1	1,038.4	1,075.0	1,359.9
Nicaragua	23.1	28.0	26.1	24.4	29.3	41.1	42.2	47.4
Panama	18.1	17.1	31.5	41.6	41.1	58.4	57.8	76.9
Paraguay	22.1	17.7	15.5	19.7	23.9	22.3	30.7	28.7
Peru	229.1	213.8	204.2	254.6	221.1	267.8	291.1	500.5
Uruguay	126.6	146.0	138.6	131.2	138.1	131.8	130.0	150.2
Venezuela	239.8	235.9	226.9	216.1	180.3	313.6	346.6	361.8
South Asia and Middle East								6,666.8
Aden Colony	10.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	25.0
India	309.8	532.6	705.5	1,326.7	1,497.7	1,717.6	2,136.8	2,925.8
Iran	172.4	259.1	364.5	404.3	460.1	532.1	499.6	449.9
Iraq	6.3	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	156.5
Israel	360.0	440.0	515.0	589.3	599.5	646.5	765.8	868.0
Jordan	30.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	70.0
Lebanon	27.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	24.8
Pakistan	147.4	166.8	171.1	207.2	253.4	426.5	512.2	829.2
Syria	50.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	350.0
United Arab Republic	150.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	967.6
East Asia								1,010.8
Burma	17.0	35.0	76.0	84.0	85.0	86.4	86.6	82.7
Ceylon	43.9	42.4	39.2	80.2	100.9	91.1	110.3	117.3
China (Taiwan)	n.a.	n.a.	n.a.	n.a.	n.a.	37.1	n.a.	89.0
Indonesia	n.a.	n.a.	n.a.	415.0	n.a.	n.a.	n.a.	n.a.
Korea	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	78.4
Malaya	89.9	100.6	97.7	132.2	161.9	179.5	164.3	171.4
Philippines	82.6	86.3	79.8	102.8	135.0	148.0	166.6	222.3
Thailand	73.3	87.0	149.4	174.2	161.9	150.2	201.2	249.7
Vietnam	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	46.1	n.a.

Africa								3,475.7
Basutoland	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1.3
Bechuanaland	3.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	5.0
Cameroon	20.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	43.0
Central African Republic	1.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	2.4
Congo (Brazzaville)	2.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	5.0
Congo (Leopoldville)	350.0	n.a.	n.a.	n.a.	475.8	n.a.	n.a.	600.0
Dahomey	2.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	4.0
East Africa (Kenya, Uganda Tanganyika)	285.5	303.3	345.1	344.2	342.9	380.2	441.1	460.8
Ethiopia	32.6	32.2	51.2	51.2	52.2	75.0	77.0	65.8
Federation of Rhodesia and Nyasaland	366.0	491.7	482.1	526.5	543.3	551.5	538.5	571.4
Gabon	8.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	51.0
Gambia	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1.0
Ghana	20.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	230.0
Guinea	20.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	115.3
Ivory Coast	30.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	55.4
Liberia	70.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	140.0
Mali	25.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Mauritania	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	66.0
Mauritius	7.0	n a.	n.a.	n.a.	n.a.	13.5	n.a.	12.7
Morocco	250.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	400.0
Niger	3.0	n.a.	n.a.	n.a.	n.a.	n.a.	7.1	7.1
Nigeria	40.1	39.2	38.6	65.8	65.8	115.4	131.1	169.8
Rwanda Burundi	3.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	10.0
Senegal	20.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	45.8
Sierra Leone	20.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	50.0
Somalia	10.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	28.0
Sudan	9.0	9.0	9.0	9.0	75.2	102.7	159.3	169.6
Swaziland	6.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	35.0
Togo	4.0	n.a.	n.a.	n.a.	n.a.	n.a.	7.3	9.0
Tunisia	50.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	84.3
Upper Volta	20.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	37.0
Southern Europe								2,372.2
Cyprus	20.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	40.0
Gibraltar	4.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	6.0
Greece	50.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	200.0
Malta	2.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	3.0
Portugal	30.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	165.5
Spain	73.4	75.7	82.0	103.5	172.9	157.5	139.5	244.5
Turkey	600.0	592.1	586.3	755.5	819.3	760.7	818.8	935.1
Yugoslavia	331.5	411.6	413.4	445.0	524.8	563.8	737.2	778.1
GRAND TOTAL								22,438.5

NB: Data for several countries and particularly for the earlier years, are based on estimates.

17. Public indebtedness referred to thus far covers only debts as defined in paragraph 5. A number of major debtor countries have contracted external debt which is not thus covered (see paragraphs 7 and 8). Such other debts include commercial arrears and other obligations of a similar nature and the drawings from the International Monetary Fund. For some of these, we have firm data, while for the major part rough estimates have been made on the basis of various outside sources.

TABLE 6. ESTIMATED PUBLIC INDEBTEDNESS: SEVENTY-FOUR COUNTRIES, DECEMBER 31, 1962

(in millions of U.S. dollars)

	Bank Definition	Others[a]	Total
Grand Total, 74 Countries	*22,439*	*5,000*	*27,439*
Latin America	8,913	2,500[b]	11,413
South Asia & Middle East	6,667	500	7,167
East Asia	1,011	1,700[c]	2,711
Africa	3,476	100	3,576
Southern Europe	2,372	200	2,572

[a] See para. 17 above: consist mostly of short- and medium-term maturities.

[b] The major proportion owed by Brazil and Argentina.

[c] Consists mostly of a rough estimate for Indonesia.

18. At the end of 1962, total indebtedness on public account was of the order of $27 billion equivalent. As indicated in paragraph 10, the postwar average annual growth in debt has been around 15%; and the partial figures shown in Table 4 do not suggest that there has been any slackening in this rate. Consequently, it can be assumed that the present level of public and publicly guaranteed indebtedness of the developing countries exceeds $30 billion.

Chapter III Debt Service Payments: Level and Changes

1. Growth in Public Debt Service, 1956–1963, Thirty-seven Countries

19. Service payments on public and publicly guaranteed debt of the 37 countries for which continuous data are available,[3] rose from $0.7 billion in 1956 to $2.4 billion in 1963, almost a four-fold increase in seven years. (Only debt service on long- and medium-term debt, as defined in paragraph 5 is included in these numbers). Since debt outstanding of the same countries increased at 15% per annum in the same seven-year period, the implication is that the effective terms of loans deteriorated.

20. Chart II and Table 7 show the level and growth of public debt service of these 37 countries, classified into geographic regions. Table 8 contains the country data, and it also indicates the interest payments and the repayment of principal.

TABLE 7. Growth in Public Debt Service, Thirty-seven Countries, 1956 through 1963

(in millions of U.S. dollars equivalent)

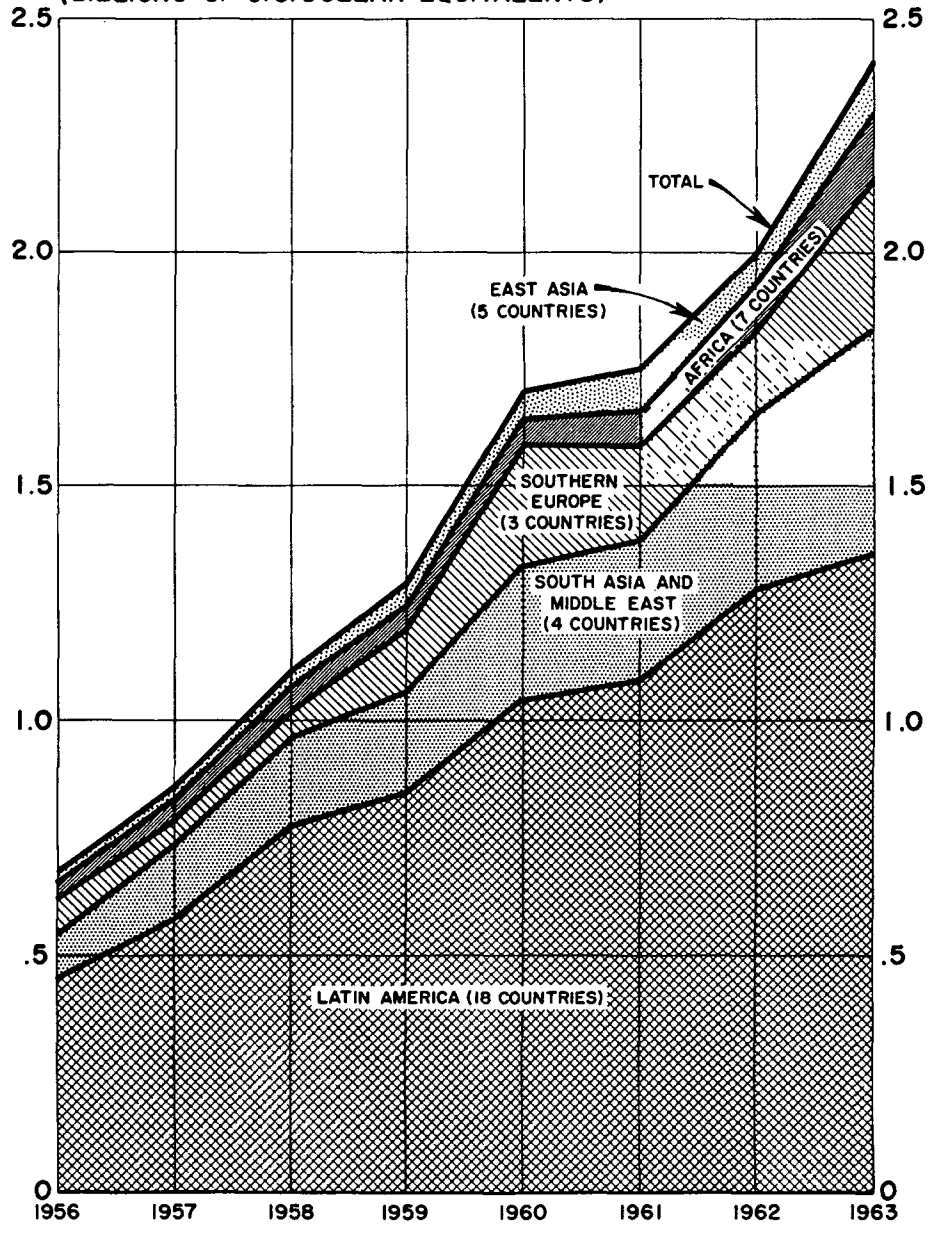
	1956	1957	1958	1959	1960	1961	1962	1963
Latin America	455	575	779	848	1,049	1,084	1,280	1,355
South Asia and Middle East	95	162	186	217	284	298	378	477
East Asia	22	27	26	46	56	89	62	112
Africa	37	44	49	55	63	78	104	143
Southern Europe	71	50	60	127	253	202	174	321
	680	858	1,100	1,293	1,706	1,751	1,998	2,408

[3] See paragraph 9.

CHART II

GROWTH OF SERVICE PAYMENTS ON EXTERNAL PUBLIC DEBT - 37 COUNTRIES

(BILLIONS OF U.S. DOLLAR EQUIVALENTS)



2. The Problem of Debt Structure

21. In 1963, as well as in 1956 amortization constituted approximately 75 per cent of the total service payments on public and publicly guaranteed debt. This large proportion of amortization is typical of the post-war structure of indebtedness and has been commented on extensively in the earlier Bank studies.[4] It arises from the fact that a large proportion of debt now consists of medium- and short-term maturities. Another factor is that international interest rates in the post-war period have been held to a level corresponding to interest rates in the developing countries, plus a moderate risk premium. Both phenomena stand in contrast to the traditional structure of international public debt. In the earlier periods, yearly amortization was fairly low because most of the debt was contracted on the long-term bond market. At the same time, the effective interest rates were high because international risks were privately borne and were judged high.

22. Since at the end of 1962, the aggregate debt outstanding and *disbursed* of the 37 countries amounted to about $15 billion (see Table I and paragraph 14), and since they paid in 1963 about $600 million on account of interest and about $1,800 million on account of repayment of principal, it can be deduced that:

(a) the effective average weighted rate of interest amounted to about 4%; and

(b) the average life of outstanding and disbursed loans would be slightly more than 8 years.

23. It is quite possible that the recorded repayments may have included some interest, particularly in the case of suppliers' credits. If an adjustment could be made for this factor, the interest payments—and the interest rate—would be somewhat higher than indicated in para. 22, while the average life of indebtedness would be somewhat longer. Nonetheless, even after such an adjustment the over-all structure of international indebtedness would still remain unfavorable, with heavy concentration on short-term maturities. It is paradoxical that while lending today is overwhelmingly for developmental purposes in which returns flow over a long period, the maturities have contracted.

24. The data available to the Bank enables the projection of the service payments due on the existing debt. The proportion of the out-

[4] Dragoslav Avramovic, IBRD, *Debt Servicing Capacity and Postwar Growth in International Indebtedness*, Johns Hopkins Press, 1958; Dragoslav Avramovic and Ravi Gulhati, IBRD, *Debt Servicing Problems of Low-Income Countries 1956–1958*, Johns Hopkins Press, 1960.

TABLE 8. AMORTIZATION, INTEREST AND TOTAL PUBLIC DEBT SERVICE, THIRTY-SEVEN COUNTRIES, 1956 THROUGH 1963

(in millions of U.S. dollars)

I Interest payments, gross, on public and publicly-guaranteed debt as recorded by the Bank.
A Amortization payments, gross on public and publicly-guaranteed debt as recorded by the Bank.
T Total service payments, gross (interest and amortization), on public and publicly-guaranteed debt as recorded by the Bank.

		1956	1957	1958	1959	1960	1961	1962	1963
Latin America	I	91.6	111.4	135.3	160.3	188.9	226.7	288.1	315.0
	A	362.9	463.7	644.2	688.1	860.4	857.2	992.1	1,039.9
	T	454.5	575.1	779.5	848.4	1,049.3	1,083.9	1,280.2	1,354.9
Argentina	I	3.4	20.0	32.0	43.0	50.0	57.4	74.6	67.0[a]
	A	14.4	52.7	92.7	118.0	203.9	194.5	203.2	182.2[a]
	T	17.8	72.7	124.7	161.0	253.9	251.9	277.8	249.2
Bolivia	I	1.2	1.3	1.9	1.1	0.5	–	0.7	3.6
	A	2.1	0.4	4.5	3.2	5.4	14.4	4.0	10.7
	T	3.3	1.7	6.4	4.3	5.9	14.4	4.7	14.3
Brazil	I	37.1	39.6	40.7	43.7	60.7	64.9	87.8	97.3
	A	143.5	188.8	210.3	186.1	215.7	181.5	205.8	236.9
	T	180.6	228.4	251.0	229.8	276.4	246.4	293.6	334.2
Chile	I	9.9	9.7	9.5	11.3	13.7	19.8	22.5	21.1
	A	40.0	37.1	34.5	43.0	58.0	106.1	115.5	80.5
	T	49.9	46.8	44.0	54.3	71.7	125.9	138.0	101.6
Colombia	I	8.7	8.7	14.4	17.6	13.6	13.4	18.0	23.3
	A	30.5	62.7	112.4	111.6	68.0	60.6	47.7	79.9
	T	39.2	71.4	126.8	129.2	81.6	74.0	65.7	103.2
Costa Rica	I	0.7	0.9	1.0	1.2	1.2	1.6	2.3	3.1
	A	2.2	3.0	3.8	3.4	4.2	4.6	7.4	8.6
	T	2.9	3.9	4.8	4.6	5.4	6.2	9.7	11.7
Dominican Republic	I	–	–	–	0.1	0.1	–	0.3	0.4
	A	–	–	0.8	0.2	0.2	0.6	1.6	3.0
	T	–	–	0.8	0.3	0.3	0.6	1.9	3.4
Ecuador	I	2.2	2.0	2.0	2.9	2.3	2.7	3.8	4.3
	A	4.2	6.1	8.0	7.3	9.1	9.8	8.6	18.3
	T	6.4	8.1	10.0	10.2	11.4	12.5	12.4	22.6
El Salvador	I	1.1	0.7	1.0	1.0	1.0	1.0	1.5	1.8
	A	0.4	0.8	0.8	2.0	2.0	1.9	2.6	3.6
	T	1.5	1.5	1.8	3.0	3.0	2.9	4.1	5.4
Guatemala	I	0.2	0.5	0.7	0.9	0.9	1.3	1.6	2.1
	A	–	–	–	1.2	1.4	2.7	13.8	9.7
	T	0.2	0.5	0.7	2.1	2.3	4.0	15.4	11.8
Honduras	I	–	0.1	0.2	0.4	0.5	0.6	0.6	0.9
	A	–	0.3	0.8	1.2	1.4	2.3	1.7	1.6
	T	–	0.4	1.0	1.6	1.9	2.9	2.3	2.5
Mexico	I	14.3	15.1	18.3	21.9	28.7	32.6	47.1	56.6
	A	79.6	68.0	97.2	128.1	162.3	141.3	218.4	239.7
	T	93.9	83.1	115.5	150.0	191.0	173.9	265.5	296.3
Nicaragua	I	0.5	0.5	0.6	0.8	0.8	1.1	1.4	1.5
	A	3.9	3.8	3.9	4.3	2.6	3.2	3.2	4.4
	T	4.4	4.3	4.5	5.1	3.4	4.3	4.6	5.9
Panama	I	0.5	0.5	0.6	1.2	1.3	1.4	1.8	2.6
	A	0.4	0.4	6.7	0.5	0.5	0.6	1.1	1.7
	T	0.9	0.9	7.3	1.7	1.8	2.0	2.9	4.3
Paraguay	I	0.3	0.4	0.6	0.9	0.7	0.6	0.8	0.9
	A	5.1	1.2	1.2	2.2	2.0	2.5	2.0	2.6
	T	5.4	1.6	1.8	3.1	2.7	3.1	2.8	3.5
Peru	I	4.7	5.1	5.4	6.2	7.1	6.1	6.4	9.3
	A	25.0	22.7	21.8	22.1	49.1	32.6	36.7	49.0
	T	29.7	27.8	27.2	28.3	56.2	38.7	43.1	58.3
Uruguay	I	4.4	4.3	4.8	4.7	4.6	4.5	4.3	5.0
	A	7.1	6.6	6.8	6.7	5.8	6.1	6.1	7.4
	T	11.5	10.9	11.6	11.4	10.4	10.6	10.4	12.8
Venezuela	I	2.4	2.0	1.6	1.4	1.2	17.7	12.6	14.2
	A	4.5	9.1	38.0	47.0	68.8	91.9	112.7	100.1
	T	6.9	11.1	39.6	48.4	70.0	109.6	125.3	114.3

(Table 8 continued)

		1956	1957	1958	1959	1960	1961	1962	1963
South Asia and Middle East	I	24.3	28.3	38.6	53.5	74.9	89.3	123.5	145.2
	A	70.4	133.5	147.1	163.9	208.7	208.3	255.0	332.0
	T	94.7	161.8	185.7	217.4	283.6	297.6	378.5	477.2
India	I	8.0	10.6	15.7	27.3	43.6	52.9	80.7	99.0
	A	4.3	5.9	8.5	18.3	43.3	47.0	78.2	139.0
	T	12.3	16.5	24.2	45.6	86.9	99.9	158.9	238.0
Iran	I	0.8	2.2	5.7	8.7	9.7	13.8	15.8	15.2
	A	5.5	32.7	40.5	51.1	52.1	58.4	61.7	47.4
	T	6.3	34.9	46.2	59.8	61.8	72.2	77.5	62.6
Israel	I	13.0	13.0	14.0	13.6	16.5	15.2	17.6	19.4
	A	42.0	60.0	70.0	81.6	93.2	85.1	90.9	99.1
	T	55.0	73.0	84.0	95.2	109.7	100.3	108.5	118.5
Pakistan	I	2.5	2.5	3.2	3.9	5.1	7.4	9.4	11.6
	A	18.6	34.8	28.1	12.9	20.1	17.8	24.2	46.5
	T	21.1	37.4	31.3	16.8	25.2	25.2	33.6	58.1
East Asia	I	7.8	8.2	8.4	10.3	14.0	17.7	20.3	32.9
	A	14.0	18.8	17.2	35.6	42.1	70.9	41.4	79.7
	T	21.8	27.0	25.6	45.9	56.1	88.6	61.7	112.6
Burma	I	0.2	0.1	0.4	0.5	2.4	2.7	2.6	3.0
	A	0.1	0.1	1.0	2.0	6.5	11.5	8.1	6.9
	T	0.3	0.2	1.4	2.5	8.9	14.2	10.7	9.9
Ceylon	I	1.8	1.9	1.7	2.1	2.7	2.3	2.5	4.1
	A	0.8	0.8	0.8	1.3	9.1	1.8	2.2	4.4
	T	2.6	2.7	2.5	3.4	11.8	4.1	4.7	8.5
Malaya	I	2.7	2.7	2.7	3.2	3.2	4.6	5.1	5.6
	A	2.1	2.2	3.2	2.4	2.5	3.7	4.5	5.1
	T	4.8	4.9	5.9	5.6	5.7	8.3	9.6	10.7
Philippines	I	1.7	1.7	1.4	1.7	2.2	4.1	4.7	13.8
	A	7.1	8.6	5.3	17.0	9.3	41.6	15.9	50.1
	T	8.8	10.3	6.7	18.7	11.5	45.7	20.6	63.9
Thailand	I	1.4	1.8	2.2	2.8	3.5	4.0	5.4	6.4
	A	3.9	7.1	6.9	12.9	14.7	12.3	10.7	13.2
	T	5.3	8.9	9.1	15.7	18.2	16.3	16.1	19.6
Africa	I	27.4	31.9	36.2	39.8	43.5	50.1	63.3	76.9
	A	9.8	12.3	12.9	15.5	19.9	28.3	40.3	66.1
	T	37.2	44.2	49.1	55.3	63.4	78.4	103.6	143.0
East Africa[b]	I	11.3	13.6	15.1	15.1	15.5	16.8	25.4	26.8
	A	3.3	3.5	5.0	5.0	6.0	6.9	7.0	9.4
	T	14.6	17.1	20.1	20.1	21.5	23.7	32.4	36.2
Ethiopia	I	0.3	0.4	0.6	0.8	1.0	1.1	1.4	2.2
	A	0.4	1.2	0.8	1.4	1.3	1.9	2.5	5.0
	T	0.7	1.6	1.4	2.2	2.3	3.0	3.9	7.2
Federation of Rhodesia and Nyasaland	I	13.6	15.7	18.2	21.0	23.0	24.9	27.0	27.8
	A	5.5	7.0	6.5	8.0	8.2	8.8	12.1	23.9
	T	19.1	22.7	24.7	29.0	31.2	33.7	39.1	51.7
Nigeria	I	1.8	1.8	1.9	2.4	2.8	4.4	5.6	16.7
	A	0.5	0.5	0.5	0.5	0.8	2.2	3.5	13.5
	T	2.3	2.3	2.4	2.9	3.6	6.6	9.1	30.2
Sudan	I	0.4	0.4	0.4	0.5	1.2	2.9	3.9	3.4
	A	0.1	0.1	0.1	0.6	3.6	8.5	15.2	14.3
	T	0.5	0.5	0.5	1.1	4.8	11.4	19.1	17.7
Southern Europe	I	10.0	10.3	10.6	35.8	31.8	30.2	41.9	61.4
	A	61.5	39.6	49.2	90.9	221.2	171.9	132.4	259.3
	T	71.5	49.9	59.8	126.7	253.0	202.1	174.3	320.7
Spain	I	1.8	2.2	2.9	3.8	3.5	3.5	6.1	8.0
	A	1.9	3.3	5.3	5.1	4.5	41.9	13.6	22.3
	T	3.7	5.5	8.2	8.9	8.0	45.4	19.7	30.3
Turkey	I	3.9	3.9	3.7	21.1	18.3	21.3	16.2	27.9
	A	8.1	5.9	5.1	32.1	152.0	71.2	35.5	126.9
	T	12.0	9.8	8.8	53.2	170.3	92.5	51.7	154.8
Yugoslavia	I	4.3	4.2	4.0	10.9	10.0	5.4	19.6	25.5
	A	51.5	30.4	38.8	53.7	64.7	58.8	83.3	110.1
	T	55.8	34.6	42.8	64.6	74.7	64.2	102.9	135.6
GRAND TOTAL	I	161.1	190.1	229.1	299.7	353.4	414.0	537.1	631.4
	A	518.6	667.9	870.6	994.0	1,352.3	1,336.6	1,461.2	1,777.0
	T	679.7	858.0	1,099.7	1,293.7	1,705.4	1,750.6	1,998.3	2,408.4

[a] Estimated from previous year's figures.

[b] Kenya, Uganda, Tanganyika, East African Common Service Organization.

Sources: IBRD Debt Data; IMF Balance of Payments Yearbook.

standing debt repayable over the next 5 years is used as a convenient indication of the debt structure. Table 9 presents this data for different countries. Another indicator of the structure of public debt, shown in Table 9 is the debt service payments as a percentage of the outstanding debt. It should be noted, however, that for some countries the position is worse than shown in the table: obligations due on account of commercial arrears, other similar debts and repayments obligations to the International Monetary Fund are not included. This is of particular importance for countries with large debts.

3. The Level of Public Debt Service, 1963 and in the Immediate Future

25. It will be recalled that the estimated public and publicly guaranteed indebtedness of 74 countries included in our larger sample, amounted to $22.4 billion at the end of 1962 ("Bank Definition"—see Table 6 and paragraph 17). Assuming the proportion of disbursed debt to total debt at 80 per cent (see paragraph 14), the total disbursed debt of these countries at the end of 1962 was of the order of $18 billion equivalent. If we further assume that service payments in these 74 countries bore the same relationship to the debt outstanding and disbursed as in the 37 countries of our smaller sample,[5] then public debt service payments in 1963 of the 74 countries would be of the following order:[6]

Amortization	$2.2 billion
Interest	0.7 billion
Total	$2.9 billion

It is likely that interest is under-stated and amortization over-stated (see paragraph 23). It is possible that interest payments approach $1 billion and amortization payments are closer to $2 billion.

26. On a wider definition of external public debt—i.e., adding commercial arrears and similar obligations to the International Monetary Fund—we have placed the debt of the 74 countries at the end of 1962 at about $27.5 billion (see Table 6). This added indebtedness of about $5 billion consisted mostly of short maturities, and it is reasonable to assume that these amounts are due for retirement—or for renegotiation

[5] On disbursed debt of $15 billion, the 37 countries paid service in 1963 of $2.4 billion or about 16% (see paragraph 22).

[6] 16% of $18 billion equals $2.9 billion; three-fourths, or $2.2 billion are assumed as amortization (see paragraph 21).

TABLE 9. DEBT STRUCTURE INDICATORS

	Percentage of Debt (incl. Undisbursed) Outstanding end 1962, Repayable in 1963–67	Debt Service Payment in 1963 as Percentage of Debt Outstanding, net of Undisbursed, end 1962
LATIN AMERICA		
Brazil	n.a. (very high)	n.a.
Argentina	n.a. (very high)	n.a.
Venezuela	68	48.7
Mexico	64	27.7
Guatemala	61	37.5
Costa Rica	47	25.1
Chile	44	18.0
Colombia	44	24.7
Peru	41	13.9
El Salvador	40	16.7
Nicaragua	38	21.3
Ecuador	36	23.7
Paraguay	31	18.8
Uruguay	30	10.8
Bolivia	26	8.1
Dominican Republic	24	19.6
Honduras	21	13.1
Panama	20	8.1
SOUTH ASIA AND MIDDLE EAST		
Israel	57	16.3
Iran	56	17.5
India	24	9.8
Pakistan	23	18.0
EAST ASIA		
Philippines	56	29.4
Burma	43	14.8
Ceylon	43	18.5
China (Taiwan)	40	25.9
Thailand	38	11.0
Korea	19	8.1
Malaya	18	8.3
AFRICA		
Ethiopia	44	16.6
Sudan	28	20.5
Fed. of Rhodesia & Nyasaland	19	9.6
East Africa	8	8.3
SOUTHERN EUROPE		
Yugoslavia	75	25.5
Turkey	59	17.5
Spain	50	16.7

—within two to three years. Consequently, on a wider definition of public debt and servicing, debt service obligations of the 74 developing countries in this year and the next are no less than $4 billion and could have well reached $5 billion per annum. (Public debt service of $3 billion p.a. on "Bank Definition" as per para. 25 *plus* $1.5 billion p.a. on the "added" indebtedness as per para. 26.)

27. Extrapolations of the nature suggested in paragraphs 25 and 26 are always suspect. Nonetheless, they are probably quite close to the truth. The fact is that in 1963, 37 countries paid as much as $2.4 billion on debt service; it is also true that several major debtors face very large obligations on account of commercial arrears and similar items, perhaps as much as $1 billion per year; and it is also a fact that service payments are starting on loans that were disbursed more recently. If we add to these items the service obligations of countries other than the 37 in our sample, the figure of $4–5 billion per annum does not look implausible.

28. The fundamental point to be repeated is that by far the largest proportion of total service payments consists of principal repayments—mostly short- and medium-term maturities; and the latter are the function of a peculiar structure of debt, which is inconsistent with the long-term character of the development process in the developing countries. As time goes on, interest payments will become increasingly important; and in some countries they have already assumed quite a large magnitude. In the majority of debtors today, however, it appears that the factor most responsible for heavy service flow are the early maturities.

29. Table 10 shows the proportions of public debt outstanding at the end of 1962, which is repayable over the three-year period 1963–1965 and over the five-year period 1963–1967. Data refer to the 37 countries in our sample and they do not include commercial arrears, obligations to the International Monetary Fund and other similar obligations.

30. Had the additional debt, arising from commercial arrears, obligations to the International Monetary Fund and other similar transactions

TABLE 10. PERCENTAGE OF DEBT AS OF END 1962, REPAYABLE IN 1963–1965 AND IN 1963–1967

	1963–65 Three Years	1963–67 Five Years
Latin America	36	55
South Asia and Middle East	19	32
East Asia	31	52
Africa	13	20
Southern Europe	41	65

(see Table 6) been taken into account in calculating the above percentages, the figures would have been higher. This would have been especially so in the case of Latin America, where the volume of such additional short- and medium-term indebtedness is most significant. In Table 6 above we have assessed this additional indebtedness of the Latin American countries at approximately $2.5 billion. This amount was almost in its entirety repayable during the period 1963–1965. Thus, with the wider definition of public debt, approximately 50 per cent of the Latin American debt outstanding at the end of 1962 was repayable during these three years. On the same basis, approximately 65% of this region's debt outstanding at the end of 1962 was repayable during the period 1963–1967.

VOLUME III | ESSAYS

Essay I

EXPORT FLUCTUATIONS AND DEBT SERVICING PROBLEMS:
Relationship between the Fluctuations in Export Earnings and Direct Investment Income Payments —A Statistical Test

Prepared by S. Shahid Husain

1. INTRODUCTION

1. The debt service ratio—ratio of service payments on external fixed-term debt to foreign exchange earnings on current account—is a convenient indicator of debt servicing burden in the short run.[1] Debt service is contractually fixed; in contrast, external earnings—particularly of primary producing countries—continuously fluctuate. The higher the ratio of fixed service payments to external earnings, the greater the strain which a debtor country may experience when external earnings contract sharply. While the debt service ratio is an incomplete and imperfect indicator of present or potential liquidity problems and should never be used in isolation of all other variables relevant to the appraisal of these problems, it does draw attention to the cash flow squeeze to which an economy—and particularly an economy in the process of growth—may be exposed.

2. Fixed-interest debt consists of public (including publicly-guaranteed) debt and of private debt. Debt service on both introduce rigidity into the economic system and into the balance of payments of the debtor; and ideally, debt service ratios, when used as indicators of potential—and actual—liquidity difficulties, should include in the nominator debt service obligations on both public and private accounts. In practice, it

[1] For complete analytical treatment, see *Volume I, An Analytical Framework*, Chapters III-4, IV, and V-9.

is most frequent that only public and publicly-guaranteed debt service ratios are computed and shown. The main reason is that today, fixed-term debt in most developing countries consists largely of public and publicly-guaranteed debt; also, the data on purely private debt are usually lacking. Another reason may be the proposition that it is the government obligations which are of the highest order of priority and therefore only public and publicly-guaranteed debt service ought to be shown in the debt service ratio; but this proposition cannot claim a general validity and is likely to remain controversial: this depends on the context of the analysis and on particular interests of particular creditors at a particular time.

3. A more general and more interesting question concerns the treatment of profits of private direct investment. The traditional "creditworthiness" analysis assumes that returns on equity capital fluctuate with export earnings; and therefore they should not be included in the debt service ratio as an indicator of the debt service burden over the short run.

4. Sections 2 and 3 test the validity of the assumption stated in paragraph 3 above. Section 4 sets forth the implications of the findings, in the wider context of debt servicing problems of the developing countries as they arise against the background of continuing and frequently violent fluctuations in their external earnings.

2. THE TEST

5. The test consists of a correlation analysis of fluctuations in receipts from merchandise exports and of fluctuations in direct investment income payments. Exports are considered the independent variable and direct investment income payments the dependent variable. The time series of both variables have been used as a basis for analysis. Since the object of the exercise is to determine the relationship between fluctuations in the two series, coefficients derived from the first differences in the two series are of greater significance than those derived from the raw data. The raw data are affected by trends and factors common to both series.

6. The test was carried out on a sample of 21 developing countries. Continuous data for export receipts and direct investment income payments were available for 20 countries for the period 1948–1961; for Israel the respective data covered the period 1952–1961.

7. There are no serious conceptual or statistical problems in the time series of merchandise exports. Some problems arise with respect to the time series of earnings on foreign direct investment. First, on the statisti-

cal level, the data are imperfect. Secondly, on the conceptual level, there is the question whether both transferred and reinvested earnings should be included in the analysis or only the former. It was decided to use the gross concept, i.e., the total earnings flow. Decision on whether or not to transfer earnings is affected by a number of factors, among them the overall economic and political prospects of the country; sometimes, the ability to transfer them is influenced by government policies of the country where investment is located; and tax considerations can frequently exercise a decisive influence. All these factors are essentially exogenous. If there is a systematic relationship between fluctuations in exports and fluctuations in earnings on foreign direct investment, it should be found in total earnings, transferred as well as reinvested.

3. FINDINGS

8. The findings of the test are summarized in Table 1 (below). For five out of 21 countries—Iraq, Venezuela, Honduras, Costa Rica and Chile—a clearly significant correlation between fluctuations in the two series was found. For the sixth country, Ecuador, the significance of this correlation was less certain.

9. Two factors are common to all these countries:

(a) direct foreign investment is heavily concentrated in the export sector: oil in Iraq and Venezuela, bananas in Honduras, Costa Rica and Ecuador and mining in Chile;

(b) products of industries in which direct foreign capital was invested accounted for a major proportion of the exports of these countries. Such products accounted for the following proportions of merchandise exports in 1955, one of the middle years of the series:

Iraq	91%	petroleum
Venezuela	96%	petroleum
Honduras	80%	bananas
Costa Rica	41%	bananas
Chile	87%	minerals
Ecuador	54%	bananas

10. For 15 out of the 21 countries the correlation between fluctuations in the two time series was not significant. In order to throw further light on these cases a further test was carried out: it was assumed that direct investment income payments would follow merchandise export receipts with a one-year time lag. As indicated in Table 2 (below), raw data give mixed results. However, the relevant correlation between

TABLE 1. RELATIONSHIP BETWEEN MERCHANDISE EXPORTS AND DIRECT INVESTMENT EARNINGS WITHOUT TIME LAG IN TWENTY-ONE LESS DEVELOPED COUNTRIES, 1948–1961[1]

	First Differences			Raw Data		
Country	r	r^2	Significance at 5% level	r	r^2	Significance at 5% level
Iraq	.930	.853	*	.995	.988	*
Venezuela	.913	.818	*	.776	.570	*
Honduras	.888	.770	*	.674	.409	*
Costa Rica	.743	.512	*	.362	.059	x
Chile	.696	.438	*	.432	.119	x
Ecuador	.527	.212	close	.961	.918	*
Peru	.483	.163	x	.926	.846	*
Ceylon	.463	.143	x	.374	.068	x
Dominican Republic	.458	.138	x	.200	.040	x
El Salvador	.391	.076	x	.821	.646	*
Paraguay	.361	.051	x	.127	0	x
Nicaragua	.326	.025	x	.425	.112	x
Haiti	.307	0	x	.144	0	x
Mexico	.267	0	x	.750	.526	*
Colombia	.257	0	x	.041	0	x
Panama	.262	0	x	.318	.011	x
Uruguay	.254	0	x	.747	.521	*
Argentina	.243	0	x	.177	0	x
Israel	.088	0	x	.839	.667	*
Guatemala	.088	0	x	.559	.255	x
Ethiopia	.054	0	x	.707	.457	*

Notes: [1] Except for Israel: 1952–1961.
r—coefficient of correlation.
r^2—coefficient of determination corrected for the degrees of freedom.
*—significant.
x—not significant.

Source: IMF, *Balance of Payments Yearbook*—various volumes.

fluctuations in the two series is of significance only for one country, Mexico.[2]

11. It may be concluded that in developing countries which do not show the characteristics indicated in para. 9, direct investment income payments need not necessarily fluctuate with fluctuations in export earnings. A poor correlation of the two time series examined reflects one of the following two situations, or a combination thereof:

(a) export earnings—and fluctuations in them—depend on products of industries in which foreign direct investment does not play a major role. This tends to be the case in countries where exports are concentrated in coffee or cotton where capital stock is largely

[2] Table 2 also lists Paraguay in this category. However, the rounding of small direct investment income data introduces potentially significant errors in computation, thus introducing a strong question mark behind the correlation figures in Table 2.

TABLE 2. RELATIONSHIP BETWEEN MERCHANDISE EXPORTS AND DIRECT INVESTMENT EARNINGS WITH ONE-YEAR TIME LAG IN TWENTY-ONE LESS DEVELOPED COUNTRIES, 1948–1961[1]

	First Differences			Raw Data		
Country	r	r^2	Significance at 5% level	r	r^2	Significance at 5% level
Iraq	.075	0	x	.928	.848	*
Venezuela	.233	0	x	.555	.246	x
Honduras	.567	.254	x	.561	.252	x
Costa Rica	.245	0	x	.742	.510	*
Chile	.028	0	x	.149	0	x
Ecuador	.383	.062	x	.922	.836	*
Peru	.292	0	x	.809	.623	*
Ceylon	.378	.057	x	.682	.417	*
Dominican Republic	.288	0	x	.426	.107	x
El Salvador	.034	0	x	.834	.667	*
Paraguay	.721	.472	*	.541	.228	x
Nicaragua	.059	0	x	.641	.357	*
Haiti	.009	0	x	.095	0	x
Mexico	.660	.380	*	.826	.654	*
Colombia	.010	0	x	.082	0	x
Panama	.310	0	x	.254	0	x
Uruguay	.016	0	x	.703	.449	*
Argentina	.247	0	x	.254	0	x
Israel	.566	.207	x	.833	.651	*
Guatemala	.094	0	x	.317	.019	x
Ethiopia	.028	0	x	.769	.554	*

Notes: [1] Except for Israel: 1952–1961.
r—coefficient of correlation.
r^2—coefficient of determination corrected for the degrees of freedom.
*—significant.
x—not significant.

Source: IMF, *Balance of Payments Yearbook*—various volumes.

domestically owned, and where exports of industries with substantial foreign direct investment are of minor significance;

(b) foreign investment is concentrated in industries catering essentially for the domestic market. While fluctuations in export earnings do not directly affect production and earnings in industries selling in the domestic market, it may be assumed that lower or higher export earnings will be reflected, with a certain time lag, in reduced or increased demand for certain domestic products. Such "automatic" adjustments will only take place if government policies are not directed towards monetary expansion during periods of falling exports and toward anti-inflation during export booms. Table 2 indicates that only in Mexico did direct investment income payments, in fact, follow fluctuations in export earnings. This may have something to do with the fact that Mexico pursued financial policies

which can be considered conservative in comparison with other developing countries.

4. IMPLICATIONS

12. "If foreign capital is invested in export industries, one would expect that profits and dividend remittances would fluctuate *pari passu* with, and in the same direction as, the country's export earnings. As a matter of fact, these fluctuations should be even more intense, since profits generally show wider amplitude of movement than gross sales. [The above findings] indicate that in the majority of countries in the sample there was no such automatic tendency for profits and dividends to fluctuate with fluctuations of export earnings . . . A partial explanation seems to be a change in the pattern of foreign investment. The major concentration of foreign capital in the earlier periods of economic history was in production for exports (so-called *enclave* investments). Consequently, profits moved parallel with export earnings. Today, foreign direct investment in less developed countries flows into two distinct directions. First, there are still countries where foreign private capital is invested in extractive industries, e.g., petroleum, aluminum, other minerals. This flow continues to account for a major part of private direct investment in the less developed countries. In these cases, profits fluctuate as exports fluctuate. There is, however, a second set of countries which are establishing industries producing import substitutes or completely new goods that are sold on the domestic market. Foreign private investment has been playing a considerable role in this development, not only with respect to consumers goods, but also in the fields of capital goods and basic chemicals. Domestic demand for these products is increasing rapidly and without much fluctuation.

13. "The implication . . . is that a change in the economic structure, which will have favorable long-term effects, has been accompanied by an increase in the short-run rigidities in the balance of payments [of many developing countries]. Their exports still consist of primary products which continue to fluctuate, while [debt service payments, including] profits of foreign-owned companies, some of which are liable to be transferred to the parent organizations, originate in a rising and barely fluctuating (domestic) market. And the problem is further complicated if inflationary pressures operate in the developing country while its exchange rate is kept overvalued."[3]

[3] *An Analytical Framework, op. cit.,* pp. 30–31.

Essay II

EXPORT FLUCTUATIONS AND DEBT SERVICING PROBLEMS: A Short-Term Liquidity Indicator

Prepared by Jan de Weille

1. INTRODUCTION

1. This paper illustrates a possible method of assessing the vulnerability of a country's balance of payments to short-run export fluctuations. An attempt is made to put together in a single measure the liquidity variables discussed in Chapter III of *Volume I, An Analytical Framework*. The method involves a short-term balance of payments forecast designed to show the degree of strain on the balance of payments in a hypothetical future two-year period in which export earnings are assumed to fall off to the maximum extent which can reasonably be expected in the country concerned. More specifically, export earnings are assumed to be at the lowest probable level in the two years 1964–65. (The fall in earnings may be caused either by a fall in export prices or by a breakdown of supply.) One important element, the initial level of exchange reserves, is approximately known for this early period, whereas it would not be known for a later period. Another element taken into account in the calculation is the increase of debt service obligations on external public debt between the base period, 1961–62, and the assumed crisis period. The projection further involves assumptions concerning the compressibility of imports and the probable level of capital inflows (less outflows) in the hypothetical crisis period.

2. As with other projections or forecasts, this method is only as good as the assumptions chosen. This note sets out the result of calculations made for three actual countries, but to avoid the drawing of conclusions which would not be warranted on the basis of this comparatively crude attempt, the countries will be referred to only as A, B, and C. The following paragraph explains in detail the method employed.

2. THE METHOD

3. *Exports:* Trend values of commodity exports have been established for the period 1955–62 by the least square method and trend values for 1964–65 by linear extrapolation. Since the object of this exercise is to illustrate the liquidity stresses in a period of export decline, the values of exports actually assumed for 1964–65 are obtained by deducting from the trend values the largest percentage drop from the trend which occurred in any two consecutive years over the period 1955–62 (Table 1).[1] That is to say, it is assumed that the maximum two-year shortfall from the trend in 1955–62 indicates the maximum shortfall to be expected in the hypothetical crisis period.

4. *Imports:* The values of imports for 1964–65 have been arrived at in the same way as for exports. Deviation from the trend in the past has been taken as a measure of compressibility and applied to the future, extrapolated trend values in order to assess the response of imports to a decline in exports (Table 1). This is no doubt a weak assumption. Past declines in imports may or may not have coincided with declines in exports—their decline may have followed with a time lag. The whole subject of import compressibility, however, needs further investigation.[2]

5. *Debt Service:* The calculation takes into account the increase in service on public and publicly-guaranteed debt (both amortization and interest) to be expected between 1961–62 and 1964–65, on the basis of presently available information (Table 2). There is no statistical basis for estimating the prospective increase in service on non-guaranteed private debt or transferred earnings on direct investment, and these items are not specifically taken into account. Also, no account is taken of service payments on public and publicly-guaranteed debt which may be contracted between 1962 and 1965. This is an omission whose seriousness will vary from case to case. In many cases, it will not be important, because there is usually a grace period on newly contracted loans. In others, the significance may be considerable, but here again the incurring of the debt in such a short period may be considered an offset to the repayment a year or two hence.

6. *Capital Inflow:* Capital inflow in 1964–65 is assumed to equal the capital inflow in 1961–62 (net of capital outflow but *not* of amortization of public debt in each case). The latter figure has been arrived at by deducting the decrease in gold and foreign exchange holdings and

[1] All tables are attached at the end of the essay.
[2] *An Analytical Framework, op. cit.*, pp. 26–29.

increase of the IMF holdings of the country's currency from the import surplus, plus debt service payments, during 1961–62 (Tables 3 and 4). The assumption of the constancy of capital inflow is supported by the relative stability of capital inflows into developing countries in recent years.[3] But this holds for these countries as a group, and not for individual cases. It is quite possible that in certain cases the capital inflows in 1961–62 may have been low and in certain others high compared to what may happen in the future. Moreover, it has to be considered that offsetting capital outflows might be larger in a crisis period than in the base period. Such factors can be taken into account only in dealing with individual cases on the basis of knowledge of specific country characteristics.

7. *Gold and Foreign Exchange Reserves:* Gold and foreign exchange reserves as of January 1, 1964, are assumed to be the same as in mid-1963 (Table 5). This is defined as the sum of:

(a) Official gold holdings;

(b) Official foreign exchange reserves;

(c) IMF drawing rights, excluding the Fund holdings of the member's currency.

8. The assumption that all reserves and potential reserves are available in the crisis period is no doubt optimistic. There would be presumably some level of reserves beyond which authorities in each country would not be prepared to go. It would be readily possible to modify the calculations to take account of this additional point.

3. THE RESULTS

9. In Table 6 projections of individual variables have been brought together in the form of a balance of payments projection.

10. The net result of all the assumed changes is expressed in the final net foreign exchange position of the country, i.e., in its international cash balance. The underlying thought is that when all the transactions due for settlement in the period under consideration have been liquidated, there should be a positive cash balance left.[4] This cash balance, if any, can then be related to future payment obligations—e.g., yearly import bill—to indicate how much worse off has the country become as a result of the crisis and how well it is prepared to meet the next crisis.

[3] In fact the assumption is of constancy of the net balance of all transactions, including invisible transactions on current account, for which explicit assumptions are not made in the calculations.

[4] The cash balance may be a result of borrowing—see paragraph 6—but this is irrelevant for short-run analysis.

11. *Net Foreign Exchange Position* is defined as the sum of:

Gross capital inflow
+ Initial gold and foreign exchange reserves
− Import surplus
− Debt Service.

12. Given the assumptions, a positive net foreign exchange position would indicate that the entire import surplus and debt service can be met out of the capital inflow and foreign exchange reserves. In Table 7, the net foreign exchange position is expressed as a percentage of imports and gross capital inflow. This not only indicates the remaining margin of maneuverability, but it also permits inter-country comparisons. The situation becomes progressively worse as we move from case A (the most comfortable position) to case C (hopeless position for the future).

4. CONCLUDING REMARKS

13. The analysis above shows a way of projecting the balance of payments and assessing liquidity on this basis. No strong claims are made for the particular assumptions adopted here. No doubt projections for operational purposes will have to take account of various factors affecting the future magnitudes of different variables.

14. The liquidity problem is very complex: the number of variables is large and our knowledge of their likely behavior is still inadequate. No single variable by itself is sufficient to permit a complete analysis. The attempt in this paper to provide an over-all framework solves one problem: the need to take into account all the variables simultaneously. But it does not solve the other problem: what values to attach to particular variables. This will always be a matter of judgment: but judgment can perhaps be better supported by facts and knowledge than the analysts have been able to provide thus far.

15. "The present state of knowledge does not permit satisfactory handling of all variables, particularly of the compressible part of imports, and their obverse, the minimum tolerable level of imports. The final choice of a country facing liquidity difficulties is between the minimum tolerable level of imports and debt servicing. In this, as in many other respects, there is an analogy between an individual and a country. For the individual also, when his income falls, the choice is between paying his debts and meeting minimum subsistence expenses. The question for him, as for a country, is how far the belt can be tightened." [5]

[5] *An Analytical Framework, op. cit.*, p. 37.

16. The compressibility of imports in periods of foreign exchange declines, and the effects on economic growth and on stability of particular patterns of adjustment of a developing country to such declines, remains a major area in which most careful research is needed. Fluctuations in export earnings lead to fluctuations in the capacity to import: and the latter influence the rate of purchase of that capital equipment which is indispensable for accelerated growth and for the diversification of production and export structures. But diversification, which is the only long-run solution to the problem of fluctuations, can proceed only in a halting manner if the capacity to import fluctuates. But how much do the fluctuations affect the rate of capital accumulation, and how much the volume of personal consumption? Or perhaps it does not matter since both are so intimately related that the fall in one leads to a fall in the other in any case?

TABLE 1. PROJECTED EXPORTS AND IMPORTS—1964/65

(million $)

	Exports			Imports			
Country	Trend value 1964/65	% down-fall	Minimum exports 1964/65	Trend value 1964/65	% down-fall	Minimum imports 1964/65	Import surplus 1964/65
A	1,721	13	1,497	2,939	25	2,204	707
B	756	8	696	1,171	19	949	253
C	2,365	6	2,223	3,110	3	3,017	794

TABLE 2. SERVICE ON PUBLIC EXTERNAL DEBT, 1961/62 AND 1964/65

(million $)

Country	1961/62	1964/65
A	75	76
B	176	270
C	540	649

TABLE 3. CHANGES IN RESERVES DURING 1961/62

(million $)

Country	Changes (decrease +, increase −)
A	−408
B	+50
C	+34

TABLE 4. GROSS CAPITAL INFLOW, 1961/62

(million $)

Country	Import surplus	Debt service	Decrease in reserves	Gross capital inflow (import surplus + debt service − decrease in reserves)
A	1,218	75	−408	1,701
B	403	176	50	529
C	318	540	34	824

TABLE 5. GOLD AND FOREIGN EXCHANGE RESERVES AND IMF DRAWING RIGHTS, MID-1963

(million $)

Country	Total reserves
A	1,242
B	293
C	629

TABLE 6. PROJECTED BALANCE OF PAYMENTS, 1964/65

(million $)

	Available Finance			To be financed			
	(1)	(2)	(1+2) (3)	(4)	(5)	(4+5) (6)	(3−6) (7)
Country	Gross inflow	Exchange reserves	Total	Import surplus	Debt service	Total	Net foreign exchange position
A	1,701	1,242	2,943	707	76	783	2,160
B	529	293	822	253	270	523	299
C	824	629	1,453	794	649	1,443	10

TABLE 7. NET FOREIGN EXCHANGE POSITION AT THE END OF 1965 IN RELATION TO IMPORTS AND CAPITAL INFLOW

	Net Foreign Exchange Position as a Percentage of:	
Country	1964/65 Imports	Gross Capital Inflow
A	98	127
B	30	57
C	0	1

Essay III

LONG-RUN GROWTH AND DEBT SERVICING PROBLEMS: Demand for Imports in the Process of Growth and Structural Change

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1. INTRODUCTION

A. The Problem

1. This paper explores the possibility of making a useful study of import requirements associated with alternative rates of growth in individual countries. It reviews certain existing material and considers how further progress can be made. It is a ground-clearing operation rather than a direct attempt to secure usable results.

2. The subject can be posed in two ways:

(a) There is the problem of those countries which are aiming at rates of growth of GNP substantially higher than their prospective rates of growth of export earnings. Such countries must either rely on increasing capital inflows or else must manage progressively to reduce the part of the total supply of resources provided by imports. The question then arises whether a strenuous (relative) import substitution effort is consistent with a fairly high rate of growth of GNP.

(b) The problem arises in a somewhat more theoretical way in connection with projections of capital inflow requirements. Such requirements can be conceived alternatively as related to a savings gap or to a foreign exchange gap. *Ex post,* as reflected in national accounting data, these two gaps are by definition equal in magnitude. But this definitional identity reveals nothing as to relations of

cause and effect. More important considerations for present purposes are:

i. That projections of the savings gap are extremely sensitive to assumptions as to rates of growth and capital-output ratios, and to the correctness of the estimate of the initial savings rate, and fairly sensitive to assumptions concerning marginal savings rates. The estimates of the foreign exchange gap, like the estimates of the savings gap, are in their nature very sensitive. They are relatively small differences of two sets of relatively large magnitudes; investment and savings, and imports and exports, respectively. Since errors are likely to be very great whenever it is the residuals (small differences) that are to be estimated, it is most useful to estimate each of the gaps independently: in this way, the estimate of one (savings gap) serves as a check for the other (foreign exchange gap).

ii. In some countries the increase of imports required to achieve a given rate of growth of product appears to be both a salient feature demanding attention in growth projections and a relationship about which it is possible to make certain judgments.

B. Export Growth and Import Substitution

3. Obviously the present problem is related to the whole question of the role of trade in development. Broadly speaking, three types of cases may be distinguished:

(a) Countries in which expansion of exports is the primary dynamic element. Such countries may pass through a phase, at least, in which exports and imports grow faster than GNP, so that their economies become progressively more open.

(b) The more neutral cases in which imports and exports grow at about the same rate as GNP.

(c) The import substitution cases in which the country becomes progressively less dependent on imports.

4. The position of a country in this spectrum may be to some extent a matter of deliberate choice; and the choice, in turn, may be influenced by particular circumstances prevailing in particular countries, as they are appraised by the decision-makers. To the extent that governments influence the pattern of development, they may have to make choices between exports promotion and import saving. Presumably, the penalty for wrong choices is slower growth of income than could otherwise have

been obtained. Thus, there have been arguments (e.g., a controversy in the *Economic Journal*) that India has too readily despaired of the possible effectiveness of expanding exports. Considerable concentration of effort on import substitution appears to have been common in Latin America. At the other end of the scale, Japan has sustained a relatively high rate of growth by vigorous export promotion.

5. Theory provides frames of thought for deciding the balance between expanding exports and developing substitutes for imports—notably the recent literature on the use of a shadow price of foreign exchange in comparing returns from different investments. The problem may in principle be approached by input-output and linear programming methods. However, three types of problems arise in practice:

(a) Absence of the necessary data for an approach by advanced methods;

(b) Elements in the problem which are not amenable to exact mathematical treatment;

(c) A consequent doubt as to whether the optimum balance between export promotion and import substitution in a particular case is indeed critical in relation to the realization of growth possibilities of the economy.

C. Approaches Used

6. This paper follows the two approaches customary in examining the relationship between economic magnitudes:

(a) International comparison;

(b) Historical examination for individual countries.

7. Cutting across this question of approach is the question of degree of aggregation in the data used.

8. At the highest degree of aggregation, the hypothesis can be explored that imports are functionally related to certain magnitudes for the whole economy—size of product, rate of growth of product, size of the country, factor endowment, etc. The obvious first step is to try this very simple form of hypothesis to see whether it yields interesting results.

9. To disaggregate somewhat, attention can be turned to certain possible relationships with broad macro-economic aggregates in the economy—the marginal propensity of consumers to buy imports, the import content of domestic production, the import content of domestic capital formation. Beyond this, an input-output approach of any feasible degree of detail can be employed.

10. The import demand for any commodity (i) may be conveniently split into four components:

$$Mi = Di + Wi + Ei - Xi$$

where X_i = domestic production of commodity i
D_i = domestic final use of i
W_i = use of i by other producers
E_i = the amount of i exported.

2. IMPORT GROWTH RELATED TO PRODUCT GROWTH

A. Time Series for Recent Years

11. Table 1 shows relationships, for a number of countries, between rates of growth of imports and of GDP in recent years. The first column represents the ratio between percentage rates of growth in imports and in GDP (or in some cases GNP and for India NNP) both series being measured in constant prices.[1] The period is indicated to the right in the table. The second column gives the average percentage annual growth in total production. Countries are arranged in descending order of the ratio of growth in imports to growth in total production.

12. The table brings out clearly a lack of any uniform relation between growth in imports and growth in total production during the 1950's. The ratio does not seem to be correlated with the growth rate of the economy, and a glance at the countries does not indicate any close correlation with the level of per capita production. The median value is in the neighborhood of 1.0, denoting an equal rate of growth for product and imports. However, even ignoring the extreme cases, there is a range from 0.5 to 1.8: imports growing half as fast as product, to imports growing nearly twice as fast as product. Figures in an earlier Bank study give a somewhat similar picture.[2]

B. Longer Time Series

13. In August 1960 the Economic Department produced a paper, *Statistical Material Relating to Behavior of Imports During Economic*

[1] GDP–Gross Domestic Product; GNP–Gross National Product (i.e., gross domestic product inclusive of factor income receipts less factor income payments); NNP–Net National Product (i.e., gross national product less depreciation).

[2] Dragoslav Avramovic, *Debt Servicing Capacity and Postwar Growth in International Indebtedness,* The Johns Hopkins Press, 1958.

TABLE 1. COMPARISON OF GROWTH RATES OF IMPORTS AND OF PRODUCT

	Ratio of percentage growth in imports to percentage growth in total production	
Nigeria	4.5	1950/52 to 1958/60
Cyprus	4.2	1952/53 to 1958/59
Turkey	1.8	1950/51 to 1954/55
Guatemala	1.6	1952/53 to 1958/59
Puerto Rico	1.5	1952/53 to 1958/59
Ecuador	1.5	1952/53 to 1958/59
Japan	1.3	1950–52 to 1958/59
Ghana	1.3	1955/56 to 1959/60
Trinidad and Tobago	1.2	1951–53 to 1958/59
El Salvador	1.2	1952/53 to 1958/59
Ceylon	1.2	1950–52 to 1958–60
Chile	1.1	1950–52 to 1958–60
New Zealand	0.9	1950–52 to 1957–59
Argentina	0.8	1951/52 to 1958–60
India	0.8	1952/53 to 1958/59
Burma	0.8	1950–52 to 1957/58
Philippines	0.7	1950–52 to 1957–59
China	0.6	1952/53 to 1958/59
Brazil	0.6	1950–52 to 1957/58
Rhodesia and Nyasaland	0.5	1954/55 to 1958/59
Congo	0.3	1950–52 to 1958/59
Australia	0.25	1954/55 to 1959/60
Colombia	0.1	1950–52 to 1958–60

Sources: Import quantities: U.N., *Monthly Bulletin of Statistics.*
U.N., *Yearbook of National Accounts Statistics.*

Product growth: Economic Department, IBRD.
U.N., *Yearbook of National Accounts Statistics.*

Development. This indicates that typically imports tend to fall off fairly gradually as a percentage of GNP—that is to say, that GNP typically increases somewhat faster than imports, but not markedly faster. Thus, for the United States imports fell from around 7.8% of GNP (in current prices) throughout the period 1874–1898 to around 4.5% of GNP in 1934–1948.

14. Only in three of the cases examined did considerable income growth take place over any considerable period with stagnating or declining imports: the USSR in the 1930's, Brazil in the 1950's and probably Australia in the 1860's.

15. The Soviet experience during the first two five-year plans from 1928 to 1937 illustrates the case of a large economy assigning maximum

priority to the development of import substituting industries, and particularly those turning out producer goods, with the specific purpose of becoming independent from imports of capital goods in the future. Soviet machinery output rose by about 20% p.a. during 1928–1937, and the volume of other producer goods (metals, minerals, fuels, energy, chemicals, and building materials) by 12% annually. The share of machinery and other producer goods in total industrial output rose from 40% in 1928 to 58% in 1937. As in other large countries, foreign trade in the USSR is relatively small in proportion to total production: at the outset of the planning period commodity imports accounted for only about 3% of gross production. The annual volume of imports during the First Five-Year Plan rose, but it was still about 20% smaller than in the prewar period. During the Second Five-Year Plan, the volume of imports was as much as 66% lower than during the period of the First Plan. However, such a strong dose of import substitution in specific production areas was accompanied by a deterioration in other sectors, particularly agriculture; at the same time there was serious pressure on personal consumption.

16. In Brazil the tendency for an extensive growth not to be accompanied by any clear tendency for imports to rise was noticeable in the 1930's and once again during the period following the import boom at the time of the Korean War and high coffee prices. In the latter period a considerable expansion of the production of capital goods and intermediate products took place. Accelerated development in the face of stagnating imports was accompanied by inflationary pressures, although other factors may have played a considerable role in this process. A detailed analysis is needed to show whether accelerated industrialization of the import-saving type was associated with a fall of production in any other economic sectors; and also, detailed analysis is needed to find out which expenditure sector, if any, was adversely affected. It would appear that mainly, the price for import substitution was inflation, while economic growth, supported by foreign capital inflow, proceeded at a rapid pace. A heavy over-hang of external debt has remained, and of a very unbalanced structure.[3]

17. In the case of Australia in the 1860's, a falling or stable volume of imports may have been accompanied by a fall in the rate of investment, while at the same time important technological changes were adopted in pastoral farming, thus contributing to the growth of the economy.

[3] *An Analytical Framework, op. cit.*, pp. 31–36.

3. IMPORTS IN RELATION TO MACRO-ECONOMIC MAGNITUDES

18. So far imports have been considered in relation to the total volume of production. The next step is to link different categories of imports with different components of total product and end use. An obvious device is to compare imports of capital goods with domestic capital formation, imports of consumption goods with total consumption, and imports of raw materials, fuels and intermediate products with domestic productive activity.

A. Imports of Capital Goods

19. Table 2 is based on figures from a UN Survey.[4] These figures suggest that the import content of gross domestic capital formation in underdeveloped countries may typically range from 20%–65% with a median of the order of 40%–45%. The actual import content or its trend is not shown as clearly correlated with any single factor such as per capita GNP, gross domestic capital formation as percentage of GNP or rate of increase of gross domestic capital formation. However, there appears to be a slight, but distinguishable, negative correlation between the import content of investment and size of population: the implication is that larger developing countries have a greater possibility to develop economically viable capital goods producing industries.

20. The UN *World Economic Survey, 1959,*[5] includes a section discussing the importance of capital goods imports for gross domestic capital formation in developing countries during the period 1950–1958.

21. Out of a total of 25 countries, four showed a rising import content; in fifteen the ratio was roughly stable and in six there was a decline in the import content. The first group consists of Chile, Guatemala, U.A.R. and Venezuela; the last group is made up of the Congo (Leopoldville), Brazil, Cuba, Ghana, Iraq and Turkey. In the large group shown as having a roughly stable ratio between imports of capital goods and total capital formation, a number of Latin American countries are found together with India, Burma, Israel, South Africa and others. The *Survey* concludes that the growth of domestic production of investment goods (notably, cement, building materials and steel) has in general barely kept up with the growth in gross domestic capital forma-

[4] United Nations, *World Economic Survey 1959,* New York.
[5] UN *World Economic Survey, 1959,* Chapter 2.

TABLE 2. IMPORTS OF CAPITAL GOODS AS SHARE OF GROSS DOMESTIC FIXED CAPITAL FORMATION

Country	Share of imports in gross domestic capital formation (%)		Trend over period			Gross domestic capital formation		Imports of capital goods as percentage of GNP, 1957–58	Per capita GNP ($)[a]	Population '000
	1950–51	1957–58	rising	stable	falling	As percentage of GNP, 1957–58	Annual increase, 1950–51 to 1957–58 (%)			
Chile	60	78	r			9	3	7	345	7,627
Mexico	65	64		s		15	6	10	320	34,626
Venezuela	47	62	r			23	10	14	530	6,709
Guatemala	49	61	r			13	8	8	185	3,759
Bolivia	49	54		s		17	6	9	105	3,462
Ecuador	58	51		s		13	9	7	130	4,298
South Africa	42	46		s		20	4	9	420	15,841
Congo (Leopoldville)	59	45			f	29	9	13	95	14,236
Portugal	46	45		s		16	6	7	230	9,125
Peru	46	45		s		21	7	9	180	10,857
Iraq	64	43			f	19	29	8	160	7,133
Cuba	51	43			f	20	11	9	430	6,743
Egypt	30	43	r			11	−4	5	110	26,059
Ghana	62	40			f	13	10	5	160	6,691
Rhodesia, Nyasaland	40	38		s		31	9	12	160	8,330
Ceylon	34	34		s		10	5	3	110	9,852
Philippines	33	33		s		8	9	3	120	27,456
Colombia	38	32		s		23	9	7	285	14,132
Thailand	32	31		s		14	7	4	105	25,520
Burma	20	26		s		20	15	5	100	20,662
India	27	25		s		10	13	3	70	429,410
Israel	16	22		s		16	3	4	600	2,114
Turkey	37	21			f	14	16	3	220	27,802
Brazil	29	20			f	13	2	3	165	65,743
Argentina	19	18		s		24	2	4	480	20,956

[a] Exchange rate conversion with some adjustment of ranking.

Sources: UN *World Economic Survey, 1959*, UN *Monthly Bulletin of Statistics*, Economic Department Estimates.

tion. Consequently, ". . . the realization of an increasing volume of investment has generally continued to depend closely upon a corresponding expansion in imported supplies of capital equipment; and even in the exceptional instances, the relative decline in import content of domestic fixed investment was often dictated by adverse circumstances of a transient nature."[6]

B. Imports of Consumption Goods

22. The *Survey* does not examine separately imports of consumption goods and raw materials, but relates the two together to domestic consumption (see Table 3). Again no very marked pattern emerges. The ratio of the two categories of imports to consumption ranges from under 10% to over 35%, with a median of about 20%. The distribution appears somewhat skewed with 9 out of 24 cases concentrated in the range 8%–15%. There is a notable tendency for the lowest percentages to be concentrated on the countries of largest population.

23. The *Survey* classifies the behavior of the import content of consumption in the following way for a period roughly from 1950–51 to 1957–58. There is no clear indication of significant regularity.

Countries in which import content of domestic consumption has:

	declined or remained stable	*risen*
Countries with greater rate of increase in import capacity than in domestic consumption	India	Burma
	Rhodesia, Nyasaland	Ecuador
	Thailand	Guatemala
	Venezuela	Iraq
		Morocco
		Peru
		Portugal
Countries with smaller rate of increase in import capacity than in domestic consumption	Argentina	Chile
	Belgian Congo	Cuba
	Bolivia	Ghana
	Brazil	Mexico
	Ceylon	
	Israel	
	Philippines	
	Turkey	
	South Africa	

[6] *Op. cit.*, p. 68.

TABLE 3. IMPORTS OF CONSUMER GOODS AND RAW MATERIALS AS PERCENTAGE OF DOMESTIC CONSUMPTION AND OF TOTAL IMPORTS, 1957–58

Country	Imports of consumer goods and raw materials as percentage of: Domestic Consumption	Total Imports	GNP ($) Per Capita	Population ('000)
Morocco	39	86	130	11,598
Rhodesia, Nyasaland	38	66	160	8,330
Ceylon	35	88	110	9,852
Cuba	35	76	430	6,743
Congo (Leopoldville)	31	59	95	14,236
Iraq	29	61	160	7,133
Ghana	28	82	160	6,691
Bolivia	27	72	105	3,462
South Africa	26	65	420	15,841
Burma	21	74	100	20,662
Portugal	21	70	230	9,125
Peru	20	56	180	10,857
Guatemala	19	67	185	3,759
Thailand	17	74	105	25,520
Ecuador	15	61	130	4,298
Venezuela	14	37	530	6,709
Chile	13	59	345	7,627
Israel	13	73	600	2,114
Argentina	10	61	480	20,956
Colombia	9	51	285	14,132
Brazil	9	62	165	65,743
Philippines	8	72	120	27,456
Mexico	8	48	320	34,626
Turkey	5	54	220	27,802
India	n.a.	57	70	429,410

Source: UN, *op. cit.*, p. 69.

24. The relationship between consumption and imports during the course of development may be separated into two parts: the evolution of the volume and composition of consumption as incomes rise, and the imports required to help sustain the successive levels and patterns of growth. Numerous studies have been made of the relationship between changes in income and changes in the volume and composition of consumption: although many of these studies, relating to consumers' behavior during the business cycle, are not relevant to the present study.

25. A recent work of interest for the present study has been carried out by Chenery and associates.[7] The results are shown in Table 4. As a

[7] ECAFE, *Formulating Industrial Development Programmes;* Report by a group of experts (Chairman: Hollis B. Chenery), 1961. This refers to an underlying study: Chenery and Watanabe, *An Inter-industry Analysis of Growth Patterns,* Research Center in Economic Growth, Stanford University, 1960 (mimeographed).

TABLE 4. AVERAGE PRIVATE CONSUMPTION PER CAPITA, BY MAJOR CATEGORIES, AT VARIOUS INCOME LEVELS

Category	Elasticities in relation to total consumption	Consumption at per capita income of $100	$200	$300
Food	.72	61.2	108.4	139.1
Clothing	1.23	6.2	14.8	22.8
Housing (rent)	1.04	5.2	10.9	15.7
Fuel and Light	1.17	2.7	6.3	9.5
Furniture	1.78	1.6	5.0	9.4
Other	1.36	13.1	34.2	55.1
Total Consumption		90.0	179.6	251.6

Source: ECAFE, *op. cit.*: based on Chenery and Watanabe, *op. cit.*

first stage, marginal propensity for total consumption of 0.77 has been estimated by a linear regression analysis of 1953 data for 30 countries. Next, elasticities in relation to total consumption were estimated for six categories of goods and services, by means of cross-section analysis of consumption data in a large number of countries.

26. There have been various discussions of the marginal propensity of consumers to import. It has been pointed out that this marginal propensity, at the extreme, may even exceed unity, home-produced goods being treated as "inferior goods" as against imports. Furthermore, in practice, it is likely that purchase of imports by consumers in developing economies will be dampened by means of high import duties or even of quantitative restrictions. A significant issue may then be the effect of import restrictions on incentives and hence on production, given the elasticities of supply of home-produced consumption goods. The relationship between imports and production is likely to be extremely difficult to quantify. In many areas the relationship is a rather subtle, dynamic one. Thus, in Africa (and no doubt in other areas) imported consumption goods play an important role in the development process in giving an incentive to the progressive transition of cultivators from subsistence to the cash economy and to increasing specialization and efficiency; and in developing countries at higher per capita income levels, the preference for "superior" imported goods may be continuously at work: thus the well known "demonstration" effect. But stronger than this effect will be the governmental measures to restrict imports of consumer goods.

27. Because of international differences in domestic elasticities of supply of consumption goods, and of the roles of different types of

consumption goods as incentives, the question of import requirements for consumption goods during the process of development appears likely to demand study on a country-by-country basis.

C. Imports of Fuels, Raw Materials, and Intermediate Products

28. A relationship which can be established with rather more certainty holds between imports of raw materials and fuels and the growth of the various sectors using these imports. Such relationships have often been explored in country economic analyses.[8]

29. Any reliable work in this field seems to depend on some further degree of disaggregation, distinguishing between industries with different fuel and raw material requirements.

D. Imports of Services

30. Detailed information on imports of services by underdeveloped countries is somewhat fragmentary and unreliable. In considering total import requirements, it might be suspected that developing countries typically pass through a stage in which their requirements for imported services increase rather rapidly, before arriving at a subsequent stage when the capacity to produce the required services at home begins to catch up with the requirements.

31. An investigation based on 1958/59 balance of payments data for 67 countries, indicates that the ratio of imports of non-merchandise to total imports is not systematically different in high- and low-income countries. This apparent similarity covers considerable differences between the composition of these imports. For instance, while in high-income countries foreign travel mainly covers expenditure on tourism abroad, in many low-income countries this item is likely to consist mainly of official and business expenditure, and of expenditure of foreign experts. (In Ghana, three-fifths of foreign travel payments in 1958/59 appears to have been incurred by foreign experts for their home leaves).

32. In spite of these dissimilarities, it seems that no consistent error is made when using data for merchandise imports to indicate a country's total dependence on imports.

[8] See Bank *Survey Mission Reports*, The Johns Hopkins Press.

4. INTER-INDUSTRY APPROACH

A. Forecasts Based on Aggregates

33. Import requirements estimated by considering prospective import contents of investment, consumption and productive activity in general, are not wholly independent of forecasts aimed at deriving the savings gap. To derive, for example, the imports which will be required for capital formation, it is necessary to make a forecast of this capital formation. And the relation between forecasts of capital formation and consumption will either depend upon, or imply, values of the incremental capital-output ratio[9] and of the savings rate. Thus, estimates of the payments gap, based on import forecasts, cannot be treated as fully independent of estimates of the savings gap.

34. The macro-economic approach considered thus far has two major shortcomings:

(a) It maintains a very rough aggregation;

(b) It does not provide any direct approach to the question of import substitution.

The next step is therefore to consider whether any further refinement can be made through an input-output or even linear programming approach.

B. Chenery's Sectoral Analysis—An Alternative

35. In a well-known article,[10] Chenery employs a regression analysis in an effort to show the determinants of the relative sizes of the various productive sectors in economies at various stages of development. He concludes that a major explanatory variable, besides per capita income level, is size of country, as measured by population. Chenery admits, on theoretical grounds, that these two explanatory variables ought ideally to be supplemented by others such as resource endowment and income distribution. However, he considers that it is difficult to see how any suitable measure of resource endowment could be devised, while data on income distribution are very imperfect for most countries. Further, national policies must be allowed an effect, but this is both unmeasurable and unpredictable.

[9] Ratio of yearly investment expenditure to annual increment in output.

[10] Hollis B. Chenery, "Patterns of Industrial Growth," *The American Economic Review*, September 1960.

36. Imports are brought into relationship with per capita income and size of the population through a regression equation of the following form:

$$\log M_i = \log a_i + b_i \log y + c_i \log N$$

This is the logarithmic form of the function

$$M_i = a_i Y^{b}{}_i N^{c}{}_i$$

where: M_i is per capita imports in sector i

Y is per capita national income

N is population

b_i is the elasticity of imports in sector i with respect to per capita income and c_i is the elasticity of imports in sector i with respect to population.

Estimates of the coefficients had been made on the basis of cross-section data for 63 countries.

37. The empirically derived formula relating total imports to per capita income and population is:

$$\log M = \log 20.40 + 0.987 \log Y - 0.281 \log N.$$

This formula indicates:

(a) that imports grow with rising per capita income—in fact imports and income per capita appear to grow at about the same rate;

(b) that a large country tends to have a lower relative dependence on imports than a small one.

The results by sector are shown in Table 5.

38. The Chenery material does not stop at considering the relationship of imports to GNP and population. The material on imports is integrated with a model of typical growth patterns for the distribution of productive activity within countries. This enables Chenery to distinguish between that part of growth in various sectors which typically caters to increases of domestic consumption or exports, and that part which constitutes import substitutions. The results, which are extremely suggestive, are summarized in Table 6. They indicate that, while there may be a general tendency for imports to increase rather less fast than GNP, this result is a compound of imports for some purposes increasing faster than that particular item of demand or production, with import substitution elsewhere. Any technique for study of the prospective growth of imports in a particular country must be able to handle the question of the balance between these two effects.

39. Chenery himself emphasizes that his elasticities do not serve accurately to predict the course of growth in any particular country. The fit of the equations to the data is imperfect, as is normal in cross-

TABLE 5. MULTIPLE CORRELATION BETWEEN IMPORTS, PER CAPITA GNP AND POPULATION SIZE[1]

ISIC code	Type of goods	a	b, growth elasticity	Standard error of b, growth elasticity	c, size elasticity	Standard error of c, size elasticity	Coefficient of determination	Standard error of estimate
0	Agriculture	1.17	1.396	.138	—.239	.091	.650	.432
1	Minerals							
11, 13	Crude petroleum, gas and coal	.07	2.363	.402	—.001[2]	.259	.420	1.081
12, 19	Mining	.17	1.563	.177	—.075[2]	.117	.668	.450
2, 3	Manufactured goods							
20–21–22	Food, beverage and tobacco	1.36	1.003	.141	—.374	.093	.552	.443
23	Textiles	2.05	.555	.119	—.536	.078	.547	.377
24	Clothing	.18	.866	.203	—.757	.126	.543	.524
25–26	Wood and furniture	.24	1.320	.154	—.406	.095	.677	.393
27	Paper	.43	1.118	.068	—.380	.043	.862	.203
28	Printing	.03	1.444	.285	—.331	.139	.506	.476
20	Leather	.15	1.143	.130	—.470	.084	.689	.361
30	Rubber	.24	.578	.118	—.540	.079	.584	.348
31	Chemicals	1.18	.956	.079	—.407	.051	.808	.242
32	Petroleum products	.88	1.007	.144	—.438	.093	.576	.432
33	Nonmetallic minerals	.28	.853	.112	—.478	.075	.649	.337
34–35	Metals	.96	1.192	.102	—.228	.064	.754	.300
36–37	Machinery	2.28	.964	.115	—.367	.071	.667	.336
38	Transport equipment	1.48	.790	.340	—.507	.214	.707	.313
	All Imports	20.40	.987	.069	—.281	.045	.808	.217

[1] The sample includes 14 countries of per capita income less than $100, 15 between $100 and $200, 16 between $200 and $400, 11 between $400 and $800 and 7 over $800.

[2] Coefficients not significantly different from zero at 95 per cent confidence level.

Note: a, corresponding to a in the regression equation in para. 36, is given at its value for Y = $100, N = 10 million, which are taken as units of measurement.

Source: Chenery, *op. cit.*, p. 634.

country correlation analysis. Moreover, a cross-section at a point in time cannot be expected to define a path to be followed in the course of time: "Historically, the growth of a country takes place in an environment in which trading possibilities and technology are constantly changing. The growth functions derived from cross-section analysis, on the other hand, represent the adaptation of countries at different levels of income to conditions of technology and trade existing at one time. Ideally, they may be thought of as interpreting the path that a typical country would follow if its income increased so rapidly that conditions of trade and technology were relatively constant."[11]

40. Chenery makes some interesting remarks concerning the implications of the standard error of estimate on ". . . the extent to which

[11] *Op. cit.*, p. 633.

TABLE 6. GROWTH ELASTICITIES OF DEMAND AND SUPPLY
(per cent increase with one per cent increase of GNP)

ISIC No.	Sector	Production (1)	Imports (2)	Total supply (3)	Import substitution (4)=(1)−(3)	Final demand (5)
	Investment and Related Products					
36–37	Machinery	2.83	.96	1.55	1.28	1.60
38	Transport equipment	2.55	.79	1.63	.92	(1.60)
34–35	Metals	2.21	1.19	1.85	.36	1.60
33	Nonmetallic minerals	1.59	.85	1.47	.12	1.45
	Subtotal	2.24	.97	1.64	1.27	1.59
	Other Intermediate Goods					
27	Paper	2.84	1.12	1.93	.91	1.60
32	Petroleum products	2.22	1.01	1.08	1.21	.80
30	Rubber	1.95	.58	1.46	.49	1.60
31	Chemicals	1.66	.96	1.46	.20	.70
23	Textiles	1.53	.56	1.23	.30	1.20
	Subtotal	1.72	.83	1.38	.34	1.34
	Consumer Goods					
25–26	Wood products	1.84	1.32	1.75	.09	(1.75)
24	Clothing	1.77	.87	1.71	.06	1.20
28	Printing	1.66	1.44	1.65	.01	1.15
29	Leather	1.57	1.14	1.45	.12	1.20
20–22	Food, beverages, tobacco	1.16	1.00	1.15	.01	(1.15)
	Subtotal	1.32	1.07	1.29	.03	(1.27)
	Total	1.55	.94	1.40	.15	1.36

Source: op. cit., p. 642.

individual countries deviate from the normal relation between income level and industrial output. . . . The standard error of estimate is equivalent to 28 per cent of output. The extremes [correspond] approximately [to] outputs 50 per cent above and below normal. In a steadily growing economy, industrial output will increase by this amount over a 20-year period if per capita income grows at 1.5 per cent a year. In these terms, there is no country in which industrial development is either advanced or retarded by much more than twenty years."[12] A similar measure could no doubt be made for imports. While a time variation of the order of twenty years is very little from an historical viewpoint, it is much too much in relation to the type of policy issues which inspire the present work.

[12] *Ibid.*, p. 636.

5. A CASE STUDY—ARGENTINA

A. THE PROBLEM

41. Argentina is one of the countries where imports deviate most considerably from what might be expected, given population and income, on the basis of Chenery's regression equation. Putting per capita GNP at $480, imports of 16.2% of GNP could be expected, while in 1960 imports were in fact 8.4% of GDP.

42. Argentina's imports as a percentage of gross product (both at 1950 prices) fell from about 25% before the First World War to 7–8% in the 1950's. In no subsequent period has the volume of imports been as great as in 1925–29 (Table 12). The falling trend in imports is beyond dispute, even though the statistics may occasionally exaggerate the down trend.

43. This decline in imports has been accompanied by a slow rate of growth of product since the 1930's. The economic growth during the last 15 years appears to have been lower than the rate of population growth.

44. The investment rate in Argentina appears to have been sufficiently high to support a higher growth rate.

45. Given these statistical data, two questions arise. First, how to explain the inconsistency between the low rate of income growth and

TABLE 7. ARGENTINA: PRODUCTION GROWTH, 1900–1960

	GDP 1950 prices	Per Capita GDP 1950 prices
	(annual percentage rates of growth)	
1900/04 to 1925/29	4.5	1.3
1925/29 to 1935/39	1.7	−0.3
1935/39 to 1945/49	3.7	1.9
1945/49 to 1950/54	2.0	−0.3
1950/51 to 1954/55	1.3	−0.8
1954/55 to 1959/60	1.0	−1.0

TABLE 8. ARGENTINA: INVESTMENT, 1900–1960

1900/04	1905/09	1925/29	1930/34	1945/49	1950/54	1960
(percent of gross domestic product)						
26	48	33	22	24	23	25

Sources: El Desarrollo Economico de la Argentina, ECLA, 1959. Economic Department, IBRD.

the high rate of investment; and secondly, could the income lag be attributed to too strenuous import substitution efforts.

B. Import Substitution

46. The import substitution efforts in Argentina have been directed towards a broad spectrum of commodities (see Table 9 below). Although import substitution has gone furthest in the case of consumer goods, the effect on imports of intermediate products and machinery has been considerable.

C. The Degree of Industrialization

47. Such considerable import substitution, affecting imports of manufactures, might be expected to be accompanied by a relatively high degree of development of manufacturing in Argentina. However, a comparison of the share of manufacturing in Argentina's GDP with the percentage which Chenery's analysis shows is "normal" for a country of Argentina's size and income level suggests that the manufacturing sector in Argentina is smaller rather than larger than "normal" (see Table 10). So far as any confidence can be attached to any "normal" proportions, this comparison suggests that import substitution efforts do not appear to have led to rapid growth of the industrial sector.

D. Specialization in Manufacturing

48. The distribution of actual value added within the manufacturing sector varies considerably from country to country (see the standard

TABLE 9. ARGENTINA: IMPORTS AND DEMAND, 1900–1954

	Imports as % of GDP (1950-prices)	Imports of consumer goods as % of total demand for consumption	Imports of intermediate products as % of final demand[1]	Imports of machinery & equipment as % of total investment in machinery & equipment
	(percentages)			
1900–04	26	13	10	46
1925–29	25	13	8	35
1930–34	15	8	6	23
1945–49	10	3	5	20
1950–54	7	1	4½	20

[1] Final demand = consumption + investment + exports.

TABLE 10. ARGENTINA: ACTUAL AND NORMAL PRODUCTION PATTERNS—MAJOR SECTORS

		Actual Value Added				"Normal" Value Added
		1950 Prices		Current Factor Prices		
		1956	1960	1956	1960	
		(percentages of total value added)				
I	Primary Production	18	18	19	23	21
	a) Agriculture	17	17	18	22	19
	b) Mining	1	1	1	1	2
II	Industry	29	28	27	25	32
	a) Manufacturing	23	22	22	21	27
	b) Construction	6	6	5	4	5
III	Transportation and Communications	11	10	12	10	8
IV	Other Services	42	43	42	41	39
	GDP	100	100	100	100	100

Note: Components may not add to totals due to rounding.

Source: Actual data based on United Nations *Yearbook of National Accounts Statistics*. The distribution of "normal" value added has been derived from data in Chenery's *"Pattern of Industrial Growth,"* The American Economic Review, September 1960, assuming per capita income $480 p.a. and population 19.5 million. The value added in each sector, v, is derived from the function: $\log v = \log a + b \log Y + c \log N$, where Y is per capita income measured in dollars, N is population, and a, b, and c are constants different for each sector.

error of estimate in Table 11). This reflects differences in resource endowment and other variations in comparative advantages between countries. Thus, the "normal" distribution represents an average and not an optimum distribution of value added in the manufacturing sector. It appears that in Argentina the actual distribution of total value added among the sub-sectors in manufacturing closely resembles the "normal" distribution.

49. This seems to support the impression that a broad spectrum of goods is domestically produced (see Table 9), and that accordingly specialization of industry has not been very intensive.

E. NEED FOR FURTHER RESEARCH

50. This brief case study on Argentina leaves the way open for a number of different interpretations. Is it the import substitution effort *per se* which has been harmful, leading to income lag for the economy as a whole? Could a higher degree of industrialization have been achieved by exploiting comparative advantages within the manufactur-

TABLE 11. ARGENTINA: ACTUAL AND NORMAL PRODUCTION PATTERNS—MANUFACTURING

ISIC Numbers		Actual Value Added, 1950 Prices, 1950	Actual Value Added, 1950 Prices, 1955	"Normal" Value Added	Positive Percentage Standard Error of Estimate
		(percentages of total value added in manufacturing)			(percent)
20–21	Food and Beverages	18	18	20	51
22	Tobacco	3	3	2	195
23	Textiles	15	12	11	102
24	Clothing	7	5	7	85
25–26	Wood, etc.	5	4	5	105
27	Paper	6	6	3	247
28	Printing			4	87
29	Leather	3	2	1	136
30	Rubber	1	2	2	230
31	Chemicals	7	8	7	87
32	Petroleum Products	5	5	1	452
33	Non-metallic Minerals	6	5	5	128
34–35	Metals, etc.	10		12	234
36–37	Machinery, etc.	12	26	8	215
38	Transport Equipment			8	280
39	Miscellaneous	3	3	3	n.a.
		100	100	100	

Note: Components may not add to totals due to rounding.

Source: Actual data from *El Desarrollo Economico de la Argentina, op. cit.*

ing sector possibly as a collateral to the development of exports of manufactures? Could the lag be explained by unfavorable export trends which have curtailed the import capacity and thus blocked the expansion of manufacturing? And what explains the unfavorable export trends themselves? These questions are very difficult to answer. Possibly after all, this case may be so complex that it does not lend itself to a close investigation of the effects of strenuous import substitution. Other case studies would obviously be desirable.

51. At this point in the investigation, it is only possible to conclude that the questions of the feasible limits to import substitution are of the utmost importance in determining the import requirements of developing countries, and that this question requires further study. It is a critical question. If income growth targets are set at, say, 5% per annum in a very large number of countries, what are the implications for their deficit on current account, given the possibility that primary product exports

TABLE 12. ARGENTINA: PRODUCTION AND IMPORTS

	Gross domestic product Billions of 1950 pesos	Population Millions	GDP per capita Pesos, 1950 prices	Imports Billions of 1950 pesos	Imports as % of GDP	Imports of consumer goods as % of total demand for consumption	Imports of intermediate products as a % of final demand[1]	Imports of machinery and equipment as a % of total investment in machinery and equipment	Imports of consumer goods as a % of total imports	Imports of machinery and equipment as a % of total imports	Primary products and semi-finished products as a % of total imports
1900–04	10.8	4.8	2250	2.8	26.1	13.1	9.5	45.5	38	15	47
1910–14	19.9	7.3	2736	5.7	28.7	15.7	9.7	36.9	36	19	45
1925–29	33.2	11.0	3025	8.2	24.8	13.3	8.0	35.3	37	22	41
1930–34	33.9	12.4	2734	5.0	14.7	8.0	6.0	23.0	39	14	47
1935–39	39.8	13.5	2946	5.9	14.8	6.8	6.1	26.4	34	19	47
1945–49	57.0	15.9	3563	5.6	9.8	3.2	4.6	19.7	24	24	52
1950–54	63.2	18.0	3517	4.6	7.3	1.2	4.5	20.1	13	21	66
1955	68.3	19.1	3571	5.2	7.5	1.0	5.2	15.8	10	16	74
1956	67.7	19.5	3473	4.8	7.1	n.a.	n.a.	n.a.	9[2]	27[2]	65
1957	70.4	19.9	3518	5.3	7.5	n.a.	n.a.	n.a.	8[2]	27[2]	66
1958	72.4	20.2	3539	5.7	7.9	n.a.	n.a.	n.a.	8[2]	25[2]	67
1959	68.9	20.6	3345	4.8	7.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1960	71.8	21.0	3419	6.0	8.4	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

[1] Consumption + investment + exports.

[2] Composition not strictly comparable with data for earlier years.

Sources: El Desarrollo Economico de la Argentina, ECLA, 1959; U.N. *Monthly Bulletin of Statistics;* IBRD, Department of Operations, Western Hemisphere; IBRD Economic Department.

TABLE 13. ARGENTINA: COMPOSITION OF THE IMPORTS OF RAW MATERIALS AND INTERMEDIATE PRODUCTS

(Percentages of Total Imports of Such Products)

Annual Averages	Total imports of raw materials and intermediate products	Fuels and lubricants	Intermediate metallic products	Construction materials and public works supplies	Non-metallic minerals, paper and pulp, chemical products, petroleum products, glass, cement and ceramics	Agricultural products, textiles, wood and cork, rubber and milk products	Others
1900–04	100.0	6.5	16.2	14.0	6.9	48.8	7.7
1910–14	100.0	11.1	15.5	24.1	8.5	39.4	1.3
1925–29	100.0	11.5	14.2	24.6	11.6	37.2	0.9
1930–34	100.0	13.7	13.8	15.5	14.2	42.5	0.3
1935–39	100.0	12.6	16.5	13.2	15.1	42.6	0.1
1945–49	100.0	13.1	19.9	10.8	17.3	38.8	0.1
1950–54	100.0	21.3	20.6	8.5	15.0	34.5	—
1955	100.0	18.9	26.8	6.3	17.7	28.5	1.8

Source: El Desarrollo Economico de la Argentina, ECLA, 1959.

TABLE 14. ARGENTINA: EXPORT AND IMPORT PRICES

Index 1950 = 100

	Export prices	Import prices	Terms of trade
1900–04	32.5	29.5	110.6
1910–14	46.2	36.2	129.8
1925–29	57.3	45.6	125.3
1930–34	28.8	34.3	82.9
1935–39	37.3	34.8	107.4
1945	59.7	68.1	87.7
1946	82.4	68.5	120.3
1947	122.1	84.9	143.8
1948	136.7	96.5	141.7
1949	126.2	107.1	117.8
1950	100.0	100.0	100.0
1951	132.1	120.6	109.5
1952	108.2	143.8	75.2
1953	110.7	110.7	100.0
1954	99.4	110.4	90.0
1955	98.8	112.3	88.0
1956	91.8	114.9	79.9
1957	82.4	113.6	72.5
1958	81.1	100.0	81.0
1959	83.3	94.4	88.2
1960	87.7	96.7	90.7

Source: El Desarrollo Economico de la Argentina, ECLA, 1959; IBRD Department of Operations, Western Hemisphere.

are unlikely to rise faster than 3 to 4% per annum? It has become increasingly clear that this question cannot be answered by an aggregative type of analysis and that most meticulous country studies are needed. But even here, the postwar history is full of wrong guesses, sometimes badly wrong guesses. What is the method that can be used to reduce the errors? And an even more difficult questions arises: what rates of growth will be associated with different rates of growth in imports, i.e., with different rates in net capital inflow? How different will they be in different countries? And what is the implication for international capital flows?

52. The present paper can only claim to have explored the boundaries between what we know and we don't know in the fields of import demand and import substitution during the process of growth. It raises more questions than it answers: but no answer can be given unless the question is raised first.

Essay IV

LONG-RUN GROWTH AND DEBT SERVICING PROBLEMS:
Projection of Debt Servicing Burdens and the Conditions of Debt Failure

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1. INTRODUCTION

1. The indicators discussed in detail in Chapters III and IV of the main paper[1] are designed to show how vulnerable a country is in its present circumstances. They may be said to give some impression of the present margin between debt servicing capacity and debt service obligations. They do not show how this margin is likely to develop in the future or whether the country is likely to become progressively more vulnerable or progressively less vulnerable, and how rapidly.

2. This further question appears to be of considerable interest for policy. On the one hand, if assistance on lenient terms is withheld from a country until it comes close to acute debt servicing difficulties, a significant danger arises of frictions and dislocations frustrating the purposes which international capital flows are designed to serve. On the other hand, since assistance on lenient terms is in less flexible supply than loans on commercial or near-commercial terms, it is desirable that the limited supplies of soft assistance should be concentrated so far as possible on countries which are highly dependent on them for the maintenance of a reasonable rate of growth, and should not be allocated needlessly to countries which will in fact be able to service loans on hard terms.

3. Determination of the way in which a country's margin of debt servicing capacity is likely to evolve in the future runs into even greater uncertainties than are involved in assessing present vulnerability. This

[1] *An Analytical Framework, op. cit.*

annex explores two approaches to the problem. The first is by means of a projection technique designed to show how relevant economic magnitudes of a country under consideration are likely to develop over time. The second approach is in a sense the reverse side of the coin. It asks what are the conditions which, if they were to persist in a country, would necessarily lead towards unmanageable debt servicing difficulties in the future.

2. PROJECTION TECHNIQUE BASED ON A GROWTH MODEL

Desirable Characteristics of a Projection Model

4. Projections to throw light on the prospects of debt servicing difficulties in the future need to cover the following elements:

A. Prospective amounts of capital inflow.

B. Prospective terms of capital inflow.

(A and B together then show the prospective development over time of debt service liabilities).

C. Development of capacity to service debt.

If capital inflow is well used, it should increase the capacity of the country to service debt. It is therefore desirable to use a projection technique which establishes an organic relationship between A and C.

A Specimen Growth Model

5. The following paragraphs describe a specimen growth model of a relatively simple kind. While this model may have some limited practical usefulness even in its present, relatively primitive form, the main object in describing it is to bring out as precisely as possible the advantages and limitations of this kind of approach.

6. Table 1 illustrates the working of the growth model, which has been set up for calculation by computer. It consists of a growth model for the domestic economy (items B to Ė in Table 1 linked to a model of the development of the balance of payments [items F to P]).

7. The domestic growth model is of the Harrod-Domar type. In this version, the growth of the domestic product is linked by means of a capital-output ratio to the size of gross domestic capital formation, with a one-year lag, and the growth of savings is linked through a marginal

TABLE 1. SPECIMEN GROWTH MODEL SHOWING

Year (t)		A	1961	1962	1963	1964
GDP	Absolute	B	4,790.00	5,053.45	5,331.39	5,624.62
	Percentage increase	B′		5.50	5.50	5.50
	Absolute increase	B°		263.45	277.94	293.23
GROSS DOMESTIC CAPITAL FORMATION	Absolute	C	706.05	744.88	785.86	829.06
	Percentage increase	C′		5.50	5.50	5.50
	Percentage of GDP	C″	14.74	14.74	14.74	14.74
GROSS DOMESTIC SAVINGS	Incremental	D°		79.04	83.38	87.97
	Total	D	618.05	697.09	780.47	868.44
	Percentage of GDP	D″	12.90	13.79	14.64	15.44
GAP — DOMESTIC BASIS (+ = surplus of savings; − = deficit of savings)	Absolute	E	−88.00	−47.79	−5.39	+39.38
	Percentage of GDP	E″	1.84	−0.95	−0.10	+0.70
EXPORTS OF GOODS AND SERVICES	Absolute	F	529.00	592.00	660.00	718.00
	Percentage increase	F′		11.91	11.49	8.79
	Percentage of GDP	F″	11.04	11.71	12.38	12.77
IMPORTS OF GOODS AND SERVICES	Absolute	G	617.00	639.79	665.39	678.62
	Percentage increase	G′		3.69	4.00	1.99
	Percentage of GDP	G″	12.88	12.66	12.48	12.07
PRIVATE INTEREST AND DIVIDENDS (+ = net credit; − = net debit)	Absolute	H	−66.22	−73.00	−76.00	−81.00
INTEREST ON INITIAL PUBLIC EXTERNAL DEBT (− = net debit)	Absolute	I	−20.78	−24.52	−23.99	−20.97
INTEREST ON SUBSEQUENT PUBLIC EXTERNAL BORROWING (− = net debit)	Absolute	J	—	—	−9.34	−16.91
PRIVATE CAPITAL TRANSACTIONS AND REMITTANCES (+ = net inflow; − = net outflow)	Absolute	K	+68.00	+58.00	+48.00	+37.00
CHANGE OF RESERVES AND PUBLIC CAPITAL TRANSACTIONS NOT INVOLVING SERVICE LIABILITIES (+ = decrease of reserves; − = increase of reserves)	Absolute	L	+124.4	−20.00	−20.00	−20.00
AMORTIZATION DUE ON INITIAL PUBLIC DEBT (negative item)	Absolute	M	(−)88.23	(−)79.48	(−)64.78	(−)67.23
AMORTIZATION DUE ON GROSS PUBLIC BORROWING OF YEAR:	1. Absolute		—	[a]	—	—
	2.		—	—	−13.08	−18.68
	3.		—	—	—	−11.52
	4.		—	—	—	—
	5.		—	—	—	—
	6.		—	—	—	—
	7.		—	—	—	—
	8.		—	—	—	—
	9.		—	—	—	—
TOTAL (negative item)		N			(−)13.08	(−)30.20
NEW PUBLIC BORROWING (positive item)	Annual Gross	P	[70.83][a]	+186.79	+164.58	+159.93
	Annual Net	P°		186.79	151.50	129.73
	Cumulative Net	P°°		186.79	338.29	468.02
SERVICE OF EXTERNAL PUBLIC DEBT AS PERCENTAGE OF:	Exports of Goods and Services	Q	20.61	17.57	16.58	18.85
	GNP	R	2.32	2.10	2.13	2.46

[a] Service on borrowing in 1961 has been allowed for under service on initial public debt — M and R.

DEVELOPMENT OF DEBT SERVICE OBLIGATIONS

($ million)

1965	1966	1967	1968	1969	1970	Derivation
5 933.97	6,260.34	6,604.66	6,967.91	7,351.15	7,755.46	B (t + 1) = g B(t) where g
5.50	5.50	5.50	5.50	5.50	5.50	is datum. B°(t) = B(t) −
309.35	326.37	344.32	363.25	383.24	404.31	B(t − 1).
874.67	922.78	973.51	1,027.08	1,083.55	1,143.15	C(t) = kB°(t + 1).
5.50	5.50	5.50	5.50	5.50	5.50	
14.74	14.74	14.74	14.74	14.74	14.74	
92.81	97.91	103.30	108.98	114.97	121.29	D°(t) = sB°(t) where s is
961.25	1,059.16	1,162.46	1,271.44	1,386.41	1,507.70	datum.
16.20	16.92	17.60	18.25	18.86	19.44	
+86.58	+136.38	+188.95	+244.36	+302.86	+364.55	E(t) = D(t) − C(t).
+1.46	+2.18	+2.86	+3.51	+4.12	+4.70	
746.00	825.00	868.00	901.00	929.00	948.00	Datum.
3.90	10.59	5.21	3.80	3.11	2.05	
12.57	13.18	13.14	12.93	12.64	12.22	
659.42	688.62	679.05	656.64	626.14	583.45	G°(t) = F(t) − E(t).
−2.83	4.43	−1.39	−3.30	−4.64	−6.82	
11.11	11.00	10.28	9.42	8.52	7.52	
−82.00	−100.00	−103.00	−104.00	−105.00	−105.00	Datum. Alternatively function of GDP or of private external capital transactions.
−17.27	−14.58	−12.15	−9.96	−8.07	−6.38	From debt service data.
−23.40	−26.43	−28.07	−26.70	−23.66	− 21.14	J(t) = rP°°(t − 1) where r is datum.
+27.00	+17.00	+14.80	+11.60	+8.40	+5.20	Datum.
–	–	–	−18.30	−91.43	−170.49	Datum.
(−)51.53	(−)45.03	(−)41.40	(−)36.26	(−)32.65	(−)27.48	From debt service data.
–	–	–	–	–	–	Calculated from each year's
−18.68	−18.68	−18.68	−5.60	−5.60	5.60	P according to amortization schedule (datum).
−16.46	−16.46	−16.46	−16.46	−4.94	−4.94	
−11.20	−15.99	−15.99	−15.99	−15.99	−4.80	
–	−7.49	−10.70	−10.70	−10.70	−10.70	
–	–	−6.39	−9.13	−9.13	−9.13	
–	–	–	−2.86	−4.09	−4.09	
–	–	–	–	–	–	
–	–	–	–	–	–	
(−)46.34	(−)58.62	(−)68.22	(−)60.74	(−)50.45	(−)39.26	
+106.96	+91.28	+40.92	–	–	–	P(t) = −[algebraic sum of E, H, I, J, K, L, M, N(t)].
60.62	32.66	−27.30	−60.74	−50.45	−39.26	P(t) = P(t) − N(t).
528.64	561.30	534.00	473.26	422.81	383.55	P°°(t + n) = P°(t) + P°(t + 1) ... + P°(t + n).
18.57	17.53	17.26	14.83	12.36	9.94	Numerator is I(t) + J(t) + M(t) + N(t).
2.38	2.36	2.32	1.96	1.59	1.24	

savings rate to the growth of product. In principle the model takes account of the desired organic relationships. Capital inflow affects the amount of investment which is possible and hence the growth of product, while the growth of product affects the growth of savings, one aspect of the growth of debt servicing capacity.

8. In the original version of the model, the rate of growth of the domestic product, the gross incremental capital-output ratio and the marginal savings rate are treated as data. Calculation by computer allows rapid exploration of the implications of various combinations of variables, and the coefficients can be varied from year to year if there is any basis for doing so.

9. According to this way of setting up the model, the savings-investment gap (which is necessarily equal to the export-import gap) is derived as a dependent variable. Other possible bases on which the calculation might be set up will be mentioned below.

10. The link between the internal growth model and the balance of payments model depends on the fact that capital inflow (including reduction of reserves) is required to cover a deficiency of domestic savings against gross domestic capital formation *plus* (net) external debt servicing liabilities; and that that part of capital inflow which is obtained by way of loans increases debt servicing liabilities in the future. The model has the special feature of taking into account debt service obligations inherited from the past.

Some Problems Relating to the Balance of Payments Projection

11. Experience with this model illustrates a number of problems which are inescapable in efforts to project the evolution of debt service obligations and debt servicing capacity.

12. For example, in the balance of payments projection it is difficult to work out a satisfactory method of handling private capital transactions and private interest and dividends. How can future private capital transactions be predicted? Should the increase of private interest and dividends be related to the amount of net capital inflow, to the growth of product, to the growth of export earnings or to all three? And on what basis? How does the private rate of return enter into the model? The appropriate treatment of private interest and dividends needs further investigation.

13. In the original form of the calculation, as shown, new public borrowing is derived as a residual. An alternative would be to make

assumptions as to future availability of gross public capital inflow, and work back to the implications for the attainable growth of product.

14. Further difficulties arise in linking new public borrowing, and service arising from it, to the figures for service of past debt, as a result of the lags which exist in practice between contracting debt and disbursements. However, these are technicalities which go beyond the scope of this note.

15. One point concerning the treatment of service on new borrowing does, however, deserve comment. Allowance has to be made for the fact that new borrowing is typically a blend of short-, medium- and long-term transactions. To treat amortization as a constant percentage based on the average life of debt would significantly falsify the way in which amortization liabilities, and the gross borrowing corresponding to a given net capital inflow, build up in practice. It is necessary to treat each year's gross borrowing as giving rise to a string of service payments, determined by the amortization terms of the various transactions. Table 2 shows amortization schedules arising out of public borrowing in actual cases, the nature of the schedule depending very much on the relative importance in each case of long-term and short-term borrowing and the existence of fairly long grace periods on some loans. It is possible to derive suitable amortization schedules for use in the projection calculations either by drawing on empirical experience of the kind shown in Table 2 or by making assumptions as to the range of terms on which loans may be expected to be available.

TABLE 2. AMORTIZATION SCHEDULES ON NEW EXTERNAL PUBLIC DEBT INCURRED IN 1960

	Years after contracting debt (Amortization as % of debt contracted)									
	1	2	3	4	5	6	7	8	9	10
China (Taiwan)	15.8	23.2	20.4	13.2	9.8	6.6	5.4	5.4	—	—
Yugoslavia	7.3	12.0	15.7	15.0	13.4	10.1	6.8	4.1	1.6	1.6
Chile	n.a.	9.0	16.5	16.8	13.4	9.4	8.6	7.3	5.5	4.2
Spain	6.1	13.7	13.9	13.9	13.9	13.9	13.7	6.2	—	—
Peru	11.8	14.4	11.1	12.7	7.7	5.8	4.5	3.4	3.4	3.4
Philippines	0.5	3.5	10.4	15.6	15.1	14.1	12.8	12.8	2.2	2.2
Mexico	n.a.	10.0	10.0	7.8	8.5	8.8	8.3	7.5	7.0	7.1
Israel	6.0	8.6	8.6	8.5	7.0	6.3	5.6	3.1	2.1	2.2
Pakistan	—	1.1	2.8	4.3	4.8	5.0	5.0	5.0	5.0	5.7
Colombia	0.2	1.0	2.6	3.1	3.6	4.1	3.5	3.7	3.9	4.1
India	0.1	0.2	1.0	2.0	2.9	7.8	8.5	8.6	8.6	8.7

Source: IBRD Economic Department.

Fundamental Problems of the Growth Model

16. More basic difficulties arise in selecting the assumptions used for the internal growth projection. The way in which the various magnitudes develop in a model of the Harrod-Domar type is very crucially dependent on the assumed capital-output ratio, rate of growth of product and marginal savings rate. The effects of variations of these values will be illustrated in the second part of this paper.

Cross-check with the Export-Import Balance

17. The difficulty of predicting the capital-output ratio and marginal savings rate, and hence the evolution of the savings-investment balance associated with a given rate of growth of product, parallels the difficulty of determining the import requirements associated with a given growth of product, and hence the evolution of the export-import balance. However, to some extent the deficiencies of both import-export and savings-investment projections considered individually can be lessened by using the one type of projection as a check on the other. In this event, the savings-investment gap must be equal at all times to the import-export gap. Thus if there exists for the country a forecast of the development of exports of goods and services, it is possible to derive from this and from the projected evolution of the savings-investment gap a series for imports of goods and services. The implication may then be that imports of goods and services would grow considerably faster or considerably slower than the assumed or estimated rate of growth of product, in a way which appears implausible—e.g., in Table 1 imports decline after 1966 in what may well be a highly implausible way. Some adjustment is then required to bring the various magnitudes into a plausible relationship. An alternative procedure is to work back from a projection of the import-export balance and to see whether it is consistent with a plausible combination of values for the capital-output ratio and marginal savings rate.

18. Admittedly, plausibility and internal consistency do not assure the correctness of a forecast. But at least it is possible to have more confidence in a forecast which is plausible and internally consistent than in one that is not. In this connection, the speed of computation made possible by programming the model for an electronic computer is helpful, since it enables a number of variants of the assumptions to be tried without loss of time. It is then possible to reject the variants which lead to results which, while internally consistent, are implausible, and to

focus attention on the projections which appear to cover the range of plausible cases. But, of course, this method of proceeding by elimination still may not lead to the selection of a single projection model which is felt with some confidence to show what is likely to happen.

Identification of the Breaking Point

19. A further limitation of calculations of the kind shown in Table 1 is that they only show what debt service obligations, export earnings, savings, etc. will be over the period covered, according to the assumptions used. They do not show how great the difficulty of meeting the debt service obligations is likely to be. For this, it is ideally necessary to project into the future the sort of examination discussed in the *Analytical Framework*. As indicated there, the debt-servicing difficulties, arising from structural relationships, are ultimately reflected in some sort of liquidity crisis in which these difficulties show up in an acute form.

20. In most respects, assessment of vulnerability in the future is even more difficult than assessment of present vulnerability. For example, present external reserves are known, but it is virtually impossible to predict what reserves will be at some future date (even though the projection model may assume that the country can afford to draw down its reserves over the coming years or alternatively must aim to build them up).

21. On the other hand, such relevant factors as prospective fluctuations of export earnings and compressibility of imports might be assumed to remain the same in the future as now. Alternatively, it may appear reasonable to assume either growing or diminishing vulnerability on account of these factors.

22. Under certain conditions, the problem may be less serious than might appear. It is perhaps not necessary to be able to forecast that a country will run into difficulties at some definite, identifiable time. It may be adequate to base judgment on the consideration that, in certain specified conditions, the debtor country will have incurred such a large flow of debt service obligations that an implausibly high continuing capital inflow will be needed to permit a minimum required flow of imports; or, alternatively, that the debt service ratios reach such a high level that any interruption (or expected interruption) in capital inflows or any serious fall in external earnings would create a very serious temptation to default. It may be necessary to be content with establishing the likelihood of a trend movement in this direction, without being

able to specify at all precisely when the stage of acute crisis is likely to be reached.

3. CONDITIONS LEADING TO BREAKDOWN

23. In this chapter, the long-term debt servicing problem will be considered as a race between the growth of debt servicing liabilities and the strengthening of the economy, including the balance of payments. The problem is to determine in a particular case whether or not the strengthening of the economy is likely to outpace the growth of debt service liabilities.

Build-up of Debt Service Liabilities—A Crude Illustration

24. The rapid build-up of debt service liabilities when loans on commercial or near-commercial terms continue to be made over a fairly long period of time, and the progressive divergence of gross from net lending under these conditions, have already been pointed out in the main study.[2] This point is again illustrated by Tables 3 and 4.

25. If gross lending remains constant at 1000.0 units per year, then with repayment over 15 years amortization reaches 933.8 in year 15 and 1000.5 by year 20 (Table 3). Thus lending net of amortization rapidly falls off to zero. The real transfer of resources net of both interest and amortization falls off to zero even more rapidly, and by year 20 and in subsequent years the borrowing country is paying about 480 units more in interest and amortization combined than it receives in new loans. This is not to deny that lending on the pattern shown may be advantageous to the borrowing country. The present focus is on the arithmetical relationships involved and not on their economic significance.

26. The lower part of Table 3 examines a hypothetical case in which there is a real transfer of resources of 1000 units per year net of interest as well as amortization. Gross borrowing rapidly becomes a rather large multiple of the net transfer of resources, and debt outstanding and annual service charges build up to very large figures.

27. Table 4 again shows the implications of a continuing real transfer of resources of 1000 units per year, net of interest and amortization, on various different loan terms ranging from 15 years, 6 per cent to the soft terms on which all IDA credits to date have been made. It can be seen that the build-up of debt service liabilities and hence of annual gross

[2] *Ibid.*, pp. 55 and 69–73.

TABLE 3. GROSS AND NET BORROWING AND THE DEVELOPMENT OF DEBT SERVICE WITH HARD LOAN TERMS—TWO TIME-PATTERNS

(Loan terms: interest 6 per cent p.a., repayment over 15 years.)

Year	Annual gross borrowing	Debt outstanding	Annual amortization	Annual interest	Borrowing net of amortization	Transfer of resources net of interest and amortization
Gross borrowing of 1000 per year						
5	1,000.0	4,333.0	266.8	216.0	733.2	517.2
10	1,000.0	6,998.5	600.3	395.9	399.7	3.8
15	1,000.0	7,996.5	933.8	475.8	66.2	−409.6
20	1,000.0	7,994.0	1,000.5	479.7	−0.5	−480.2
25	1,000.0	7,991.5	1,000.5	479.5	−0.5	−480.0
30	1,000.0	7,989.0	1,000.5	479.4	−0.5	−479.9
40	1,000.0	7,984.0	1,000.5	479.1	−0.5	−479.6
50	1,000.0	7,979.0	1,000.5	478.8	−0.5	−479.3
60	1,000.0	7,974.5	1,000.5	478.5	−0.5	−479.0
Transfer of resources of 1000 per year net of amortization and interest						
5	1,583.3	5,637.1	320.8	262.5	1,262.5	1,000.0
10	2,670.8	13,180.7	981.3	689.5	1,689.5	1,000.0
15	4,336.6	23,275.8	2,075.7	1,260.9	2,260.9	1,000.0
20	6,505.2	36,785.3	3,479.6	2,025.6	3,025.6	1,000.0
25	9,399.9	54,864.0	5,351.0	3,048.9	4,048.9	1,000.0
30	13,300.0	79,057.3	7,881.7	4,418.3	5,418.3	1,000.0
40	25,460.1	154,760.3	15,756.7	8,703.4	9,703.4	1,000.0
50	47,247.8	290,332.9	29,870.5	16,377.3	17,377.3	1,000.0
60	86,267.5	533,122.9	55,147.3	30,120.2	31,120.2	1,000.0

Source: IBRD Economic Department.

lending is very much less formidable with the "softer" terms than with the "harder" terms.

28. It may appear unrealistic that a borrowing country should seek and receive a constant real transfer of resources net of interest as well as amortization over a considerable period of time. This method of presentation was chosen because it seems to put the loans onto a truly comparable basis. If it were lending net of amortization which was the same with different loan terms, then the various loan cases would be significantly different in respect of the amounts of interest paid. Once again, the purpose is only to show the arithmetical relationships. The economic implications will be investigated below.

DEBT SERVICE CHARGES AND RETURN ON INVESTMENT

29. Building up of large external debt service liabilities does not necessarily involve serious or intractable debt servicing difficulties.

TABLE 4. GROSS LENDING REQUIRED TO MAINTAIN A REAL TRANSFER OF RESOURCES OF 1000 UNITS PER YEAR ON VARIOUS LOAN TERMS

Loan types:		*Interest rate*	*Repayment over*[a]
	A	6%	15 years
	B	6%	40 years
	C	3%	15 years
	D	3%	40 years
	E	IDA terms[b]	

Year	Loan type:	Annual net borrowing	Annual gross borrowing	Debt outstanding[c]	Annual amortization	Annual interest	Total service
5	A	1,000	1,583	5,637	321	262	583
	B	1,000	1,376	5,637	113	262	376
	C	1,000	1,433	5,309	308	126	433
	D	1,000	1,234	5,309	109	126	234
	E	1,000	1,030	5,076	0	30	30
10	A	1,000	2,671	13,181	981	689	1,671
	B	1,000	2,004	13,181	315	689	1,004
	C	1,000	2,183	11,464	878	305	1,183
	D	1,000	1,584	11,464	280	305	584
	E	1,000	1,070	10,344	0	70	70
15	A	1,000	4,337	23,276	2,076	1,261	3,337
	B	1,000	2,867	23,276	606	1,261	1,867
	C	1,000	3,252	18,599	1,739	513	2,252
	D	1,000	2,011	18,599	498	513	1,011
	E	1,000	1,151	15,814	41	110	151
20	A	1,000	6,505	36,786	3,480	2,026	5,505
	B	1,000	4,045	36,786	1,019	2,026	3,045
	C	1,000	4,428	26,870	2,674	754	3,428
	D	1,000	2,528	26,870	774	754	1,528
	E	1,000	1,245	21,491	93	153	245
25	A	1,000	9,400	54,865	5,351	3,049	8,400
	B	1,000	5,649	54,865	1,600	3,049	4,649
	C	1,000	5,788	36,459	3,755	1,033	4,788
	D	1,000	3,153	36,459	1,120	1,033	2,153
	E	1,000	1,425	27,385	229	196	425
30	A	1,000	13,300	79,058	7,882	4,418	12,300
	B	1,000	7,827	79,058	2,409	4,418	6,827
	C	1,000	7,388	47,575	5,032	1,357	6,388
	D	1,000	3,907	47,575	1,551	1,357	2,907
	E	1,000	1,635	33,503	393	242	635
40	A	1,000	25,460	154,762	15,757	8,704	24,460
	B	1,000	14,763	154,762	5,060	8,704	13,763
	C	1,000	11,358	75,401	8,191	2,167	10,358
	D	1,000	5,904	75,401	2,737	2,167	4,904
	E	1,000	2,100	46,447	762	338	1,100
50	A	1,000	47,248	290,336	29,871	16,378	46,248
	B	1,000	27,051	290,336	9,673	16,378	26,051
	C	1,000	16,701	112,797	12,445	3,256	15,701
	D	1,000	8,464	112,797	4,208	3,256	7,464
	E	1,000	2,669	60,394	1,227	442	1,669
60	A	1,000	86,268	533,128	55,147	30,120	85,268
	B	1,000	49,065	533,128	17,945	30,120	48,065
	C	1,000	23,883	163,053	18,163	4,720	22,883
	D	1,000	11,916	163,053	6,196	4,720	10,916
	E	1,000	3,105	75,424	1,551	554	2,105

[a] Repayment in equal annual instalments.

[b] Service charge of 0.75% p.a.; no amortization in first ten years; thereafter amortization at the rate of 1% of the original principal sum in each year of the second ten-year period and at 3% in each of the following 30 years.

[c] Beginning of year.

NOTE: In the calculations it has been assumed that borrowing takes place at the beginning of each year and that interest falls due at the beginning of each year on the debt which has been outstanding since the beginning of the previous year. The first amortization instalment falls due on the first anniversary of incurring the debt, except in type E where it falls due on the eleventh anniversary (10-year grace period).

Debt outstanding and annual interest can be calculated from tables, and are therefore accurate. There may be some relatively small rounding errors in the calculation of amortization and hence of total service and annual gross borrowing.

Source: IBRD Economic Department.

Everything depends on how rapidly the strengthening of the economy, including the ability to transfer debt service, proceeds in relation to the build-up of debt service liabilities.

30. One possible approach to this problem is by way of the level of the rate of return on investments.

31. It is only advantageous for a country—as for an enterprise—to borrow if it can use the proceeds of the borrowing to increase its production by more than is required to meet the service charges arising out of the borrowing: i.e., if borrowing secures a net increase of income after payment of debt service.

32. However, (a) estimates of rates of return on many types of investment are habitually imprecise and (b) it is not possible to conclude, at least in any straightforward way, that if a country can secure high rates of return on investment, it can therefore borrow without risk of debt servicing difficulties. The rates of return which have to be compared with the rate of interest in order to determine whether or not borrowing is advantageous can only be validly calculated on the basis of prices which reflect the true opportunity cost of all products and factors of production. Amongst other conditions, the rate of return can only be validly computed at prices which are consistent with a viable balance of payments—i.e., at correct "shadow prices" of foreign exchange. It may therefore be misleading to say that, because the rate of return on an investment is 7 per cent, therefore this investment can be financed by borrowing externally at 6 per cent without danger to the balance of payments. Rather, it is necessary first to determine the conditions in which the balance of payments will remain viable, given prospective external debt service obligations and capital inflow: for it is only on the basis of such conditions, and the "shadow prices" derived from such conditions, that it is possible validly to calculate a rate of return on investment so as to show whether borrowing is advantageous or not.[3]

33. It follows that in a sense the transfer problem is fundamental, and that considerations of rates of return greatly depend on the outcome of the transfer problem.

34. This being so, it appears important to explore much more carefully than has been done in the past the relations in various countries between variations in the amount of foreign exchange prospectively available in the future—taking into account both the prospective development of export availabilities and the demand for exports as well as capital inflows and debt service obligations—and the shadow price of

[3] C.f. Claudio Segré, "Problems of Foreign Indebtedness of Developing Countries," *Banca Nazionale del Lavoro Quarterly Review*, September 1962, p. 274.

foreign exchange; and between the shadow price of foreign exchange and rates of return on investment at the margin.

35. Some advance in the application of shadow prices has already been made. This refers to prices of products and prices of factors of production. However, only limited probings have been made into the area of "shadow prices" for foreign exchange. Until more advance is made in this direction, the computations of the rates of return—and the comparisons between these rates and the rate of interest—will remain deficient, and this may have serious implications in some cases. The proper choice of shadow prices of products and factors including the shadow price of foreign exchange, is not only relevant to the problem of adequate choice of investment projects which the borrowing countries wish to undertake and the external agencies want to finance; it is also relevant to the question of how much a country can afford to borrow from abroad, given the rate(s) of interest at which foreign loans are available.

36. Such computations are further complicated by the fact that future shadow prices of foreign exchange, and hence properly computed rates of return, are themselves influenced, among other factors, by the future balance between service payments and new capital inflows, which in turn depends in part on today's and tomorrow's terms of assistance.

37. Views are divided on how difficult it is to derive the "real" rate of return on investment, because views are also divided on how difficult —and even how important—it is to derive the "shadow" rate of exchange. Nonetheless, the possibility cannot be excluded that there are countries where the rate of return, however defined, is below the international rate of interest, of, say, 6 per cent. "Among countries which are today engaged in attempts to raise the standard of living of their peoples—and the number of countries is around one hundred—there are bound to be some where natural obstacles are so severe that the returns on capital are very low. If international transfer of resources is considered necessary in such cases, such flows must not be provided at conventional terms if virtually certain debt failures are to be avoided."[4]

A Growth Model Approach

38. If the difficulties of making meaningful comparisons between rates of return and rates of interest on external borrowing are indeed serious, the problem may perhaps be outflanked to some extent by

[4] Volume I—*An Analytical Framework, op. cit.*, Chapter V.

means of an approach based on a growth model similar to that described earlier in this paper.

39. In the first instance, the growth model is used to investigate the consequences of the proposition that at some indefinite future date a country must be able to live with its external interest and dividend liabilities, even if it is not required to make net repayment of debt; that is to say, it must be able to generate a surplus of exports of goods and services over imports of goods and services,[5] and similarly a surplus of gross domestic savings over gross domestic capital formation,[6] at least equal to net interest and dividend liabilities. So long as the export (savings) surplus is less than net interest and dividend liabilities, the country must either run down external reserves or receive net capital inflow in order to balance its external accounts. To the extent that it has to borrow at interest, it increases its future interest liabilities, which in turn have to be covered by an export (savings) surplus, reduction of reserves or capital inflow. By so doing it may be escaping its immediate difficulties at the expense of creating even more problems for the future.

40. At the extreme, it is clearly out of the question for a country to continue over a long period to increase its external debt, and interest liabilities thereon, at a higher percentage rate than it increases its domestic product. At some stages of development, a faster proportionate increase of external interest liabilities than of domestic product may be perfectly workable; but this cannot go on indefinitely without leading to breakdown.

41. Avoidance of greater percentage increase of external interest liabilities than of domestic product over the long term is clearly a minimum condition for the avoidance of intractable debt servicing difficulties. It may not be a sufficient condition, for reasons which will be discussed below. Initial concentration on the boundary between conditions in which a country will or will not increase debt and interest thereon more rapidly than product over the long run has two advantages, simplicity of calculation and avoidance of the necessity of choosing an arbitrary time dimension to the problem.

42. For the sake of simplicity, the illustrative calculations the results of which will be shown below assume certain constant features of

[5] In this context, imports and exports of goods and services are defined as excluding interest and dividend liabilities and receipts.

[6] Since in the event the differences between gross domestic savings and gross domestic capital formation is necessarily equal to the difference between exports of goods and services and imports of goods and services.

the growth pattern. Thus a constant rate of growth of gross domestic product (GDP) is assumed.

43. It is then assumed that a constant value of investment is required to make possible a given increase of product—for example, 3.5 units of (gross) investment to make possible a production stream, beginning in the next year, of 1 unit per year (gross incremental capital-output ratio of 3.5:1). It might seem more consistent with the assumption of a fixed incremental capital-output ratio to reckon investment net of depreciation, but it is more convenient for purposes of the present calculation to assume constancy of a gross incremental capital-output ratio. The assumption of constancy is in any case merely a simplifying assumption which could not be applied in any practical case.

44. The assumptions imply a constant "required" relationship of gross domestic capital formation to GDP. Thus on the assumptions of a capital-output ratio of 3.5:1, and of 5 per cent annual growth of GDP, the constant "required" investment rate would be 17.5 per cent of GDP.

45. Two assumptions are made concerning the behavior of savings over time. The first is an assumed level of initial gross domestic savings, as a percentage of GDP. The second is an assumed value of the marginal gross domestic savings rate—that is to say, the percentage of any increase of GDP which will be saved.

46. The interesting cases are those where the initial savings rate is lower than the "required" investment rate, but the marginal savings rate is higher than the "required" investment rate. In these circumstances, the simplified model of a developing economy passes through anything from three to six of the following stages:

1. Gross domestic savings less than the "required" gross domestic capital formation. External debt then grows at a faster percentage rate than the (average) rate of interest on existing debt; for if debt at the end of one year is 100 and the rate of interest is 6 per cent, then debt must increase to more than 106 before there is any excess of capital inflow available to supplement domestic savings in the finance of capital formation.[7]

[7] For the purposes of this model, savings, the savings-investment gap and, by implication, the import-export gap are all reckoned on a "domestic" as opposed to a "national" basis. That is to say, all savings generated in the economy are considered as being allocated by priority to the finance of domestic capital formation. If, then, there is no excess of domestic savings over capital formation to meet external interest charges, the interest charges are considered as being covered by capital inflow. This is in opposition to the conventional, "national" basis, by which payment of external interest and dividend liabilities is considered as the

2. Gross domestic savings equal to gross domestic capital formation. Debt then increases at a rate exactly equal to the rate of interest on existing debt. If this rate of interest is higher than the rate of growth of GDP (5 per cent in the example) debt and interest thereon will be continuing to grow faster than GDP.
3. Gross domestic savings somewhat greater than gross domestic capital formation, but (in cases where the rate of interest is higher than the rate of growth of GDP) not sufficiently much higher to prevent debt and interest thereon from growing faster than GDP.
4. Excess savings just sufficiently great to hold the rate of growth of debt and interest thereon equal to the rate of growth of GDP.

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first charge on domestic savings, only the remaining "national" savings being available for the finance of domestic capital formation. The role of net capital inflow is then to supplement national savings in the finance of domestic capital formation.

This form of presentation is required in order to explore the difference made by differences of interest rate, all the other variables remaining unchanged. If the marginal savings rate linked national (rather than domestic) savings to the increase of GDP, then a constant marginal national savings rate would in fact imply different savings efforts with different assumptions as to the rate of interest.

Thus use of the "domestic" basis is a convenience for the purposes of showing the workings of the model, and no implication is intended that debtor countries can expect in practice, as a matter of course, to borrow externally for the finance of external interest and dividend liabilities. For present purposes, the difference between "domestic" and "national " bases of presentation is a difference between accounting conventions, as shown by the following example:

Domestic basis		National basis	
Gross domestic capital formation	100	Gross domestic capital formation	100
		(Gross domestic savings)	(110)
Gross domestic savings	110		
Savings gap (domestic)	+ 10	(Less: external interest and dividend liabilities)	(30)
		Gross national savings	80
		Savings gap (national)	− 20
Exports of goods and services	150	Exports of goods and services	150
Imports of goods and services	140	Imports of goods and services	140
		External interest and dividend liabilities	30
Goods and services balance	+ 10	Balance on current account	− 20
External interest and dividend liabilities	30		
Amortization	60	Amortization	60
Gross capital inflow	80	Gross capital inflow	80

5. Excess savings sufficient to reduce the rate of growth of debt and interest thereon below the rate of growth of GDP. Debt continues to increase in absolute terms, but becomes progressively smaller relative to GDP.

6. Excess savings greater than interest on external debt, so that net indebtedness is progressively reduced in absolute terms.

47. The growth model has been used to define the conditions under which development would tend to settle down at stage 4—debt and interest thereon growing at the same rate as GDP. If stage 4 were not reached, then debt and debt service would continue indefinitely to grow more rapidly than GDP, clearly an untenable situation. Thus, as stated in paras. 40–41 above, a movement culminating in stage 4 must be considered the minimum condition of freedom from a problem of unmanageable indebtedness. In practice countries may have to reckon on being able to progress to stage 5 or even stage 6, and even to do so in a limited period of time. However, for the time being attention will be concentrated on the implications of the less stringent limitation of reaching stage 4 at some unspecified future date.

48. It is then possible to reason as follows: In the long run, the proportion of the product saved in any one year will tend to approach more and more closely the marginal savings rate. Thus the excess of domestic savings over the "required" level of investment will tend to approach a proportion of GDP equal to the difference between the marginal savings rate and the "required" investment rate. If the marginal savings rate is 20 per cent and the "required" investment rate 17.5 per cent, surplus savings, available to meet debt service charges, will rise towards 2.5 per cent of GDP in the long run.

49. If the marginal savings rate were no greater than the "required" investment rate, then in the long run debt would continue to increase at a rate at least equal to the rate of interest—c.f., stage 1 in para. 46 above. Hence, if the rate of interest were higher than the rate of growth of product, debt, and interest thereon, would increase more rapidly than product. At the other extreme, if at any time the excess of savings over the "required" level of investment became equal to the interest charge at that time, external debt would cease to grow.

50. The critical case, where debt would grow at the same rate as the domestic product, must be somewhere between. In fact, for any ratio of "surplus savings" to GDP and any interest rate larger than the rate of growth of GDP, there is some size of debt (relative to GDP) such that debt will increase at the same rate as GDP. Alternatively, given the size of debt relative to GDP there is some rate of interest such that debt

will increase at the same rate as GDP. The relationship is shown by the following equation:

$$Dn = \frac{Yo(1 + r)^{n+1}(kr - \acute{s})}{r - i} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (i)$$

where Dn = debt in year n, this being a late year in which it is a fair approximation that the ratio of savings to GDP has become equal to the marginal savings rate;

Yo = gross domestic product in year 0;

r = rate of growth of GDP (so that $Yo\,(1 + r)^{n+1}$ is the size of GDP in the year following year n);

k = gross incremental capital-output ratio, linking the increase of the growth of product between two consecutive years with the rate of investment in the first of these years;

$\acute{s}$ = marginal gross domestic savings rate (so that $kr - \acute{s}$ = surplus savings).

51. Now, if it is assumed that there was no external debt in year 0, the debt in year n is determined by the parameters of the growth model and by the rate of interest (assumed constant), according to the following formula:

$$Dn = Yo\left[(kr - \acute{s})\frac{(1 + i)^{n+1} - (1 + r)^{n+1}}{i - r} - (s_o^n - \acute{s})\frac{(1 + i)^{n+1} - 1}{i}\right] \quad (ii)$$

where, in addition to the symbols shown above, s_0^n = gross domestic savings as a percentage of GDP in year 0.

52. By substituting the right-hand side of equation (i) for Dn in equation (ii), the following formula is obtained for the conditions in which debt will increase over the long term at the same rate as GDP:

$$i'' = \frac{r(s_o^n - \acute{s})}{s_o^n - kr} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (iii)$$

The derivation of these formulae is shown in the appendix at the end of this paper.

53. If the product growth rate were 5 per cent per annum, the capital-output ratio 3.5:1, the marginal savings rate 20 per cent and the initial savings rate 10 per cent, then the value of i'', which may be called the "critical interest rate," would be 6.2/3 per cent.

54. Because the formula is simplified by assuming that the savings rate in year n has risen to equality with the marginal savings rate, the conditions of the formula will not be closely fulfilled until a very distant

year. That is to say, given the relationships shown in formula (iii), debt in any year which is of practical interest from the point of view of the present will be increasing rather more rapidly than domestic production. This is the case even if the formulae are applied to show conditions as far ahead as years 70–71. With values of the variables as in para. 53, the development between these two distant years would be as follows:

	Year 70	Year 71
GDP	3,043	3,195
Gross domestic capital formation		559
Gross domestic savings		629
Savings gap		+ 70
Interest on debt		309
Required capital inflow		239
Debt, end year	4,642	4,881
Percentage increase of debt		5.1%

55. If, given all the assumptions, the interest rate were higher than 6.2/3 per cent, debt, which includes a considerable element of capitalized interest, would have grown to more than 4,642 in year 70. Because of the larger debt and the higher interest rate, interest in year 70 would amount to more than 309. Interest not covered by excess savings would then be more than 5.1 per cent of debt outstanding at the end of year 70, and hence debt would increase by more than 5.1 per cent in year 71, and indeed by more than 5 per cent in all subsequent years. This would be a situation of a viciously cumulative debt burden. It is in this sense that the interest rate of 6.2/3 per cent, and the other interest rates shown in the tables below, are critical rates. At lower rates of interest, a stage would be reached at which debt would begin to decrease relative to GNP.

56. Tables 5 to 7 explore the implications of the critical interest rate formula from a number of angles.

57. Two types of special cases are worthy of mention:

(1) If the marginal savings rate is equal to the "required" investment rate, then there will never be any surplus of domestic savings to meet interest charges. In the long run, debt will increase at the same rate as product if the rate of interest is equal to the rate of growth of product.

(2) The viciously cumulative debt problem is no longer a limitation on the attainable rate of growth when the following condition is met: excess of marginal savings rate over initial average savings rate not less than product of the interest rate and the capital-output ratio. For example, if the capital-output ratio is 3:1, and the interest rate 5 per cent, the product of these is 15 per cent.

TABLE 5A. CRITICAL INTEREST RATES CONSISTENT WITH VARIOUS GROWTH RATES, CAPITAL-OUTPUT RATIOS AND MARGINAL SAVINGS RATES

(Initial Savings Rate 5% in all Cases)

		Marginal Savings Rate				
		12	16	20	24	28
	2% Annual Growth of GDP					
Capital-	2:1	[a]	[a]	[a]	[a]	[a]
output	3:1	14.0	22.0	30.0	38.0	46.0
ratio	4:1	4.7	7.3	10.0	12.7	15.3
	5:1	2.8	4.4	6.0	7.6	9.2
	3% Annual Growth of GDP					
Capital-	2:1	21.0	33.0	45.0	57.0	69.0
output	3:1	5.2	8.2	11.2	14.2	17.2
ratio	4:1	3.0	4.7	6.4	8.1	9.8
	5:1	2.1	3.3	4.5	5.7	6.9
	4% Annual Growth of GDP					
Capital-	2:1	9.3	14.7	20.0	25.3	30.7
output	3:1	4.0	6.3	8.6	10.9	13.1
ratio	4:1	2.5	4.0	5.5	6.9	8.4
	5:1	1.9	2.9	4.0	5.1	6.1
	5% Annual Growth of GDP					
Capital-	2:1	7.0	11.0	15.0	19.0	23.0
output	3:1	3.5	5.5	7.5	9.5	11.5
ratio	4:1	2.3	3.7	5.0	6.3	7.7
	5:1	1.7	2.7	3.7	4.7	5.7
	7% Annual Growth of GDP					
Capital-	2:1	5.4	8.5	11.7	14.8	17.9
output	3:1	3.1	4.8	6.6	8.3	10.1
ratio	4:1	2.1	3.3	4.6	5.8	7.0
	5:1	1.6	2.6	3.5	4.4	5.4

[a] No capital inflow required at any time.

Source: IBRD Economic Department.

With an initial savings rate of 5 per cent (assumed in the tables) the possibility of a viciously cumulative interest burden ceases to be a problem if the marginal savings rate is 20 per cent or more. The growth rate attainable without risks of viciously cumulative indebtedness rises very steeply as the marginal savings rate approaches 20 per cent.

58. Various reasons will be reviewed below why the "critical interest rate" calculation may understate the risks of a long-term debt servicing problem. But before going on to these points it is desirable to explore further just what the formula does and does not imply.

TABLE 5B. CRITICAL INTEREST RATES CONSISTENT WITH VARIOUS GROWTH RATES, CAPITAL-OUTPUT RATIOS AND MARGINAL SAVINGS RATES

(Initial Savings Rate 10% in all Cases)

		Marginal Savings Rate				
		12	16	20	24	28
	2% Annual Growth of GDP					
Capital-output ratio	2:1	[a]	[a]	[a]	[a]	[a]
	3:1	[a]	[a]	[a]	[a]	[a]
	4:1	[a]	[a]	[a]	[a]	[a]
	5:1	[a]	[a]	[a]	[a]	[a]
	3% Annual Growth of GDP					
Capital-output ratio	2:1	[a]	[a]	[a]	[a]	[a]
	3:1	[a]	[a]	[a]	[a]	[a]
	4:1	3.0	9.0	15.0	21.0	27.0
	5:1	1.2	3.6	6.0	8.4	10.8
	4% Annual Growth of GDP					
Capital-output ratio	2:1	[a]	[a]	[a]	[a]	[a]
	3:1	4.0	12.0	20.0	28.0	36.0
	4:1	1.3	4.0	6.7	9.3	12.0
	5:1	0.8	2.4	4:0	5.6	7.2
	5% Annual Growth of GDP					
Capital-output ratio	2:1	[a]	[a]	[a]	[a]	[a]
	3:1	2.0	6.0	10.0	14.0	18.0
	4:1	1.0	3.0	5.0	7.0	9.0
	5:1	0.7	2.0	3.3	4.7	6.0
	7% Annual Growth of GDP					
Capital-output ratio	2:1	3.5	10.5	17.5	24.5	31.5
	3:1	1.3	3.8	6.4	8.9	11.4
	4:1	0.8	2.3	3.9	5.4	7.0
	5:1	0.6	1.7	2.8	3.9	5.0

[a] No capital inflow required at any time.

Source: IBRD Economic Department.

UNMANAGEABLE DEBT AS A MATTER OF RIGIDITIES

59. The concept of "unmanageable debt" depends on the idea that there is a limit to the export-import (equals savings-investment) surplus which any country will be able to generate in the long run.

60. At the extreme, the real cost involved in export expansion and import substitution to the degree required to make possible service of debt from a country's own resources might become so great as to cause a decrease in a country's aggregate real income. The borrowing would then have turned out to be disadvantageous. In these circumstances,

TABLE 6A. MARGINAL SAVINGS RATES CONSISTENT WITH VARIOUS CRITICAL INTEREST RATES, GROWTH RATES AND CAPITAL-OUTPUT RATIOS

(Initial Savings Rate 5% in all Cases)

		GDP Growth Rate				
		2	3	4	5	7
	Critical Interest Rate 2%					
Capital	2:1	[a]	5.6	6.5	7.0	7.6
output	3:1	6.0	7.6	8.5	9.0	9.6
ratio	4:1	8.0	9.6	10.5	11.0	11.6
	5:1	10.0	11.6	12.5	13.0	13.6
	Critical Interest Rate 3%					
Capital-	2:1	[a]	6.0	7.2	8.0	8.9
output	3:1	6.5	9.0	10.3	11.0	11.9
ratio	4:1	9.5	12.0	13.3	14.0	14.9
	5:1	12.5	15.0	16.3	17.0	17.9
	Critical Interest Rate 4%					
Capital-	2:1	[a]	6.3	8.0	9.0	10.1
output	3:1	7.0	10.3	12.0	13.0	14.1
ratio	4:1	11.0	14.3	16.0	17.0	18.1
	5:1	15.0	18.3	20.0	21.0	22.1
	Critical Interest Rate 5%					
Capital-	2:1	[a]	6.6	8.8	10.0	11.4
output	3:1	7.5	11.6	13.8	15.0	16.4
ratio	4:1	12.5	16.6	18.8	20.0	21.4
	5:1	17.5	21.6	23.8	25.0	26.4
	Critical Interest Rate 6%					
Capital-	2:1	[a]	7.0	9.5	11.0	12.7
output	3:1	9.0	13.0	15.5	17.0	18.7
ratio	4:1	17.0	19.0	21.5	23.0	24.7
	5:1	25.0	25.0	27.5	29.0	30.7
	Critical Interest Rate 8%					
Capital-	2:1	[a]	7.6	11.0	13.0	15.3
output	3:1	9.0	15.6	19.0	21.0	23.3
ratio	4:1	17.0	23.6	27.0	29.0	31.3
	5:1	25.0	31.6	35.0	37.0	39.3

[a] No capital inflow required at any time.

Source: IBRD Economic Department.

there would be likely to be great resistance to generating the export surplus required to service debt, and indeed it might appear a practical impossibility to do so.

61. In the growth model calculations presented in this paper, the element of inflexibility is represented by the assumptions on the one side of a fixed rate of growth of GDP and fixed capital-output ratio,

TABLE 6B. MARGINAL SAVINGS RATES CONSISTENT WITH VARIOUS CRITICAL INTEREST RATES, GROWTH RATES AND CAPITAL-OUTPUT RATIOS
(Initial Savings Rate 10% in all Cases)

		GDP Growth Rate				
		2	3	4	5	7
	Critical Interest Rate 2%					
Capital-output ratio	2:1	[a]	[a]	[a]	[a]	11.1
	3:1	[a]	[a]	11.0	12.0	13.1
	4:1	[a]	11.3	13.0	14.0	15.1
	5:1	[a]	13.3	15.0	16.0	17.1
	Critical Interest Rate 3%					
Capital-output ratio	2:1	[a]	[a]	[a]	[a]	11.7
	3:1	[a]	[a]	11.5	13.0	14.7
	4:1	[a]	12.0	14.5	16.0	17.7
	5:1	[a]	15.0	17.5	19.0	20.7
	Critical Interest Rate 4%					
Capital-output ratio	2:1	[a]	[a]	[a]	[a]	12.3
	3:1	[a]	[a]	12.0	14.0	16.3
	4:1	[a]	12.7	16.0	18.0	20.3
	5:1	[a]	16.7	20.0	22.0	24.3
	Critical Interest Rate 5%					
Capital-output ratio	2:1	[a]	[a]	[a]	[a]	12.9
	3:1	[a]	[a]	12.5	15.0	17.9
	4:1	[a]	13.4	17.5	20.0	22.9
	5:1	[a]	18.4	22.5	25.0	27.9
	Critical Interest Rate 6%					
Capital-output ratio	2:1	[a]	[a]	[a]	[a]	13.4
	3:1	[a]	[a]	13.0	16.0	19.4
	4:1	[a]	14.0	19.0	22.0	25.4
	5:1	[a]	20.0	25.0	28.0	31.4
	Critical Interest Rate 8%					
Capital-output ratio	2:1	[a]	[a]	[a]	[a]	14.6
	3:1	[a]	[a]	14.0	18.0	22.6
	4:1	[a]	15.4	22.0	26.0	30.6
	5:1	[a]	23.4	30.0	34.0	38.6

[a] No capital inflow required at any time.

Source: IBRD Economic Department.

implying a fixed "required" investment rate, and on the other side of a fixed marginal savings rate, establishing a ceiling to the rise of the average savings rate.

62. It might be considered that in order to meet its debt service obligations in practice, a country ought to take effective measures to increase savings and/or cut back investment, even at some cost to the

TABLE 7A. GROWTH RATES CONSISTENT WITH VARIOUS CRITICAL INTEREST RATES, CAPITAL-OUTPUT RATIOS, AND MARGINAL SAVINGS RATES

(Initial Savings Rate 5% in all Cases)

		Marginal Savings Rate				
		12	16	20	24	28
	Critical Interest Rate 2%					
Capital-	2:1	[a]	[a]	[a]	[a]	[a]
output	3:1	[a]	[a]	[a]	[a]	[a]
ratio	4:1	10.0	[a]	[a]	[a]	[a]
	5:1	3.0	[a]	[a]	[a]	[a]
	Critical Interest Rate 3%					
Capital-	2:1	[a]	[a]	[a]	[a]	[a]
output	3:1	7.5	[a]	[a]	[a]	[a]
ratio	4:1	3.0	15.0	[a]	[a]	[a]
	5:1	1.9	3.7	[a]	[a]	[a]
	Critical Interest Rate 4%					
Capital-	2:1	20.0	[a]	[a]	[a]	[a]
output	3:1	4.0	20.0	[a]	[a]	[a]
ratio	4:1	2.2	4.0	20.0	[a]	[a]
	5:1	1.5	2.2	4.0	20.0	[a]
	Critical Interest Rate 5%					
Capital-	2:1	8.3	[a]	[a]	[a]	[a]
output	3:1	3.1	6.3	[a]	[a]	[a]
ratio	4:1	1.9	2.8	5.0	25.0	[a]
	5:1	1.4	1.8	2.5	4.1	12.5
	Critical Interest Rate 6%					
Capital-	2:1	6.0	30.0	[a]	[a]	[a]
output	3:1	2.7	4.3	10.0	[a]	[a]
ratio	4:1	1.8	2.3	3.3	6.0	30.0
	5:1	1.3	1.6	2.0	2.7	4.3
	Critical Interest Rate 8%					
Capital-	2:1	4.4	8.0	40.0	[a]	[a]
output	3:1	2.4	3.1	4.4	8.0	40.0
ratio	4:1	1.6	1.9	2.4	3.1	4.4
	5:1	1.2	1.4	1.6	1.9	2.4

[a] Viciously cumulative debt no longer a limitation to the rate of growth.

Source: IBRD Economic Department.

pace of development: and hence that the assumptions of fixed coefficients in the growth model is a significant falsification of the real problem. However, in the first place there are in practice political-psychological limits to the rates of growth of product which countries are likely to consider reasonable minimum requirements, and to the ability to increase savings. Secondly, a determination to improve the savings-

TABLE 7B. GROWTH RATES CONSISTENT WITH VARIOUS CRITICAL INTEREST RATES, CAPITAL-OUTPUT RATIOS, AND MARGINAL SAVINGS RATES

(Initial Savings Rate 10% in all Cases)

		Marginal Savings Rate				
		12	16	20	24	28
	Critical Interest Rate 2%					
Capital-	2:1	10.0	[a]	[a]	[a]	[a]
output	3:1	5.0	[a]	[a]	[a]	[a]
ratio	4:1	3.3	10.0	[a]	[a]	[a]
	5:1	2.5	3.3	[a]	[a]	[a]
	Critical Interest Rate 3%					
Capital-	2:1	7.5	[a]	[a]	[a]	[a]
output	3:1	4.3	10.0	[a]	[a]	[a]
ratio	4:1	3.0	5.0	15.0	[a]	[a]
	5:1	2.3	2.7	4.3	10.0	[a]
	Critical Interest Rate 4%					
Capital-	2:1	6.7	20.0	[a]	[a]	[a]
output	3:1	4.0	6.7	20.0	[a]	[a]
ratio	4:1	2.9	4.0	6.7	20.0	[a]
	5:1	2.3	2.9	4.0	6.7	20.0
	Critical Interest Rate 5%					
Capital-	2:1	6.2	12.5	[a]	[a]	[a]
output	3:1	3.8	5.5	10.0	50.0	[a]
ratio	4:1	2.8	3.6	5.0	8.3	25.0
	5:1	2.2	2.6	3.3	4.5	7.1
	Critical Interest Rate 6%					
Capital-	2:1	6.0	10.0	30.0	[a]	[a]
output	3:1	3.7	5.0	7.5	15.0	[a]
ratio	4:1	2.7	3.3	4.3	6.0	10.0
	5:1	2.1	2.5	3.0	3.7	5.0
	Critical Interest Rate 8%					
Capital-	2:1	5.7	8.0	13.3	40.0	[a]
output	3:1	3.6	4.4	5.7	8.0	13.3
ratio	4:1	2.7	3.1	3.6	4.4	5.7
	5:1	2.1	2.3	2.7	3.1	3.6

[a] Viciously cumulative debt no longer a limitation to the rate of growth.

Source: IBRD Economic Department.

investment balance will not necessarily lead to an improvement in the export-import balance. To some extent, reduction of consumption and investment will decrease pressure to import and release resources for export; but to some extent it may also lead to underemployment of domestic resources and so tend to raise the capital-output ratio and decrease the absolute amounts of savings which actually materialize over a period. The savings-investment balance and the export-import balance

are necessarily equal in the event, but this reveals nothing of the mechanism by which they are brought into equality in actual cases.

63. In a recent paper on this same subject of the impact of capital inflows into developing countries,[8] Sir Roy Harrod points out certain limitations on the probable increase of domestic savings over time. In a model which is rather similar to that used in this paper, Harrod treats savings as being the residual after subtracting from total income "income not available for capital formation." Income not available for capital formation is reckoned as increasing at a constant percentage rate reflecting three factors:

a. rate of growth of population;

b. a rate of increase of per capita income considered as necessary to give incentives adequate to ensure development;

c. possibly failure of real income to increase as fast as production due to progressive deterioration of the terms of trade.

Harrod allows 2.0 per cent annual increase of per capita income as the necessary incentive and 0.5 per cent per year to allow for deterioration of the terms of trade. Thus if the rate of growth of population were 2.5 per cent per year, income not available for capital formation would increase at 5 per cent per year. If the gross domestic product also increased at 5 per cent per year, savings would increase no faster than product. The marginal savings rate would be equal to the initial average savings rate.

64. If, by contrast, income not available for capital formation grows less fast than total income, then the marginal savings rate is higher than the initial average savings rate, and what is more, the marginal savings rate rises over time. For example, if the initial savings rate is 10 per cent, total income increases by 5 per cent per year and income not available for capital formation increases by 4.5 per cent per year, the marginal savings rate is 19 per cent in year 1, 22.4 per cent in year 10 and 26 per cent in year 20.

65. To the extent that it implies a rising marginal savings rate, Harrod's model might appear more "optimistic" than the model developed in this paper. However, in his text Harrod emphasizes the difficulties of keeping the rate of growth of income not available for capital formation below the rate of growth of income as a whole, particularly in countries where population is growing rapidly. Hence he could not necessarily

[8] Sir Roy Harrod, "Desirable International Movements of Capital in Relation to Growth of Borrowers and Lenders and Growth of Markets," in *International Trade Theory in a Developing World, Proceedings of a Conference held by the International Economic Association.*

regard a high and rising marginal savings rate as something which can be maintained over a long period of time. At some point of time, pressures for relatively rapid increase of per capita consumption may become very great.

66. In fact it seems fair to suggest that the main bearing of Harrod's paper on the analysis in this paper is to stress the limitation on the increase of savings implied by population growth rather than to deny the probable existence of a long-term limit to "surplus savings"—i.e., the excess of gross domestic savings over the acceptable minimum of gross domestic capital formation.

Critical Interest Rate and the Rate of Return

67. In order to avoid misunderstanding, it should be emphasized that equation (iii) merely establishes a relationship of mutual consistency between various sets of values of the rate of growth of product, capital-output ratio, initial savings rate, marginal savings rate and critical interest rate, as defined. The equation does not say anything about relations of economic cause and effect as they work out in practice.

68. Underlying the equation, the basic rule still holds that it is advantageous for a country to borrow up to the point at which the rate of return on investment at the margin falls to equality with the rate of interest on external borrowing. As more is borrowed, the marginal rate of return on investment falls for three reasons:

i. rise in the capital-output ratio, as limitations of skilled manpower lead to progressive deterioration of standards of projection selection, design, execution and exploitation;
ii. rise in the opportunity cost of factors of production other than capital;
iii. (possibly) rise in the future opportunity cost of foreign exchange, due to higher total external debt service liabilities, to be taken into account in a proper calculation of the rate of return.

69. The tables indicate that a given critical interest rate is consistent with the stated values of growth rate, capital-output ratio, initial savings rate and marginal savings rate. However, this does not imply that such a combination of values can necessarily be achieved in practice. For example, the amount of investment implied by any given calculation may not be consistent with a capital-output ratio as indicated. It has been mentioned in connection with Table 7 that some of the higher growth rates indicated in the table are not to be expected in practice (para. 58

above). For example, as efforts are made to increase the rate of growth of product by investing more, the capital-output ratio is likely to rise for "absorptive capacity" reasons. Thus any unrealistically high growth rates in Tables 7A and 7B may be ignored as involving unrealistic combinations of growth rate and capital-output ratio.

More Restrictive Limitations on Actual Borrowing

70. The calculation of the critical interest rate is based on a number of assumptions which may need to be modified in practical cases.

71. In the first place, the form of the calculations may tend to understate the problem of viciously cumulative debt. It is assumed that a country starts with the stated marginal savings rate in year 0, the year in which it has no actual debt. In practice, marginal savings rates are likely to rise only gradually and countries begin to accumulate external debt when their marginal rates are below the levels at which the average savings rate may be expected to level off in the long run. Hence countries are likely to have accumulated more debt than the calculations imply by the time their average savings rate levels off at some culminating level.

72. A more fundamental difficulty arises as to whether avoidance of a higher long-term rate of growth of debt than of product is a sufficient condition for the avoidance of unmanageable debt servicing difficulties. The calculations assume that countries can continue to borrow and service debt in perpetuity on whatever scale the calculations may imply, without breakdown of the process so long as conditions of viciously cumulative debt can be avoided. This may be unrealistic since the liquidity problem raised by an unduly high level of gross borrowing and high ratio of service charges to, e.g., gross domestic savings and export earnings may be a more effective limitation.

73. Four types of limitation may be distinguished which are likely to be more restrictive in practice than the mere avoidance of viciously cumulative debt over the long run:

a. increased vulnerability to falls in export earnings and gross capital inflow as inflexible external debt service liabilities become large in relation to other economic magnitudes in the debtor country;

b. increasing reluctance to lend on the part of suppliers of capital when the debt service liabilities of the debtor country become large;

c. increasing temptation in the debtor country to default when debt service liabilities become large in relation to the amount of net

capital inflow which can be expected; a related point is the possible political objection to paying too much in service charges to foreigners;

d. limitations on the level of gross lending: to the extent that new loans are related to the finance of development projects and of certain types of imports, there is a ceiling on gross lending which depends on the amount of suitable projects and/or imports which are put up for financing.

Ratio of Interest Liabilities to Domestic Savings

74. The point that problems of vulnerability and temptation to default may become acute well before the problem of viciously cumulative debt is illustrated by the figures in Table 8. This table shows interest as a percentage of gross domestic savings in a distant year (year 70) when the growth model is worked out for various combinations of variables. In all the cases shown (except perhaps that with interest rate of 2 per cent, growth rate of 3 per cent and capital-output ratio of 3:1) the ratio of interest to domestic savings becomes high in the course of time—i.e., anything from 42 per cent to 80 per cent.

75. Before such high ratios are reached, the situation of the debtor country would be likely to be highly vulnerable, especially when it is considered that contractual amortization liabilities may be something like twice as great as interest charges.[9]

76. It follows that the avoidance of viciously cumulative indebtedness may not be a sufficient condition for viability of a debtor country. Hence it follows also that, given the other stated values, countries may not be able to maintain viability with interest rates as high, marginal savings rates as low or growth rates as high as are suggested by Tables 5 to 7. It is, however, difficult to say just how much lower must be the interest rate or the growth rate, or just how much higher the marginal savings rate, to maintain viability, since it is difficult to lay down, e.g., the ceiling ratio of interest to domestic savings which is consistent with viability.

An Alternative Calculation of the Required Marginal Savings Rate

77. Table 9 shows the difference, for various values of the other relevant variables, between the marginal savings rate required to avoid viciously cumulative indebtedness over the long run and the marginal

[9] E.g., interest on outstanding debt 6 per cent; 12 per cent of debt outstanding at the end of a year repayable in the next year.

TABLE 8. RATIO OF INTEREST PAYMENTS ON FOREIGN DEBT TO GROSS DOMESTIC SAVINGS IN YEAR 70 GIVEN ASSUMPTIONS ABOUT INTEREST RATE, GROWTH RATE, CAPITAL-OUTPUT RATIO, INITIAL AVERAGE SAVINGS RATE, AND MARGINAL SAVINGS RATE

(Average Savings Rate 5% in all Cases)

Figures in parentheses are marginal savings rates consistent with ultimate equiproportionate growth of debt and gross domestic product given the stated interest rate, rate of growth of product and capital-output ratio.

		Rate of Growth of Domestic Product	
		3	5
Critical Interest Rate 2%			
Capital-output ratio	3:1	32.4 (7.6)	42.6 (9.0)
	4:1	45.6 (9.6)	54.0 (11.0)
	5:1	54.4 (11.6)	60.7 (13.0)
Critical Interest Rate 4%			
Capital-output ratio	3:1	49.0 (10.3)	60.7 (13.0)
	4:1	62.6 (14.3)	69.8 (17.0)
	5:1	70.5 (18.3)	75.3 (21.0)
Critical Interest Rate 5%			
Capital-output ratio	3:1	56.2 (11.6)	65.9 (15.0)
	4:1	68.8 (16.6)	74.3 (20.0)
	5:1	75.8 (21.6)	79.3 (25.0)

Source: IBRD Economic Department.

savings rate required in order that net external indebtedness shall return to zero by year 50. The condition that debt should go from zero to zero in as little as 50 years seems to be a rather severe one which might apply in few if any practical cases. Thus the marginal savings rates shown in Table 9 may be considered to lie on either side of the marginal savings rate which would in fact be required, given the values of the other variables, to maintain a viable situation.

SIR ROY HARROD'S CALCULATIONS

78. In the paper already cited, Sir Roy Harrod works out a somewhat similar calculation on the basis of a 20-year "crash program." The basic

TABLE 9. REQUIRED MARGINAL SAVINGS RATES TO AVOID LONG-TERM VICIOUSLY CUMULATIVE DEBT AND TO REDUCE NET EXTERNAL DEBT TO ZERO BY YEAR 50
(Initial Savings Rate 5% in all Cases)

A. Marginal savings rate required to avoid viciously cumulative debt.
B. Marginal savings rate required to reduce net external debt to zero by year 50.

			Rate of Growth of Domestic Product		
			3	5	7
Interest Rate 2%	3:1	A	7.6	9.0	9.6
Capital-		B	12.9	18.9	23.8
output	4:1	A	9.6	11.0	11.6
ratio		B	18.8	25.8	32.1
	5.1	A	11.6	13.0	13.6
		B	24.7	32.8	40.3
Interest Rate 4%	3:1	A	10.3	13.0	14.1
Capital-		B	14.0	22.6	24.9
output	4:1	A	14.3	17.0	18.1
ratio		B	20.7	27.8	34.9
	5:1	A	18.3	21.0	22.1
		B	27.5	35.4	43.6

Source: IBRD Economic Department.

assumption is that the country triples its income over 20 years and also becomes independent of net capital inflow at the end of this period.

79. A problem with all such calculations is the essentially arbitrary nature of the assumptions on which they rest. For example, while 20 years may seem a reasonably long period for some countries to receive fairly large amounts of capital inflow on non-commercial terms, a country which brings a crash program to a successful conclusion might reasonably expect to attract a continuing net inflow of private investment and other capital on commercial or near-commercial terms.

GENERALIZED FORM OF THE CALCULATIONS

80. In earlier work on which much of the present paper is based, Mr. Gerald M. Alter worked out formulae for the conditions in which external debt would reach zero in a stated year (c.f., Table 9, above) and the conditions in which external debt would reach an absolute maximum in a stated year, and thereafter begin to decline.[10] He points out that ". . . a country which is capable of repaying debt completely in

[10] Gerald M. Alter, "The Servicing of Foreign Capital Inflows by Underdeveloped Countries," in International Economic Association, *Economic Development for Latin America.*

[e.g.,] 25 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 period or, a lesser degree of independence to be achieved over a shorter time period."

4. CONCLUSIONS

81. Three kinds of problem arise in determining how likely a country is to run into debt servicing difficulties in the future.

A. The first problem is to predict future amounts and terms of capital inflow. Is there a limit to the gross capital inflow which the country can expect to receive in any period of time? Will the country find it progressively more difficult to borrow, or be able to borrow only on progressively more unfavorable terms, as its debt and debt service liabilities increase? How much may be expected to be available in the form of grants, soft credits and loans on relatively favorable terms, and over what period of time?

B. The second range of problems arises in judging the conditions in which the country must be expected to come under acute pressure or temptation to postpone or repudiate external debt servicing liabilities.

C. The third range of problems concerns the probable future growth of the borrowing economy. How will its size of product, capital-output ratio, savings rate, export earnings and minimum acceptable level of imports evolve over time? Assumptions of fixed values for such variables as rate of growth of product, incremental capital-output ratio and marginal savings rate are a convenience for illustrative calculations, but involve an over-simplification. The way in which such variables develop in practice will depend on other relevant factors such as export earnings, amounts and terms of available capital inflows and the determination and skill with which the developing country adapts itself to such external circumstances.

82. If the problem be thought of as the determination of appropriate terms and amounts of capital flows in order to make possible the attainment of accepted development targets in the borrowing countries, then the problem of *predicting* amounts and terms of capital flows (A) ceases to be a separate difficulty. But problems B and C remain.

83. Because of these problems, particular projection calculations are

apt to appear arbitrary. Nevertheless, it appears possible to draw certain conclusions from the calculations set out in Tables 5 to 7 and 9.

84. Tables 5 to 7 indicate that with interest rates of the order of 5–6 per cent, the problem of viciously cumulative indebtedness may in fact be a serious problem for some countries. That is to say, countries with fairly low marginal savings rates and with fairly high capital-output ratios would run into the problem of viciously cumulative indebtedness as long as these conditions persist, if they try to achieve growth rates above a low level, unless they can obtain capital inflow at interest rates which, taking all categories of inflow into account, average less than 5–6 per cent.

85. It has been pointed out that Tables 5 to 7 tend, if anything, to understate the gravity of the long-term debt servicing problem. If there are other limitations on the maintenance of a viable balance of payments, more restrictive than the avoidance of viciously cumulative debt over the long run, then it follows that these tables overstate the critical interest rates and attainable growth rates, or understate the required marginal savings rates, consistent with the avoidance of debt servicing difficulties in practice.

86. Information on marginal savings rates and capital-output ratios in underdeveloped countries is meager and unreliable. Thus it is difficult to identify with any certainty countries which depend on capital inflow at relatively low average rates of interest for the attainment of reasonably satisfactory rates of growth, or to judge how widespread such cases may be. It nevertheless seems probable that some countries, particularly those with high rates of population growth, have difficulty in achieving marginal savings rates as high as 15–20 per cent. And it may be suspected that countries where skilled men are scarce and which, under the pressure of their population and of the "demonstration" effect, feel compelled to force the pace of development, may rapidly run into relatively high capital-output ratios as a result of inefficiency in selecting, designing, executing and exploiting development projects—i.e., limitations of absorptive capacity.

87. Thus the possibility should be faced that there are underdeveloped countries—and their number may be significant—which could not achieve rates of growth of product substantially in excess of their rates of growth of population if they could only receive capital inflow at effective average rates of interest of the order of 5–6 per cent; and which, conversely, need to receive capital inflow at average rates of interest of substantially less than 5–6 per cent if they are to increase their per capita incomes at an appreciable rate.

88. A further conclusion is that, while favorable terms on both interest and amortization may be desirable in order to help a borrowing country to avoid liquidity difficulties, the rate of interest has a further significance in influencing the rate at which external indebtedness increases. The more domestic savings are required at any time to meet external interest charges, the less is left to finance domestic capital formation and the more capital inflow is therefore required to make possible a given investment effort.

Mathematical Appendix

Prepared by S. Shahid Husain

The following formulation of the growth model is essentially based on the work of Gerald M. Alter.[1] However, while Alter assumes the Marginal Rate of Domestic Savings as a function of increase in *per capita* Gross Domestic Product, in the present paper the Marginal Rate of Domestic Savings is a function of increase in the Gross Domestic Product. This paper also goes a step further and determines the conditions for equiproportionate growth of debt, interest, payment, income, savings and investment.

Symbols

Y — Gross Domestic Product.

r — Rate of growth of Gross Domestic Product.

S — Gross Domestic Savings.

$\overset{a}{S_0}$ — Average gross domestic savings ratio in year zero.

$\acute{s}$ — Marginal Rate of Gross Domestic Savings assumed to be a constant proportion of the increase in GDP in the current year.

I — Gross Domestic Investment.

K — Projected incremental capital-output ratio, assuming a one year lag between investment and income.

F — Net Capital Inflow, i.e., excess of gross capital inflow over all service payments (interest and amortization).

D — Total foreign debt at the end of each year.

[1] Gerald M. Alter, *op. cit.*

i — Average interest rate on foreign debt. By assumption interest payments in any year are computed on debt outstanding at the end of the previous year.

Subscript n denotes time period; first period denoted by subscript o. It is assumed that no debt is outstanding at the beginning of year o.

Derivation of S_n

$$S_n = S_0^a Y_0 + sY_0(1+r) \text{ --- } sY_0(1+r)^{n-1}$$
$$= Y_0[S_0^a + sr(1+r) \text{ --- } sr(1+r)^{n-1}]$$
$$= Y_0[S_0^a + sr\{1 + (1+r) \text{ --- } (1+r)^{n-1}\}]$$
$$= Y_0\left[S_0^a + sr\frac{(1+r)^n - 1}{1+r-1}\right]$$
$$= Y_0\left[S_0^a + sr\frac{(1+r)^n - 1}{r}\right]$$
$$S_n = Y_0[S_0^a + s\{(1+r)^n - 1\}]$$

Derivation of I_n

$$I_n = K[Y_0(1+r)^{n+1} - Y_0(1+r)^n]$$
$$= K_{Y_0}[(1+r)^{n+1} - (1+r)^n]$$
$$= K_{Y_0}(1+r)^n(1+r-1)$$
$$I_n = KrY_0(1+r)^n$$

Derivation of F_n

$$F_n = I_n - S_n$$

Substituting for I_n and S_n

$$F_n = KrY_0(1+r)^n - Y_0[S_0^a - s\{(1+r)^n - 1\}]$$
$$= Y_0[Kr(1+r)^n - S_0^a - s(1+r)^n + s]$$
$$= Y_0[(Kr - s)(1+r)^n - (S_0^a - s)]$$

Derivation of D_n

$$D_0 = KrY_0(1+r)^0 - Y_0[S_0^a + s\{(1+r)^0 - 1\}]$$
$$D_1 = [KrY_0(1+r)^0 - Y_0[S_0^a + s\{(1+r)^0 - 1\}]](1+i)$$
$$+ [KrY_0(1+r) - Y_0[S_0^a + s\{(1+r) - 1\}]]$$
$$D_n = [KrY_0(1+r)^0 - Y_0[S_0^a + s\{(1+r)^0 - 1\}]](1+i)^n \text{ - - - - -}$$
$$+ [KrY_0(1+r)^n - Y_0[S_0^a + s\{(1+r)^n - 1\}]](1+i)^0$$

$$D_n = Y_0\left[(Kr - s)(1+i)^n \frac{1-\left(\frac{1+r}{1-i}\right)^{n+1}}{1-\frac{1+r}{1-i}} - (S_0^a - s)(1+i)^n \frac{1-\left(\frac{1}{1+i}\right)^{n+1}}{1-\left(\frac{1}{1+i}\right)}\right]$$

$$D_n^* = Y_0\left[(Kr - s)\frac{(1+i)^{n+1} - (1+r)^{n+1}}{i-r} - (S_0^a - s)\frac{(1+i)^{n+1}-1}{i}\right]$$

Conditions of Equiproportionate Growth of Debt, Interest, Payment, Income, Savings and Investment

Since the Incremental Capital-Output Ratio is the same as the average Capital-Output Ratio, investment increases throughout at the same rate as GDP. However, since the initial Average Rate of Savings is lower than the Marginal Rate of Savings, savings increase at a higher rate than GDP. With the passage of time as the Average Rate of Savings approaches the Marginal Rate of Savings, the Rate of Growth of Savings approaches the Rate of Growth of GDP. If year n is sufficiently distant, the Rate of Growth of Savings can be assumed to approximate the Rate of Growth of GDP and Investment.

Increase in debt in any year equals interest payments on debt outstanding at the end of previous year minus savings, available for amortization and interest payments, after providing for domestic investment requirements (or plus excess of domestic investment requirements over domestic savings).

In terms of symbols:

$D_n = iD_{n-1} - (sY_n - KrY_n)$

The condition for debt to increase at the same rate as GDP is:

$D_n = rD_{n-1}$

* This formula does not apply to cases where r = i. It can be shown that where r = i:

$$D_n = Y_0\left[n(Kr - s)(1+r)^n - (S_0^a - s)\frac{(1+r)^{n+1}-1}{r}\right]$$

Therefore, the condition for the equiproportionate growth of income and debt is:

$$rD_{n-1} = iD_{n-1} - (\$Y_n - KrY_n)$$

Solving this equation:

$$D_{n-1}(r - i) = Y_n(Kr - \$)$$

Since $Y_n = Y_0(1 + r)^n$

$$D_{n-1}(r - i) = Y_0(1 + r)^n(Kr - \$)$$

$$D_{n-1} = \frac{Y_0(1 + r)^n(Kr - \$)}{r - i}$$

Therefore

$$D_n = \frac{Y_0(1 + r)^{n+1}(Kr - \$)}{r - i}$$

In the debt formula previously derived

$$D_n = \left[(Kr - \$)\frac{(1 + i)^{n+1} - (1 + r)^{n+1}}{i - r} - (S_0^a - \$)\frac{(1 + i)^{n+1} - 1}{i}\right]$$

Substituting $\dfrac{Y_0(1 + r)^{n+1}(Kr - \$)}{r - i}$

for D_n in the above equation.

$$\frac{Y_0(1 + r)^{n+1}(Kr - \$)}{r - i} = Y_0\left[(Kr - \$)\frac{(1 + i)^{n+1} - (1 + r)^{n+1}}{i - r} - (S_0^a - \$)\frac{(1 + i)^{n+1} - 1}{i}\right]$$

$$= Y_0\frac{(1 + r)^{n+1}(Kr - \$)}{r - i} + Y_0\left[\frac{(Kr - \$)(1 + i)^{n+1}}{i - r} - (S_0^a - \$)\frac{(1 + i)^{n+1} - 1}{i}\right]$$

or

$$Y_0\left[\frac{(Kr - \$)(1 + i)^{n+1}}{i - r} - (S_0^a - \$)\frac{(1 + i)^{n+1} - 1}{i}\right] = 0.$$

Since for high values of n, $(1 + i)^{n+1}$ sufficiently approximates $(1 + i)^{n+1} - 1$, -1 can be ignored.

Hence,

$$Y_0\left[\frac{(Kr - \$)(1 + i)^{n+1}}{i - r} - (S_0^a - \$)\frac{(1 + i)^{n+1}}{i}\right] = 0.$$

Dividing by $Y_0(1 + i)^{n+1}$

$$\frac{Kr - \acute{s}}{i - r} = \frac{S_0^a - \acute{s}}{i}$$

$$i(Kr - \acute{s}) = (i - r)(S_0^a - \acute{s})$$

$$i(Kr - \acute{s}) - i(S_0^a - \acute{s}) = -r(S_0^a - \acute{s})$$

$$i(S_0^a - \acute{s}) - i(Kr - \acute{s}) = r(S_0^a - \acute{s})$$

$$i(S_0^a - Kr) = r(S_0^a - \acute{s})$$

$$\text{therefore} \quad i = \frac{r(S_0^a - \acute{s})}{(S_0^a - Kr)}$$

Given any four of these ratios the fifth condition of equiproportionate growth of debt and GDP can be derived from the above equation.

Essay V | Points to Ponder

Prepared by Dragoslav Avramovic

1. Some of the questions raised in the preceding essays are in a sense fundamental and they are certainly most difficult.

2. In the first volume of this series—*An Analytical Framework*—it was argued that six specific conditions[1] would have to be met for the mechanism of international lending on "hard" terms to work reasonably successfully:

(*a*) *Financial*

i. Creditors agree to lend continuously despite high debt service ratios (very high in some countries) and despite the general rigidities in the balance of payments of their debtors. The length of the period of lending depends on how far particular debtors are from the point of "self-sustained" growth. (Self-sustained growth is defind to mean a rate of income increase of, say, 5% p.a., financed out of domestically generated funds and out of foreign capital which flows into the country because it wants to do so);

ii. Debtors manage their external accounts in a way which enables them to pay their bills as they fall due;

iii. Fluctuations in export earnings of the debtors are substantially moderated, thus facilitating the fulfilment of conditions i and ii.

(*b*) *Growth*

i. The return on capital is higher than the international rate of interest;

ii. The plough-back of profits is high enough so that at some point, domestically generated savings exceed domestic investment require-

[1] The seventh condition, relating to the acute "cash squeeze" cases and arising from past financial practices, can be disregarded in the present context. (See *An Analytical Framework*, Chapter VI.)

ments and thus leave a surplus which can be used to meet service payments; and

iii. The number of investment projects that are undertaken and that meet the condition (b) i. is sufficient to enable the total output to grow at a "satisfactory" rate. A reasonably high income growth rate will also help in meeting the condition (b)ii.

3. Upon further reflection, it may be argued that the six conditions can be reduced to only one: a high level of investment that yields a high rate of return. Once this is achieved, the rest will take care of itself: if the rate of return is high, the plough-back will also be high; if the plough-back is high, output will grow quickly; if output grows quickly the balance of payments will tend to show structural strength which will facilitate external debt management. Such structural strength in effect implies that the dependence of the export structure on a few fluctuating commodities has ceased. All this having been achieved, continuing capital inflow will take place; and this inflow, including reinvestment of profits, will in turn further raise the rate of growth in output.

4. Some will argue that this formulation begs the question: too many issues are implied to have been solved. But against this argument, the case can be made that this formulation does help to turn the spotlight on the crucial problem, whose solution at the same time solves the problem of underdevelopment: how to attain a high rate of investment and at the same time to have the investment consist of projects whose weighted average rate of return is high? Sustained rapid growth will not take place in the absence of a substantial flow of high-yielding projects. If projects are not good, there will be no net earnings, no matter how large the number of projects; and if there are no net earnings there will be no plough-back into more investment. On the other hand, too few projects, even if excellent, will fail to lift the country's growth rate above the rate of population growth. In either case, balance of payments difficulties will soon become formidable, or stagnation will prevail. The growth process—and debts which have in part financed growth—will be jeopardized.

5. In Essay Four—*Projection of Debt Servicing Burdens and The Conditions of Debt Failure*—it is in effect argued that as the investment rate is raised, the rate of return on capital will decline, and this will tend to prevent a significant increase in the output growth rate. Is this inevitably true? Are not the factors determining the rate of return on capital and its behavior over time one of the great economic mysteries? Are decreasing returns really a rule? Have we not witnessed periods of increasing returns *pari passu* with an increase in the rate of investment?

And do we really know what the precise inter-relationship is between the two? Perhaps there is some third factor which determines both the rate of investment and rate of return on capital. And what is this third factor? The "absorptive capacity"? And what determines this capacity?

6. Only by systematic country-by-country studies in depth can answers to these questions be given, at least in part. Research results contained in these essays do not, and they can not, provide these answers; consequently, the basic issue—can a particular country or a group of countries attain self-sustained growth with the help of foreign capital that is given on "hard" terms, or do they need for this purpose "soft" money—is no nearer the solution. These essays, and indeed these three volumes, have attempted to provide a framework for systematic analysis of the likely outcome of the growth-cum-debt process; they have not focussed this framework on any individual country or a group of countries.

7. "There is nothing inevitable or automatic about the progression of debt [over time], because there is nothing automatic about the process of economic growth. Many things can go wrong, and the country may never leave . . . the stage in which its debt continuously tends to increase. Where poverty or a continuing deterioration in the terms of trade make it difficult to achieve high marginal savings rate; or where capital-output ratio becomes prohibitively high because the efficiency in resource use is handicapped by the scarcity of skills and paucity of natural resources, there the growth-cum-debt sequence will not work, because there is no growth. If the rate of return on investment is lower than the rate of interest on borrowed capital, and if the marginal savings rate is low, the borrower will experience viciously rising indebtedness and, by definition, an unmanageable debt burden.

8. "Are there countries in which the rate of return is lower than the international conventional rate of interest, of, say, 6 per cent? We do not know. However, the possibility cannot be excluded that such cases exist. Among countries which are today engaged in attempts to raise the standard of living of their peoples—and the number of countries is around one hundred—there are bound to be some where natural obstacles are so severe that the returns on capital are very low. If international transfer of resources is considered necessary in such cases, such flows must not be provided at conventional terms if virtually certain debt failures are to be avoided. . . . There are [also] countries where the present level of income is very low, population large and natural resources limited in relation to population. In these cases, return on particular investments may be high and yet the aggregate rate of savings

may remain low. If, despite being low, the aggregate rate of savings is increasing gradually, it is possible that ultimately domestic savings will exceed investment. The time span may, however, be extremely long and consequently, the gross capital inflow that will be needed, and the indebtedness which would result from financing the country predominantly on hard terms, may be extremely high. These are so-called 'long-haul' countries.

9. "At the opposite end are countries where conditions are extremely favorable: output grows fast, the plough-back is large and increasing, the rate of return on investment is high, the composition of output responds quickly to external demand conditions and to the country's growth requirements. In such a lucky country, the stage sequence of the debt cycle may not take place because the borrower is *too* successful. Foreign investors are eager to employ their funds in this country, whether the country wants it or not, because returns are large and secure. A country which has fully succeeded in the growth process may not reduce its indebtedness at all. . . . Its situation is analogous to that of a successful corporation whose debt grows with its own growth. This is a well-known and perfectly logical case of 'Unto everyone that hath shall be given.'

10. "Instead of reducing debt, such a country starts exporting capital, while at the same time continuing to borrow abroad. Economic history has a number of such examples. The most recent experience is that of Japan and Italy. Fifteen years ago, economic forecasts for these countries were not too exuberant, in view of the structural problems whose solution seemed to require a very long time. The forecasters certainly did not envisage the impressive record of growth and structural change which has been attained in less than one-half of the lifetime of a single generation. The marginal savings rate must have gone up more, and the capital-output ratio must have been less than we had anticipated; and these countries' breakthrough in the world market with an ever increasing variety of products, competitively produced and sold, has surpassed all expectations. These countries have become an increasingly attractive field for foreign investment. There are perhaps today several developing countries whose position is not dissimilar to that of Japan and Italy at the beginning of the 1950's.

11. "If a phenomenon such as a 'typical' developing country existed at all, it would probably stand somewhere in between the two extremes outlined above. The difficulty is that 'somewhere' still encompasses an uncomfortably wide span. Given our present state of knowledge, our insecurity prevents us from dividing the 'somewhere' into more pre-

cisely defined subgroups. To do this, we would have to identify the specific countries which would fit a shorter or a longer time path of the growth-cum-debt sequence. And while we have some suspicions that division may have in fact already occurred within the developing world we would still prefer to dodge this issue in the present study."[2]

12. The preparation of country studies in depth within the framework developed in these three volumes, would be the step needed to complete the work and to test the theory.

[2] *An Analytical Framework, op. cit.*, pp. 55–56 and 93.

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ECONOMIC GROWTH AND EXTERNAL DEBT

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