

DOCUMENT OF INTERNATIONAL MONETARY FUND
AND NOT FOR PUBLIC USE

**FOR
AGENDA**

MASTER FILES

ROOM C-120

01

SM/86/162

July 2, 1986

To: Members of the Executive Board

From: The Secretary

Subject: Theoretical Aspects of the Design of Fund-Supported
Adjustment Programs

Attached for consideration by the Executive Directors is a paper on theoretical aspects underlying the design of Fund-supported adjustment programs. This subject has been scheduled for discussion on Wednesday, July 30, 1986.

Mr. Rhomberg (ext. 8976) or Mr. Lanyi (ext. 7401) is available to answer technical or factual questions relating to this paper prior to the Board discussion.

Att: (1)

Other Distribution:
Department Heads



INTERNATIONAL MONETARY FUND

Theoretical Aspects of the Design of Fund-Supported Adjustment Programs

Prepared by the Research Department

(In consultation with other departments)

Approved by Wm. C. Hood

July 2, 1986

	<u>Contents</u>	<u>Page</u>
I.	Introduction	1
II.	Elements of Program Design	3
	1. Accounting framework and use of models	4
	2. General macroeconomic framework for Fund-supported programs	5
	3. Choice of economic objectives and policy instruments	13
	4. Dynamics and lags	19
III.	A Theoretical Analysis of Financial Programming: Monetary and Fiscal Policy	21
	1. Derivation of the basic financial programming model	22
	2. Some extensions of the financial planning framework	28
	3. The specification of monetary policy	34
	a. The transmission mechanism	34
	b. Dynamics of monetary policy	39
	c. The choice between money and credit as policy variables	42
	4. The specification of fiscal policy	46
	a. Public sector spending	47
	b. Public sector revenues	50
	c. Public sector deficit	50
IV.	The Role of Supply-Side, Exchange Rate, and Debt Management Policies in Financial Programming	52
	1. Supply-side policies	53
	a. Measures to improve resource allocation	54
	b. Policies to increase the rate of economic growth	58
	c. Supply-side policies and the period of adjustment	64

2. Exchange rate policies	64
a. The availability of exchange rate adjustment as a policy instrument	65
b. Analytical aspects of exchange rate policies	67
c. Determining the desirable extent of exchange rate adjustment	70
d. Estimating the impact of exchange rate changes	73
3. External debt management policies	75
a. Real aspects of debt problems	75
b. Financial aspects of debt problems	80
V. Summary and Conclusions	81

Charts

1. Time Path of Real Money Balances in Response to Monetary Shock	42a
2. Effects of Interest-Rate Policy on Private Savings and Investments	60a
3. Effects of a Devaluation	68a
4. Growth Paths for Exports, Debt, Investment Income Payments and the Current Account Balance	78a

I. Introduction

An adjustment program consists of a comprehensive set of economic measures designed to achieve broad macroeconomic goals, such as an improvement in the balance of payments, a better utilization of productive potential, and an increase in the long-term rate of economic growth. These objectives are often linked; for instance, achievement of a stable rate of economic growth requires, among other things, a sustainable structure of the balance of payments. The adoption of such a program may be motivated by the presence in the economy of an imbalance between aggregate demand and aggregate supply that may create inflationary pressures or require unsustainably high levels of external borrowing, or both. In some cases, an external deficit may be latent (in the sense of being suppressed by an unusually low level of domestic economic activity or by an unduly restrictive trade and exchange system) and may reflect structural weaknesses in the economy that preclude the simultaneous achievement of macroeconomic balance and an adequate rate of economic growth. In either of these circumstances, Fund members may seek the advice and financial support of the Fund.

A fundamental objective of a Fund-supported adjustment program is to provide for an orderly adjustment of both macroeconomic and structural imbalances so as to foster economic growth while bringing about a balance of payments position that is sustainable in the medium term. Such an adjustment program generally takes the form of a set of policy intentions by the authorities that is judged by the Fund to warrant financial support. The program is usually formulated with the assistance of the Fund staff. Understandings pertaining to the use of monetary and fiscal policy to influence macroeconomic performance typically play a major role in adjustment programs. Use of these primary instruments of demand management is often supplemented by a variety of other measures, most prominently exchange rate policy, but also structural policies, such as pricing policies, incomes policies, trade policies, and specific aspects of taxation or public spending policies.

The Fund's approach to economic stabilization, generally referred to as "financial programming," is based largely on oral tradition. There is surprisingly little readily accessible written material on its theoretical underpinnings, in particular, on the interaction of various policy measures in achieving the ultimate objectives. To be sure, the analytical basis of the programs negotiated in the 1950s and 1960s was articulated and formalized in a number of papers by the Fund staff, principally by Polak (1957) and Robichek (1967 and 1971). ^{1/} To many observers the approaches

^{1/} See also "Formulation of Credit Ceilings in Stand-By Arrangements," SM/71/145, June 11, 1971. This paper gives a comprehensive list of studies that were relevant to the issue of specifying credit ceilings, and to the relationship between these ceilings and the balance of payments. A compendium of the earlier papers on the Fund's approach to financial programming is also contained in IMF (1977).

outlined in these papers remain the theoretical mainstay of all Fund programs. 1/ Even the more recent published writings by Fund staff in the general area of financial programming closely follow the directions set by these contributions. 2/

Since the early 1970s, however, the conception and the structure of adjustment programs have gradually evolved and expanded. In part, modifications in thinking about these programs have arisen from major institutional and structural developments in the economies that the Fund has been called on to assist. Furthermore, several events in the 1970s, including the movement to a system of floating exchange rates among major currencies, large fluctuations in world prices of commodities, sharp increases in real interest rates in international credit markets, and an extended period of slow growth in major export markets, aggravated the adjustment problems of developing countries and seriously complicated the task of economic management. Finally, the design of Fund-supported adjustment programs has gradually absorbed many of the developments that have taken place in the study of macroeconomics and international economics.

The purpose of this paper is to describe the analytical framework underlying the design of Fund-supported adjustment programs. While it draws heavily on previous studies, it also attempts to identify theoretical developments that have taken place in financial programming in more recent years. 3/ Particular emphasis is placed on the response of an economy to the combination of measures that are part of the typical Fund-supported program. As will be stressed in the description of the body of theory underlying Fund-supported adjustment programs, the Fund's approach to program design is eclectic. The paper will, it is hoped, serve to dispel the notion that these programs are all based on a particular view of the economy or on the convictions of a single school of economic thought. While money and monetary policy necessarily play an important role in determining balance of payments outcomes and therefore clearly also in the design of adjustment programs, this does not make Fund-supported adjustment programs necessarily "monetarist" in character. 4/ The concentration on monetary flows in such programs can be justified on several grounds, ranging from a view that the balance of payments is essentially a monetary phenomenon to the pragmatic reason that data on the monetary variables contain important macroeconomic information and are relatively more accurate and timely than data on real variables. 5/

1/ See, for example, Dell (1982) and Diaz-Alejandro (1984).

2/ This is especially true in the volumes dealing with case studies of Kenya and Colombia. See IMF Institute (1981) and (1984).

3/ Papers by Crockett (1981) and Guitian (1981) do provide general descriptions of the policy content of Fund-supported adjustment programs, but neither goes into detail on the implicit theoretical relationships.

4/ This characterization has been used by, among others, Dell (1982).

5/ This point has been stressed by Heller and Rhomberg in IMF (1977).

A few additional remarks are in order to delineate the scope and describe the orientation of this paper more precisely. First, the paper does not pretend to offer a unified and unique theory underlying Fund-supported adjustment programs. There are various possible interpretations of the theoretical mechanisms forming the adjustment process, and consequently a variety of theoretical models can be used as the framework for constructing adjustment programs. Second, the paper does not describe the practice of financial programming. Its purpose is simply to provide a description of the "state of the art" with respect to the theoretical nexus underlying that practice. Operational issues arising in this connection are discussed in a forthcoming paper on "Program Design and Performance Criteria". Third, this paper deals exclusively with general issues and not with special characteristics of stabilization programs in specific countries or situations, thereby skirting around the important fact that Fund-supported adjustment programs are tailored to the circumstances of the members with which they are negotiated. Fourth, since Fund programs in recent years have been solely with developing countries, the analysis of the paper is focused on the economic features typical of these countries. 1/ Finally, no discussion is given in this paper of the global effects of Fund-supported adjustment programs, a topic covered comprehensively in a recent Fund publication. 2/

The remainder of the paper is organized as follows. Section II describes the general approach to Fund-supported programs and the relationship among the main economic objectives and policy instruments that are central to such programs. Section III describes the basic framework for financial programming, relating the monetary and fiscal accounts to the balance of payments. The use of other major policy instruments--in particular those operating through the supply-side, the exchange rate, and external debt management--and the channels through which they affect the balance of payments and growth, are analyzed in Section IV. The concluding section summarizes the main theoretical issues raised in the paper.

II. Elements of Program Design

In the negotiation of a Fund-supported program, technical analysis and political processes are intimately linked. An adjustment program is, on the one hand, an application of the theory of economic policy, which provides a framework for determining the policy actions needed to reach given economic objectives. On the other hand, agreement on such a program generally also implies a consensus with respect to the objectives sought, their hierarchy, and the weights accorded to them. This section will

1/ This is not to imply, however, that much of the analysis in the paper may not also be relevant for industrial countries as well.

2/ See Goldstein (1986).

attempt to identify the various technical and political elements that are important in the design of adjustment programs, especially of Fund-supported programs for developing countries. After describing the accounting framework for economic policy in general and the setting for the use of the Fund's resources in particular, this section will turn to a brief overview of the objectives and instruments of economic policy relevant in Fund-supported programs, as well as of their relationships and dynamic interactions.

1. Accounting framework and use of models

An integrated system of accounts covering national income and expenditure, as well as certain financial flows and associated stocks, lies at the heart of the macroeconomic appraisal and analysis of the economic performance of any economy. For countries that have sophisticated statistical systems, such accounts include timely and detailed data on national income and expenditure, the current and capital accounts of the balance of payments, and the accounts of the central bank, the banking system, and the government. For certain recorded flows, estimates of real flows and associated price indicators are available. For countries with less fully developed statistical coverage the record may have important gaps and become available with substantial delays.

The economic accounts serve several purposes in the process of designing an adjustment program. First, they give to the programmer raw material required for arriving at an assessment of the state of the economy and the need for an adjustment of policy. Second, they provide the framework for the model of macroeconomic performance that gives the logical structure to any macroeconomic program. ^{1/} Finally, the accounts provide consistency checks for forecasts and policy packages.

For purposes of financial programming it is useful to divide an economy into sectors and record the transactions taking place among them. The four sectors usually distinguished are the private nonfinancial sector, ^{2/} the government sector, ^{2/} the banking sector, and the foreign sector. The last-mentioned sector embraces all transactions of nonresidents with residents, and the consolidated accounts of this sector thus become an abbreviated balance of payments account.

^{1/} Indeed, the financial programming model presented in Section III was originally designed to enable the analyst to carry out macroeconomic projections using the only two types of data--monetary and balance of payments accounts--that were available in many countries.

^{2/} Whether publicly owned enterprises are included in the private non-financial sector or in the government sector differs among countries and depends also on the policy content of a financial programming exercise. The crucial issue is whether public enterprises are treated as primarily private (profit-seeking) firms or as primarily subject to government control.

For each sector the transactions between its members and those of other sectors can be divided into two categories: transactions arising in the course of producing or acquiring goods and services, and financial transactions. Since the two sets of accounts contain all incoming and outgoing transactions, the balance of all transactions for each sector is necessarily equal to zero, and the balance of income/expenditure transactions--which can be thought of as the saving (or dissaving) of that sector--is thus equal and of opposite sign to the balance of financial transactions. Indeed, the complete accounting framework, which need not be articulated in this paper, shows numerous equivalence relationships, or "identities," of this sort among the magnitudes recorded in the accounts. For instance, any excess of private and government spending on goods and services over the value of national output must be equal to an excess of imports over exports of goods and services; or, any government deficit not covered by borrowing from abroad must correspond to the government's *borrowing from the private nonfinancial sector and from the banking system*; and so forth. These accounting relationships highlight the fact that any sector's spending beyond its income must be financed by the savings of other sectors, and that such excess spending by an entire economy is possible only when it is financed by net saving of residents of the rest of the world (recorded in the foreign sector account).

These and other identities can be useful in gauging tendencies in an economy and in assessing the effects of policy changes. For an adequate quantitative understanding of economic processes and the operation of policies they must, however, be complemented by relations that indicate the typical reaction or response of some of the variables included in the accounting framework to changes in other variables. These "behavioral relationships" can be combined with the identities derived from the accounting framework to form a schematic quantitative representation, or "model," of economic processes involving the accounts, or "variables," that form the accounting system in question. Economic models can provide the quantitative framework required for forecasting and policy analysis. They can be used in two distinct modes: first, by assessing the consequences of foreseen or assumed changes in variables determined independently of the processes illustrated in the model ("exogenous variables") for the magnitudes determined within the model ("endogenous variables"); and second, by determining the changes in policy variables ("instruments") needed to achieve desired changes in some of the endogenous variables considered to be "objectives" of economic policy. Financial programming involves the use of models in this second mode. It determines the appropriate setting of policy instruments in the light of the underlying economic situation and the desired outcome.

2. General macroeconomic framework for Fund-supported programs

The type of macroeconomic analysis that characterizes the financial programming exercise underlying Fund-supported adjustment programs is motivated by the general approach to the use of Fund resources found in the relevant provisions of the Articles of Agreement. Under Article V, Section 3, the Fund is called upon to adopt policies on the use of its

general resources that will assist members to deal with their balance of payments problems "in a manner consistent with the provisions" of the Articles and "will establish adequate safeguards for the temporary use" of those resources. The first of these provisions refers, inter alia, to the purposes of the Fund, which are laid down in Article I; these include facilitating the expansion of international trade, promoting exchange stability, eliminating exchange restrictions, and maintaining orderly exchange arrangements among members. Article I refers to the use of Fund resources as follows:

To give confidence to members by making the general resources of the Fund temporarily available to them under adequate safeguards, thus providing them with opportunity to correct maladjustments in their balance of payments without resorting to measures destructive of national or international prosperity (Article I(v)).

It further enjoins the Fund to shorten the duration and lessen "the degree of disequilibrium in the international balances of payments of members" (Article I(vi)). Finally, the "provisions of the Fund" referred to in Article V, Section 3 clearly include the obligations of members with regard to avoidance of restrictions on current payments and discriminatory currency practices, as provided for in Article VIII, Sections 2 and 3 and Article XIV, Section 2.

The Fund has a mandate to ensure that the use of its resources by a member is linked to a policy program that leads within a reasonable time to a viable payments position, permitting scheduled repayment of the Fund resources advanced. More broadly, the Fund must have regard to the prospects that a member's policies, if sustained beyond the program period, lead to an orderly long-term evolution of the member's external indebtedness. These objectives must be achieved, however, without either damaging the member's national prosperity or increasing the restrictiveness of international trade and payments. This specification of institutional purposes and associated obligations was clearly motivated by the experience of the 1930s, when countries attempted to deal with unsustainable payments imbalances by "beggar-my-neighbor" policies--trade and exchange restrictions and competitive depreciation of their currencies--which contributed to the high unemployment rates of that period. The experience of that era also shows that equilibrium in the balance of payments maintained by means of low levels of output and expenditure is in fact a suppressed disequilibrium. Use of the Fund's general resources is therefore justified to support not only programs designed to correct overt payments imbalances but also, even where no initial imbalances exist, programs of economic recovery or structural adjustment that in the first stages may generate temporary external disequilibria.

Based on this general mandate, the analytical framework underlying Fund-supported programs is focused not only on the balance of payments and its various components but equally on overall macroeconomic developments. Indeed, the justification for offering the use of the Fund's resources is not a desire to prolong an external deficit by helping to finance it but the avoidance of unduly harsh measures that might have to be used by the member in the absence of financial support and could be destructive of the member's prosperity as well as of that of its trading partners.

In giving a brief preliminary sketch of the framework used in the Fund to analyze adjustment programs, it may be useful to consider first a balance of payments disequilibrium that appears to be reversible within a relatively short period--say, one to two years--and then to examine the more serious problems of a disequilibrium so large--involving, for instance, serious structural impediments to growth or a large overhang of external debt--that the strategy for returning to equilibrium can only be framed over a considerably longer period. The two cases differ principally in respect of the emphasis placed in a Fund-supported program on measures aimed at the growth or utilization of productive capacity. In a program for a country with the more serious type of disequilibrium, the growth of exports and output typically becomes a crucial element in the strategy for achieving balance of payments viability.

In the short term, the analysis underlying the formulation of Fund-supported programs assumes productive capacity to be fixed, although not necessarily fully utilized. Output (and thus income) ^{1/} could, therefore, change within the limits set by the existing productive potential. Residents' expenditure on domestic and foreign goods and services--the sum of private consumption, domestic investment, and government expenditure, which is often called "absorption"--could either exceed or fall short of domestic income. The difference between the value of domestic production (Y)--which is equal to income--and absorption (A) is the balance of trade in goods and services, which is sometimes loosely referred to as the current account balance (CA): ^{2/}

$$(2.1) \quad CA = Y - A$$

^{1/} In order to avoid unnecessary complication of this analysis, income and the value of output are assumed to be equal. In national income accounting, the value of output exceeds that of income chiefly by (1) indirect business taxes and (2) net payments to foreigners for factor services.

^{2/} As used in balance of payments accounting, the current account includes private and official unilateral transfers in addition to trade in goods and services. In this paper the narrower concept of current account balance is used unless otherwise indicated.

The current account shows a surplus if income exceeds absorption and a deficit in the reverse case. This formulation illustrates the important principle that a current account deficit can be reduced by a decline in absorption (relative to income) or by an increase in income (relative to absorption). The analysis of macroeconomic policy in an open economy on the basis of this relationship is referred to as the "absorption approach." ^{1/}

The desired current account balance is, of course, not likely to be zero. Foreign residents (including foreign governments) may more or less regularly make investments in and transfers to the economy in question, and domestic residents may in turn make investments and transfers abroad. The net balance of these transfers and capital transactions is itself affected by changes in the domestic economy and in the rest of the world--in particular, by the policies of the member and those pursued abroad. Ordinarily, however, there is an underlying tendency toward a net balance on account of transfers and capital flows that differs significantly from zero and marks the country as either a net recipient or a net provider of investments, loans, donations, and other transfers. An important determinant of these flows is the judgments of creditors and debtors as to what constitutes a sustainable level of external indebtedness for the country. Balance of payments adjustment refers primarily to the process by which the current account balance is made to conform to sustainable long-term capital flows and transfers; ^{2/} it refers as well to the restoration of capital inflows, or the stemming of outflows, where a loss of confidence has reduced net inflows below a sustainable level.

Adjustment programs for which Fund support is requested typically involve the problem of reducing a current account deficit to fit a sustainable net inflow of capital and may also be aimed at restoring a sustainable net capital inflow. In directing economic policy to this adjustment objective, the authorities are faced not so much with a target outcome that ought to be precisely achieved if possible, but with a more or less binding constraint that it may not be easy to violate for long periods and by large margins. Additional financing (including Fund support) can often be obtained, at any rate in the short and medium term, to permit the temporary acquisition of additional foreign resources. In the long run, however, the resource use of an economy must be constrained to the sum of domestic resources and those willingly made available for indefinite periods by the collectivity of foreign residents. Any short-run excess use of resources must in general be eventually reversed, either by restoring reserves previously drawn down or by repaying short-term foreign indebtedness.

^{1/} This approach was in part developed by the Fund staff (see Alexander, 1952).

^{2/} Reference to transfers will be omitted in the rest of the paper for the sake of simplicity.

The way in which the balance of payments acts as a constraint to resource use in the economy can be illustrated by an extension of equation 2.1. First, note should be taken of the balance of payments identity

$$(2.2) \quad \Delta R = CA + \Delta FI,$$

where ΔR is the change in net foreign assets of the banking system (including net international reserves of the monetary authorities) and ΔFI is the change in net foreign indebtedness of nonbank residents. Combining equations (2.1) and (2.2), one obtains

$$(2.3) \quad \Delta R = Y - A + \Delta FI,$$

which shows that an excess of absorption over income not financed entirely by foreign borrowing leads to a running down of net foreign assets. Since the stock of such assets is limited, there is clearly a limit to the extent to which absorption can be financed in this manner. For some countries, this loss in net reserves may take the form of accumulating arrears. What equation (2.3) also shows is that a balance of payments deficit leads to a decline in the overall liquid balances of residents; this result plays an important role in the financial programming framework described in Section III.

It follows from the definition of the current account balance as the difference between income and absorption (identity (2.1) above) that a desired reduction in a current account deficit can be achieved through some combination of increasing output and reducing absorption. To be sure, there may be induced secondary effects on absorption resulting from an increase in output and income, and on output resulting from a fall in absorption. It can be shown, however, that under reasonable assumptions these further effects are always less than the initial change that has induced them.

It is generally easier to reduce absorption than to increase production. For this reason, policies affecting absorption are often first put in place when a rapid decline in a current account deficit is mandatory. In many instances, the source of excessive domestic demand is the government sector, or more broadly the public sector, ^{1/} and a combination of a reduction in public sector outlays and an increase in revenues appears the most direct way of reducing domestic demand; similarly, private consumption and investment can be reduced by raising taxes. Alternatively, demand management policies may be pursued by influencing the monetary aggregates underlying both domestic demand and the balance of payments--for example, by measures to change the volume of credit extended to the private sector.

^{1/} Publicly owned enterprises are sometimes combined with the government sector for financial programming purposes. In a number of instances the deteriorating financial position of these enterprises has been a major factor in the expansion of domestic credit to the public sector as a whole.

(Alterations in net financial flows between the government and the banking sector can, of course, only be accomplished through changes of government expenditure and taxes.) The analysis of expenditure-reducing policies by focusing on the monetary aggregates is the main thrust of the financial programming model described in Section III.

Even though demand-management policies may be motivated by the desire to improve a country's external balance, they tend to affect primarily the aggregate demand for domestic goods and services and thereby the "internal balance" of the economy. "Internal balance" refers to the conformity between aggregate expenditure (equal to absorption plus exports minus imports) and potential output at stable prices. The value of the output of domestic goods and services is of necessity equal to the aggregate expenditure by domestic and foreign residents on these goods and services, and a change in the latter necessarily produces a corresponding change in the former. If aggregate expenditure exceeded the productive capacity of an economy at the existing price level, the result would be a rise in prices that would continue until the excess demand was eliminated (for instance, by a fall in the real value of financial assets). If aggregate expenditure fell short of productive capacity, prices could conceivably fall if they were flexible downward; the more likely outcome would, however, be a fall in employment of labor and other resources without much of a decline in prices.

In general, external balance and internal balance cannot be simultaneously achieved without employing at least two separate policy instruments, one acting to reduce expenditure and the other to increase output.^{1/} It is true that if absorption exceeded output while aggregate expenditure on domestic goods and services exceeded potential output at existing prices, progressively applied restraint in demand policies could for some time alleviate both the external deficit and the inflationary pressure resulting from the internal disequilibrium. But this policy of demand restraint would only by coincidence lead to simultaneous achievement of external and internal balance. If internal balance were restored while an external deficit still existed, further restraint of demand to achieve external balance would upset the internal equilibrium and bring about underutilization of productive resources. What is needed in such a situation is a policy that can increase the global (domestic and foreign) demand for domestic goods and services without at the same time raising the domestic absorption of all (domestic and foreign) goods and services. This result can be achieved through "expenditure-switching" policies--for instance, exchange rate adjustments--designed to change the relative prices of foreign and domestic goods facing both residents and nonresidents.

^{1/} This is, of course, an example of Tinbergen's rule that in general a specified number of policy objectives cannot be attained without using at least the same number of policy instruments. See Tinbergen (1952).

Expenditure-switching policies can reduce a current account deficit not only by diverting residents' and nonresidents' expenditures from foreign to domestic goods, but also by causing a shift of resources between different types of domestic goods and services produced. Specifically, a devaluation of the exchange rate entails a rise in incentives to produce goods for export or competing with imports and a fall in incentives to produce goods that are not currently or potentially traded across borders. The dichotomy between "nontradable" and "tradable" goods has become a principal analytical tool for analyzing devaluation and other expenditure-switching policies; 1/ this analytical approach is further discussed in Section IV.3.

The basic structure of the framework just described suggests why Fund programs have normally combined measures to reduce (or control the rise in) domestic aggregate demand with policies that improve incentives to export and discourage imports. Expenditure-switching policies cover a wide range of measures, including in the first instance exchange rate policies and other measures (such as liberalization of price controls and quantitative trade restrictions) that correct price distortions favoring foreign over domestic goods. In many instances, however, governments will attempt to accomplish the same aims by intensifying import and foreign exchange restrictions, or by changes in the structure of government taxes and subsidies. (All the policies mentioned, of course, may also have effects on absorption itself.) In countries where output is below its potential because of inefficient resource allocation, policies designed to switch expenditures on the demand side can also have the effect of increasing output by improving its composition on the supply side. They may therefore have welcome growth-supporting effects. The unquestioned difficulty of devising and implementing successful growth-oriented adjustment programs derives, however, from the fact that expenditure-switching policies often involve greater structural changes, are less certain in their effect, and may take longer both to implement and to achieve desired results, than expenditure-reducing policies. Furthermore, while expenditure-reducing policies are unlikely to be entirely neutral in their effect on income distribution, the distributive effects of expenditure-switching policies are more visible and tend to entail greater political difficulties, 2/ causing governments to hesitate in their implementation. When governments are slow to put such growth-oriented measures into effect, and when there are sizable lags between

1/ In the "dependent economy model," the analysis focuses on the distinction between tradables and nontradables, rather than on that between importables and exportables, because it is assumed that the terms of trade are exogenously determined. This model, in its modern form, originates with papers by Salter (1959) and Swan (1960).

2/ See IMF Fiscal Affairs Department (1986) and Addison and Demery (1985).

implementation and results, 1/ all the more burden is placed on expenditure-reducing policies to eliminate an external deficit, especially in the initial stages of an adjustment program.

Among alternative measures to induce expenditure switching, exchange rate adjustments are preferable, because other means, such as import restrictions or tax/subsidy schemes, tend to be discriminatory in their impact on different types of imports and exports and hence result in inefficient patterns of resource use (see Section IV.2). While the emphasis on the efficient use of existing capacity has become more prominent in adjustment programs in recent years, with considerable attention being paid to supply-side policies (see Section IV.1), it has never been absent from the thinking underlying Fund-supported programs. The elimination of barriers to international trade and support for a multilateral payments system were explicitly included in the purposes of the Fund precisely because the authors of the Articles of Agreement believed that a trade-promoting institutional framework contributed to global prosperity.

A member may encounter a disequilibrium in its balance of payments that is so serious that its elimination cannot be carried out in the short run, along the lines just sketched, in a manner consistent with the maintenance of its national prosperity. Since the debt crisis of 1982, such cases have multiplied. In such instances, it may not be possible to provide adequate safeguards for the temporary use of Fund resources merely on the basis of a program spanning one or two years without incurring unacceptably large reductions in domestic expenditure, because the economy's debt service burden has grown far out of proportion to its export earnings. Rather, it is necessary under these circumstances to pursue a medium-term strategy at whose core is the growth of the economy's debt-servicing capacity, while at the same time keeping domestic expenditure and the balance of payments under strict control and attempting to restructure external obligations to private and public creditors so as to provide the "breathing space" required to carry out the necessary adjustments. The role of external debt management in adjustment programs is discussed in more detail in Section IV.3.

The analysis presented earlier in this section, which showed the need for output to increase more than absorption in order to reduce a balance of payments deficit, is applicable also in the context of medium-term growth. To sustain an improvement in a country's external position, growth in expenditure cannot, in general, be allowed to exceed the growth in output. It is sometimes suggested that in heavily indebted countries, where growth has been slow in recent years because of contractions in domestic expenditure and unfavorable external conditions--or, for that

1/ See Section II.4.

matter, simply because of severe structural problems--economic recovery could be led by government expenditure. But as the earlier analysis has made clear, such a policy, unless accompanied by expenditure-switching measures, will lead to a renewed slide into large external payments deficits. It is true that this analysis abstracts from external borrowing and capital flight, and that a sustainable amount of such borrowing can make it possible for a while to maintain a higher rate of growth of absorption than output, and may indeed be necessary to achieve a desired rate of output growth. Nevertheless, if the rate of growth of output is not adequate, and growth not adequately outward-oriented, it will in the long run not be possible to service the external debt without reducing absorption and, inevitably, the economic well-being of the population. Economic growth and external equilibrium are therefore complementary and mutually supporting objectives of economic policy.

As explained in Section IV, the analysis of "supply-side" policies is complicated by the fact that their effects are of two distinct types. One effect of such policies is to increase output from existing productive capacity, for which there is substantial scope in a typical developing country. This end may be met by such measures as liberalizing previously controlled consumer prices or previously restricted imports and foreign exchange transactions, maintaining realistic exchange rates and interest rates, permitting the allocation of credit to be carried out through competition for funds rather than through bureaucratic processes, and raising artificially depressed agricultural producer prices.

A second type of effect of supply-side policies is to increase the rate of growth of productive capacity itself. This is accomplished not only by policies to increase domestic saving and investment--such as maintaining realistic interest rates, reducing fiscal deficits, and reallocating fiscal expenditures toward activities with the strongest benefits for growth and economic development--but also by policies that are aimed at maximizing current output within the applicable constraints and simultaneously tend to guide new resources to investments with the highest rates of return.

Finally, in formulating growth-oriented policies in a medium-term framework for heavily indebted countries, it is important to note that aiming at a more rapid growth rate of output does not imply indifference to the composition of that output. Unless the new productive capacity enables the country to increase exports by at least the rate at which output itself is growing, and also to avoid acceleration in the growth of imports, external payments difficulties are eventually bound to reappear.

3. Choice of economic objectives and policy instruments

Following the overview of the macroeconomic framework within which Fund-supported adjustment programs are being arranged, this subsection and the

next one take up a number of more detailed or technical considerations relating to policymaking in general that have a bearing on the design of Fund-supported programs. These considerations, which are presented preparatory to the substantive discussion of program design in Sections III and IV below, deal with relations among objectives, as well as between objectives and policy instruments, and with questions of timing.

It has already been suggested above that not all Fund-supported adjustment programs emphasize the same principal objectives. Some variation in this respect is not at all surprising in view of the diversity of member countries in their social, political, and institutional characteristics. All the same, it is possible to discern a set of "core objectives" of Fund-supported programs, which receive particular attention by the authorities and the Fund in view of the circumstances typically present when the Fund is approached by a member. Most notable among these core objectives are the achievement of external and internal balance and of adequate economic growth. The question arises of how these objectives relate to each other and to other policy objectives that may be pursued by the authorities. A further issue concerns the distinction between variables that are considered to be objectives and those that constitute constraints.

Governments pursue a wide variety of policy objectives. One well-known analysis classifies three functions of government from an economic standpoint: allocation, distribution, and stabilization. ^{1/} "Allocation" includes, inter alia, many noneconomic functions of the government, such as defense and justice. Even these noneconomic functions, however, require budget expenditures and therefore play at least an indirect role in economic decision making (e.g., regarding the size of the budget). There are, of course, many specific objectives that are clearly economic in nature. In a developing country, some of these objectives are often regarded as crucial for the process of economic development: among these are some typical government functions, such as provision of education, health facilities, sanitation, roads and bridges, and agricultural extension services, as well as special programs to assist particular sectors or groups in the economy that are deemed to be especially in need of government assistance to raise their income and productivity. Attempts to extend such assistance have often led to establishment of complicated systems of taxes, tax preferences, subsidies, licenses, price controls, selective credit and interest rate regulations, and other measures. While many of these measures may be justified on developmental grounds, some are principally of a distributive nature--for instance, the distribution of free or subsidized basic food products.

^{1/} This classification, which was proposed by Musgrave, is described by Tanzi (1986).

In balancing the competing objectives, government--and the Fund--may be faced with a variety of conflicts among them. Pursuit of allocational and distributional objectives may impede the adoption of measures required to correct a balance of payments disequilibrium and liberalize the system of trade and payments. An example of the first such conflict would be the case of required cuts in fiscal expenditure not being made because of the government's unwillingness to cut back on budget items reflecting its other priorities in the areas of "allocation" and "distribution." An example of the second would be the unwillingness to eliminate an import and exchange licensing system that is designed to channel foreign exchange to preferred activities.

Analytical frameworks have been devised that show how a government can, at least in principle, achieve an optimal approximation to a set of objectives. The general character of these frameworks can be illustrated by describing first the solution to a problem of policy design with a single objective and then showing the modifications necessary when there are multiple objectives.

If there were a single objective, for instance, the achievement of the highest possible absorption subject to certain constraints, a simple rule for setting policy instruments would suffice. Initially, all instruments would continually be changed so as to increase absorption until the first constraint became effective, say, until the country began to lose international reserves. Thereafter, one of the instruments, namely, that with the relatively strongest effect on the balance of payments, would have to be adjusted to prevent further reserve losses while the other instruments would still be employed with a view to raising absorption. As soon as a second constraint became binding, another instrument would have to be diverted to prevent its being exceeded, and so forth. Eventually all available policy instruments must be set with a view to observing the constraints and none would be available to promote a further increase in absorption. It is noteworthy that a constraint that becomes binding in effect takes on the role of an objective of economic policy. With an appropriate model, the final setting of the policy instruments would not need to be determined sequentially by trial and error, in the manner just described, but could be derived at once. All the same, there is merit in a trial and error approach to policymaking, since models are necessarily incomplete and inaccurate.

The task of policy setting is more complicated when there are two or more objectives to be attained. It is then first necessary to establish the relative value of increments of the objectives. The policy-maker would, for instance, have to determine the addition to the countries' external debt that would be acceptable as the price for a

gain in absorption (say, in investment) by 1 percent. After such an "objective function" has been specified, the two (or several) objectives can be pursued in a balanced manner, observing all constraints in the same way as described above for a single objective.

A particular problem that presents itself in this context is the change in the relative value of objectives when the degree to which each of them is attained varies. This aspect is especially troublesome when some objectives are open-ended and monotonically increasing in value while others are not. As an example of the first kind, more income is always better than less. By contrast, less inflation is better than more inflation only up to a point: 7 percent inflation is better than 10 percent inflation, but 3 percent deflation is not better than price stability. This may mean that the objective function--the relative importance of the competing objectives--has to be specified over the entire range of achievable values of the objectives. This is a requirement that in practice probably defies formal solution and invites the intuitive approach typically found in economic policymaking.

These formal considerations suggest that, as a practical matter, the specification of ultimate objectives and their relative importance must be a function largely reserved to the government. The Fund, as an advisor, would however address itself to technical relationships between ultimate and intermediate (or proximate) objectives, as well as to the relation between policy instruments, objectives, and constraints. As already indicated, the Fund's advice on economic policy must of course reflect members' choices with respect to objectives as well as relevant institutional and structural features of their economies. As a provider of resources, and thus as a creditor, the Fund must concern itself principally with the observance of the balance of payments constraint.

The problem of conflicting objectives is not entirely caused by the inclusion of diverse and peripheral goals. Even among the policy objectives at or near the core of a Fund-supported program, there are possible conflicts, or at least relationships that are not always entirely transparent. A good example of the difficult questions that arise in this context is the goal of price stability, which is often considered a separate objective in its own right, on a par with external balance and economic growth. Nevertheless, it is not always clear whether price stability is implied by, or is a necessary condition for, the achievement of external balance and adequate economic growth. Questions have arisen at one time or another with regard to the relationship between these objectives in connection with specific adjustment programs, and they are by no means settled issues. First, price stability would appear to be implicit in a financial program for bringing aggregate expenditure into line with aggregate output. Nevertheless, in some circumstances the inflationary process seems to take on a life of its own, even after an

initial excess of aggregate expenditure has been eliminated, so that a protracted period of economic contraction may be required to reduce inflation. Second, there are strong reasons for supposing that a chronic environment of high inflation eventually discourages saving and productive investment, in part because of the high variability of relative prices associated with high rates of inflation. ^{1/} While in principle the negative impact of inflation on resource allocation can be reduced by a system of indexing prices (including wages, interest rates and exchange rates), in practice such indexation can itself fuel an inflationary process. Third, a sharp improvement in the current account may in some circumstances lead to inflationary pressures that are difficult to counteract through other policies. Finally, there are situations where achieving short-run policy objectives may at least postpone the achievement of short-run price stability: for example, when elimination of price controls produces a once-for-all increase in prices of the previously controlled items, or when a larger-than-targeted positive turnabout in the balance of payments produces an inflow of foreign exchange in an economy where tariffs and other import barriers place a substantial wedge between foreign and domestic prices. Some of these problems have to do with questions of lags and timing that are discussed in the following subsection.

Because the basic objectives of economic policy are often difficult to relate to the instruments at the disposal of the authorities for achieving them, it is a frequent practice in program design to decide first on some intermediate objectives, which are derived from the ultimate goals, and then determine the policies needed for achieving them. In the process, achievable targets are set for some of the objectives that are in fact open-ended. For instance, a target growth of output of 3 percent may be set as an intermediate objective in lieu of the ultimate objective of maximizing the economic well-being of the country's population. These intermediate targets are often regarded as floors or ceilings (i.e., as constraints) rather than as point targets, since it is difficult at first glance to see any harm in overperformance. ^{2/} Overperformance of a balance of payments target by a heavily indebted country, or of a price stability target by a country with a high rate of inflation, or of output growth by any country should ordinarily be welcome developments. Nevertheless, such overperformance may entail the penalty of a negative effect on the achievement of one or several of the other objectives of the program. For example, a less than full utilization of the room for manoeuvre allowed within the balance of payments constraint may sacrifice output gains

^{1/} On the last specific point, see Blejer (1983). For a more general discussion, see Johnson (1984).

^{2/} This is also true for certain performance criteria, which are explicitly formulated as floors or ceilings. See "Program Design and Performance Criteria."

that could otherwise have been realized. Again, greater-than-targeted output growth, if not oriented toward exports or substitutes for imports, may impede achievement of an inflation target or result in violation of the balance of payments constraint. Once an achievable set of intermediate targets has been determined, it may be best to aim at avoiding overperformance of individual objectives as much as underperformance. If it becomes clear that several objectives could be overperformed, it might be best to redesign the program.

An important part of the overall program design--perhaps the most difficult part--lies in the derivation of intermediate targets from ultimate objectives. The quantitative targets must be jointly feasible, and the set of targets should be optimal. In deriving such targets, the program designer inevitably provides part of the solution of the policy problem dealt with in the program. In the underlying model or analytical framework, intermediate targets provide a linkage between the ultimate objectives and the policy instruments, sometimes being more closely related to one or the other. In some instances, the policy instruments are themselves regarded as targets, and the ultimate objectives are not made explicit at all but are implied in the targeted values for the instruments. This procedure has the disadvantage of not specifying the policy problem for which the program seeks a solution and therefore of making more difficult an assessment of the success or failure of the program. 1/

The choice of objectives, intermediate objectives, and policy instruments may be constrained, or predetermined in certain respects, by long-standing economic institutions that represent a past or prevailing political consensus. For example, there are countries that are members of a currency union or use a fixed exchange rate as the keystone to their economic policies. This sort of arrangement already constrains the framework of policies and the available policy instruments in comparison with a country that has a floating, or at least partially flexible, exchange regime. This issue is addressed in Section IV.2.

A further factor influencing the availability of different policy instruments is the role of central government planning and direct controls over different facets of economic activity. The institutional setting in

1/ In particular, there is the issue of whether or not the chosen instruments are in principle capable, within the constraints for their use, to achieve the objectives of the program. This question touches on the problem of the relation between objectives, instruments, and performance criteria, which on the whole falls outside the scope of this paper except for some references in Section III.3. See "Program Design and Performance Criteria."

these respects may reflect political ideologies and may not be extensively adaptable to the requirements of program design. Nevertheless, experience in recent years has shown that such measures as the decentralization of economic decisions and the use of realistic prices to guide such decisions can be used to improve the efficiency of production and investment in a variety of political and institutional settings.

More broadly, the choice of policy instruments is heavily influenced by the stage of development of economic institutions. In a country with sophisticated financial markets, for example, there are more means available for the government to influence the rate of monetary expansion (although there are also more ways to satisfy the demand for credit, in the face of restrictive official policies, through the layering of financial assets). In a country with a relatively undeveloped, sharply segmented financial market, the economy is likely to respond much less flexibly to changes in monetary policy. Moreover, where there are severe policy-related distortions--arising from price controls, exchange and trade restrictions, overvalued exchange rates, and official ceilings on interest rates--the efficacy of normal demand-management policies is greatly weakened, and the need for structural changes is all the more urgent. In some less-developed countries such structural changes may amount to nothing less than the new development of certain economic institutions, such as particular types of markets.

The choice of policy instruments is often dictated by the circumstances in which an adjustment program is being formulated. In situations in which the external financing constraint is severe and the need for a sharp adjustment in the current account is urgent, emphasis must be placed on rapid changes in fiscal and monetary policies rather than on the more slowly moving processes bringing about structural adjustments.

4. Dynamics and lags

It is generally true that economic theory provides a guide only to basic equilibrium relationships, and does not furnish information on the length of time it takes for changes in exogenous variables, including policy instruments, to have an impact on the endogenous variables.^{1/} Simple policy models--such as the expenditure-reducing/expenditure-switching paradigm--are set in a world of instantaneous adjustments. In practice, however, policies operate with lags that can be substantial. For example, changes in monetary policy may take considerable time before affecting aggregate demand, prices, and the balance of payments; the reasons for this are explained in Section III.3. Another well-known lag is between exchange rate adjustments and the balance of trade (see Section IV.2).

^{1/} There may, of course, also be substantial lags with regard to policy action itself: that is, between the need for action and the recognition of that need, and between the recognition of the need and the policy action.

The empirical investigation of such lags has led to many innovations in econometrics over the past 30 years. Nevertheless, the lags prevailing in many smaller developing countries remain largely a matter of guesswork and judgment and may in any event vary with prevailing circumstances. Estimates must be made of these lags, however, because the best timing of policy measures depends on them: in particular, the phasing of quantitative Fund-supported programs requires estimates of the speed with which policies affect the ultimate objectives. A broader question is posed by the fact that aggregate demand policies may take more rapid effect than certain supply-side measures. Where this is true, it may imply the desirability of obtaining additional external financing in order to avoid having to overshoot the targeted expenditure reduction until the supply-side part of the program shows the expected results.

Another problem of timing arises with respect to the two types of supply-side policies, those that are aimed at increasing current output and those designed to raise the growth rate of productive capacity. The results of the latter policies may not become evident for several years, yet there is often a need for an immediate increase in output to prevent serious hardships resulting from expenditure reductions and thereby to sustain the political viability of an adjustment program. Supply-side policies of the first type come into play in this context, even though uncertainties as to the extent and timing of their effects can cause serious difficulties. In a successful program, growth in productive capacity is being fostered while increases in output (and greater outward orientation of output) are being achieved with the use of existing resources. The fruits of growth policies are intended to become available when possibilities of expanding output on the basis of existing resources have been exhausted.

The interactions between supply-side policies and demand-management policies, as well as between the different supply-side measures themselves, pose further problems in designing an adjustment strategy. Specifically, the liberalization of import restrictions, of domestic financial markets, and of foreign exchange markets each alters the way in which the economy responds to changes in fiscal, monetary, and exchange rate policies. Moreover, the impact of a particular supply-side measure (e.g., freeing interest rate determination from official controls) will depend on whether other supply-side measures (e.g., liberalization of restrictions on capital inflows and outflows) have also been taken. The effect of different sequences of liberalization of various markets in the economy is a subject that has only recently begun to receive serious attention. ^{1/}

Perhaps the greatest problem in forecasting the dynamics of policy effects arises in connection with efforts to bring down high rates of inflation. This is especially true of a gradualistic approach, where the

^{1/} See Edwards (1984) and Khan and Zahler (1983), (1985).

results depend crucially on the private sector's expectations generated by government policies. The strategy of a shock approach--such as a currency reform and price freeze, accompanied by strong fiscal and monetary measures--has often met with initial success, but the long-run results, which depend on a variety of factors, are more uncertain. There is still much to be learned about the effects of monetary policy, exchange rate movements, price and wage controls, and interest rates on the inflationary process.

The examples just mentioned underline the importance of using knowledge of different time lags to ascertain the proper timing and strength of policy measures, as well as to setting realistic intermediate objectives. If policy instruments are chosen that achieve desired objectives only in the long run, and if the objective must be met in the short run, then the use of such instruments may have to be supplemented by the temporary use of other measures. This may have to be done even in those instances where the policy instruments with the weaker short-run effects are superior from an efficiency standpoint--for example, exchange rate adjustments are preferable to import restrictions as a means of improving the balance of trade, but the restrictions are likely to show stronger immediate effects. As this example also makes clear, a medium-term policy strategy must specify time paths for the objectives and instrument variables contained in the program.

An important instance in which the knowledge of time lags is crucial for economic policy decisions is when a choice must be made between a shock treatment or a gradualistic approach to policy reform. It is true that political considerations may be paramount in making such decisions; often, a gradualistic approach is chosen because of its greater political acceptability. Nevertheless, the gradual introduction of measures whose results are achieved only with a long time lag may result in an unacceptably long waiting period. This is typically the case with structural reforms, which frequently encounter strong political resistance and are therefore introduced in stages. Such gradualism leads to especially unfortunate results when accompanied by demand-management policies that are introduced over a short period. Such temporal misalignment of policies can lead to unnecessarily large declines in income and output over the short run or, alternatively, to unnecessarily large foreign borrowing over the period required for the results of supply-side policies to catch up with those of demand-management measures.

III. A Theoretical Analysis of Financial Programming: Monetary and Fiscal Policy

The previous section has described Fund-supported adjustment programs as complex packages of policy measures designed to achieve a viable balance of payments, in the medium term if not in the short term. While programs

differ considerably in their details, there is nevertheless a common thread running through them, namely, the need to restore balance of payments equilibrium while maintaining, indeed strengthening, the conditions for achieving a satisfactory rate of long-term output growth. As a necessary condition for achieving this outcome, the basic structure of all programs is built on a financial analysis that aims at ensuring consistency between the impact of proposed policy measures and the desired balance of payments outcome. ^{1/} This consistency, which is incorporated into a set of balance sheet relationships that relate the assets and liabilities of the banking system to the balance of payments, has sometimes been termed the "monetary approach to the balance of payments" ^{2/} and has often been mistakenly identified as the "theory" underlying Fund-supported adjustment programs. ^{3/} While Fund staff certainly played a significant role in its development, ^{4/} and while it is utilized in some form in Fund-supported programs, this financial programming framework is only one element, albeit perhaps a central one, in the theoretical underpinnings of Fund-supported adjustment programs.

This section will outline the basic financial programming framework of an open economy with fixed exchange rates and discuss its principal advantages and shortcomings, leaving to Section IV policies specifically related to achieving medium-term growth objectives. The model serves as a convenient starting point for a more detailed study of the various alternative transmission mechanisms between the array of policies typically included in Fund programs and the ultimate objectives of the balance of payments, price stability and economic growth. While one may base programs on different theoretical relationships, it is shown that monetary consistency, as incorporated in the financial programming approach, must always hold. This model is described in subsection 1, and its extensions set out in subsection 2 highlight the respective roles of monetary and fiscal policy. A more detailed discussion of the specifics of these policies, within the setting of a Fund-supported adjustment program, is given in subsections 3 and 4, respectively. The roles of other policies, both in restoring balance of payments equilibrium and in achieving other objectives, are taken up subsequently in Section IV.

1. Derivation of the basic financial programming framework

The view that the balance of payments is essentially, but not exclusively, a monetary phenomenon--in other words, that the demand and supply of money play a fundamental role in its determination--has a long history

^{1/} See "Adjustment Programs--Broad Design and Key Indicators," EBS/82/98 (June 1, 1982).

^{2/} See Frenkel and Johnson (1976). The Fund has also adopted a similar definition for this approach, see IMF (1977).

^{3/} See Diaz-Alejandro (1984).

^{4/} See Heller and Rhomberg in IMF (1977).

in economics. 1/ The monetary nature of the balance of payments, and the distinction drawn between money of external origin (international reserves) and money of domestic origin (domestic credit) also has a fairly long history in the operations of the Fund. 2/ The absorption approach, discussed in the previous section, played a key role in the design of Fund-supported programs, and at the same time changed the thinking on balance of payments issues by posing the problems of adjustment in a way that highlighted the policy aspects. 3/ The transformation of the absorption approach from a general theory into a policy device required, at the very least, some knowledge of the nature of the links between the monetary sector and the balance of payments. The papers by Polak (1957) and Robichek (1967), (1971) start from the proposition that in an open economy operating under a fixed exchange rate, the money supply is an endogenous variable influenced by surpluses and deficits in the balance of payments, and not an exogenous policy instrument as was customarily assumed in closed-economy models. The Polak and Robichek approaches can basically be interpreted as attempts to integrate monetary and credit factors into balance of payments analysis, and thus derive a formal relationship between the domestic component of the money stock (domestic credit) and changes in international reserves, which could then be fruitfully employed for policy. The earlier work by the two authors has influenced a large number of research papers written in the Fund on the subject of stabilization policies in developing countries, 4/ and the theoretical aspects of present Fund-supported adjustment programs can be shown to have their roots in these studies.

At the core of every Fund-related program is a basic financial programming framework based on the notions just reviewed. The actual design of a program is far more complex and pragmatic than would be indicated by this framework, but it does serve to highlight the essential theoretical features of any program designed for a small open economy operating under a fixed exchange rate. 5/

The financial programming approach starts with the accounting identity expressing the change in the money stock as the sum of the changes in its international and domestic components:

1/ See Frenkel and Johnson (1976).

2/ Heller and Rhomberg in IMF (1977) trace this distinction back to a paper by Triffin (1946).

3/ See also Johnson (1958).

4/ See, for example, the papers contained in IMF (1977).

5/ The assumption of a fixed exchange rate is crucial to this analysis. However, it should perhaps be noted that a large majority of the Fund's member countries peg their currencies in some form. The role of the exchange rate will be discussed in Section IV.2.

$$(3.1) \quad \Delta M = \Delta R + \Delta D$$

where M is the stock of money, R is the domestic-currency value of net foreign assets of the banking system (international reserves), ^{1/} D is net domestic assets of the banking system (domestic credit), and "Δ" preceding a variable indicates a one-period change. This identity is of course, only a balance sheet relationship for the banking system, where liabilities (money) are equal to the sum of foreign and domestic assets. ^{2/}

The second building block of this model is the demand for money, which can be specified in a variety of ways, ranging from a constant income velocity of money to a general function relating the (nominal) demand for money to variables such as domestic income, prices, and the opportunity costs of holding money. Assume that the demand for money balances takes the form:

$$(3.2) \quad \Delta M^d = f(\Delta Y, \Delta P, \dots)$$

where the change in nominal money balances (ΔM^d) is positively related to the change in real income (ΔY), the change in the domestic price level (ΔP), and other unspecified variables. The latter would presumably include interest rates paid on deposits and other financial assets, wealth, and expected inflation, among others.

A more restrictive version of equation (3.2) would relate the change in nominal money (ΔM^d) to changes in nominal income (ΔY):

$$(3.2a) \quad \Delta M^d = k \Delta Y$$

where k is the inverse of the income velocity of money, and assumed to be constant over time.

The third and final building block is a condition defining flow equilibrium in the money market. This simply means that the change in the demand for money is equal to the change in the actual supply of money:

^{1/} For simplicity it is assumed here that all foreign assets are held by the central bank, so that variation in net foreign assets is identical to the balance of payments of the country. This assumption would be valid in circumstances where commercial banks were required to surrender all foreign exchange to the central bank. Alternatively, the framework could be adapted to allow commercial banks to hold foreign assets by introducing an additional term explicitly into (3.1) that captured variations in net foreign assets of commercial banks.

^{2/} In the following discussion it is assumed that "other liabilities" and "other assets" of the banking system are either zero, or subsumed in the items that are listed here.

$$(3.3) \quad \Delta M^d = \Delta M$$

These three components, (3.1)-(3.3), can be combined to yield an expression for the change in net foreign assets, in which the balance of payments is given by the difference between the change in the money stock (equal to the change in the nominal demand for money from the equilibrium condition) and the change in domestic credit:

$$(3.4) \quad \Delta R = \Delta M - \Delta D = f(\Delta y, \Delta P, \dots) - \Delta D$$

This equation essentially says that the change in net foreign assets will be positive (the balance of payments will be in surplus) to the extent that the change in the total money stock exceeds the change in domestic credit. Indeed, in the special "small country" case, where the domestic price level is determined by foreign prices through purchasing power parity (or the "law of one price") and real income is assumed exogenous, so that the demand for money is effectively independent of changes in domestic credit, any increases in domestic credit above the desired increase in money will be offset by decreases in net foreign assets on a one-for-one basis. 1/

The simple model described by (3.4) can also be put in a more general framework, similar to that suggested in Section II.2, by explicitly considering income and expenditure relationships and the role of private capital movements in an open economy. The analysis here still retains the money demand function as the main behavioral relationship, although, as discussed later, this is only one of a number of relationships that need to be quantified in arriving at a framework for analysis. We can begin by restating (2.1), namely, that the gap between income and absorption is equal to the current account (equal to differences between imports and exports of goods and services):

$$(3.5) \quad CA = Y - A$$

The current account must be matched by changes in net foreign assets of the banking system (ΔR) and in the net foreign indebtedness of all nonbank residents (ΔFI),

$$(3.6) \quad CA = \Delta R - \Delta FI.$$

Since the change in net foreign assets of the banking system is also equal to the difference between the change in the money supply and the

1/ This type of analysis is characteristic of the "Chicago version" of the monetary approach to the balance of payments. See Frenkel and Johnson (1976).

change in domestic credit from the balance sheet of the banking system, it can be seen that combining (3.4) and (3.6) yields:

$$(3.7) \quad CA + \Delta FI = \Delta M - \Delta D$$

In terms of the difference between nominal income (Y) and domestic absorption (A), equation (3.7) can be rewritten as:

$$(3.8) \quad Y - A + \Delta FI = \Delta M - \Delta D$$

In other words, calls on resources by residents (absorption) will exceed the sum of the supply of domestic resources (income) and foreign savings (changes in net foreign indebtedness) when the change in domestic credit exceeds the change in the money stock.

If it is assumed that M^d is a function of a few variables and that these variables are independent of ΔD , then the conclusion remains that a ceiling for ΔD will determine ΔR , i.e., the balance of payments. It should be noted, however, that any current account balance matched by an appropriate nonbank capital flow is also consistent with equilibrium in this framework. Moreover, in each case one would still have to determine whether the domestic price level, the domestic interest rate, or domestic expenditure might be influenced by a change in net domestic assets.

With the overall outlines of the financial programming framework in mind, it is relatively straightforward to show how the basic relationship between the change in net foreign assets and changes in domestic credit--i.e., equation (3.4)--can be used for the design of a financial program. ^{1/} In the simplest case, only three steps are required. First, it is necessary to set a target for changes in net foreign assets over some specified period, generally a year. Second, an estimate is made of the probable course of the demand for money over the same period. This involves projecting, or setting targets for, the principal determinants of money demand, such as real income and prices. If a simple velocity function is being utilized, then all that is needed is a projection for nominal income and an assumption of how the income velocity of money, if not assumed constant, is likely to behave over the period. For more general demand for money functions, such a projection would require estimates of the parameters that link the demand for money to the relevant explanatory variables. Finally, given a forecast of the demand for money during the period in question and the overall balance of payments target (i.e., changes in net foreign assets), the corresponding figure for the change in net domestic assets of the banking system is deduced from the balance sheet identity of assets and liabilities.

1/ See "Formulation of Credit Ceilings in Stand-By Arrangements," SM/71/145 (June 11, 1971), and "Adjustment Programs--Broad Design and Key Indicators," EBS/82/98 (June 1, 1982).

It is obvious from the above description that within the framework of the simple financial programming framework there is no conceptual difficulty in deriving the domestic credit ceiling consistent with a desired change in net foreign assets. The whole exercise involves mainly the manipulation of balance sheet relationships with the demand for money being the only behavioral relationship to enter the picture. The demand for money, therefore, becomes a critical relationship in the analysis. In order for a change in domestic credit to have a predictable effect on the balance of payments, the demand for money must be a stable function of a limited set of variables. 1/ Given that this relationship is stable, an increase in domestic credit would cause a divergence between the demand for money and the supply of money, resulting in a decline in net foreign assets, because the public would not be willing to hold the additional money that was created. If there were no such divergence, then there would be no cumulative effect on the balance of payments. This would occur if the demand for money were passive in the sense that it simply adjusted to equilibrate the money market when there was any type of shock.

In the economic literature there is widespread support for the view that the demand for money bears a stable relationship to a well-defined set of economic variables. While it is possible to reject the extreme view that the income-velocity of money is constant, a view that was embedded in the earlier writings on the subject in the Fund, 2/ this does not affect the analysis. All that is needed is that the demand for money, or velocity, respond in a predictable way to variables such as real income, prices, interest rates, and so forth, and furthermore that it be independent of changes in domestic credit. On the first of these two conditions, studies both within the Fund and outside 3/ have shown that it is possible to identify empirically a well-defined demand function for money for a variety of developing countries. Typically, the preferred specification is one that relates the demand for real money balances to the level of real income and a variable representing the opportunity cost of holding money.

The second condition is more problematic. While it is easy to accept the view that the demand for money is a useful empirical regularity, the assumption that changes in domestic credit result only in changes in reserves is much less likely to hold in practice. The conditions for

1/ Alternatively, if the income-absorption relationship were more predictable, it could be the basis for manipulating the remaining identities.

2/ Polak (1957), for example, used the constant velocity assumption for simplicity.

3/ See, for example, Aghevli et al. (1979), Crockett and Owens (1980), Khan (1980), and the papers contained in Meiselman (1970).

making this assumption are quite stringent: in effect, an expansionary open market operation by the monetary authorities must have no effect on domestic interest rates, spending decisions, prices, or the exchange rate. Clearly such an assumption would not apply to a large country with a floating exchange rate. The extent to which it might apply depends, *inter alia*, on the openness of goods and capital markets, the breadth of these markets, and the degree of exchange rate flexibility. The feedback among real income, prices, and the monetary sector will be further discussed below.

2. Some extensions of the financial programming framework

So far the presentation of the financial programming framework has focused exclusively on changes in net foreign assets, and has been completely neutral about the structure of the balance of payments. Specifically, this framework approach does not specify where the improvement in the balance of payments will occur, be it via the current account or the capital account, and within the current account, via reductions in imports or increases in exports. Yet such distinctions are very important considerations in the design of Fund-supported adjustment programs. One standard extension of the basic financial programming framework is, therefore, to decompose the balance of payments into its individual components and explain these items separately. As will be shown, this is a straightforward extension of the monetary relationships developed earlier.

In the simplest case, to analyze the structure of the balance of payments requires the addition of a second behavioral relationship, namely, the demand for imports. The specification, as in the case of the money demand relationship, can be a very simple one that makes imports a constant function of domestic income, or a more complicated one that allows the effects of changes in relative prices, exchange rate changes, and perhaps other variables measuring import capacity. For sake of simplicity, assume that the volume of imports is positively related only to real income: ^{1/}

$$(3.9) \quad \text{IMV} = \alpha y$$

where IMV is the volume of imports, y is real income, and α is a constant. The value of imports can be derived from this equation by simply multiplying the volume (IMV) by exogenously given import prices.

The balance of payments identity is:

$$(3.10) \quad \Delta R = X - \text{IM} + \text{AFI}$$

^{1/} The more general case will be discussed in the section dealing with exchange rate policies.

where X and IM are the domestic-currency values of exports and imports of goods and services, respectively, and ΔFI is the change in net external indebtedness not held by the banking system.

With the addition of the equation for imports, the derivation of the domestic credit ceiling now becomes somewhat more involved. Step one is still to set a target for the overall balance of payments in the program period (AR^*). Step two entails making projections or assumptions about the behavior of those components of the balance of payments that are considered to be exogenously determined, that is, exports of goods and services and net nonbank capital flows. Projections of export receipts can be made on the basis of forecasts of real income growth in the country's export markets, and possibly the export prices of competing countries in the world market. For the case of net nonbank capital flows it is often necessary first to determine a "sustainable" level of foreign debt that is consistent with the country's current and future debt-servicing capacity, and then to ensure that the increase in net external indebtedness is consistent with this sustainable level. ^{1/} The capital flows item will presumably include aid flows, direct investment, as well as commercial foreign borrowing. Having obtained the values for exports and capital flows, the target value of imports can then be derived as a residual from the balance of payments identity (3.10) as:

$$(3.11) \quad IM^* = AR^* - (\bar{X} + \bar{\Delta FI})$$

where IM^* is the target value of imports and \bar{X} and $\bar{\Delta FI}$ are the projected, or target, values of exports and capital flows, respectively.

Step three is to project real income and set a target for domestic prices, and step four is to use these values to obtain the increase in the demand for money and the increase in imports from the two behavioral equations in the system. Step five is, as before, to solve for the change in domestic credit that would be consistent with the target change in net foreign assets and desired increase in nominal money balances. Finally, step six is to compare the value of imports that emerges from the import equation (3.9) with that emerging as a residual from the balance of payments identity (3.11). If the two are equal, the exercise is completed. If, on the other hand, the two values of imports are different, as is frequently the case, some type of adjustment has to be made. Such an adjustment could involve altering the target changes in net foreign assets, prices, and capital flows, or the projections for real income and exports. This iterative procedure would continue until the values of imports converged to a single one. In the end a domestic credit ceiling would be derived that would be simultaneously consistent

^{1/} This issue is discussed in Section IV.3.

with the target overall balance of payments (ΔR), and with the target or forecast values of its components.

A second extension that can be made to the financial programming approach is to link the monetary and fiscal accounts through expanding the underlying balance sheet relationships. This is done by discriminating between the expansion of credit to the private sector and that to the public sector, 1/ and taking into account the connections between the government budgetary position and official foreign borrowing on the one hand and the growth of domestic credit on the other. In practice, because of the central role of fiscal expenditure and revenues in a government's economic policy, and because of the dependence of private sector economic activity on an adequate supply of credit, this stage of the financial programming process is often regarded as the one involving the most crucial decisions.

That inclusion of fiscal deficits is presented here as an extension to the basic financial programming approach should not obscure the frequent importance of fiscal deficits in creating initial imbalances and the facts that imbalances must often in large measure be tackled through fiscal adjustment, that fiscal policies are among those most directly amenable to strong and rapid government action, and that a more satisfactory growth performance often requires a reallocation of resources from the public sector to more directly productive nongovernment sectors.

Fiscal policy features can be grafted on to the financial programming framework in a fairly straightforward manner. To do so requires the following three additional ex post identities: first, that the change in net foreign indebtedness of the country (ΔFI) is the sum of changes in the private sector's (ΔFI_p) and public sector's (ΔFI_g) net foreign debt position:

$$(3.12) \quad \Delta FI = \Delta FI_p + \Delta FI_g$$

Second, a similar decomposition between the private and public sectors can be made with respect to changes in domestic credit:

$$(3.13) \quad \Delta D = \Delta D_p + \Delta D_g$$

where ΔD_p is the change in credit channelled to the private sector, and ΔD_g is correspondingly the change in credit going to the government. It should be noted, however, that D_g is conventionally defined as credit to

1/ As noted earlier, in many programming exercises, the government sector (which may, or may not, include state and local governments) also comprises nonfinancial publicly-owned enterprises. "Government" and "public sector" are used here interchangeably on the understanding that the definition of the public sector may vary from case to case.

the government minus the government's deposits in the banking system; hence, D and M are also defined correspondingly for programming purposes.

Finally the government budget constraint is introduced, whereby the government must finance any deficit by either increasing its net borrowing from abroad, or by increasing its net borrowing from the banking system:

$$(3.14) \quad G - T = \Delta Dg + \Delta FIg$$

where G is total government expenditure and T is total government revenue; therefore (G-T) represents the fiscal deficit. This budget constraint contains an implicit assumption that there are no sales of government debt to the private (nonbank) sectors. For most developing countries this is not a particularly restrictive assumption to make; in these countries, markets for government securities are non-existent or very thin, so that the government has no real alternatives but to finance its deficit by borrowing abroad or from the banking system. Nevertheless, in a number of developing countries financial programming needs to take into account the fact that certain controlled, or "captive," nonbank financing sources--such as social security and pension funds, public enterprises, and local government--may provide a substantial portion of government resources.

The last three identities--(3.12), (3.13), and (3.14)--establish the relationship between monetary expansion and the fiscal position of the government, and provide an important rationale for placing ceilings on both the amount of foreign borrowing (ΔFIg) and the amount of bank financing (ΔDg) undertaken by the public sector; for in such ceilings lie the means of monitoring the size of the public sector deficit. ^{1/} Nevertheless, while these may be the principal means of monitoring the public sector's financial balance, the policies underlying that balance are, of course, chiefly concerned with expenditures and revenues (see Section III.4). It should also be noted that the ceiling on foreign borrowing usually has other purposes besides monitoring public sector finances (see Section IV.3). ^{2/}

Restricting the flow of credit to the public sector is frequently employed as a policy because the rate of credit expansion to the private sector (ΔDp) is generally an important secondary target in financial programs: allowing the private sector a sufficient amount of credit for

^{1/} See "Fiscal Provisions as Performance Criteria in Stand-By Arrangements," SM/68/141 (August 29, 1968). This subject is also addressed in a more recent paper by Kelly (1982).

^{2/} Foreign debt ceilings in Fund programs may take a variety of forms; such ceilings are applied to the entire public sector, together with borrowing with official guarantee, so that foreign borrowing by the central government alone is not thereby directly limited.

investment purposes, thereby maintaining or increasing the rate of economic growth, is an objective that must be taken into account in targeting the share of financial resources to be absorbed by the public sector. Basically, once the monetary model is used to solve for the overall rate of credit expansion (ΔD), the rate of credit expansion to the public sector (ΔD_g) can be derived as the difference between the overall rate of credit expansion (ΔD) and the targeted rate of credit expansion to the private sector (ΔD_p), or vice versa. ^{1/} By either technique, the calculated (or targeted) value of credit expansion to the public sector can then be added to the feasible level of official foreign borrowing (as in (3.14)) to obtain a first-round estimate of for the government's overall budget deficit. To the extent that this deficit is different from the budget plans of the authorities, there have to be changes in taxes or expenditures, or both, so as to close the fiscal resource gap; alternatively, credit to the private sector must be more restricted than originally planned.

A third possible extension of the basic financial programming framework is to relate the basic monetary relationship to the balance sheet of the central bank as opposed to the banking system as a whole. The policy variable in such a case would be changes in net domestic assets of the central bank rather than total domestic credit expansion. In Fund-supported adjustment programs both forms of credit ceilings have been employed as criteria for measures taken to achieve a particular balance of payments outcome.

In order to apply the exercise solely to the central bank, it is first necessary to define the balance sheet equality between changes in the liabilities of the central bank (reserve money or high-powered money) and changes in its assets (net foreign assets and net domestic assets):

$$(3.15) \quad \Delta H = \Delta R + \Delta DCB$$

where H is reserve money, and equal to currency in the hands of the public and reserves of commercial banks; R is the stock of net foreign assets; ^{2/} and DCB is the stock of domestic assets (net of deposits) of the central bank. Again a "Δ" prefix defines a one-period change in the variable.

The total supply of money (M) is related to reserve money (H) through a multiplicative relationship:

^{1/} The target rate of expansion of credit to the private sector can be estimated by relating it to the change in projected nominal income or to the projected rate of private investment.

^{2/} Since commercial banks are assumed not to hold foreign assets, the net foreign assets variable remains the same as before.

$$(3.16) \quad M = mH$$

where m is the money multiplier. This money multiplier is a function of the currency-deposits ratio and the ratio of commercial bank reserves to deposits; it is therefore partly determined by the public's preferences and partly by government policies (changes in reserve requirements or the discount rate) that affect the reserves position of banks.

If the money multiplier is stable and predictable, then with these two additional identities, (3.15) and (3.16), the financial programming exercise can be conducted as before. One simply has to replace the balance sheet relationship of the banking system, equation (3.1), with the following: 1/

$$(3.17) \quad \Delta M = m[\Delta R + \Delta DCB]$$

and the analysis will carry through under fairly general assumptions. 2/

The choice between the alternative forms of credit as a policy instrument is based on a number of factors. 3/ First, it depends crucially on the way the authorities operate monetary policy. To the extent that the monetary authorities implement credit policy through controls over total bank credit and other financial markets are poorly developed, the obvious credit variable would be the broader one covering the overall banking system. If, on the other hand, the monetary authorities take decisions related to credit policy in the context of their own credit operations, supplemented by variations in reserve requirements on the commercial banks that affect the money multiplier, then the appropriate credit variable would be one covering the domestic assets of the central bank alone. Second, how the money multiplier is likely to behave is an important factor in the decision. If the multiplier moves in an

1/ It is assumed for simplicity here that the money multiplier is constant so that $\Delta m[R + DCB] = 0$.

2/ Note that in this case a change in net foreign assets, ΔR , now leads to a change in reserve money, ΔH , rather than money, ΔM , as in the simple monetary model. The two models would be equivalent if: (a) the money multiplier is unity ($m = 1$), that is commercial banks operate under a 100 percent reserve requirement against reserves acquired through the sale of foreign assets; (b) the central bank follows a rule that automatically sterilizes changes in foreign assets by offsetting changes in net domestic assets; or (c) a change in the composition of reserve money has no further impact on the economy, as might be the case where there is an effective ceiling on total domestic credit. These issues are taken up in later in this section.

3/ See "Formulation of Credit Ceilings in Stand-By Arrangements," SM/71/145 (June 11, 1971) for a comprehensive discussion of this issue.

erratic or unpredictable fashion, it would clearly be more effective to work with overall domestic credit expansion than with credit extended by the central bank. Ultimately the question of whether to impose ceilings on net domestic assets of the central bank or the banking system is an empirical one and will depend on the structure of the financial system and the operating procedure for monetary policy in the particular country under consideration. At the theoretical level it is difficult, if not impossible, to argue for a particular definition of domestic credit.

3. The specification of monetary policy

The financial programming framework just described has proved a useful way of thinking about the balance of payments and macroeconomic policy. With some straightforward extensions, this framework can be used to handle issues relating to the determination of both the overall balance of payments as well as its components, and be easily linked to monetary policy and to the fiscal accounts of the government. At the same time, however, it must be stressed that this model is only a theoretical abstraction and for policy purposes must be specified more precisely. In particular, it must be supplemented by specific assumptions regarding the transmission mechanism relating the policy instruments to the ultimate objectives of balance of payments improvement and price stability; its validity in the short run can be questioned in some circumstances; and in its simplest form, it considers only one particular policy instrument, that is, the rate of domestic credit expansion, leaving open the issue whether it is in all circumstances more practicable to target domestic credit rather than the money supply itself. These three issues are discussed in the remainder of this section.

a. The transmission mechanism

The financial programming approach takes an eclectic view of the transmission mechanism underlying the adjustment of the balance of payments to any type of shock, such as a change in the rate of growth of domestic credit. In fact, this approach can be considered a relatively general theory of long-run behavior that encompasses a variety of models of short-term adjustment. ^{1/} The fundamental equation relating the balance of payments to the determinants of the demand for money and the rate of domestic credit expansion is thus an outcome of an adjustment process, and not a description of the channels through which the policy variables affect changes in net foreign assets.

A transmission process consistent with the basic financial programming framework was developed by Polak (1957), who introduced a structure that made imports a function of nominal income in a manner similar to equation

^{1/} See Mussa (1974).

(3.9), and then added a quantity theory of money equation to explain nominal income. ^{1/} In the context of this model, an increase in the rate of credit expansion would increase the money supply and nominal income; this in turn would raise imports and cause an outflow of international reserves. This process would continue until the initial increase in domestic credit was exactly matched by the loss of international reserves. The Robichek (1967) model differed from the Polak model only with respect to the speed of adjustment of imports, and not in any fundamental sense. If imports responded instantaneously to a change in domestic credit, then the basic monetary relationship would hold continuously. In a sense the Robichek model is, therefore, a particular case of the Polak model, where imports behave passively to eliminate any disequilibrium in the money market.

More elaborate versions of the adjustment process permit expenditures to be affected directly by changes in real money balances and interest rates, ^{2/} or in a world of capital mobility, allow the purchase or sales of assets in response to changes in relative interest rates. For example, in a model developed by Khan and Knight (1981), (1982), the excess demand for money balances plays a direct role in the short-run behavior of prices, real income, and the balance of payments. In this model an increase in domestic credit will in the short run increase domestic inflation, raise domestic output, and worsen the balance of payments. Eventually the decline in the money supply due to the outflow of international reserves will cause a reversal of the process so that once again in the long run the monetary relationship will continue to hold.

In the fixed exchange rate models just described, the public disposes of surplus cash balances emanating from an expansion of domestic credit by purchasing foreign goods and securities. Thus excessive credit expansion is absorbed in large part by the balance of payments, affecting only the prices of nontraded goods and the composition of output as between the traded and nontraded goods sectors. Under flexible exchange rates, an expansion in credit results in an increase in the money supply, a depreciation of the exchange rate that is proportional to the increase in the stock of money, and a similar increase in the domestic price level. Most developing countries, however, possess neither the rich menu of financial assets nor the degree of integration with international markets for goods and financial assets required to render these descriptions of the effects of monetary policy directly relevant.

^{1/} This is why the Polak model is often characterized as "the quantity theory of money in an open economy." This quantity theory of money equation used by Polak can also be interpreted as the demand for money. See Prais (1961).

^{2/} See Prais (1961), the papers in IMF (1977), and Aghevli and Khan (1980).

To approximate the situation in a typical developing country, it may be useful to analyze the effects of monetary policy on aggregate demand and the balance of payments. In a stylized setting in which the private sector can hold financial assets in the form of currency, deposits in commercial banks, and loans in the informal financial sector (or, for short, "curb market"), it can borrow in the curb market or from the commercial banking system. 1/ Lending and deposit rates at commercial banks are fixed by the government at below-market rates, but the rate in the curb market is free to settle at market-clearing levels. In addition to these financial assets, the private sector holds both reproducible and nonreproducible real assets. The authorities maintain an overvalued exchange rate parity and defend it with a system of foreign exchange controls that can initially be taken to be completely effective. While these assumptions may appear restrictive, in general such features would be present in some degree in many developing countries requiring Fund assistance.

Unlike the simple model outlined earlier, the monetary authorities can influence domestic base money in this setting via their control over credit extended by the central bank. They can affect the money supply and total bank credit to the nonfinancial private sector through their control over the monetary base and over required reserve ratios at commercial banks. 2/ In terms of the simple monetary model this implies that the authorities can change both net foreign assets (through direct controls) and domestic credit. 3/ Since equation (3.4) must continue to hold, the change in money supply (M) will adjust to preserve the balance sheet relationship.

Monetary and fiscal policies would be closely linked in a country with the financial structure assumed here. 4/ To the extent that the gap between public sector purchases of domestically-produced goods and services

1/ An informal financial sector plays a major role in most developing economies; see, for example, Chandavarkar (1986). Moreover, the assumption of a functioning curb market allows one to analyze the effects of interest rates on aggregate demand. Without such a market, the effects of monetary policy would be limited to those on wealth, real cash balances, and the rationing of credit.

2/ Open market operations are not used as a tool of monetary policy in this framework for the reason that there are only limited markets for government debt in most developing countries.

3/ The authorities can, of course, exercise direct influence over domestic credit of the formal financial sector, but such influence also has indirect effects on the interest rate, and thereby the equilibrium volume of credit extended in the curb market.

4/ See "Fiscal Provisions as Performance Criteria in Stand-By Arrangements," SM/68/141 (August 29, 1968).

and net taxes (taxes net of transfers) collected from the private sector is financed either externally or through central bank credit, the monetary base will expand. However, scope still remains for an independent monetary policy. The monetary authorities can effect changes in the expansion of the domestic money supply, apart from the increased credit implied by the financing of the public sector deficit, by changing the rate at which foreign exchange is made available to the public, by altering the growth of credit to the banking system, or by changing reserve requirements. 1/

As in the standard closed-economy case, monetary policy affects real aggregate demand by causing divergences between the actual and desired composition of the private sector's portfolio. The monetary authorities can change the supply of money without affecting the availability of bank credit to the nonfinancial private sector by combining a change in the monetary base with an appropriate change in reserve requirements in the same direction. Alternatively, they can change the availability of bank credit without changing the total money supply by altering the base and required reserve ratios in opposite directions by appropriate amounts. Starting from a position of portfolio equilibrium, 2/ an increase in the supply of bank credit to the nonfinancial private sector will cause borrowers to shift away from the curb market to the lower-cost bank credit market. As a result, the curb market interest rate will fall. Since this rate represents the marginal cost of funds in the economy, interest-sensitive components of private demand will be stimulated. In particular, the implicit value of reproducible real assets will rise relative to their production costs and demand for such assets will increase. Similarly, an increase in the money supply leaves the private sector with too much money in its portfolio relative to loans and real assets. The resulting increase in the supply of curb market loans leads to a fall in the curb market interest rate and this, together with the initial portfolio imbalance, causes an increase in the implicit value of real assets relative to their production costs. Aggregate demand is again increased as a result of the increased demand for real assets. Conversely, a reduction in the availability of bank credit or in the supply of money would, of course, cause these mechanisms to work in reverse and thus reduce aggregate demand.

Monetary policy works somewhat differently if exchange controls are ineffective. Assuming such controls to be completely absent, the private sector can now add foreign exchange, or more generally claims on non-residents, to its portfolio of financial assets either by retaining export

1/ In the last case the authorities can prescribe legal reserve requirements, define the assets qualifying as legal reserves, and provide for sanctions for reserve deficiencies.

2/ This equilibrium, however, is conditioned by the fact that lending and deposit rates are fixed by the government.

receipts in the form of foreign exchange or by acquiring foreign exchange from the central bank at the official parity. This case now approximates more closely the simple monetary model, since the authorities no longer exercise direct control over the change in international reserves (\mathcal{R}). With the relaxation of the assumption of exchange controls the power of monetary policy to affect aggregate demand is diminished. Some of the effects of an increased supply of money are dissipated into an increased demand for foreign exchange. The private sector can satisfy this demand by acquiring foreign exchange from the central bank in exchange for domestic money. As a result, the initial increase in the money supply is partially reabsorbed by the central bank. ^{1/} Effects on the curb market interest rate and on the demand for real assets are therefore weakened. Similarly, if households consider the extension of loans in the curb market and holdings of foreign exchange to be close substitutes, the effects of changes in the availability of bank credit to the private sector are also weakened in this case. As borrowers move from the curb market to the bank credit market following an increase in the supply of bank credit, the more elastic supply of loans in the curb market in this case cushions the fall that would otherwise be observed in the curb market loan rate.

The two preceding paragraphs have described the effects of monetary policy on real aggregate demand at a given domestic price level. The ultimate effects of such changes in aggregate demand on domestic output and the domestic price level will also depend to a large extent on whether the policy measures were anticipated at the time that currently prevailing nominal wage contracts were negotiated. Broadly speaking, the greater the extent to which changes in monetary policy are anticipated by the private sector, the more such policies will affect the domestic price level rather than the level of real output. This result emerges from the "rational expectations" model associated with Lucas (1972), among others.

For policy purposes it is clearly necessary to have an understanding of the manner in which the balance of payments is likely to be affected by changes in the rate of credit expansion. The hitting of a short-run balance of payments target becomes complicated in a world where the variables that determine the demand for money are themselves influenced by policy, and it is essential for the authorities to know how these variables will respond. While the financial programming approach emphasizes monetary relationships, it does not imply that the transmission process has to be monetarist in character. Indeed, a Keynesian structure with rigid nominal wages in the short run, and with the domestic level of output, the domestic

^{1/} In models with fixed exchange rates and tradable goods prices in line with world prices, this reabsorption would be complete over time.

rate of inflation, and domestic interest rates all responding to monetary policy, is also quite compatible with the financial programming approach. 1/ What this discussion demonstrates is that this approach does not depend on any one particular model and can be consistent with a broad class of models that include fixed or flexible exchange rates, tradable and nontradable goods, flexible or rigid prices and wages, market-determined or fixed interest rates, and either full or variable employment.

b. Dynamics of monetary policy

Use of the financial programming model is generally straightforward when applied to the long run, when all adjustments have worked themselves out. On an empirical level, however, the demand for money is regarded as stable over periods of one year or more, rather than over the very short term. In the short run, for example, the demand for money may be more or less passive, operating as a buffer stock that serves to absorb the changes in other variables. Both theory and empirical evidence indicate that the stock of real money balances tends to rise initially, or that the income velocity of money falls, when there is an increase in the nominal supply of money. These excess cash balances are worked off slowly over time until the public is once again in equilibrium. Consequently, one might observe no particular relationship between increases in domestic credit and changes in net foreign assets if the period of observation were too short. In time, however, the expected adjustment process will begin to take hold.

In addition, it is not possible to assume that the variables that affect the demand for money, particularly real income, are independent of changes in domestic credit unless the period is taken to refer to the long run. Standard monetary theory argues that in the long run the rate of growth of output will be independent of the rate of monetary expansion. 2/ In the short run, as will be shown below, output can be influenced by changes in domestic credit and thus cause shifts in the demand for money.

It is a standard property of models of the demand for money that in the long run the rate of growth of money will be equal to the rate of growth of real income plus the rate of price inflation adjusted for changes in velocity. 3/ Any variation in the exogenous variables will *definitionally* lead to an instantaneous change in money balances to a new equilibrium. However, in the short run there is no presumption that individuals will be continually on their demand schedules, and, as a matter of fact, it is likely that they will not. In other words, if

1/ See Montiel (1985).

2/ See, for example, Friedman (1956) and Lucas (1972).

3/ In the constant income velocity version of the demand for money, the last variable would obviously not be relevant.

there is a change in any of the variables that influence money holdings, there may be a significant lapse of time before money balances actually adjust to the new level. If there are such lags in adjustment, then assuming continuous equilibrium when projecting the demand for money in the course of a financial program would lead to errors that could have a significant impact on the credit ceilings. Since projections are customarily made over a one-year period, for the equilibrium model to be valid, all adjustments must necessarily occur within the year. (Moreover in Fund programs quarterly projections of the demand for money are also required to fix quarterly performance criteria.) How long it takes for individuals to respond to changes in real income, prices, interest rates, and so forth, is an empirical question that does not permit a general answer; it depends on the characteristics of the individual country. In some cases it may be legitimate to use an equilibrium model, while in others the lags in response may be quite long.

All this does not imply that the monetary model is completely irrelevant for short-run analysis of the balance of payments. Indeed, the long-run period over which the approach is applicable may well be only a year. This, however, is an empirical question. Furthermore, there is nothing in the methodology that precludes the introduction of dynamics and less restrictive adjustment assumptions. In the actual formulation of Fund-supported adjustment programs, these considerations suggest a number of specific problems. Two of these are discussed below: the way that time lags are generally introduced into the formulation and accounting for the short-run movements in velocity and the "liquidity overhang" problem.

Within the framework of money demand models there is a variety of ways of introducing dynamic behavior. The simplest procedure is to impose some arbitrary set of lags on each of the explanatory variables and perform empirical tests to determine the appropriate lag structure. A more common practice is to use some variants of the "error-learning" model. In such models, it is generally hypothesized that because of costs of adjustment and the costs of being out of equilibrium, the stock of real (or nominal) money balances adjusts proportionally to the discrepancy between the demand for money and the actual supply. In other words, when there is a change in the demand for money, the public is assumed to adjust only part of the way in the same period. Complete adjustment, which is defined when the demand and supply of money are equal, is thus achieved slowly over time. This partial-adjustment variant of the error-learning framework has become very popular, because it has a certain theoretical appeal and, perhaps more importantly from a practical point of view, is relatively easy to apply. From the empirical estimates it is possible to ascertain directly how long adjustment takes, i.e., the length of the lags. If the model indicates that all adjustment takes place within the year, then the equilibrium model can be utilized for the financial programming exercise. On the other hand, the presence of slow adjustment would require the use of the short-run money demand function.

While the error-learning models do introduce dynamics into the picture, they are not able to capture the short-run phenomenon that an increase in the rate of monetary expansion results in a larger initial stock of real money balances, or, what amounts to the same thing, that the income velocity tends initially to move in the opposite direction of the change in monetary growth. This behavior of real money balances has been found in a number of studies, for example, by Harberger (1963) on Chile, Diz (1970) on Argentina, and Pastore (1975) on Brazil, ^{1/} and a theoretical rationale has been provided by, among others, Friedman (1970). ^{2/} Typically, one observes that the time path of real money balances after a monetary increase appears as shown in Chart 1. At time t_0 , there is a once-for-all increase in the rate of monetary growth, and initially the stock of real money balances rises, reaching a maximum at point t . As inflation catches up with the growth of money at t^* , real money balances are once again at their previous level. The process continues beyond t^* as inflation overshoots the rate of growth of money, and real money balances fall below their original level.

The type of behavior observed in Chart 1 has two important implications for financial programming. First, if the authorities set a credit ceiling that involves a reduction in monetary growth, then the observed demand for money may also fall in the short run. Therefore, in analyzing the short-run effects of monetary policy on the balance of payments, care must be exercised in using the short-run demand for money function, and allowance has to be made for shifts in the function.

The second problem has to do with the phenomenon of "liquidity overhang." The Fund generally comes into situations of fundamental disequilibrium when there has been excessive monetary expansion in the past. Clearly, in projecting the likely behavior of velocity over the next year, the staff have to recognize that there has probably been a large build-up of cash balances and cannot proceed as if the money market was in equilibrium, and thus use the standard money demand model. In other words, it would be incorrect to start as if the situation was characterized by a position like t_0 in Chart 1. More than likely the economy is somewhere between t_0 and t^* , if not at t . The desired growth in the money supply would have to allow for the existing excess stock of money balances, and this may call for a sharper reduction in the growth of money than if there were no overhang. In the design of programs, therefore, a judgment must be made regarding the approximate magnitude of the

^{1/} See also Khan (1980) for results for a cross section of 11 developing countries.

^{2/} Friedman (1970) argues that real money balances rise in the transition phase because prices do not respond immediately to a change in monetary growth.

overhang and this judgmental magnitude can then be used as a base to project velocity during the program period.

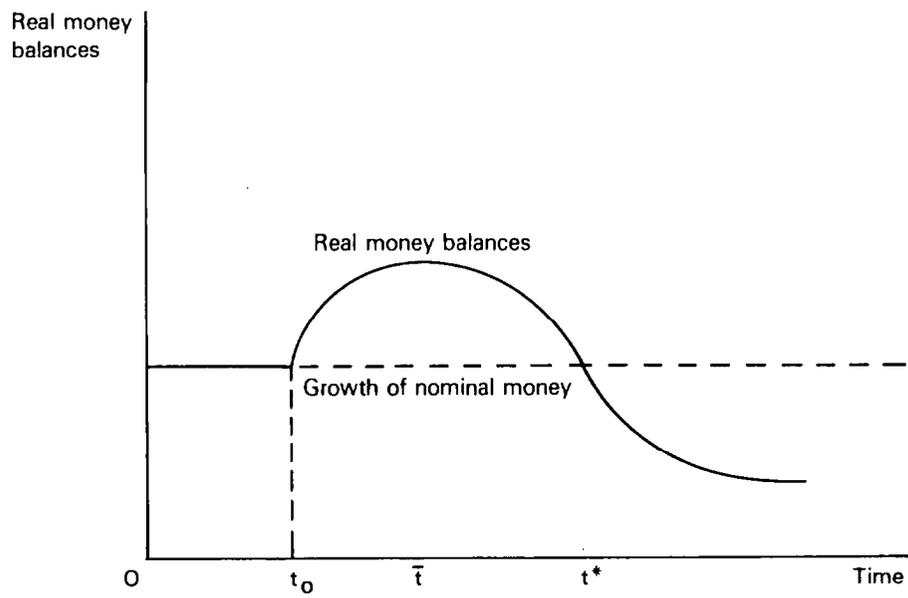
c. The choice between money and credit as policy variables

In the standard financial programming approach it may be assumed that the economy is closely integrated with the rest of the world and that it operates under a fixed exchange rate system. Under these assumptions, it follows that control of domestic credit--which in turn may largely depend on the fiscal deficit--is the only available instrument of financial policy for the authorities to determine the change in net foreign assets; they are unable to control the money supply. ^{1/} In this subsection the assumptions lying behind the simple model are relaxed, and with inflation treated as an endogenous variable and an objective of the program, some considerations are discussed pertinent to the issue of whether in some circumstances it would be more effective to target money or reserve money, as an intermediate variable, than domestic credit. The choice between credit and money depends, inter alia, on: (i) the strength of the linkages between the domestic and external goods and financial markets; and (ii) the country's exchange rate arrangements. The importance of each of these is discussed below.

The strength of the linkages between domestic and international markets for goods is a key factor influencing the use of ceilings for monetary or credit aggregates in Fund-supported adjustment programs. If domestic and international markets for traded goods are closely integrated, for example, movements in the domestic prices of tradable goods would be tied to changes in the exchange rate and international prices. If international traded goods prices were stable, domestic goods prices would then change only in response to an exchange rate movement. Stable domestic prices of tradable goods would also help stabilize the prices of nontraded goods. In this situation, inflation would generally be associated only with the changes in prices produced by an exchange rate depreciation. As a result, it has been argued that the choice between a ceiling on a monetary or credit aggregate, as well as the specification of exchange rate policy, can be decided on the basis of the contribution of these instruments to the attainment of the other objectives of the program. For example, with closely integrated foreign and domestic goods markets, the combination of a ceiling on the domestic credit of the banking system and a fixed exchange rate has often been viewed as a means of achieving an improvement in the current account balance without generating a sustained inflation (apart from the response of prices to

^{1/} This is the rationale used in, "Formulation of Credit Ceilings in Stand-By Arrangements," SM/71/145 (June 11, 1971), and also by the papers in Frenkel and Johnson (1976) and IMF (1977).

CHART 1
TIME PATH OF REAL MONEY BALANCE
IN RESPONSE TO MONETARY SHOCK





any initial exchange rate depreciation). ^{1/} In these circumstances, there would be no conflict between the external and inflation objectives of the Fund program; and a ceiling on monetary growth would not generally be required to limit inflation.

For most Fund members, however, the linkages between domestic and international goods markets are far less direct, because of trade barriers, transactions costs, and shipping charges. These weaker linkages provide scope for extended periods of domestic inflation and create the possibility of a conflict between the attainment of the program's external balance and inflation objectives. Domestic prices would respond not only to exchange rate adjustments but also to such factors as increases in reserve money generated by the conversion of foreign exchange or expansion of domestic credit by the central bank. In this situation, it might be argued that a ceiling on domestic monetary growth or the rate of growth of reserve money would be required to limit inflation.

The strength of the linkages between domestic and international financial markets is also a key factor influencing the use of ceilings for monetary and credit aggregates. Access to international financial markets affects the economy's structure in at least two important ways: first, it gives residents an opportunity to acquire net credit (and goods and services) from abroad; and second, reserve money can expand as a result of the conversion of foreign exchange acquired through current account imbalances, external borrowing, or liquidation of foreign assets. Such capital flows may be temporary and reversible. In some instances, they may be a positive development, representing the repatriation of residents' foreign capital holdings. In other instances, depending on their size and sustainability, such transactions can weaken the effectiveness of credit ceilings both by providing a source of credit from outside the banking system and also by creating an incentive for the development of unregulated domestic sources of credit. For example, central bank purchases of foreign exchange (possibly as part of a commitment to maintain a given exchange rate) increase the net foreign assets of the central bank as well as the stock of reserve money. Depending on the nature of the banking system, such an increase in reserve money could create an equal or substantially greater increase in total money, which would in turn affect domestic prices. Moreover, if there is an effective ceiling on bank credit, the existence of an unsatisfied demand for credit and an excess supply of reserve money will create substantial incentives for the development and more active use of unregulated nonbank financial intermediaries as an alternative source of credit.

^{1/} The exchange rate might have to be adjusted at the beginning of the program to eliminate any initial overvaluation of the exchange rate. An alternative policy could involve adjusting the nominal exchange rate to any difference between domestic and international inflation.

Under the circumstances just described, in which the central bank is defending a fixed exchange rate, it can be argued that the inflationary effects of an overall balance of payments surplus (resulting from both current and capital account developments) could be mitigated by limiting the expansion of reserve money. Holding down the growth of reserve money would require the central bank to sterilize the impact of the capital inflows on reserve money by reducing the domestic credit of the central bank. The sustainability of such a policy depends on the cost of reducing central-bank domestic credit and on the scope and persistence of net inflows of foreign exchange. The sterilization of an external surplus may involve a sharp redistribution of credit within the private sector, creating serious financing difficulties for those sectors of the economy especially dependent on domestic bank credit and not directly benefiting from higher foreign exchange receipts. ^{1/} The feasibility of continued sterilization is determined by the nature of the balance of payments surplus. For example, in some situations a capital inflow represents a once-for-all movement of capital between domestic and international markets, such as a reflow of funds to the domestic market following a currency realignment. In cases where it was judged necessary to offset any inflationary effect of this inflow, either targeted limits on credit expansion could be correspondingly adjusted or a targeted ceiling on reserve money could guide the authorities to undertake the required sterilization. In other instances, the capital inflow might reflect an unexpected increase in the demand of money. In such cases, the authorities would have to make a judgment with respect to how much of the inflow to sterilize and how much of an increase in reserve money to permit to satisfy the increased demand for money. In either case, it would be important to limit domestic credit expansion, since in the absence of a capital inflow it would still be important to ensure that the balance of payments target was met.

There is a far more serious problem when the capital flows represent the continuing arbitrage of financial market conditions between domestic and international markets. In economies with severe credit rationing, there are large incentives to obtain credit from international sources. In this case, a ceiling on reserve money would involve a sterilization of the capital inflow, leading not only to an ongoing redistribution of credit within the private-sector financial markets but also continuing increases in foreign exchange reserves of the central bank, without changing the conditions that originally created the capital inflow. Alternatively, the absence of such a ceiling on reserve money could result in a rapid increase in reserve money and thereby in inflationary pressure.

^{1/} It should be noted that in economies where credit is rationed primarily by interest rates, such sterilization would be much less likely to have these sectoral effects since credit could flow from one sector to another in response to changes in relative interest rates.

The policy dilemma just analyzed in the context of fixed exchange rates suggests a trade-off between price stability and exchange rate flexibility under circumstances in which the authorities must deal with excessive capital flows or an undesirably large current account surplus. For example, if the exchange rate has been substantially depreciated in an effort to secure a favorable trade balance, then substantial unexpected capital inflows could be generated by yield differentials that reflect, in part, the expectation that further large exchange rate depreciations are unlikely. If such flows occur, there could be substantial inflationary pressure in the economy. To limit this inflation, a greater degree of exchange rate flexibility may be required since a fixed exchange rate, relatively unrestricted capital flows, and the establishment of effective ceilings on credit or reserve money may at times be incompatible.

In general, with an exchange rate that is fixed or is adjusted only gradually (for example, to reflect inflation differentials), the authorities may find it difficult to control the growth of domestic monetary aggregates over any extended period. (This consideration should be borne in mind when a real exchange rate target is set as part of an adjustment program.) Even when the authorities limit the issuance of reserve money from domestic sources, portfolio and spending adjustments in the private sector would lead to external payments imbalances that could expand reserve money as the authorities intervene in the foreign exchange markets to maintain their exchange rate policy. In contrast, a flexible exchange rate allows the authorities to control the growth of reserve money, thereby making a ceiling on a monetary aggregate a potentially effective performance criterion.

In a number of respects, the effectiveness of ceilings on domestic credit is more closely related to the presence of unregulated domestic and foreign sources of credit than to the exchange rate regime. If sources of credit other than through the domestic banking system are limited, then a ceiling on domestic credit of the banking system can be quite effective in influencing domestic spending and activity, regardless of the exchange regime. More generally, the authorities have relatively great influence on domestic spending and activity and thereby the country's external balance, through policies affecting the domestic credit of the banking system when most domestic financial institutions are part of that system, domestic tradable goods prices are closely tied to world prices, and linkages between domestic and international financial markets are relatively weak. Moreover, with a fixed exchange rate, a ceiling on domestic credit would generally be more readily attained than a ceiling on a monetary aggregate.

In contrast, a ceiling on a monetary aggregate would be the most useful type of monetary target when the economy has a flexible exchange rate, domestic goods prices are not closely tied to world prices, strong linkages exist between domestic and international financial markets, and there is

a variety of unregulated domestic financial intermediaries that can provide credit not subject to the ceiling on credit from the banking system. Since credit ceilings in Fund-supported adjustment programs are often defined with regard to the lending of the banking system, the existence of significant financial intermediation outside the regulated banking system, through either domestic or foreign financial intermediaries, could weaken the relationship between the ceiling on credit from the banking system and economic activity or the current account balance.

The theoretical conclusions just summarized are subject, however, to serious qualifications arising from institutional and practical limitations. First of all, unless the exchange rate is allowed to float without official intervention, the feasibility of the authorities controlling a reserve money aggregate depends upon their ability to sterilize inflows of foreign exchange. As pointed out earlier, this may not only entail costs arising from the redistribution of credit but may also be limited by the lack of financial instruments, other than commercial bank reserves, available for sale by the central bank to mop up excess liquidity. This is a situation prevailing in many developing countries. Secondly, a "clean float" may in many circumstances be ruled out, either because a country is committed to membership in a currency union or another arrangement entailing long-term fixity of the exchange rate, or because some degree of official intervention seems justified--for instance, to avoid the inflationary effects of "overshooting." Under these conditions, there are often severe limits to the ability of the monetary authorities to control monetary aggregates, and ceilings on domestic credit rather than on such aggregates have therefore been chosen in the preponderance of cases.

4. The specification of fiscal policy

Fiscal policy--that is, the use of the government's budget to affect total domestic spending (absorption) and aggregate demand for domestically produced goods--was briefly discussed earlier in this section as an extension of the simple monetary model. In that context, a ceiling on the expansion of domestic credit to the public sector was derived in conjunction with the overall expansion of credit consistent with a balance of payments target and the targeted flow of credit to the private sector. Coupled with a limitation on external borrowing by the public sector, this yielded an effective limit on the size of the fiscal deficit. Thus in the simple financial programming framework fiscal policy played the role of constraining the government sector's demand for credit within an overall ceiling on total domestic credit expansion, taking into account the private sector's credit needs. In other words, fiscal policy was considered as an aspect of monetary policy and presumed to have no independent effects on aggregate demand and the balance of payments.

In reality, however, measures to reduce fiscal deficits are often of central importance in altering the level of aggregate demand and the current account balance, as well as influencing the current level and future growth of output. The supply-side effects are discussed in Section IV. With regard to demand-side effects, their interaction with the determinants of the demand for money, such as the price level and output, makes the setting of credit ceilings more complex. Although, the net effects of fiscal policy on aggregate demand are currently much debated in the academic literature, 1/ there are many instances in which it is readily apparent that large fiscal deficits have been the chief cause of both internal and external imbalances. Moreover, changes in these deficits may be the chief available means for offsetting changes in other components of aggregate demand (for instance, "fiscal sterilization" of an export boom through temporary increases in export taxes). For these reasons, changes in fiscal policy are often the key feature of adjustment programs.

Since total spending by domestic residents consists of the sum of spending by the public and private sectors, fiscal policy will affect total spending directly through the public sector's spending on goods and services and indirectly through the effects of both the expenditure and revenue sides of the public sector's budget on private spending. The direct and indirect effects on total spending of the expenditure side of the public sector's budget will be considered first, followed by the revenue side. 2/ A final subsection briefly discusses the interpretation of the fiscal deficit.

a. Public sector spending

In broad terms, spending by the public sector can be classified into spending on goods and services, transfer payments, and interest payments. It is useful to consider the effects of each of these on aggregate spending separately.

Public sector spending on currently-produced goods and services is itself a component of total domestic spending, and this, of course, represents its direct contribution to domestic absorption. If public sector purchases are devoted to domestically-produced goods that are not internationally tradable, they also represent an addition to aggregate demand for domestic goods. However, public sector imports and purchases of domestic goods that could have been sold abroad at the prevailing world price do not directly affect the aggregate demand for domestic goods.

1/ Some of the issues in these controversies are briefly discussed later in this subsection.

2/ Issues related to the composition of spending are taken up in Section IV in connection with supply-side policies.

Public sector spending on such traded goods contributes to a worsening of the trade balance while having no effect on real aggregate demand, or on such macroeconomic variables as real output and the domestic rate of inflation.

The indirect effects of public sector purchases have generated a considerable controversy, known as the "crowding out" debate. There are many channels through which an increase in public spending could have an indirect effect on private spending. At issue is the extent to which an increase in public spending reduces or increases private spending, thus resulting in an increase in total spending that differs from the original public sector spending increase. Several levels of such "crowding out" or "crowding in" can be distinguished. First, if the public sector buys goods and services in order to supply public goods that are substitutes or complements for goods purchased by the private sector, total private spending may be affected. 1/ Second, to the extent that the increased public spending gives rise to an equal tax liability for the private sector, either in the present through tax financing or in the future due to the need to retire public debt, current or future private disposable income would be reduced, and this would result in some reduction in private spending. 2/ Third, if the increased public spending results in a net increase in aggregate demand at original price and interest rate levels, domestic economic activity could increase, but this could lead to a reduction of private expenditures: for example, if domestic interest rates adjust upward immediately to maintain portfolio equilibrium with an increased demand for money, interest-sensitive components of aggregate demand would tend to fall, or, alternatively, if portfolio imbalances tend to persist, the excess demand for money may cause households to curtail current spending in order to accumulate cash balances. 3/ Even in the absence of the last-mentioned effect, the financing of the additional public expenditures could increase the cost or reduce the availability of financing for the private sector, depending on the financial structure of the economy and on the nature of the accompanying monetary policy. 4/

1/ For example, investment in infrastructure by the public sector may increase the productivity of the private capital stock at the margin, and thus stimulate additional private investment. Empirical evidence on this type of effect has been provided by Sundararajan and Thakur (1980) and Blejer and Khan (1984).

2/ This is known as the "Ricardian equivalence" proposition that was outlined in an important paper by Barro (1974). Many economists, however, (e.g., Buiter and Tobin (1979)), argue that the discount rates applied to future tax liabilities by the private sector are sufficiently large so as to make the effect on current spending fairly small.

3/ A number of models, for example, Khan and Knight (1981), (1982), introduce the real balance effect into spending decisions following the rationale provided by Archibald and Lipsey (1958).

4/ See, for example, Blinder and Solow (1974).

Finally, if nominal wages are flexible, or if the increase in public spending was foreseen at the time that currently prevailing nominal wage contracts were entered into, the domestic price level could rise sufficiently to reduce private spending by an amount equivalent to the increase in public spending, leaving no net change in total real aggregate demand. 1/ Clearly, the importance of each of these factors will be determined by the institutional characteristics and structural parameters of individual countries.

Transfer payments from the public to the domestic private sector do not represent a purchase of currently produced goods and services and thus have no direct effect on domestic absorption. They do, however, affect private disposable income and may thereby have an indirect effect on private spending. The amount of private spending induced by a transfer of a given size is likely to depend on the permanence of the transfer (temporary transfers are likely to be largely saved), the characteristics of the private sector recipient, which affect the marginal propensity to consume out of current income (including demographic factors such as age and household size), and the nature of the financial system (which will affect the extent to which recipients are likely to be liquidity-constrained). 2/

Finally, since interest payments by the public sector represent the purchase of a financial service, their effects on domestic absorption and aggregate demand are equivalent to those of public sector purchases of other goods and services. In particular, an increase in public sector interest payments on foreign debt with unchanged public spending on goods and nonfactor services would have no effect on aggregate demand for domestically-produced goods and services. 3/

In recent years a debate has arisen on whether the part of interest payments corresponding to the inflation rate has the same impact on aggregate demand as that part corresponding to real interest. This question is obviously of particular importance in high-inflation countries. It can be argued that the inflationary component of interest payments is equivalent to amortization of the public debt. Such amortization is usually not regarded as a government expenditure, since it is assumed that under normal circumstances the public reinvests in government debt at the same terms as before, leaving aggregate demand thereby unaffected.

1/ This "policy neutrality" result has come to be known as the Lucas-Sargent-Wallace (LSW) proposition, after the seminal papers by Lucas (1972) and Sargent and Wallace (1975).

2/ See Tobin and Dolde (1971).

3/ Assuming that these interest payments do not require actions, such as taxes or increases in the money supply, that affect private-sector behavior.

It is nevertheless doubtful, especially in circumstances of high inflation, that the inflationary component of interest payments is entirely neutral in its effect on aggregate demand, because of changes in the terms and "moneyness" of government debt that are likely to occur in such a situation, ^{1/} especially if acquisition of foreign assets is a feasible alternative to holding government debt.

b. Public sector revenues

For purposes of macroeconomic analysis, it is useful to subdivide the revenue side into two broad analytical categories; taxes collected from the private sector and transfers received from abroad.

Taxes collected from the private sector have the opposite macroeconomic impact of transfers paid to the private sector. Although domestic absorption is not directly affected, a tax increase should reduce private absorption indirectly by reducing private disposable income. The specific impact of taxes on economic incentives and income distribution is, of course, an important topic that is raised again in Section IV.1. It also bears mention that attempts to raise taxes beyond accustomed levels can lead to widespread evasion and transfer of various economic activities to black markets.

Transfers to the public sector from abroad also have no direct effect on domestic absorption, given public sector spending. To the extent that an expected future increase in such transfers causes the private sector to revise downward its estimate of its future tax liabilities, however, the perceived "permanent" disposable income of the private sector could rise and an indirect positive effect on domestic absorption would ensue.

The effects on real aggregate demand of changes in other items on the revenue side of the public sector budget can be derived by analogy to the cases of taxes and transfers from abroad. For example, an increase in the net income of public enterprises derived from an increase in their output prices acts like a tax on the private sector to the extent that output is sold domestically (e.g., public utilities and public transport) and like a transfer from abroad if that output is sold abroad (e.g., nationalized export industries).

c. Public sector deficit

The deficit of the public sector is frequently used as an indicator of changes in the fiscal stimulus to aggregate demand. The measure has considerable appeal, since increases in public spending on nontraded goods

^{1/} See the recent paper on "Inflation and the Measurement of Fiscal Deficits" (SM/86/53, 3/3/86).

and services and on transfers to the private sector simultaneously increase the fiscal deficit and aggregate demand, whereas increases in taxes on the private sector reduce both aggregate demand and the fiscal deficit.

However, it has long been recognized that the public sector deficit must be used with great caution as an indicator of the fiscal stimulus to aggregate demand and of the magnitude of the adjustment effort undertaken by a country in the course of a program of economic stabilization. ^{1/} In part this is because public sector purchases of goods and services have different impacts on aggregate demand from changes in taxes and transfers, so that the composition of the deficit matters, along with its size. In addition, of course, the endogeneity of tax receipts means that fiscal outcomes are only imperfectly controlled by the authorities. Perhaps just as important, though less familiar, is the observation that, in open economies, public sector spending on imports, payments of interest on foreign debt, and net transfers received from abroad may have a substantial impact on recorded fiscal deficits while (at least in the absence of discounting of future tax liabilities) leaving aggregate demand for domestic goods and services completely unaffected.

Furthermore, as indicated earlier, in an inflationary setting there are problems analyzing the effect on aggregate demand of the inflationary component of interest payments on the public debt. For high-inflation countries, the notion of an "operational deficit" that excludes this component has sometimes been proposed. While the conventional definition of the deficit, in this respect, also leads to inconsistencies--for instance, the size of the deficit may depend on the extent to which the public debt is held domestically or abroad--the operational deficit may seriously underestimate the monetary and aggregate-demand consequences of government financing operations. ^{2/} Regardless of the definition of the deficit, the total borrowing requirement, in nominal terms, does have to be financed and such financing does have to be monitored in a program to control the overall expansion of domestic credit.

The inexact correspondence between changes in the size of the public sector deficit and changes in the magnitude of the public sector's stimulus to aggregate demand explains why it may be insufficient, when aggregate demand is an intermediate policy target, to restrain public sector deficits from the "financing" side--i.e., through the imposition of subceilings on the expansion of credit to the public sector and of limitations on external borrowing by the public sector (Section II.3). Since the effects on aggregate demand of a public sector deficit of a given size

^{1/} See, for example, "Adjustment Program--Broad Design and Key Indicators" EBS/82/98 (June 1, 1982).

^{2/} See "Inflation and the Measurement of Fiscal Deficits," op. cit.

will vary depending on the composition of spending and revenues, decisions regarding the components of expenditures and revenues may also need to be geared to achieve the desired degree of restraint on aggregate demand.

IV. The Role of Supply-Side, Exchange Rate, and Debt Management Policies in Financial Programming

If the sole objective of a Fund-related adjustment program were simply to secure a short-run improvement in the balance of payments, then policies designed to control aggregate demand, such as the restraint of domestic credit expansion, would be sufficient in most instances. In fact, however, Fund-supported adjustment programs have a broader set of objectives, including the full and efficient utilization of existing productive capacity, the achievement of a balance of payments position that is sustainable over the medium term, and an improved long-term growth performance. Reliance on a single instrument, or even a set of policies that were exclusively directed toward demand management, would generally be inconsistent with the multiple objectives of programs. For these reasons, Fund-supported programs have increasingly included the use of a wide spectrum of policy instruments, as documented in the forthcoming paper on "Program Design and Performance Criteria."

The relationship between the demand management policies discussed in Section III and those to be discussed in this section was reviewed briefly in Section II. Essentially, the purpose of adjustment programs is to carry out needed corrections in the balance of payments while minimizing the adverse consequences for output of the reduction in absorption that such corrections may involve. As explained in Section II, this can be accomplished by expenditure-switching policies that increase foreign and domestic demand for domestically produced goods and services, but these policies may also have to be accompanied by structural adjustments that enable the new mix of output to be forthcoming. Expenditure-reducing policies may themselves contain a component of structural improvement, such as a shift in resources from the public sector to the private sector. Nevertheless, to fully exploit the capacity of the economy to expand output, there will normally be a need to take other policy measures that alter the incentives offered to the private sector (and also guidelines for decision making in the public sector) so as to induce a more efficient utilization of existing resources, as well as a better quality and higher level of new investment. These policies are discussed in subsection 1.

A major policy instrument in switching of expenditure from foreign to domestic output and inducing the required reallocation of resources is exchange rate policy. Because the exchange rate is a major price in the economy, a change in the rate influences macroeconomic as well as microeconomic variables, and exchange rate adjustments must be carefully planned to harmonize with other policy measures. In some countries, a

basic decision to retain fixed exchange rates places a greater burden on other policy instruments to achieve required adjustments. In countries willing to carry out exchange rate changes, determining the proper extent of a change and estimating its effect on prices and the balance of payments adds considerable complexity to the financial programming exercise. These topics are discussed in subsection 2.

Increasingly, even adjustment programs with a time horizon of only one to two years are carried out with an awareness of their medium-term implications. This has become a feature of Fund-supported programs since the widespread external payments crises of 1982-83. As a result, a strategy for medium-term external debt is a necessary foundation for setting external financing targets (ΔFI in equations (3.9)-(3.13)) in the context of a financial programming exercise. The concern here is that foreign borrowing not exceed amounts that are sustainable in the medium term. These considerations are reviewed in subsection 3.

1. Supply-side policies

Supply-side policies may be defined generally as "measures designed to increase directly the incentive or ability of the domestic productive sector to supply real goods and services at a given level of aggregate nominal domestic demand." ^{1/} As explained in Section II, the growth of domestic output is not only itself a central objective of economic policy but will also lead to an improvement in the current account of the balance of payments. In the medium term, an adequate rate of growth of domestic output, and especially of exports, is in many cases a crucial element in reducing the relative burden of external debt and eventually achieving a viable external position.

Supply-oriented policies can take a wide variety of specific forms depending on the economy in question and the types of problems faced by the domestic productive sector. However, they may be categorized under two broad headings. First, there are policies to increase the current level of domestic output by improving the efficiency with which labor, capital, and other scarce resources are allocated among competing uses. This category includes measures to reduce distortions that drive a wedge between prices and marginal costs; such distortions may include exchange rate rigidities, price controls, imperfect competition, taxes, subsidies, and trade restrictions.

The second category of supply-oriented policies consists of all those measures that seek to directly stimulate economic growth. Under this heading would fall incentives to raise the rate of fixed capital formation in the domestic economy and to increase the rate of return to such capital,

^{1/} "Supply-Oriented Adjustment Policies," SM/81/78 (April 6, 1981).

choice of the optimum set of public sector investments, the expansion of education and manpower training programs, and the stimulation of technological innovation. In contrast to measures in the first category, which are designed to improve the static efficiency of resource allocation, these policies are intended to increase the rate of growth over the medium term. Nevertheless, because many of the measures of the first type also affect the efficiency of investment as well as the efficiency of resource allocation, there is a substantial overlap between the two categories.

a. Measures to improve resource allocation

In recent years, countries undertaking Fund-supported adjustment programs have faced multiple supply-side problems, many of which have required detailed attention at the microeconomic level. As a result, Fund programs have given increased emphasis to supply enhancement over this period, as reflected in the annual reviews of Fund-supported adjustment programs undertaken by the staff (see, for example, "Upper Credit Tranche Stand-By and Extended Arrangements Approved in 1981," EBS/83/216 (October 4, 1983) and "Experience with Adjustment Programs," EBS/84/228 (November 13, 1984)). While the problems that give rise to an inefficient allocation of resources tend to be both microeconomic in character and country-specific, the evidence surveyed in these papers suggests that in the case of developing countries misallocation of resources typically stems from one or more of the broad problem areas discussed below. ^{1/} It will be evident that a number of the policies mentioned influence both the efficiency with which existing resources are utilized and the rate of return to new investments. Indeed, these outcomes are interrelated, as the rate of return on new investment may improve with better utilization of the existing capital utilization.

(1) Inadequate infrastructure. This problem has been found to be characteristic of low-income economies generally, and experience with Fund programs suggests that it tends to be most prevalent in countries where public management of infrastructure has been inefficient or misdirected. ^{2/} This problem is, of course, inherent at low levels of

^{1/} Since the exchange rate is one of the most important prices in the economy, inappropriate exchange rate levels can result in several and pervasive distortions in resource allocation, particularly between the traded and nontraded goods sectors. This topic is taken up below in Section IV.2.

^{2/} A general discussion of this problem is to be found in the annual reviews of Fund programs. See, for example, the two Fund staff papers cited in the previous paragraph.

development, but can be exacerbated by wasteful use of government investment resources (including a tendency to neglect the rural sector) and by failure to make provision for the additional current outlays required to maintain new infrastructural investments. Improvements in this area include more careful budgetary planning, based on cost-benefit calculations (government expenditure issues are further discussed below). This is an area in which collaboration with the World Bank is important.

(2) Dependence upon one or two export products. Specialization in production is essential in order for a country to reap the gains from international trade along the lines of comparative advantage. Nevertheless, in a dynamic setting a narrow concentration on one or a few exportables may make a country excessively vulnerable to shifts in external market conditions and in its terms of trade. Policies to encourage export diversification include, above all, maintaining an appropriate exchange rate, freeing domestic prices, and minimizing import protection (which tends to direct resources to the import-substituting sector rather than exports). In addition, special tax incentives and other types of government assistance may be necessary to give additional impetus to new exports at initial stages of diversification, but should eventually be removed once these new activities are established in order to allow them to become fully competitive in world markets.

(3) Barriers to imports and foreign payments. Tariffs, quotas, and other trade and payments restrictions reduce the levels of trade and specialization, and tend to foster the development of import-substitute industries that often fail to attain the degree of efficiency and flexibility shown by firms that are continuously exposed to international competition. At the same time, as just mentioned, such policies tend indirectly to hinder export diversification. 1/

(4) Price controls. These fall into two categories. First, there are those controls associated with the output of public sector enterprises. In many developing countries, such enterprises produce a wide range of goods and services--such as energy, transportation and distribution 2/--that are important elements of domestic private sector consumption. Pricing such output at less than its market clearing level results in a gain to consumers of the output but reduces the incentives to produce it domestically, raises imports, and directly increases the fiscal deficit of the consolidated public sector. Similarly, to the extent that public sector industries produce inputs to the production of the domestic private sector, underpricing of such inputs may artificially

1/ See Edwards (1984) and Krueger (1985) for a discussion of the pros and cons of liberalization policies involving tariff reductions.

2/ Notably, the marketing of basic foodstuffs, both locally produced and imported.

raise the profitability of certain sectors, providing false signals as to the areas of the economy that should receive emphasis in the overall development strategy. While the raising of administered prices is expected to yield significant gains for the economy in the medium to long run, this has to be balanced against the likelihood that the policy is likely to increase prices in the short run.

One particularly important instance of this problem concerns agricultural pricing. In many countries, food products are directly subsidized, and marketing boards pay domestic producers significantly less than the world market prices for their output. Such policies are frequently undertaken as a direct means of altering the distribution of income in the economy, particularly to increase the per capita consumption of low-income groups. However, food subsidies are seldom an efficient means of redistributing income. In addition, uncompetitive prices for food products reduce domestic production, thereby increasing imports. As a result, subsidization of food products may both increase net imports of food products and impose a direct drain on the fiscal budget.

In addition, governments often try to impose controls over certain goods and services produced by the private sector. This is sometimes administered by channeling sales, or a part of sales, through state-controlled retail outlets. Quite aside from the price distortions created, the attempt to control prices can also lead to fiscal burdens, as the prices required to induce the needed supply from local producers (or to pay for imports) may diverge from the prices offered to consumers. A somewhat less harmful version of these controls is to impose limits on the margins of wholesalers and retailers. There may also be circumstances, such as an all-out effort to bring a hyperinflation to a stop, in which an across-the-board price freeze can serve a useful purpose for a limited period. Beyond such a period, however, if imposed prices move far out of line with underlying cost-price relationships, the development of widespread black markets becomes inevitable.

(5) Real wage increases in excess of productivity growth.

Excessive wage increases in key sectors can exert a strong negative effect over time on profitability and external competitiveness. Not infrequently this problem originates within the public sector, which, by acting as residual employer, pushes wages above levels consistent with high employment in the private sector. Wage policies in the public sector therefore not only have important implications for the control of government expenditure but also for the growth of the private sector.

(6) Tax policy. The pattern of taxation in developing countries has generally tended to evolve in ways that favor ease of securing revenues rather than incentives to efficient resource allocation. Exports, imports, certain types of agricultural production, the financial sector, and salary/wage employment (especially in the public sector) have traditionally been the most accessible sources of revenue, while other sectors--

such as trade, services, and small-scale manufacturing--have tended in practice to be more lightly taxed. The tax systems in many developing countries have therefore tended to foster a bias against producers of exports, marketable agricultural goods, import-intensive activities, large-scale enterprises, and the "organized" or "formal" sector generally. This bias has had the effect, inter alia, of discouraging investment in these areas. One of the most difficult tasks in structural reform of an economy is to revise the tax system so as to remove such unwanted disincentives, while at the same time avoiding a weakening of the tax base. In general, such an effort requires both a strengthening of tax administration and considerable political fortitude on the part of the authorities who must contend with groups whose tax burden has increased as a result of the reform.

(7) Allocation of government expenditure. Although already mentioned in other connections, the allocation of government expenditure needs to be examined as such. In all countries, spending programs evolve in a piecemeal manner, often without careful comparison of the relative priorities of these programs. A period of fiscal retrenchment provides an appropriate opportunity to re-examine these priorities. In particular, scrutiny needs to be focused on the allocation of the budget between current and capital spending, and, within current spending, the amounts going to "human infrastructure" or the upkeep of physical investments, as compared to less productive expenditures on consumption subsidies, subsidies of public enterprises (whose public-sector status might also bear re-examination), the government wage and salary bill (prompting a focus on the efficiency of government employment), and other categories of unproductive expenditures (such as national security).

The above list indicates the broad categories of price and allocative distortions that have been most frequently encountered in countries seeking adjustment programs with the Fund. Because of the need of these countries to generate more foreign exchange earnings, the need for structural adjustment has often been linked to whether a country has been pursuing an "inward-oriented" or an "outward-oriented" development strategy. The latter is defined as a development strategy in which the authorities refrain from creating artificial incentives to firms to produce and sell in the domestic market rather than in export markets. 1/

1/ In an empirical paper covering 28 developing economies, Balassa (1982) found that countries with outward-oriented development policies tended to exhibit better export performance and economic growth as compared with countries that followed inward-oriented development strategies. Balassa attributed this better performance partly to the fact that firms in countries pursuing outward-oriented strategies are exposed to foreign competition and thereby gain experience in altering product composition in response to shifts in foreign demand and changes in external competitiveness. Thus, the national economy exhibits greater flexibility than

The attractiveness of policies designed to improve the efficiency of resource allocation lies in the fact that such measures can potentially increase output that can be produced from a given stock of resources without necessarily lowering the level of current consumption. Nevertheless, attempts to eliminate major distortions present a number of practical difficulties that must be recognized. First, if capital and labor are not mobile among different sectors of the economy, major changes in the pattern of resource allocations may necessitate an extended period of adjustment during which some factors, in particular labor, may be unemployed. Second, many government policies that create distortions could be designed to achieve objectives other than economic efficiency, and have been implemented in full knowledge of their likely effect on economic efficiency and resource allocation. These policies--including employment programs, consumer subsidies, price controls on essential commodities, and restrictions on imports of luxury goods--often have significant distributional, and therefore political, implications, which must be taken into account when advocating changes that are based purely on efficiency grounds. ^{1/} Finally, the theory of second best suggests that if a country has a number of significant distortions, the elimination of only some of them will not necessarily result in an immediate gain in efficiency. This consideration, however, should not stand in the way of a long-run program to eliminate these distortions.

b. Policies to increase the rate of economic growth

Fund-supported adjustment programs place considerable emphasis on achieving external adjustment through policies that will ensure a satisfactory rate of economic growth over the longer term. Beyond the short term, when a considerable increase in output can be achieved through more efficient and fuller utilization of existing resources, economic growth over the long term also requires an increase in productive capacity. This can come about through both a higher rate of investment and the choice of investments that yield a higher rate of return to capital.

(1) Increasing the rate of investment. In general, the goal of stimulating higher levels of investment, and thus higher output growth, has been implemented via measures to increase domestic savings. ^{2/} There

^{1/} (Cont'd from p. 57) is the case in countries with an inward orientation, where limited competition within the domestic market gives firms less incentive to control costs or to innovate. The case studies contained in Krueger and others (1981) generally bear this out. The adoption of appropriate exchange rate policies is obviously an issue of concern in this area as well; it is discussed in detail in Section IV.2.

^{1/} See, again, IMF Fiscal Affairs Department (1986).

^{2/} The Fund collaborates closely with the World Bank in evaluating the investment strategy of the country, but its concern remains at the macro-economic level.

is now a general consensus that investment in developing countries is constrained by the availability of savings, thereby giving policies that favor public and private savings a special importance in adjustment programs. On the public sector side, this involves steps to improve the fiscal position, while in the case of private savings the concentration has been on interest rate policy.

In Fund programs, interest rate policy is regarded as having a major influence not only on short-run adjustments of spending, inflation, and external payments but also on the longer-term accumulation of financial wealth and the level and composition of investment. ^{1/} The basic theory underlying interest rate policy as a means of increasing savings and investment can be illustrated using a simple diagrammatic analysis. In Chart 2, where the horizontal axis measures real private savings and investment and the vertical axis measures the real return on saving and the real cost of capital, the volume of investment (I) is assumed to be negatively related to the cost of capital (r). The total supply of funds available to finance domestic investment consists of domestic saving S_D plus foreign saving, $S_F (= \Delta FIp)$. The horizontal sum of saving from the two sources, $(S_D + S_F)$, is assumed to be an upward-sloping function of the real return. ^{2/} Both the investment and saving curves are drawn for a constant level of real income.

Suppose that, as a result of a combination of domestic inflation and ceilings on interest rates, the real return on savings is initially equal to r_0 . At this interest rate, the supply of savings that is available to domestic private investors from both domestic and foreign sources is equal to OD, while the desired demand for savings by private investors is equal to OC. Since the amount of private capital formation that can actually be undertaken is constrained by the supply of savings, the interest rate ceilings imply that the economy will be continuously at point A, where the actual level of fixed capital formation is equal to the amount of savings that is available at that interest rate, and there is a continuous excess demand for investment funds equal to DC. Domestic savings are equal to OF, and the private sector's current account deficit is equal to FD. If interest rate ceilings were eliminated, the equilibrium in the domestic market for savings would occur at some real interest rate r_e above r_0 and, to the extent that the supply of either domestic or foreign savings is interest-elastic, ex ante saving would increase. The new equilibrium at E would involve both a higher real domestic interest

^{1/} This view is generally referred to as the McKinnon-Shaw hypothesis. See McKinnon (1973). For a general discussion of this issue, see, IMF Research Department (1983).

^{2/} Even if domestic savings are unresponsive to the rate of interest, as is sometimes asserted, the economy could obtain a larger proportion of world savings and thus increase total savings ($S = S_D + S_F$).

rate, r_e , and a higher equilibrium level of both savings and private sector investment, OH. The private sector's current account deficit would rise from FD to GH, but this larger deficit is now a reflection of a higher level of private domestic investment, financed by foreign capital inflows, rather than a low rate of savings. This analysis suggests that elimination of distortions in the market for financial savings would be expected to yield significant gains in terms of a higher rate of domestic private fixed capital formation, and therefore a more rapid rate of growth of capacity output.

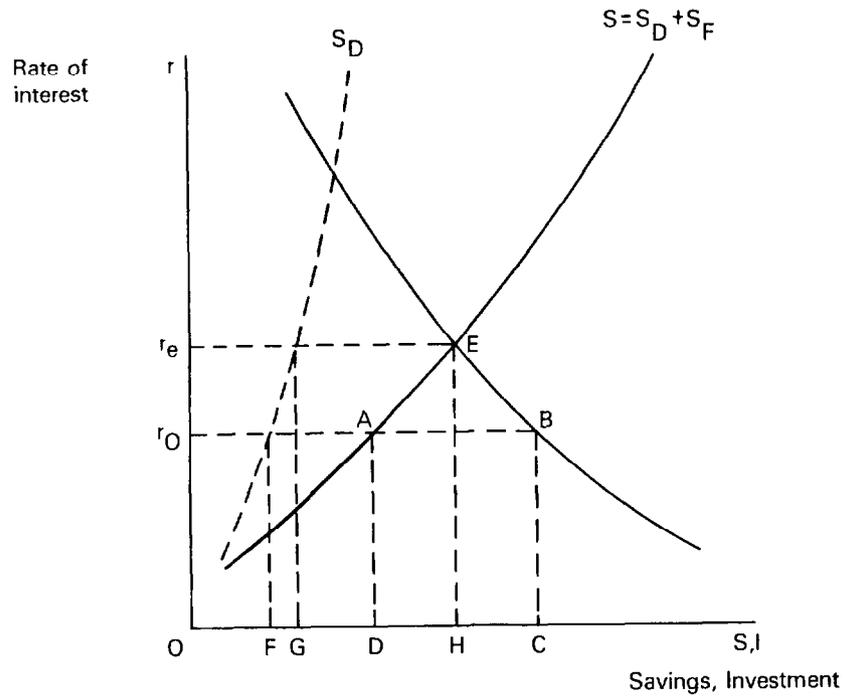
Fund members have adopted a broad spectrum of policies relating to the control of interest rates and the regulation and supervision of their financial systems. While some members have recently been reducing regulations in the financial system and have begun to rely on market-determined interest rates to clear financial markets, others have established extensive controls on interest rates and other aspects of financial market behavior. These restrictions have been motivated by a variety of factors including the desire to influence the flow of credit amongst sectors of the economy and the concern that market-determined interest rates would tend to produce serious imperfections. For example, it has been argued that such imperfections would arise because domestic financial markets are "thin" in the sense that they have an oligopolistic or monopolistic structure. In this situation, freeing interest rates from controls would lead to sharply higher loan rates that would increase the cost of capital and thereby discourage investment. Moreover, high nominal interest rates would also increase the cost of servicing government debt. There could also be adverse effects on the distribution of income, especially if holdings of financial instruments are narrowly distributed.

In many cases, such controls have resulted in highly negative real rates of interest--defined as the nominal interest rate adjusted for anticipated inflation--on domestic financial instruments for extended periods, at least in regulated financial markets. ^{1/} In such instances, the real holdings of domestic financial assets have often grown less rapidly than the real economy, and capital flight has tended to be a serious problem. ^{2/} As shown in Chart 1, when such developments occur, they can severely restrict the availability of real credit and thereby inhibit investment. Since available credits are often first allocated to large enterprises, credits for small and medium-sized firms may be severely rationed, even though their investments may yield a higher rate of return. To increase the availability of real credit, interest-rate policy could be used to encourage the accumulation of domestic

^{1/} Under such circumstances, real interest rates in curb markets are likely to be positive.

^{2/} Some evidence on these phenomena is contained in IMF Research Department (1983).

CHART 2
EFFECTS OF INTEREST-RATE POLICY ON
PRIVATE SAVINGS AND INVESTMENT





financial assets by offering holders of these assets a sufficiently attractive return. At the same time, other structural reforms could be undertaken to increase the efficiency of the financial system. 1/

The above considerations indicate why raising real interest rates on domestic financial instruments is a key element in Fund-supported adjustment programs. In setting the level of nominal interest rates, considerable judgment must therefore be exercised regarding the future course of inflation during the program. Nonetheless, establishing the perception that holders of domestic financial instruments will earn positive real returns that are to some degree competitive with the real yields that can be obtained on comparable foreign instruments appears to be a vital element in promoting balance of payments adjustment, preventing capital flight, and strengthening domestic savings. If such a return is paid to holders of domestic deposits, however, then loan rates must also be set at a level sufficient to ensure that efficient financial institutions, both private and state-owned, at least cover their operating costs. The spreads between lending and deposit rates tend to be relatively large in most developing countries for a variety of reasons, including high required reserve ratios, a limited degree of competition in the financial system, low productive efficiency of financial institutions, and selective credit and interest controls that require these institutions to undertake a substantial amount of concessionary lending. Financial reforms that reduce reserve ratios or lead to greater efficiency in the financial system can help reduce these spreads.

Any changes in interest rates and other financial reforms must be coordinated with the other policy actions that are a part of the stabilization program. The experiences of a number of developing countries with financial reforms suggests that this coordination is especially important during the early phases of the stabilization program. In particular, certain combinations of policies can potentially be a source of instability for a financial system undergoing major structural change. For example, if a large fiscal deficit is being financed through extensive issuance

1/ Perhaps the best-known example of the beneficial effects of freeing interest rates is the major reform of Korea's financial system which took place in September 1965. Interest rates on time deposits were doubled (to 30 percent per year on new 18-month time deposits and bank lending rates, although subsidized, were also raised from 16 percent to 26 percent per year; see Harris (1985)). This reform was among the factors responsible for a jump in the domestic saving rate and rate of fixed capital formation in Korea allowing it to achieve a real growth rate on the order of 10 percent per annum over the subsequent decade. Real domestic saving as a proportion of GNP more than doubled from 7.5 percent in 1964 to 17.5 percent in 1969.

of central bank credit to the government, then there is likely to be little scope for interest rate policy or a financial reform program. ^{1/} The rapid monetary growth and inflation that would be associated with such a fiscal deficit could potentially lead to sharp changes in the flows of funds in and out of the financial system as well as between different types of financial institutions. Until the fiscal accounts can be brought under control, major financial reforms may best be deferred. ^{2/}

Interest rate policy would also have to be coordinated with exchange rate policy in order to avoid problems with capital flows. Although many member countries have restrictions on external capital movements, holdings of foreign assets and liabilities have nonetheless become important components of resident portfolios in a number of these countries since the 1970s. Moreover, while the linkages between domestic and international financial markets are often imperfect, significant differences in the perceived yields on domestic and foreign instruments have at times stimulated periods of capital inflows or capital flight. In this context, the relevant yield on foreign instruments would equal the foreign interest rate adjustment for anticipated changes in the exchange rate between the domestic currency and the currency in which the foreign instrument is denominated. Interest rate and exchange rate policies therefore have the potential to sharply alter the relative yields on domestic and foreign financial instruments. For example, the initial phase of a stabilization program could involve an increase in domestic interest rates (e.g., to stimulate savings) and a significant depreciation of the exchange rate (e.g., to improve the current account balance). If the initial exchange rate depreciation is viewed as reducing or eliminating the need for further exchange rate adjustments, then these interest rate and exchange rate changes may make domestic assets quite attractive relative to foreign assets and make foreign credits appear relatively less expensive. The resulting capital inflows (which could involve repatriation of holdings of foreign assets by domestic residents) could result in a significant expansion of reserve money as the central bank intervenes to maintain the exchange rate. Such monetary growth could create strong inflationary pressure, which could seriously destabilize any financial reform (see Section III.3.c).

^{1/} Except perhaps to establish interest rates that compensate holders of domestic financial assets for inflation.

^{2/} For example, concurrently with the financial reform the Korean authorities also undertook a fiscal reform. This resulted in fiscal surpluses, which rose from 20 percent of national savings in 1965 to over 40 percent by 1971. See Harris (1985). The inability to control fiscal deficits is often considered one of the more important factors that resulted in a failure of the liberalization experiments, particularly in Argentina. See Sjaastad (1983).

While these potential problems make specifying the initial increase in interest rates a difficult issue, they should not be viewed as justification for maintaining highly negative real yields on domestic financial instruments and an inefficient financial system. Although circumstances at the beginning of a Fund program may warrant a sharp increase in administered interest rates, an excessive increase in rates could affect investment and create problems with capital flows. In such a situation, it may be useful to adjust interest rates to the rate of inflation that is anticipated to prevail as the new stabilization and financial reform policies take hold rather than the current rate of inflation. For this to be successful, however, the public would have to believe that the authorities were committed to carrying out a program based on realistic objectives. If such a perception were established, then the maintenance of positive real yields on domestic financial instruments would strengthen domestic savings and the financial system.

(2) Increasing the return to investment. There has been a retrenchment of public sector investment accompanying the adjustment measures undertaken by a number of Fund members since 1982. This process has led governments to look more carefully at their public sector investment programs and, in doing so, discovering that much past investment has not yielded returns commensurate with the cost of borrowing (often external borrowing) to finance it. A more careful evaluation and choice of public sector investment is an essential part of a strategy to raise the rate of return on new capital formation in the economy as a whole.

As for private sector investment, one important policy measure to encourage a careful choice of investments is the maintenance of positive real interest rates that adequately reflect real rates of return. Artificially low interest rates not only create an inflated demand for borrowed funds but also dilute the process of using the going rate of interest as a benchmark against which entrepreneurs can assess whether a possible investment is worth undertaking. If nominal interest rates are lower than the expected rate of inflation, investment is likely to take relatively unproductive forms, such as real estate development and the buildup of inventories, which are regarded as good hedges against inflation.

Another important element in an economic environment to encourage efficient investment is maintaining a set of relative costs and prices that represent real underlying scarcities: included in this, of course, would be an exchange rate that reflects the true underlying cost of foreign exchange. In this respect, policies to encourage efficient investment are the same as those enumerated in the preceding subsection to encourage efficient allocation of existing productive capacity. It may also be noted in this connection that high rates of inflation, which tend to lead to greater variations in relative prices and higher risk premiums (owing to greater uncertainty) than do low rates of inflation, serve over the long run to undermine rational investment choices.

c. Supply-side policies and the period of adjustment

Whatever the supply-oriented measures that are being implemented in the context of a Fund-supported adjustment program, substantial time may be needed for such policies to show results. Major shifts in resource allocation may entail a significant rise in fixed capital formation in expanding sectors, combined with the release of capital and labor from contracting sectors. It is difficult for such major adjustments to occur smoothly without a short-term impact on the level of output and employment. In addition, in developing countries the goal of achieving more efficient resource allocation may often conflict with that of reducing the current account deficit in the short run. Since developing countries import a large proportion of capital goods, programs that place a greater emphasis on the supply-oriented measures frequently take a different view about the objectives regarding the current account in the early years of the adjustment program than do programs that aim primarily at controlling excess aggregate domestic demand. In particular, to the extent that major adjustments in aggregate domestic supply require an initial rise in the level of domestic investment, reductions in current account deficits are not necessarily sought in the early years of programs. In these cases, adjustment programs have on occasion allowed for an initial increase in the current account deficit to reflect higher imports of essential inputs and investment goods. This would be necessary, for example, where a rise in export processing activity is being planned and an initial increase in imports must be financed before the corresponding export earnings are realized.

These considerations also influence, and are influenced by, the relative importance in the program of improving the growth rate of output over the medium term. Although measures to improve output from currently available resources may also take time to achieve results, those to generate growth in usable productive capacity may take even longer. While the results of these first type of measure to some extent provide breathing space until the second type takes hold (see Section II.4), it is nevertheless true that a program with a strong growth orientation may also involve larger amounts of financing over a longer period than a program in which a shorter time horizon is appropriate.

2. Exchange rate policies

As was pointed out in Section III, in the simple financial programming framework the exchange rate played only an indirect role through the effects on the demand for money. A depreciation of the currency from a fixed rate would create an excess demand for real cash balances, and this in turn would result in a decline in real absorption. Devaluation is therefore only an expenditure-reducing policy in this simple framework. At the same time, however, exchange rate adjustment is also an expenditure-switching policy, influencing the composition of domestic expenditure

between foreign and domestic goods (see Section II). The expenditure-switching effect of an exchange rate change operates principally through altering the incentives that are offered with regard to domestic supply of exports and import substitutes and domestic expenditure on imports and exportable goods. Such incentives depend on the prices of tradable goods in terms of domestic currency, relative to domestic costs (wages, raw materials, and other input costs), and to the domestic prices of nontradable goods. Thus any comprehensive analysis of exchange rate policies has to take into account the effects of a devaluation both on absorption, and, through changing incentives, on aggregate supply.

This section first discusses the availability of exchange rate adjustment as a policy instrument. It then summarizes how devaluation is theoretically expected to affect both aggregate demand and aggregate supply. The final two subsections discuss issues related to determining the extent of the exchange rate adjustment and to estimating the impact of exchange rate policy.

a. Availability of exchange rate adjustment
as a policy instrument

A long-standing debate in the economic literature concerns the proposition that the easiest and most logical means for dealing with an external imbalance that can (or should) no longer be financed is to allow the exchange rate for the domestic currency to be determined in the market, i.e., to float. ^{1/} Against this proposition it has been argued that for the currencies of many developing countries foreign exchange markets are too thin to prevent excessive volatility of exchange rate movements and that for small open economies a reasonable degree of exchange rate stability is a necessary condition for financial stability generally. ^{2/} Ever since the onset of generalized floating of major currencies in 1973, the Fund has not taken a rigid view as to the exchange arrangement adopted by a member, so long as timely measures of a non-restrictive nature are taken to maintain the needed degree of international competitiveness of the traded goods sector.

In determining the proper role for exchange rate adjustment in a particular adjustment or stabilization program, the special characteristics of the member country need to be taken into account. Countries that are members of a currency union or have a strong tradition of maintaining a fixed link with another currency will generally choose to use policy instruments other than the exchange rate to carry out necessary adjustments, often with negative effects both on the speed of adjustment and the cost of adjustment in terms of lost output. It may nevertheless be felt that the long-term advantages of the currency union or fixed currency

^{1/} See Friedman (1953) for the classic statement of this argument.

^{2/} See Black (1976).

peg outweigh these costs of adjustment. Another type of country where exchange rate adjustments may be regarded as running counter to the established policy framework is the centrally planned economy, where the tendency is to deal with internal or external imbalances through revisions in the plan, rather than through changes in price incentives to producers and consumers. In this instance, the emphasis finally laid upon exchange rate policy reflects the willingness of the authorities to modify the system of economic management in favor of one relying more on decentralized decision making and price incentives.

At the other extreme from countries with an established tradition of fixed exchange rates are high-inflation countries where continual exchange rate adjustment is built into the economic system. Indeed, exchange rate changes can be regarded in some cases as merely a particular type of indexation. For these countries, the key decision is at what rate the domestic currency should be depreciated; this depends on a number of considerations, especially the policies being simultaneously carried out with respect to the interest rate, fiscal policy, and domestic credit expansion.

In between these extremes are countries with varying degrees of exchange rate flexibility. Closely related to the degree of exchange rate flexibility are varying degrees of willingness on the part of the monetary authorities to permit prices and trade flows to be determined by market processes. A country whose authorities are reluctant to use exchange rate adjustments as an expenditure-switching device have at their disposal only two types of options to influence the relative prices of domestic and foreign goods: government intervention in the exchange and trade system, and demand management policy. Both these alternatives are in most circumstances inferior to exchange rate adjustments: the first, because unless very carefully administered it leads to distorted prices among traded goods, and the second, because bringing down the price level, or lowering the rate of inflation, can be a slow and difficult process that may entail costs of reduced output and employment. Yet in a number of countries fixed exchange rates, whether inside or outside a currency union, are seen as yielding large benefits in terms of such factors as investment confidence, avoidance of capital flight, encouragement of foreign trade, and provision of a stabilizing influence on domestic demand management policies. In a related case, where an effort is being made to bring a high rate of inflation to a halt through currency reform and related measures, fixing the exchange rate for a specified period may be necessary to support temporary general freezes on prices and wages.

For countries that are members of currency unions, the use of exchange rate adjustment as a policy instrument is literally not considered as an option, except on the rare occasion when membership in the currency union is itself being reconsidered. In certain other countries, however, exchange rate adjustments may be complicated by what might be described as

involuntary de facto membership in a currency union, namely through "currency substitution," or the widespread use of foreign currency (or other forms of money) as a payments and accounting medium for domestic transactions. Currency substitution can create serious problems of monetary control and in other ways also complicate the formulation of adjustment policies. 1/

b. Analytical aspects of exchange rate policies

The main theoretical aspects of devaluation have been discussed at considerable length in the literature, 2/ and for the case of a small country that cannot alter its terms of trade, a graphical analysis adapted from Khan and Knight (1982) can be used to illustrate both the demand-side and supply-side effects of exchange rate adjustments.

In Chart 3 the vertical axis measures the domestic currency price of output, P , while the horizontal axis measures the quantity of real output demanded and supplied by domestic residents, Y . The S_L curve represents the amount of real output that domestic producers would be willing to supply in the long run at each price level given their existing stock of capital, labor and other factors of production. 3/ Real domestic demand, D , is a downward-sloping function, reflecting the fact that an increase in the price of output reduces the real values of both factor incomes and financial assets. 4/ With the world price level (in domestic currency) equal to $P_0 (=e_0 P_F)$, the country produces S_0 and aggregate domestic demand is D_0 , so that there is excess real aggregate domestic demand equal to $D_0 - S_0$ and a current account deficit equal to $P_0(D_0 - S_0)$ in terms of domestic currency and $(P_0/e_0)(D_0 - S_0)$ in terms of foreign currency. The devaluation increases the world price level, in domestic currency terms, to P_1 . The main demand-side effects are a reduction in real wealth and expenditure owing to the fall in the real value of financial assets, an increase in the domestic price of tradable goods, and a reduction in real wages. For these reasons, devaluation decreases domestic demand in Chart 3 to a point like C. This move to C thus represents the expenditure-reducing effect of devaluation.

1/ See Ramirez-Rojas (1985).

2/ See, for example, Guitian (1976), Johnson (1976), Dornbusch (1981), and Donovan (1981). An extended analysis is contained in "Exchange Rate Policies in Developing Countries," SM/82/8 (January 11, 1982).

3/ Since the model is static and neglects capital accumulation, the "long-run" supply curve is assumed to be vertical.

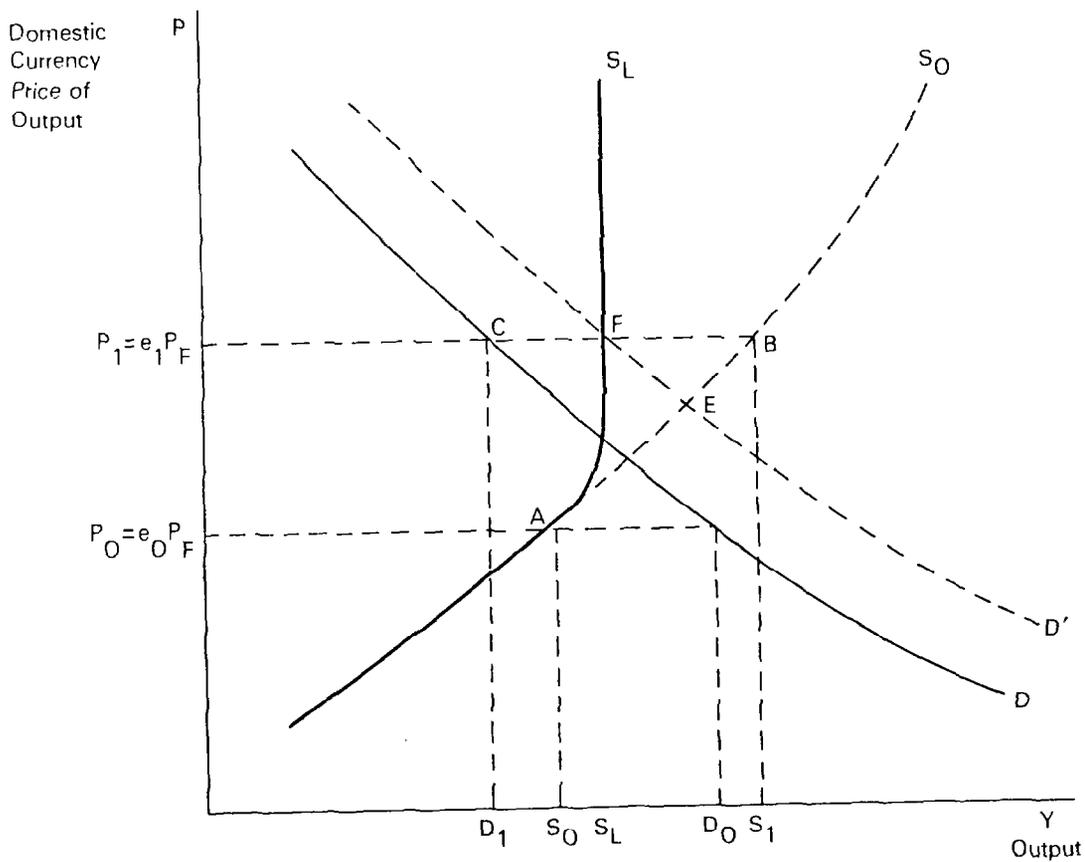
4/ Total (domestic plus foreign) demand for domestic output becomes perfectly elastic at the world price level P_0 , reflecting the assumption that the country has only a negligible effect on prices prevailing in world markets and cannot alter its external terms of trade.

On the supply side, however, the effects of the devaluation tend to be expansionary. To the extent that the prices of domestic labor, land and capital rise less than proportionately to the domestic currency price of final output in the short run, devaluation has a temporary stimulative impact on aggregate supply, and real output initially rises along the short-run supply curve, S_0 . In this case, both the aggregate demand and aggregate supply effects of the devaluation tend to reduce excess domestic absorption and the payments deficit. Since foreign demand for domestic output is infinitely elastic at the price level P_1 , the short-run effect of the devaluation in the example of Chart 3 is to turn the current account (in real terms) from an initial deficit of $D_0 - S_0$ to a surplus of $S_1 - D_1$. Over time, as nominal factor prices gradually rise, output will tend to move back toward its equilibrium level on the long-run supply curve, S_L . At the same time, the gradual rise in real factor incomes, together with the increase in financial assets resulting from the payments surplus, will cause aggregate real domestic demand to shift gradually outward toward the long-run curve D' , reducing the excess supply of domestic goods and the current account surplus. As a result of these changes in demand and supply, the effects of devaluation on the current account will gradually diminish, until the two curves intersect at point F, where demand-supply balance exists in the domestic economy and the current account is in equilibrium, albeit at a higher price level.

The above analysis is, of course, standard, and it is perhaps useful to describe in some detail the role of price incentives, as they are such a crucial part of the adjustment process. It is often argued with respect to developing countries, that for certain kinds of exports or import-substituting production, relative prices are not important, at least not in the short run. For example, it is sometimes maintained that where the prices of an agricultural export sector are controlled by the government and where the quantities produced are either invariant in the short run or in the longer run are limited by factors of production that are in fixed supply, a change in the exchange rate has no effect on exports. ^{1/} While it is true that increased production of certain commodities may require additional inputs (e.g; water through irrigation) that cannot be provided by the producers themselves, this in no way changes the conclusion that decisions (by either government or private individuals) regarding the desirable level of production cannot be made without the relevant decision makers being faced by a set of relative prices that reflect the true economic costs and returns to the society. As for the issue of government price controls, the government itself cannot be indifferent to a misalignment of tradables' and nontradables' prices that requires a growing subsidy to (or declining revenue from) producers; a fall in the relative domestic price of exports (owing, for instance, to domestic inflation and a fixed exchange rate) will eventually force the government to pass on a part of the price change to producers, who may

^{1/} See Bond (1983).

CHART 3
EFFECTS OF A DEVALUATION



1
2
3



then decide to shift their effort into subsistence food production or even leisure. As for the analogous argument made on the import side, namely, that when imports are controlled directly, exchange rate changes do not control the volume imported, recent experience in a number of countries has shown that controls and misaligned prices breed black market operations, and, moreover, that economies formerly self-sufficient in food production can, when imported food becomes progressively cheaper, become increasingly dependent on imported foodstuffs.

If it is established that the alignment of relative prices is inappropriate, say, because the existence of an unsustainable current account balance, it is possible to correct this situation, in principle, through policies other than exchange rate adjustment. In general, however, the latter is likely to be a much simpler way of achieving the correct alignment than are deflationary policies designed to force down domestic prices and wages, which in most countries tend to be resistant to downward changes without substantial falls in output. In some cases, where price misalignment has occurred through exogenous exchange rate movements--for instance, an effective appreciation of the major currency to which the domestic currency is pegged--exchange rate action is again the obvious means of restoring a correct alignment. Indeed, a number of countries now maintain exchange rate regimes that are designed to make such corrections more or less automatically, either by pegging to a trade-weighted basket of other currencies, or by frequently adjusting the exchange rate for the domestic currency according to a formula that takes into account foreign and domestic inflation.

While it is generally accepted that exchange rate adjustment is the simplest way of restoring a previously existing alignment of domestic and foreign prices that had changed because of domestic inflation or foreign exchange rate movements, it is more difficult to decide to what extent exchange rate policy should bear the burden of an external adjustment, the need for which has arisen for other reasons, such as long-run changes in the terms of trade, the need to adjust to a different level of net capital inflow, or the permanent decline in domestic resources associated with traditional export commodities. In considering the role of exchange rate policies in this context, one must in general compare the impact of alternative policy packages, which may or may not include an exchange rate adjustment. 1/

1/ Too often, for example, "the effects of a devaluation" are studied as if in isolation from other policies, and its allegedly deflationary effects are cited, as if there existed some other combination of policies that would have accomplished the same adjustment in a non-deflationary way, an eventuality that may in many cases be impossible. For arguments supporting the view that devaluations will be necessarily contractionary, see Diaz-Alejandro (1965), Krugman and Taylor (1978), Dornbusch (1981) and Hanson (1983). A contrary view is presented in Gylfason and Schmid (1982).

The fact that exchange rate adjustments may have both desirable and undesirable short-term effects has led some countries to establish a dual exchange rate system, under which selected transactions take place at an "official" exchange rate maintained by intervention of the monetary authorities, while the remaining transactions take place at a "free" or "parallel" exchange rate, which is usually determined by market forces and is in most cases more depreciated than the official rate. A dual exchange market may also enable the authorities to increase revenues from the foreign exchange profits of the central bank. Nevertheless, such a system creates additional complications in the design of adjustment programs, and because of the administrative problems and price distortions arising from a dual exchange system, Fund-supported adjustment programs generally specify the eventual unification of exchange markets. 1/

c. Determining the desirable extent of exchange rate adjustment

The task of determining the degree of exchange rate change required, in conjunction with other policies, to achieve a given amount of adjustment in the balance of payments, is extremely complicated. 2/ In the first place, it is not just merchandise imports and exports that are affected by a change in exchange rates; in many countries, large changes in flows of private capital, workers' remittances and other invisible transactions may result. Moreover, it may be difficult to predict the impact of an exchange rate adjustment on all types of external transactions if the previous misalignment was so large as to encourage a sizable parallel market. Finally, the results may be yet more uncertain if the policy package includes liberalization of the foreign trade and payments system. In view of these problems, it is not surprising that the move to an appropriate exchange rate is often accomplished gradually and by utilizing to some degree market forces. Where a parallel market existed before the exchange rate adjustment, it may be maintained for a certain period or at least the rates previously prevailing in that market will be relied upon as an indicator of an appropriate "market-related" or "equilibrium" rate.

In many instances, however, there is reluctance to depend upon the market to determine an appropriate rate, and in any event one may wish to arrive at an independent judgment of what such a rate should be. It has become common practice in the Fund to base such judgments at least in part on indices of real effective exchange rates, based on some combination of export and import weights. These indices are especially useful when domestic rates of inflation have been considerably higher than those abroad; in such instances, broad judgments as to the range of necessary exchange rate correction can be reasonably sound. Two caveats are in order, however. First, one should beware of attaching

1/ See Lizondo (1984), (1985).

2/ For a detailed discussion of this issue, see "Formulation of Exchange Rate Policies in Programs Supported by the Fund," EBS/84/227 (November 7, 1984).

an excessive degree of importance to relatively small changes in such indices. For example, there are instances when the temporary appreciation of the real effective exchange rate may be necessary to dampen inflationary pressures arising from a once-for-all inflow of foreign exchange. ^{1/} Second, it should be realized that this index may be inferior to certain other indices as measurement, for example, of the "competitiveness" of the export sector of the country concerned. For countries whose chief exports are manufactures, an index of unit labor costs, relative to those of competitors and corrected by relevant exchange rates, would be a more accurate indicator. The real effective exchange rate is the principal index used for exchange rate analysis for most developing member countries chiefly because of data availability and comprehensive-ness of coverage, not because of its superiority as an indicator of export competitiveness. In any event, the usefulness of any index is limited when it comes to judging what would be an appropriate level of the exchange rate, without additional information; usually, such judgments are based on determining that some past level of the rate was correct and that past level is set up as a target, but such reasoning is in danger of falsely estimating the influences of economic events that have occurred in the meantime.

A more sophisticated approach to exchange rate analysis is to estimate import demand and export supply equations for the country in question, and to use the resulting elasticities to arrive at that exchange rate which will produce the desired changes in foreign trade flows. Where the data availability makes such an approach possible--and it is not possible for a large number of developing countries--it does provide a more accurate idea of the appropriateness of a particular change in exchange rates than does use of the real effective exchange rate index. Nevertheless, this technique is open to the criticism that it takes a partial equilibrium view of the economy, and that ultimately the correct level of the exchange rate cannot be determined without taking a general equilibrium view, i.e., examining the interaction between the exchange rate and the other principal macroeconomic variables, all of which are being simultaneously affected not only by the exchange rate itself but also by the other policy actions that comprise the stabilization program. The impact of exchange rate adjustments on domestic inflationary pressures is an important example of these interrelationships.

In attempting to estimate the correct size of an exchange rate adjustment, the time element must also be taken into account. There is no presumption that imports and exports will respond instantaneously to any changes in relative prices, income, or other relevant variables. The lags in trade relationships could arise as a result of recognition lags,

^{1/} See Section III.3.c.

decision lags, delivery lags, replacement lags, and production lags. Gauging the pattern and length of such time lags is important not only for obtaining forecasts of imports and exports but also for evaluating many policy issues related, for example, to changes in tariffs, exchange rates, and so on. 1/

One approach to incorporating lags in trade equations is to employ the error-learning or partial-adjustment model that was discussed in the context of the demand for money (Section III.3.b). However, in contrast to the money demand case, such models may not be very realistic when used to estimate the dynamic behavior of imports and exports for a variety of reasons. First, the error-learning models assume that the largest effect of any change in the explanatory variables occurs in the first period. However, it could be argued that the true lag effect in foreign trade relationships builds up gradually over time and declines after that. In other words, the appropriate lag pattern could have an inverted "v" shape rather than the steadily declining pattern emerging from the error-learning model. This becomes particularly important in the case of export supply functions. If, for example, a country is a primary producer, then a change in relative prices, brought about through, say, an exchange rate change, may only affect supply after a considerable lag.

Second, the error-learning model assumes that the lag in response of the dependent variable is the same irrespective of whether the change in imports or exports is due to variations in prices or in the scale variable. A number of writers have argued that the delayed response of imports and exports is likely to be quite different depending on the explanatory variable that initiates the response. While there appears to be some agreement that the effect of real income on imports and capacity on exports is largest in the initial period and declines rapidly thereafter, there is much less of a consensus on the proper distributed-lag pattern for price changes.

These two problems have led researchers to experiment with alternative lag structures, 2/ the timing issue in trade relationships is far from settled. The types of lags will depend, among other things, on the commodity composition of imports and exports, the capacity of the country's productive sectors, port facilities, and so on. In other words, the lags will be country specific and generally have to be determined case by case, whether through econometric estimation or use of other information.

1/ This subject of lags in trade relationships was discussed in detail in the seminal paper by Orcutt (1950). For a more recent treatment, see the survey by Goldstein and Khan (1985).

2/ See Goldstein and Khan (1985) for a discussion of some of these.

d. Estimating the impact of exchange rate changes ^{1/}

For countries where a reliable macroeconomic model exists, with all the caveats with which such models are used for either forecasts or simulations, it would in principle be possible to simulate different combinations of exchange rate and other policy actions, in order to determine which combination would produce the best possible result in terms of external and internal balance. In practice, for Fund member countries such a procedure is hardly ever used, because the requisite model simply does not exist. The financial programming exercise described earlier in Section III of this paper provides a workable way of determining some of the principal results of policy actions being considered, and the consequences of possible exchange rate adjustments can be grafted, as it were, onto this framework.

To do so, it is necessary, first, to examine the interaction among the exchange rate, prices and wages in the economy, in order to determine what are likely to be the repercussions of a change in the exchange rate for domestic prices and costs. This can be done by estimating the share of the prices of imported goods and services in whatever domestic price index (typically, the consumer price index) is being examined; by assuming that wages adjust by a particular percentage of the resulting change in the price index (the extent of such an adjustment may itself be a policy variable); and by using these initial estimates of changes in prices and wages to estimate the overall change in the price index resulting from the initial exchange rate adjustment. One will thus have a basis to determine what real effective exchange rate is likely to result from a given change in the nominal exchange rate. ^{2/}

The proposed exchange rate adjustment and resulting price changes are then available for estimating the impact on the balance of payments. As mentioned above, such an estimate must employ whatever data and econometric analysis is available on price elasticities of import demand and supply of exports and import substitutes, and must also take into account the impact of previously existing parallel markets (in goods as well as foreign exchange) and of any planned liberalization of the trade and payments system. Furthermore, as already mentioned, the impact of an exchange rate adjustment (as well as the expectation of a continued active exchange rate policy) on private capital flows may be quite important in some countries, but is extremely difficult to forecast. Finally, if a change in the official exchange rate is

^{1/} A more detailed version of the analysis in this section may be found in Lanyi (1984).

^{2/} Note that this procedure only approximates the first round or initial effects of a nominal depreciation on the real exchange rate.

considered sufficient to rechannel through the official market transactions that were formerly conducted through illegal parallel markets and therefore not recorded, it will be necessary to modify the estimates by the expected amount of the previously unrecorded exports and imports moving through the official market.

The next step in integrating exchange rate projections with the financial programming model is to estimate the impact of the changes in exchange rate, prices, wages, and foreign trade (as described above) on government expenditures and revenue. In particular, close attention will have to be paid to the implications for expenditures of the price and wage adjustments (as regards the domestic component of expenditure) and of the exchange rate adjustments (for the foreign component). On the revenue side, as import and export taxes are typically an important--often, the most important--source of revenue, one can normally expect substantial movement arising both from the exchange rate adjustment and from the resulting changes in the volumes of imports and exports.

The last step in programming a simultaneous change in the exchange rate and in financial policies is to substitute the predicted changes in the balance of payments into the equation relating the change in domestic credit to the change in net foreign assets (equation (3.4), thereby yielding, for a projected change in the demand for money, a particular value for the change in domestic credit. The desired change in money demand should, of course, itself be consistent with the changes in price level that are being targeted, given the size of exchange rate adjustment being attempted, and the predicted change in real output. If the resulting value for domestic credit does not seem reasonable, that is, if there is insufficient credit available for the private sector once the amount of credit going to the public sector has been determined, the assumptions with regard to other policy variables--especially exchange rate policy, fiscal policy, and wage policy--need to be examined and readjusted in order to come to a more consistent solution.

The type of programming exercise just described is complicated by the need to look at medium-term as well as short-term consequences: for example, the inflationary process linking exchange rate, prices and wages is likely to take place over a period of months, if not years. Furthermore, as noted earlier, the combined impact of price and exchange rate changes on the trade balance is also subject to various lags. Associated with the programming problem is a policy issue, namely whether it is better to make the required exchange rate adjustment in one step or to permit a certain portion of this adjustment to be made gradually over time in a series of small steps, after a large initial step. It is sometimes felt that a more gradual adjustment tends to soften the inflationary consequences; against this, there is the consideration that a front-loaded adjustment brings about a quicker change in the foreign trade balance. The

choice of speed of adjustment is essentially a variant of the "gradualism versus shock" issue that has been discussed in Section II.4. However, since there are ample reasons, already spelled out above, for considerable uncertainty as to the proper amount of exchange rate movement, it may be best at the start to make only the minimum amount of adjustment that is certain to be needed. Following that, further moves can be made in small stages, observing the results at each step, until the desired balance of payments adjustment has been obtained. Against this, however, it is sometimes argued that if a country is not willing to adjust the exchange rate frequently, one might wish to devalue by more than initially necessary in order to avoid the capital flight arising from the expectation of a further imminent devaluation.

3. External debt management policies

The pursuit of an adequate rate of economic growth, consistent with a sustainable balance of payments over the medium term, requires, in the first instance, a judgment about the ability of a country to obtain and productively employ resources made available from abroad. In the context of an adjustment program, guidelines on external debt management basically describe policies that would provide the country with the maximum sustainable net resource transfer over the medium term. ^{1/} These guidelines have typically involved setting limits on the level and maturity composition of the external debt acquired; in situations where external financing has become scarce, a country's debt strategy may also include negotiation of rescheduling the existing stock of external debt, attempts to increase the flow of concessional financing, and limiting the amount of short- and medium-term borrowing on non-concessional terms. The amount of sustainable and obtainable foreign borrowing--whichever is lower--defines the necessary degree of adjustment of the imbalances in the economy; hence, external debt management policies become of critical importance in financial programming.

This section first discusses the real aspects of debt problems and then the financial aspects.

a. Real aspects of debt problems

At the most basic level the problem of determining the sustainable level of foreign borrowing is one of allocation of real resources over time and across countries. In terms of the monetary framework developed in Section III.1, the difference between domestic income (Y) and absorption (A) must be matched by an equivalent change in net foreign assets (ΔR) and changes in net external indebtedness (ΔFI), i.e.:

$$(4.1) \quad Y - A = \Delta R - \Delta FI$$

^{1/} See Loser (1977) and "External Debt Management Policies" (SM/79/125, 5/9/79).

This section focuses primarily on the relationship between a country's use of the net goods and services provided by nonresidents and the net external debt associated with these flows. For the present analysis the monetary authorities are combined with the rest of the economy so that the change in total foreign debt is defined as:

$$(4.2) \quad \Delta FD = \Delta FI - \Delta R$$

For developing countries there is a strong presumption that net foreign savings can and should be utilized to augment the stock of domestic capital over and above what could be provided by domestic savings; in addition, short-term and medium-term borrowing (such as the use of Fund resources) may also be used to smooth the consumption path over time. This presumption in turn implies that the "normal" external position for a developing country would involve net inflows of goods and services from abroad, conventionally measured by the current account balance. Roughly speaking, the addition to the stock of net financial debt over time must contribute to the country's ability to make payments to nonresidents; this is the fundamental relationship underlying the notion of sustainability. In the aggregate this means that the value of net exports of goods and services must increase sufficiently in order to pay nonresidents for the use of their savings without impairing the flow of imports required for supporting the full utilization of productive capacity. 1/

The analytical framework relevant to this question deals with the relationships among foreign and domestic savings, capital formation and growth and has been extensively reviewed in publications by Fund staff. 2/ This framework, which is based on the "growth with debt" literature, focuses on the net exchanges of goods and services among countries and its main lesson is that a country should acquire foreign savings (in the form of net imports of goods and services) as long as this provides the basis for paying the required rate of return to the supplying country over the time period during which the resources are made available. The basis for paying the required rate of return is usually thought of as the increased output made possible by the additional real capital that can be accumulated with the aid of net foreign savings. 3/ To be sure,

1/ To be sure, an ongoing process of import substitution may reduce the rate of growth of exports implied by this criterion. But import substitution has natural limits in most cases, so that this qualification would be likely in most instances apply only for a period of some years, not over the long run.

2/ See, for example, Loser (1977), and McDonald (1982).

3/ It might also be optimal for countries to utilize external debt to smooth consumption over time in the face of various internal and external shocks. A more general criterion would be that the pattern of distribution of world savings should be welfare enhancing. See Williamson (1973).

however, the ability to acquire foreign savings is limited by their availability, a circumstance partly exogenous and partly dependent on foreign perceptions of domestic economic developments.

While in theory it may be possible to calculate the sustainable level of net resource transfers, many of the theoretical determinants of these transfers, such as the rates of return on capital in different countries, are very difficult to quantify. 1/ Nevertheless, it is necessary to make approximations, and one useful way to summarize the relationship between debt and the capacity to service debt is to calculate ratios of debt to exports or debt to GNP over time. There are, however, conceptual problems in defining the "sustainable" level of such ratios. If a country can profitably employ a stock of foreign savings that is large relative to domestic savings, it follows that its debt-to-exports ratio will be high relative to a country that has a lesser capacity to profitably utilize foreign savings. The equilibrium level of such ratios will vary from country to country and for a given country over time. It has not proven possible, even after the fact, to measure the factors that would allow an accurate prediction as to what levels of the ratios prove to be sustainable. 2/

Perhaps the chief practical value of this framework is that it provides signals to the danger of situations in which debt can grow explosively. If an increment to external debt adds more to investment income payments than to the capacity to make such payments, the "error" implicit in obtaining these resources must be reversed through net exports of goods and services. 3/ If it is not, and conditions do not change, additional debt will be incurred in order to make payments and debt will grow faster than debt service capacity. A shorthand way of stating this condition is that the "real" or inflation-adjusted interest rate paid on additional debt must be less than or equal to the expected "real" (inflation-adjusted) growth in exports.

1/ Furthermore, any such calculation is by definition conditional on the assumptions of the future path of a number of domestic and foreign variables. For example, what might be considered sustainable at a given interest rate may prove to be unsustainable if the interest rate should rise above the assumed value. Since most commercial debt carries a floating interest rate, calculations based on some fixed rate are bound to be only conjectural at best.

2/ See Donovan (1984).

3/ It is assumed here that the level of investment income payments does not depend on the realized productivity of the investment undertaken. If the external debt took the form of equity the "reversal" of the capital inflow could simply be a capital loss for the nonresident investor.

These relationships are illustrated in Chart 4. In this example inflation is assumed to be zero; hence, real and nominal magnitudes are equal. At time t_0 real exports are growing at a constant rate (g). Real debt (FD), shown in the second panel, is growing at a constant rate (d). Since real investment income payments (IY), shown in the third panel, are equal to FD times the real interest rate (r), which is constant, IY also grows at rate d . As long as $g = d$ the ratio of investment income payments to exports, (IY/X) , will remain at its initial value. A convenient way to ensure that $g = d$ is to assume:

- i. That trade in goods is balanced so that the real value of debt cannot change over time because of trade in goods. 1/
- ii. That the real rate of interest on external debt, r , is equal to the growth rate of exports, g .
- iii. Under these conditions the real current account deficit will be equal to $IY = rFD$ and will grow at rate d . This is shown in the bottom panel of Chart 4.

In this special case, the growth in debt is matched by the growth in exports, and as long as r is constant, the ratios (IY/X) and (FD/X) will remain unchanged.

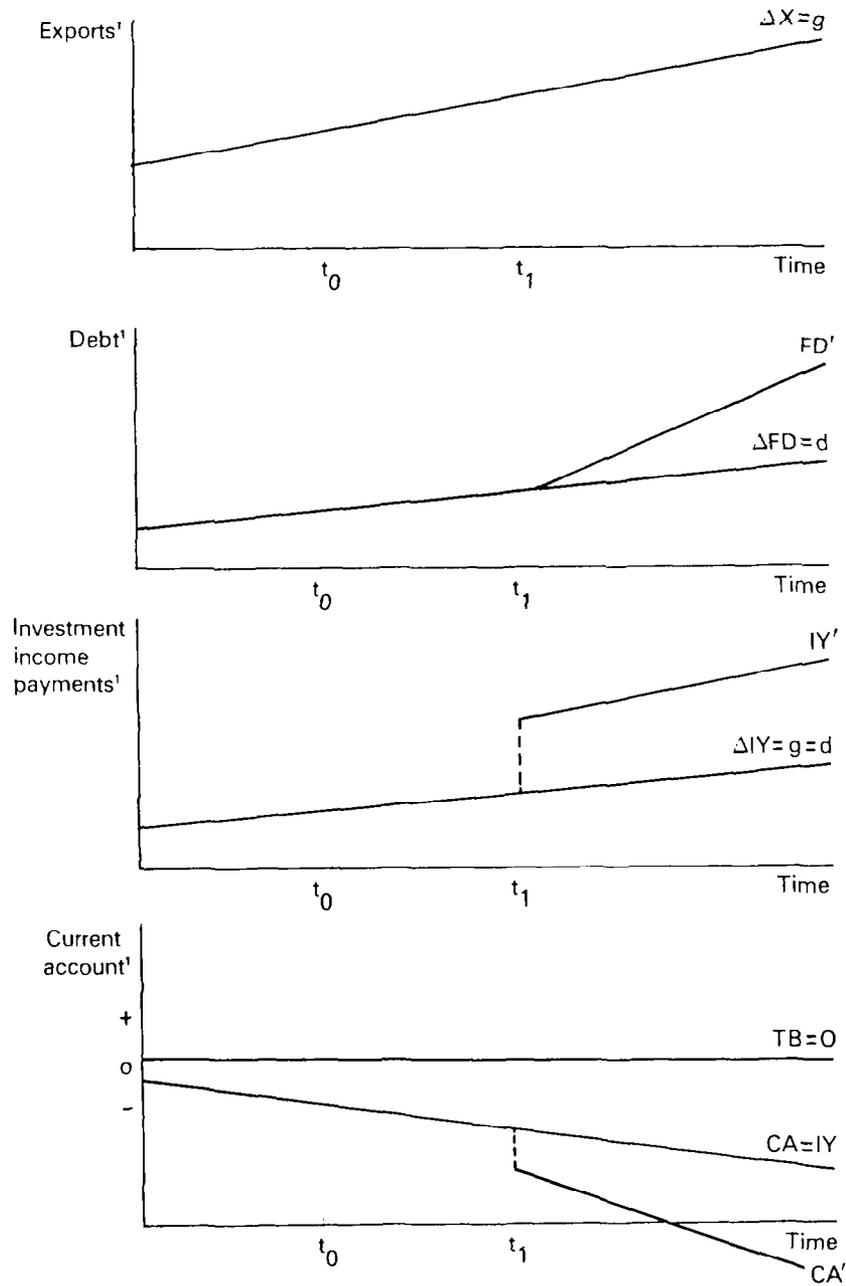
It follows that in cases where a country's exports are expected to grow at the same rate as, or more rapidly than, the real rate of interest on its external debt, the outlook for roughly balanced trade and a current account deficit is not a cause for concern. Nevertheless, a number of factors can change this outlook. For example, a change in the real rate of interest on external debt immediately alters these relationships. In terms of Chart 4, at time t_1 the real rate of interest increases. There is no immediate effect on FD or X , but IY jumps to IY' and the ratio, (IY/X) , also increases proportionately. 2/ If the trade balance does not change, the current account deficit widens to CA' and the increased real interest payments are added to the debt so that FD grows at a higher rate along FD' which further increases (IY/X) and (FD/X) . In fact, if the real rate of interest exceeds the growth rate of exports, the trade balance will have to move into surplus in order to avoid an ever increasing ratio of debt and investment income payments to exports.

Although it is perhaps difficult to see how such a situation could develop in the world of certainty assumed in a simple analytic framework, such situations can easily arise when conditions change in an unexpected

1/ Goods in this simple framework include merchandise and all non-financial services.

2/ It is assumed that all debt carries floating rates. In a more realistic example IY would move gradually to IY' as existing debt matures and is renegotiated at the higher real interest rate.

CHART 4
GROWTH PATHS FOR EXPORTS, DEBT,
INVESTMENT INCOME PAYMENTS AND
THE CURRENT ACCOUNT BALANCE



¹ All vertical axes are in log scale.



manner. As in the example above, an unexpected rise in the external "real" interest rate can make the payments associated with existing debt excessive relative to the perhaps unchanged outlook for a country's debt service capacity. Moreover, a country's debt service capacity could deteriorate because of unwise domestic policies that reduce the expected return of foreign capital in terms of export capacity. Finally, less favorable external factors such as slow economic growth of trading partners or adverse changes in the terms of trade could introduce the possibility of explosive growth of debt. In practice, therefore, the "theory" of real resource transfers is probably most useful in warning against circumstances where concepts such as debt-to-GNP or debt-to-export ratios are changing or are expected to change rapidly. Such an outlook would call into question the sustainability of the country's external position.

A crucial judgment in designing a Fund program, therefore, is in determining the circumstances under which the country's debt position could become explosive. To provide a quantitative view of these possibilities, staff analyses include medium-term outlooks for key debt relationships under alternative assumptions for the country's own policies and the external environment, including the projected behavior of interest rates on external debt. In this context the exercises connected with the World Economic Outlook provide a coherent outlook for the external environment likely to be faced by individual program countries. 1/

It should be noted that in cases where private creditors have already determined that the sustainability of the country's position is doubtful, the short-term outlook for the current account is constrained, since only official financing may be available. In this case, to the extent that the Fund cannot influence official capital flows, other than the resources it itself provides, the short-run adjustment path for the current account is largely determined by forces outside the control of a Fund-supported adjustment program. The issue remains, however, as to what path of policies (perhaps involving debt reduction relative to domestic output for some interval) will allow a quick and relatively costless eventual return to a normal growth path for debt.

The theory of growth with debt is not well-suited to guide policy during such transition periods. The obvious, but not very helpful, condition is that the necessary adjustment should be accomplished at the minimum cost in terms of loss of output. One practical consideration is that imports should not be compressed below a level that causes an unnecessary reduction in the rate of economic growth. It should be recognized, however, that there may be little room to maneuver where credits from private sources are no longer available. Financial assistance by the Fund obviously plays an important role in these circumstances,

1/ See also Goldstein (1986).

and furthermore, by making the medium-term implications of the adjustment effort clear, the program can advance the time in which the country's access to foreign savings is restored.

b. Financial aspects of debt problems

There is a growing recognition both within the Fund and elsewhere that the basic theory of resource allocation over time discussed above needs to be augmented with a more complete analysis of the financial transactions of program countries. A given net transfer of goods and services to a country--that is, the current account balance--is consistent with a virtually unlimited exchange of financial assets and liabilities between residents and nonresidents. As conditions within the program and in the world economy change, the currency composition, maturity, yield formula and a host of other factors also have important implications for the country's position. Gains and losses on financial positions are typically not recorded in the balance of payments; nevertheless, they may be an important short-run determinant of both the debtor countries' and their creditors' financial strength. A Fund-supported adjustment program can provide a framework for modifying the terms of financial contracts in order to facilitate planning for an orderly adjustment effort. In this context rescheduling amortization payments to creditors in ways that sustain the adjustment process and facilitate the return of normal creditor-debtor relations can be particularly important.

Another important aspect of financial arrangements is that in some cases a rise in gross external debt is accompanied by an increase in gross external claims on nonresidents. ^{1/} In such cases of private capital outflows the net resource transfer to the country in the past has not been equal to the stock of gross debt but instead to the stock of debt less accumulated official and private financial claims on nonresidents. In principle, the income from such financial claims should provide the basis for servicing gross external debt--just as would productive physical capital. In cases, however, where the financial incentives are such as to keep earnings outside the country these incentives must be altered as a part of an adjustment effort in order to persuade residents to repatriate their foreign earnings and assets, and thus recapture this element of debt-servicing capacity.

^{1/} This can include both financial assets as well as real assets.

V. Summary and Conclusions

The design of adjustment programs is a difficult task, involving analysis of a complex and incompletely understood set of economic relationships, as well as hard political decisions. Programs must be aimed to meet the country's principal economic objectives, including both a satisfactory rate of growth of output and general macroeconomic balance. The goal of sustaining a viable balance of payments position over the medium term is closely related to the specification of domestic macroeconomic objectives: the targeted excess of domestic expenditure over income must not exceed the amount of additional external debt that can be accumulated without undue increase in the relative burden of debt service. The formulation of a feasible set of objectives is thus the first step in designing a program; for this, a general framework of analysis is needed. The next step is to choose the instruments with which to achieve the objectives of the program; this, in turn, requires knowledge about the transmission process whereby policy variables affect output, prices, and the balance of payments.

While national authorities must take into account a broad range of economic and noneconomic objectives in their decision making, the Fund focuses typically on a few central macroeconomic targets. It is argued in an earlier section that while Fund-supported programs are necessarily focused on external balance, a focus inherent in the Fund's legal basis, there is also a serious concern with efficient utilization of resources and with long-run economic expansion, which underlies the Fund's commitment to ensuring the maintenance of a multilateral payments system as the basis for the sound growth of international trade. This concern is strengthened by the need to embed even short-term adjustment programs in a medium-term setting that takes full account of the likely evolution of external indebtedness and the relative burden of debt service.

The relationship between external and internal balance, as shown in the absorption approach and the accounting framework for financial programming, provides the basis for defining the fundamental macroeconomic adjustments necessary. Nevertheless, there is a whole range of policy packages compatible with achieving those objectives; some of these packages are stimulatory to long-run economic growth and some of them are not. The Fund is in principle committed to favoring programs that involve a minimum sacrifice of growth objectives. Macroeconomic balance, while a necessary condition for sustained growth, is certainly not a sufficient condition, and where resources are poorly utilized and growth rates are inadequate, it is necessary to undertake changes of various sorts to raise current output, increase rates of saving and investment, and improve the return on investment. While the paper makes an analytical distinction between policies that improve utilization of resources currently available and those that raise the rate of growth of productive capacity, it is also pointed out that a number of supply-side measures have a positive

impact in both these respects: policies that induce an improved allocation of resources also induce better investment decisions. It is also true, however, that policies to improve growth rates of output over the medium to long term may not show substantial results within the program period of even an Extended Fund Facility program.

Another major argument of the paper is that the standard financial programming framework is consistent with a wide range of hypotheses about the transmission mechanism between stabilization policies and the targeted macroeconomic variables, and therefore with different overall policy strategies. In particular, the time lags between policy changes and changes in the economic variables being targeted will have an important bearing on the choice of policy measures and the timing of their implementation. This last point is of particular importance because of the difficult decisions that must always be made with regard to the pace at which various measures, such as the reduction of a fiscal deficit, should be implemented.

At various points in the paper reference is made to questions with regard to the nature and timing of relationships between economic variables, for which up to now only partial answers have been discovered. It is also mentioned that these relationships may vary among countries, so that empirical estimation of such relationships must be made on a country-by-country basis. Among the relationships of interest in this connection are the demand for money function, the reaction of imports and exports to exchange rate changes, and the impact of changes in relative prices on output in agriculture and other sectors.

It was shown, also, that the role of exchange rate policies always raises difficult questions in a Fund program and also influences the choices with respect to the conduct of monetary policy. While exchange rate adjustments are often the simplest way of altering the relative prices of traded and nontraded goods in a desired direction, they may be ruled out by fixed exchange rate arrangements that are embedded in a country's economic system. A fixed exchange rate, or limited exchange rate flexibility, raises the further question of how much scope exists for the authorities to influence the stock of money in an open economy. The greater the flexibility of exchange rates, the greater is the degree of control that can be exercised by the monetary authorities over the money supply. With flexible rates, there may be circumstances under which a monetary aggregate other than domestic credit would be a more appropriate, or at least a desirable supplementary, policy target, especially when inflation is a major concern.

More broadly, an important factor in the design of adjustment programs is the institutional and political setting. Aside from the question of exchange rate regime, which in the extreme case of membership in a currency union limits the scope for the use of both exchange rate and monetary

policies in carrying out needed adjustments, there are other institutional features of crucial importance. For example, the degree and the modalities of central planning in an economy affect the scope for the use of prices and exchange rates to affect economic decision making in the non-governmental sector. Even in economies that are not "planned," the adherence to government controls and the political resistance to structural reforms vary widely across countries.

A general conclusion arising from the topics reviewed in this paper is that in many areas relevant to adjustment programs there is considerable room for both more thinking about the general medium-term strategy of adjustment programs and more empirical research. With regard to the latter, the empirical testing of relationships should be conducted wherever possible for individual countries. Past experience should be examined with respect to the response of supply and demand to changes in exchange rates, shifts in the demand for money in response to accelerating or decelerating inflation, the effects of different types of market liberalization on both supply and demand relationships, the behavior and performance of public and private sectors in response to changed price incentives, and a number of other topics. The experience with adjustment programs since 1980 provides a rich (if not yet complete) set of data in this regard. Clearly, the future evolution of thinking about adjustment programs will continue, as in the past, to reflect such new information as well as developments in the discipline of economics and the emergence of new economic problems facing member countries.

References

- Addison, Tony, and Lionel Demery, "Macro-Economic Stabilisation, Income Distribution and Poverty: A Preliminary Survey," Overseas Development Institute, Working Paper No. 15 (February, 1985).
- Aghevli, Bijan B., Mohsin S. Khan, P.R. Narverkar, and Brock K. Short, "Monetary Policy in Selected Asian Countries," IMF Staff Papers (December 1979), pp. 775-824.
- Aghevli, Bijan R. and Mohsin S. Khan, "Credit Policy and the Balance of Payments in Developing Countries," in Warren L. Coats, Jr. and Deena R. Khatkhate, eds., Money and Monetary Policy in Less Developed Countries (London, 1980), pp. 685-711.
- Alexander, Sidney S., "Effects of Devaluation on a Trade Balance," IMF Staff Papers (April 1952), pp. 263-78.
- Archibald, G.C., and R.G. Lipsey, "Monetary and Value Theory: A Critique of Lange and Patinkin," Review of Economic Studies (October 1958), pp. 1-22.
- Balassa, Bela, "Structural Adjustment Policies in Developing Economies," World Development (January 1982), pp. 23-38.
- Barro, Robert J., "Are Government Bonds Net Wealth?" Journal of Political Economy (December 1974), pp. 1095-1117.
- Black, Stanley, "Exchange Policies for Less Developed Countries in a World of Floating Rates," Essays in International Finance No. 119, Princeton University (November, 1976).
- Blejer, Mario I., "On the Anatomy of Inflation: The Variability of Relative Commodity Prices in Argentina," Journal of Money, Credit and Banking (November, 1983), pp. 469-82.
- _____, and Mohsin S. Khan, "Government Policy and Private Investment in Developing Countries," IMF Staff Papers (June 1984), pp. 379-403.
- Blinder, Alan S., and Robert Solow, "Analytical Foundations of Fiscal Policy," in The Economics of Public Finance, ed. by Alan Blinder et al., (Washington, D.C. 1974), pp. 105-109.
- Bond, Marian, "Agricultural Responses to Prices in Sub-Saharan African Countries," IMF Staff Papers (December 1983), pp. 703-726.

- Buiter, Willem H., and James Tobin, "Debt Neutrality: A Brief Review of Doctrine and Evidence," in Social Security versus Private Saving, ed. by George von Furstenberg (Cambridge, Mass. 1979), pp. 395-429.
- Chandavarkar, A.G., "The Informal Financial Sector in Developing Countries: Analysis, Evidence and Policy Implications," IMF DM/86/13 (February 1986).
- Crockett, Andrew D., "Stabilization Policies in Developing Countries: Some Policy Considerations," IMF Staff Papers (March 1981), pp. 54-79.
- _____, and Owen J. Evans, "Demand for Money in Middle Eastern Countries," IMF Staff Papers (September 1980), pp. 543-77.
- Dell, Sydney, "Stabilization: The Political Economy of Overkill," World Development (August 1982), pp. 597-612.
- Diaz-Alejandro, Carlos, Exchange Rate Devaluation in a Semi-Industrialized Economy: The Experience of Argentina 1955-1961 (Cambridge 1965).
- _____, "IMF Conditionality: What Kind?" PIDE Tidings (January-February 1984), pp. 7-9.
- Diz, Adolfo, C., "Money and Prices in Argentina, 1935-1962," in Varieties of Monetary Experiences, ed. by David Meiselman (Chicago 1970), pp. 71-162.
- Donovan, Donal, "Real Responses Associated with Exchange Rate Action in Selected Upper Credit Tranche Stabilization Programs," IMF Staff Papers (December 1981), pp. 698-727.
- _____, "The Sources of Current External Debt Servicing Difficulties: Some Empirical Evidence," IMF DM/84/15 (March 1984).
- Dornbusch, Rudiger, Open Economy Macroeconomics (New York 1981).
- Edwards, Sebastian, "The Order of Liberalization of the Balance of Payments: Should the Current Account be Opened Up First?" World Bank Staff Working Paper No. 710 (December 1984).
- Frenkel, Jacob A., and Harry G. Johnson, eds., The Monetary Approach to the Balance of Payments (London 1976).
- Friedman, Milton, "The Case for Flexible Exchange Rates," in Essays in Positive Economics (Chicago, 1953).

- _____, "The Quantity Theory of Money--A Restatement," in Studies in the Quantity Theory of Money, ed. by Milton Friedman, (Chicago 1956).
- _____, "A Theoretical Framework for Monetary Analysis," Journal of Political Economy (March/April 1970), pp. 193-238.
- Goldstein, Morris, The Global Effects of Fund-Supported Adjustment Programs, IMF Occasional Paper No. 42 (March 1986).
- _____, and Mohsin S. Khan, "Income and Price Effects in Foreign Trade," in Handbook of International Economics, Vol II, ed. by Peter B. Kenen and Ronald W. Jones (North-Holland 1985), pp. 1041-105.
- Guitian, Manuel, "The Effects of Changes in the Exchange Rate on Output, Prices, and the Balance of Payments," Journal of International Economics (February 1976), pp. 65-74.
- _____, Fund Conditionality: Evolution of Principles and Practices, IMF Pamphlet Series No. 38, 1981.
- Gylfason, Thorvaldur, and Michael Schmid, "Do Devaluations Cause Stagflation?" Institute for International Economic Studies, University of Stockholm, Seminar Paper No. 201 (April 1982).
- Hanson, James A., "Contractionary Devaluation, Substitution in Production and Consumption, and the Role of the Labor Market," Journal of International Economics (February 1983), pp. 179-189.
- Harberger, Arnold C., "The Dynamics of Inflation in Chile," in Measurement in Economics: Studies in Mathematical Economics and Econometrics in Memory of Yehuda Grunfeld (Stanford 1963), pp. 219-250.
- Harris, Laurence, "Financial Reform and Economic Growth: A New Interpretation of South Korea's Experience," unpublished (February 1985).
- International Monetary Fund, The Monetary Approach to the Balance of Payments (Washington, D.C. 1977).
- IMF Fiscal Affairs Department, "Fund-Supported Programs, Fiscal Policy, and the Distribution of Income," IMF Occasional Paper No. 46 (1986, forthcoming).
- IMF Institute, Financial Policy Workshops: The Case of Kenya (Washington, D.C. 1981).
- _____, Programacion Financiera Aplicada: El Caso de Colombia (Washington, D.C. 1984).

- _____, IMF Research Department, Interest Rate Policies in Developing Countries, IMF Occasional Paper No. 22 (October 1983).
- Johnson, Harry G., "Towards a General Theory of the Balance of Payments," in International Trade and Economic Growth (London 1958), pp. 153-68.
- Johnson, Omotunde, E.G., "The Exchange Rate as an Instrument of Policy in a Developing Country," IMF Staff Papers (July 1976), pp. 334-48.
- _____, "On Growth and Inflation in Developing Countries," IMF Staff Papers (December 1984), pp. 636-60.
- Kelly, Margaret R., "Fiscal Adjustment and Fund-Supported Programs," IMF Staff Papers (December 1982), pp. 561-602.
- Khan, Mohsin S., "Monetary Shocks and the Dynamics of Inflation," IMF Staff Papers (June 1980), pp. 250-84.
- _____, and Malcolm D. Knight, "Stabilization Programs in Developing Countries: A Formal Framework," IMF Staff Papers (March 1981), pp. 1-53.
- _____, and Malcolm D. Knight, "Some Theoretical and Empirical Issues Relating to Economic Stabilization in Developing Countries," World Development (September 1982), pp. 709-30.
- _____, and Roberto Zahler, "The Macroeconomic Effects of Changes in Barriers to Trade and Capital Flows: A Simulation Analysis," IMF Staff Papers (June 1983), pp. 223-82.
- _____, "Trade and Financial Liberalization Given External Shocks and Inconsistent Domestic Policies," IMF Staff Papers (March 1985) pp. 22-55.
- Krueger, Anne O., "How to Liberalize a Small, Open Economy," in The Economics of the Caribbean Basin, ed. by Michael Connolly and John McDermott (New York 1985), pp. 12-23.
- _____, and others, eds., Trade and Employment in Developing Countries: Vol. 1 - Individual Studies (Chicago 1981).
- Krugman, Paul, and Lance Taylor, "Contractionary Effects of Devaluation," Journal of International Economics (August 1978), pp. 445-56.
- Lanyi, Anthony, "Simple Methods for Measuring the Impact of Exchange Rate Changes in Developing Countries," IMF unpublished (December 1984).

- Lizondo, Jose Saul, "Exchange Rate Differentials and Balance of Payments under Dual Exchange Markets," DM/84/61 (October 1984)
- _____, "Unification of Dual Exchange Markets," IMF DM/85/21 (April 1985).
- Loser, Claudio M., "External Debt Management and Balance of Payments Policies," IMF Staff Papers (March 1977), pp. 168-92.
- Lucas, Robert E., Jr., "Expectations and the Neutrality of Money," Journal of Economic Theory (April 1972), pp. 103-24.
- McDonald, Donogh C. "Debt Capacity and Developing Country Borrowing: A Survey of the Literature," IMF Staff Papers (December 1982), pp. 603-46.
- McKinnon, Ronald I., Money and Capital in Economic Development (Washington, D.C. 1973).
- Meiselman, David, ed., Varieties of Monetary Experience (Chicago 1970).
- Montiel, Peter, "A Monetary Analysis of a Small Open Economy with a Keynesian Structure," IMF Staff Papers (June 1985), pp. 179-210.
- Mussa, Michael, "A Monetary Approach to Balance-of-Payments Analysis," Journal of Money, Credit, and Banking (August 1974), pp. 333-51.
- Orcutt, G., "Measurement of Price Elasticities in International Trade," Review of Economics and Statistics (May 1950), pp. 117-32.
- Ortiz, Guillermo, "Currency Substitution in Mexico: The Dollarization Problem," Journal of Money, Credit, and Banking (May 1983), pp. 174-85.
- Pastore, Affonso C., "Notes on Recent Monetary Policy in Brazil," Annals of Economic and Social Measurement (Fall 1975), pp. 489-508.
- Polak, Jacques J., "Monetary Analysis of Income Formation and Payments Problems," IMF Staff Papers (November 1957), pp. 1-50; reprinted in IMF (1977).
- Prais, S.J., "Mathematical Notes on the Quantity Theory of Money in an Economy," IMF Staff Papers (May 1961), pp. 212-26; reprinted in IMF (1977).
- Ramirez-Rojas, C. Luis, "Currency Substitution in Argentina, Mexico and Uruguay," IMF Staff Papers (December 1985), pp. 629-67.

Kobichek, E. Walter, "Financial Programming Exercises of the International Monetary Fund in Latin America," address to a seminar of Brazilian professors of economics, Rio de Janeiro (September 1967).

_____, "Financial Programming: Stand-By Arrangements and Stabilization Programs," IMF unpublished (January 1971).

Salter, W.E.G., "Internal and External Balance--the Role of Price and Expenditure Effects," Economic Record (August 1959).

Sargent, Thomas J., Neil Wallace, "Rational Expectations, the Optimum Monetary Instrument, and the Optimal Money Supply Rule," Journal of Political Economy (April 1975), pp. 241-54.

Sjaastad, Larry A., "Failure of Economic Liberalism in the Cone of Latin America," World Economy (March 1983), pp. 5-26.

Sundararajan, V., and Subhash Thakur, "Public Investment, Crowding Out, and Growth: A Dynamic Model Applied to India and Korea," IMF Staff Papers (December 1980), pp. 814-55.

Swan, Trevor, "Economic Control in a Dependent Economy," Economic Record (March 1960).

Tanzi, Vito, "The Growth of Public Expenditure in Industrial Countries: An International and Historical Perspective," IMF DM/86/12 (February 1986)

_____, and Mario I. Blejer, "Inflation, Interest Rate Policy, and Currency Substitutions in Developing Economies: A Discussion of Some Major Issues," World Development (September 1982), pp. 781-90.

Tinbergen, Jan, On the Theory of Economic Policy (Amsterdam, 1952).

Tobin, James, and Walter C. Dolde, "Wealth, Liquidity, and Consumption," in Consumer Spending and Monetary Policy: The Linkages, Conference Series No. 5, Federal Reserve Bank of Boston (Boston 1971), pp. 99-147.

Triffin, Robert, "Esbozo General de un Analisis de las Series Estadisticas Monetarias y Bancarias de America Latina sobre Bases Uniformes y Comparables," in Memoria: Primera Reunion de Tecnicas sobre Problemas de Banca Central del Continente Americano, Bank of Mexico (Mexico City 1946), pp. 410-30.

Williamson, John H., "Payments Objectives and Economic Welfare," IMF Staff Papers (November 1973), pp. 573-90.

