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The Agricultural Sector and Adjustment Programs
Supported by IMF Stand-By Arrangements

Prepared by Omotunde E.G. Johnson*

Authorized for Distribution by Mohsin S. Khan

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Abstract

Adjustment programs supported by Fund stand-by arrangements often include policies directed at the agricultural sector. The framework used in the analysis of total and marketed output determination focuses on the factors influencing the internal terms of trade of the agricultural sector and the supply response of the producers. Programs also include policies to improve efficiency and increase the productivity of resources in agriculture. Changes in the real exchange rate affects agricultural exports. A survey of the stand-by programs of 1985-86 reveal a diversity of specific policy measures aimed at the agricultural sector.

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Summary

When performance of the agricultural sector significantly influences macroeconomic developments, adjustment programs supported by Fund stand-by arrangements often include analysis of that sector and policies directed toward raising its efficiency, output, and exports. This paper discusses the framework that is explicit and implicit in such policy formulation.

It is argued that the analysis of total and marketed output determination essentially focuses on the factors influencing the internal terms of trade of the agricultural sector and the supply response of the producers. Marketed output is specified as a function of variables that are often incorporated in adjustment programs. The paper also includes a discussion of the real exchange rate as an instrument to influence agricultural exports.

Since programs commonly include policies to improve the efficiency and the productivity of resources in agriculture, the nature of, and rationale for, such policies to augment both intrasectoral and intersectoral efficiency are discussed. A survey of the stand-by programs that were in existence during 1985/86 reveals a diversity of specific policy measures aimed at the agricultural sector.



I. Introduction

Among the more frequently heard criticisms of adjustment programs supported by IMF stand-by arrangements is that they do not pay enough attention to output growth--that they may in fact often be adverse to longer term growth. This drawback reflects macroeconomic policies that are supposedly deflationary, short-term in focus and hamper capital formation. But to the extent that agriculture is important in the production structure of a country, adjustment programs that favorably affect agriculture will also redound beneficially on overall growth.

While it is fair to say that greater sensitivity to growth effects has been inducing greater attention to the impact of macroeconomic measures on particular sectors of the economy, in Fund-supported adjustment programs, there have also been other contributory factors. Perhaps the most important of these has been the realization that the attainment of balance of payments sustainability often requires major structural reforms, including changes in the production structure, rehabilitation of some sectors, and enhancement of net investment in others. Balance of payments adjustment measures, in such circumstances, cannot easily be divorced from policies to improve growth performance.

This paper is concerned with the way in which the agricultural sector has featured in programs supported by IMF stand-by arrangements--still the most important facility under which members make use of the institution's resources. First the paper discusses the legal framework within which the stand-by programs take effect. Then the paper delves into the analytical framework within which the agricultural sector is considered in such programs. It is argued that the emphasis is on the internal terms of trade of agriculture and the supply response of producers in that sector. This leads into the rationale for the fundamental equation (16) which specifies the marketed output as a function of variables that are often incorporated in the adjustment programs, and a discussion of the real exchange rate as an instrument to influence agricultural exports. Since programs usually deal directly with issues related to the efficiency of resource use and various credit, investment and fiscal measures designed to raise private returns in agriculture, the section on the analytical framework also touches on these aspects. Both intersectoral and intrasectoral (within agriculture) efficiency are discussed.

The paper then turns to the recent experience. As a sample, the programs supported by stand-by arrangements (with 36 countries) that were in existence during the financial year May 1, 1985 to April 30, 1986 are reviewed. A general picture is given of the way agriculture featured in those programs. Finally, by way of concluding remarks, some critical issues of policy packaging are briefly discussed.

II. Legal Framework

In a decision taken on March 2, 1979, following a review of stand-by policies, the Executive Board of the Fund set forth the "Guidelines on Conditionality." ^{1/} Paragraph 4 of the Guidelines stated that in helping members to devise adjustment programs, "the Fund will pay due regard to the domestic social and political objectives, the economic priorities, and the circumstances of members, including the causes of their balance of payments problems." In paragraph 7, the decision stated that a member "may be expected to adopt some corrective measures before a stand-by arrangement is approved by the Fund, but only if necessary to enable the member to adopt and carry out a program consistent with the Fund's provisions and policies." Most importantly, in paragraph 9 of the decision it was stated that performance criteria "will be limited to those that are necessary to evaluate implementation of the program with a view to ensuring the achievement of its objectives. Performance criteria will normally be confined to (i) macroeconomic variables, and (ii) those necessary to implement specific provisions of the Articles or policies adopted under them. Performance criteria may relate to other variables only in exceptional cases when they are essential for the effectiveness of the member's program because of their macroeconomic impact."

An implication of the above statements is that the broad policy measures contained in adjustment programs--the prior actions and intentions--and the performance criteria related to stand-by arrangements, if they include reference to agriculture, must be justifiable in the light of their macroeconomic effects. Such macroeconomic effects may be on targets such as growth of real gross domestic product (GDP), the rate of inflation, and the current account of the balance of payments. Alternatively, the macroeconomic effects may be on intermediate targets such as the central government budget balance in relation to GDP or domestic credit of the banking system.

Whereas agricultural policies have featured prominently as prior actions and as specific policy intentions in adjustment programs supported by stand-by arrangements, they have not been used as performance criteria. It should be recalled that performance criteria have sought to provide a balance between assurances to a member that it can have access to the Fund's resources during the period of the arrangement, on the basis of criteria that are objective in character--i.e, not requiring

^{1/} See Selected Decisions of the International Monetary Fund and Selected Documents, Twelfth Issue (Washington, International Monetary Fund April 1986), pp. 26-28.

subjective judgment on the part of anyone—and assurances to the Fund as to proper use of its resources. 1/ The policy variables utilized for specifying performance criteria must, therefore, be capable of being expressed in quantitative or objective terms; must be available with only a short time lag; must be significant enough to mirror and/or influence developments in the economy at large; and must be within the control of the authorities. These constraints on the character of performance criteria are necessary, because failure to observe the performance criteria included in a particular program interrupts a member's right to purchase under the stand-by arrangement until a waiver or modification of the criteria are approved by the Fund. 2/

Conditionality, of course, encompasses a broader range of policy actions than those covered by performance criteria. All prior actions and intentions (whether or not they constitute performance criteria) would be part of conditionality. Thus, whereas policies directly aimed at agriculture, in light of their macroeconomic effects, may not be included among the performance criteria, such policies are considered part of the conditionality for use of the Fund's resources.

III. Analytical Framework

Agriculture has featured prominently in Fund-supported programs when it is believed that agricultural policies and institutions have had an important role to play in bringing about the balance of payments, growth and inflationary problems (the external and internal imbalances) that the program is designed to tackle. In the countries concerned, the agricultural sector itself is generally conspicuous in several areas of the macroeconomy viz., in employment, GDP, exports and imports, as inputs for industry, and as a provider of revenue for the government budget. If agriculture is not very important in one or more of these areas, it is safe to say that adjustment programs supported by a Fund stand-by would not pay much attention to agriculture, even though, inevitably, the program will have an impact on that sector.

Typically where agriculture is important for macroeconomic performance, the sector provides employment for over half of the labor force (often two thirds or more) and accounts for over one quarter of GDP and, often, about the same percentage or more of exports. But the agricultural sector can be also crucial for macroeconomic performance in situations where the contribution of the industrial sector to employment, exports

1/ See Gold (1970) pp. 150-3 and Johnson (1977).

2/ Ibid.

and GDP is greater than that of agriculture, if the latter sector provides an essential linkage with industry through its supply of raw materials, e.g., sugarcane and sugar refinery. Furthermore, agriculture may also influence macroeconomic performance through the fiscal impact of subsidies to, and taxation of, agricultural products and inputs.

Fund-supported adjustment programs have invariably been concerned with three basic interrelated issues when they have directly addressed problems of immediate relevance to the agricultural sector. The terms of trade between the agricultural and the nonagricultural sectors is often the focus of analysis in trying to reach a decision on producer prices to be set by official marketing boards and on the magnitude of exchange rate adjustment. At other times, the agricultural sector is at the center of broader growth and adjustment issues and the focus of analysis becomes the supply response of agriculture. Finally, the general question of efficiency in agriculture is often of great importance within the framework of a public investment program that is itself a centerpiece in the adjustment effort.

1. Terms of trade

Of major interest in discussions leading to stand-by arrangements, particularly in low-income countries, has been the terms of trade between the agricultural and nonagricultural sectors. In many countries the Fund staff has held the view that public policy has resulted in adverse terms of trade for the agricultural sector, with adverse consequences for the balance of payments.

From an analytical point of view what the terms of trade argument boils down to is the hypothesis that if all prices were freely determined in open markets and if effective rates of taxation were the same for all commodities then the value added in agriculture (VAa) as a ratio to GDP (Y) would have been much higher than is currently the case. Instead, for many years, vis-à-vis the nonagricultural sectors (industry and services), the agricultural sector was faced with negative effective protection (NEP) as compared with a presumably ideal zero effective protection (ZEP). 1/

1/ The view that the agricultural sector has been forced, by public policy, to face adverse terms of trade is quite widely held. See, e.g., D. Gale Johnson (1987). See also Nashashibi (1980) for an analysis of exchange rate depreciation in a situation in which improving the terms of trade and competitiveness of agricultural crops are crucial elements in the determination of the exchange rate change.

The NEP situation has arisen in turn because the average public-policy-induced (controlled) real price for agriculture was, during those years, kept lower than what would have been realized under open markets cum equal taxation and this disparity was not sufficiently counterbalanced by additional subsidies in the regulated regime (say, $s.C_a$, where s is subsidy as a fraction of cost (C_a) in agriculture). In brief, NEP implies

$$(1) \quad \left[\frac{\overline{Pc_a} - \overline{Pf_a}}{P} + \frac{\overline{s.C_a}}{P} \right] < 0$$

where $\overline{Pc_a}$ is the controlled price of agriculture, $\overline{Pf_a}$ is the corresponding free market price, and P is the general price level. A bar over a variable indicates that the average (mean) over some time period (years) is being calculated. Note that agricultural prices and subsidies being considered are those received by producers.

Fund-supported adjustment programs will, therefore, tend to include actions directed at the agricultural sector when it is the Fund's view that agriculture is faced with negative effective protection vis-à-vis the nonagricultural sectors and that this fact is having adverse consequences for the balance of payments. The obvious policy implication--as can be seen from equation (1)--could be a call for the raising of the controlled price in real terms ($\overline{Pc_a}/P$), or the freeing of all markets (so that there is no disparity between $\overline{Pf_a}$ and $\overline{Pc_a}$), or increasing the effective rate of subsidy(s). Budgetary constraints on the central government (or public sector) generally impel raising $\overline{Pc_a}/P$ or freeing markets--i.e., improving the terms of trade of agriculture.

In many low-income countries the producer prices of agricultural commodities particularly of export crops are established by a state marketing board. Such boards have come to be used as agents for taxing farmers--by paying farmers substantially less than the average sale (export) price realized by the board. Much of the effective tax is then remitted to the government, and accounts for a substantial part of government revenue. This situation has meant that, even when the choice has been made to improve the terms of trade to agriculture, by raising $\overline{Pc_a}/P$, the mechanics involved must often take into account a government budgetary constraint. In many practical situations the consequence has been that producer prices and exchange rate changes (currency depreciation) have been decided together.

Let Q represent the quantity of agricultural output, G_r total government revenue, G_{ra} government revenue obtained from agriculture, G_{rn} government revenue obtained from nonagricultural activities, and e the exchange rate; an increase in e would be a currency appreciation and vice versa

for depreciation. As a simplified illustration of the problem we consider the changes in agricultural output and in government revenue resulting from changes in producer prices and the exchange rate with other policies remaining unchanged. Noting that

$$(2) \quad dQ = \frac{\delta Q}{\delta e} \cdot de + \frac{\delta Q}{\delta PC_a} \cdot dPC_a$$

$$(3) \quad dG_r = \frac{\delta G_{rn}}{\delta e} \cdot de + \frac{\delta G_{rn}}{\delta PC_a} \cdot dPC_a + \frac{\delta G_{ra}}{\delta PC_a} \cdot dPC_a + \frac{\delta G_{ra}}{\delta e} \cdot de$$

with target growth rates for Q and G_r -- \hat{Q} and \hat{G}_r -- it is, with some manipulation, possible to state the program's aim as the solution of equation (4)

for \hat{e} and \hat{PC}_a ; that is,

$$(4) \quad \begin{bmatrix} \hat{Q} \\ \hat{G}_r \end{bmatrix} = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix} \begin{bmatrix} \hat{e} \\ \hat{PC}_a \end{bmatrix}$$

where

$$a_{11} = \eta_e \cdot \epsilon_s$$

$$a_{12} = \eta_{pc} \cdot \epsilon_s$$

$$a_{21} = s_n(\alpha_e + \theta_e) + s_a(\eta_e \cdot \epsilon_s + \beta_e)$$

$$a_{22} = s_n(\alpha_{pc} + \theta_{pc}) + s_a(\eta_{pc} \cdot \epsilon_s + \beta_{pc})$$

and

$$\eta_i = \text{elasticity of the terms of trade } (PC/P)_a$$

with respect to i, with i = e, PC_a ;

$$\epsilon_s = \text{elasticity of Q with respect to } PC_a/P;$$

α_i = elasticity of real nonagricultural income
with respect to i ;

β_i = elasticity of the tax rate on agriculture
with respect to i ;

θ_i = elasticity of the tax rate on nonagricultural
income with respect to i ;

s_n, s_a = the share of nonagriculture and agriculture,
respectively, in total tax income.

A hat (^) over a variable indicates a proportionate rate of change.

In the analytical framework represented by equations (2) to (4) the two questions most frequently asked are the following. First, if the exchange rate is to be lowered by some rate (\hat{e})--for whatever reason-- then by what magnitude should "the" producer price be raised to attain a given Q ? Second, if producer price is to be raised by a given magnitude, by how much should the exchange rate be lowered in order to attain a given change in government revenue? The a priori view or working assumption is normally that, on the one hand, currency depreciation lowers the terms of trade of agriculture--since aggregate price level (P) rises-- while it tends to raise government revenue through the inflationary effect on nominal incomes and the substantial dependence of government revenue on (internationally) traded goods. On the other hand, producer price increases raise the terms of trade of agriculture but tend to lower government revenue.

The working hypothesis, of course, often becomes complicated by two considerations. One is that the existence of large external debt and sizable imports--related to a public investment program--can cause government expenditure to be so seriously affected by exchange rate changes that the problem is better specified in terms of overall fiscal balance rather than simply government revenue. In our framework there is no particular benefit in taking into account this additional complication. The other consideration is that if the elasticity of supply of Q (i.e., ϵ_s) is greater than unity, then government revenue need not fall because of a producer price increase. But the controlled prices are more often than not on commodities (mainly tree crops) for which the short-run elasticities are positive but less than unity.

As a first approximation it is seen, from manipulation of the basic equations (2) and (3), that an answer to the first of the two questions is that

$$(5) \hat{p}_a^{pc} = \frac{\hat{Q}}{\eta_{pc} \cdot \epsilon_s} - \hat{e} \cdot \frac{\eta_e}{\eta_{pc}}$$

Hence the program would aim at a producer price increase large enough to neutralize the adverse terms of trade effect of currency depreciation and induce the desired quantity increase. Similarly, with regard to the second question, as a first approximation, we have

$$(6) \quad \hat{e} = \frac{\hat{G}_r}{a_{21}} - \frac{a_{22}}{a_{21}} \cdot \hat{p}_a^c$$

The exchange rate change must, therefore, be large enough to neutralize any negative impact on (net) government revenue of the exogenously determined producer price increase.

Equations (5) and (6) hold in equilibrium and given either \hat{e} or \hat{p}_a^c , the other variable can be solved. But in this framework, the general solution for \hat{e} and \hat{p}_a^c can only come from a solution of a system such as equation (4).

2. Supply response

It is evident from the above discussion that the elasticity of supply of Q with respect to the terms of trade (PC/P) is a crucial parameter. Most discussions of supply response in^a agriculture, therefore, tend to be couched in terms of the quantity response in that sector to real producer price changes. But we shall see that in the context of (macroeconomic) stabilization or adjustment programs it is generally more useful to conceptualize supply response in a far broader way.

a. The basic model

The basic model of supply response uses an essentially Nerlovian framework. ^{1/} This model assigns a conspicuous place to the producer price primarily because it is viewed as the main policy variable in the short term to influence, directly, the real quantities in agriculture.

^{1/} See Nerlove (1958), Bond (1983), Subrata and Ingersent (1984), and the references cited in those works.

In the basic model, output depends on acreage (A) and yield per acre μ . Both A and μ depend on expected real producer price(s) and various other factors whose effects are not captured through the producer price variable. Such other factors--e.g., the weather--are grouped into one variable, say Z. The model incorporates the fact that it could take time to adjust acreage to its desired level so that divergencies could occur between actual acreage and desired acreage. In addition, a distinction is made between potential and actual yield. For instance, farmers may fail to tend trees or pick fruits from trees.

If, then, A represents actual acreage and μ potential yield, it is possible to specify that

$$(7) \quad Q_t = Q_t (\mu_t, A_{t-1}, P_{at}^c, Z_t)$$

or
$$(8) \quad Q_t = q_t (P_{at}^c, Z_t, \lambda) \cdot Q_{t-1}$$

where the subscript t indicates time and P_{at}^c is real producer price.

Equation (8) embodies the assumptions that it may require more than one time period to adjust acreage; the variable λ is an adjustment coefficient and takes account of the fact that some of the output in period t may be related to a divergence between actual and desired (equilibrium) output in period t-1. Equation (8) also incorporates the assumption that actual yield and acreage depend on producer price(s) and the other composite variable Z. In short, Q_t , is a multiple q_t

of Q_{t-1} , with q depending on λ and percentage changes in P_a^c and Z.

For any given value of λ , the greater are \hat{P}_{at}^c and \hat{Z}_t the greater would tend to be q_t .

The basic model, even in a short-run formulation, often includes some consideration of technical progress or structural change. This can usually be done in several ways. Such changes can be thought of as embodied in Z already. Or they can be thought of as increasing the efficiency units of Z so that instead of Z in equations (8) and (9) one can have T.Z with T being some index of technical and structural changes. Finally, T can be included as a separate argument in the Q_t function. If the last procedure is adopted then we have

$$(9) \quad Q_t = q_t (P_{at}^c, Z_t, T, \lambda) \cdot Q_{t-1}$$

as a simple formulation of the basic supply response model.

b. The more complete model

In the framework of programming macroeconomic adjustment it is found useful, and indeed often essential, to expand and augment the above basic model in at least four ways. First, the agricultural sector can be viewed as comprising a group of households that may consume part of their agricultural goods and allocate their time between leisure, agricultural work and nonagricultural pursuits. This sort of approach, which is consistent with agricultural household models, 1/ also helps underscore the fact that it is the marketed surplus and not simply total output that should be the focus of analysis in the typical adjustment program framework. Second, the agricultural sector uses bank credit, particularly in marketing operations, although often also for the purchase of inputs. Even where farmers do not themselves borrow directly from commercial banks, marketing agents and other middlemen do so, and, in turn, often relend to farmers. Thus bank credit plays an important role in agriculture and the programmer must usually consider the effects of variation in credit on the marketed amount of produce. Third, it is commonly found useful to consider explicitly some of the elements of Z, especially technical assistance and other variable inputs, such as fertilizers, that may be related to extension services of the authorities. Fourth, domestic marketing (including transportation) costs are sometimes highlighted in the programming exercise.

Consider now the agriculture sector as a set of producing and consuming households. We can write the balance sheet of the sector as:

$$(10) \quad Q \equiv \frac{P_n}{P_a} \cdot X_n + \frac{w_a}{P_a} \cdot L_p + \frac{P_v}{P_a} \cdot V - \frac{Y_{na}}{P_a} + X_a + \frac{S_a}{P_a} - \frac{w_n}{P_a} \cdot L_{na} + \frac{R_a}{P_a} \cdot A$$

such that, $L_p \equiv L - N + X_L + L_{na}$

where Q = real agricultural output

P_n = price of "the" nonagricultural commodity

P_a = price of agricultural commodity (= P_a^c with controlled prices)

1/ See Singh, Squire, and Strauss (1986).

- V = nonlabor variable inputs such as fertilizer
- w_a = nominal wage rate in agriculture
- P_v = price of other variable input--e.g., fertilizer
- S_a = savings of agricultural households in financial intermediaries
- Y_{na} = nonfarm nonlabor income of farmers (e.g., interest earnings on bank savings)
- w_n = nonagricultural wage rate (relevant for agricultural households)
- L_{na} = labor supplied to nonagricultural sector by farmers
- L = total labor used in production of Q
- N = total agricultural household time available
- X_L = leisure taken by agricultural households
- X_n = agricultural households' consumption of the nonagricultural commodity
- X_a = agricultural households' consumption of Q
- A = physical assets (land, capital)
- R_a = rental on physical assets

Equation (10) states that the total produce of agricultural households plus income obtained by working in the nonagricultural sector plus nonlabor nonagricultural income received, is used up in purchases of nonagricultural commodities (X_n), nonfamily labor (L_p), physical variable inputs (V), and physical assets (A), plus consumption of their own output (X_a) and accumulation of bank assets through saving (S_a).

Define total output as the sum of marketed surplus (Q_m) and subsistence or own consumption (X_a). That is

$$(11) \quad Q \equiv Q_m + X_a$$

Also define real value added in agriculture as the difference between total output (Q) and the real cost of purchased inputs. That is, abstracting from credit and from transportation costs,

$$(12) \quad \frac{VA_a}{P_a} \equiv Q - \frac{P_v}{P_a} \cdot v - \frac{w_a}{P_a} \cdot L_p$$

where VA_a is nominal value added in agriculture. Now since output (Q) is a function of L , V , and A , it is possible to write the real value added as a function of output and factor prices. That is,

$$(13) \quad Q = Q(L, V, A) \text{ and}$$

$$(14) \quad \frac{VA_a}{P_a} = F\left(\frac{P_v}{P_a}, \frac{w_a}{P_a}, Q\right)$$

It is assumed that equation (14) can also be written in the form of equation (15) below. That is,

$$(15) \quad \frac{VA_a}{P_a Q} = \psi\left(\frac{P_v}{P_a}, \frac{w_a}{P_a}\right)$$

From equations (12) and (13) we see that the ratio of real value added to output would decrease as the prices of inputs increase relative to P_a in a way that depends on the input coefficients in production as well as the elasticities of substitution among inputs. Equation (15) is, therefore, quite general.

Now the basic hypothesis of the augmented model is that marketed output increases with the ratio of value added to total output and with the desire to accumulate savings on the part of agricultural households, but that Q_m tends to diminish with real wage rates outside agriculture and with real nonfarm nonlabor incomes available to these households. If then we include domestic credit factors (availability and cost), and marketing cost, as arguments in the Q_m function, and make the additional

assumption that savings ratios tend to increase with real interest (bank deposit) rates (at least up to a point), then it is possible to write the Q_m function as follows:

$$(16) \quad Q_m = Q_m \left(\frac{P_v}{P_a}, \frac{w_a}{P_a}, \frac{R_a}{P_a}, \frac{P_n}{P_a}, rs, \frac{Y_{na}}{P_a}, \frac{w_n}{P_a}, \frac{DC_a}{P_a}, i_a, m_a \right)$$

where

- rs = real interest earned on savings in financial institutions
- Dc_a = stock of domestic credit extended to agriculture
- i_a = interest rate charged on agricultural loans
- m_a = transport and other marketing cost per unit of Q_m

Equation (16) is quite general. Not all variables included there would be considered in all adjustment programs. Which ones are taken into account, i.e., the particular arguments of the Q_m function in a

particular situation, usually depends on the institutional, political and social realities of the country concerned. The important point to note is that there are generally several instruments at the disposal of the authorities to influence Q_m . The more controlled the economy the greater,

by definition, is the impact which the authorities have over the level and rate of change of instruments.

3. The real exchange rate and agricultural exports ^{1/}

In adjustment programs supported by use of Fund resources probably the main focus of analysis is the real exchange rate. Policies are usually designed to lower the real exchange rate, that is, more generally, to raise the price of traded goods relative to nontraded goods. To effect a real exchange rate depreciation the domestic rate of inflation need to be less than the relevant foreign rate of inflation. For this it may be possible to rely on domestic fiscal, monetary, and interest rate policies.

^{1/} This section relies heavily on material contained in O.E.G. Johnson (1987).

Reducing the relative prices of nontraded goods by restrictive monetary and fiscal policies may be difficult, and at times even undesirable. Credit restraint can have adverse shock effects on output, while slashing budgetary expenditures and raising taxation might well face political impediments because of their effects on real output and income distribution. Such obstacles often impel a cautious approach to monetary and fiscal measures. In addition, the rates of wage and price increases commonly reflect inertia, and any sudden drop in monetary expansion may provoke acute unemployment. Moreover, when major structural distortions have set in, particularly between traded and nontraded goods, a prompt and sizable alteration of relative prices may be imperative in the initial stages of an adjustment program. As a result of such considerations it is often found useful to devalue or depreciate the domestic currency in order to lower the real exchange rate.

It is, of course, important to recall that monetary and fiscal restraint cannot be avoided even if currency depreciation is the major instrument used to lower the real exchange rate. Without the financial restraints, there will be offsetting increases in the prices of nontraded goods; the currency depreciation will then result in a rise in the absolute price level but the relative price between traded and nontraded goods will not change.

Indeed experience with Fund-supported adjustment programs in developing countries indicates that an important factor in the failure of currency depreciation to induce an expansion in export supply is the inability of the authorities to ensure that the real exchange rate falls significantly and remains at the depreciated level for a period long enough to permit adjustment of supply. Invariably, this is due to a failure to pass on devaluation-induced price increases to producers of exportables--where such prices are regulated--or an incapacity for various social and political reasons to restrain budgetary deficits and monetary expansion sufficiently to abate domestic inflation.

Suppose now that in equation (16) above the Q_m function refers to agricultural export (traded) commodities and that nontraded agricultural commodities (mainly food items) are added to nontraded nonagricultural commodities. Then a depreciation of the real exchange rate for agriculture would be tantamount to a fall in P_n/P_a where P_n is now the price level of nontraded goods and P_a is the price level of traded agricultural goods. The quantity Q_m itself is now the exportable quantity. It is seen that this quantity depends on price elasticities of domestic production and on other domestic physical and financial factors that affect supply.

In analyzing the price responsiveness of agricultural exports it is usually necessary to make an explicit distinction between annual crops, such as cotton and rice, and tree crops such as coffee cocoa, palm oil, rubber and tea. The rationale has already been stated in discussing the basic Nerlovian framework; namely, for tree crops capacity increases (the acreage planted) usually do not begin to yield increments in output for many years. This lengthy gestation period for tree crops usually makes the short-run elasticities of supply substantially smaller than the long-run elasticities.

Even in the case of annual crops, capacity constraints are often an important factor in the short run because of land shortage or rudimentary technology. In certain places, the most aggressive farmers and those that are relatively more market-oriented or producing traded goods may not possess enough land to employ themselves fully. In many low-income countries the limited use of fertilizers and modern machinery often seriously circumscribes the short-run elasticity of supply to price increases. In addition, the active role of government agencies in the form of extension services and various other incentive programs, affects the supply responses of farmers to price incentives, including those emanating from real exchange rate changes.

Also of notable importance are the factors represented simply by m_a in equation (16). Indeed domestic marketing constraints sometimes function as a disincentive limiting the supply response of farmers. As with capacity constraints, marketing constraints drive a wedge between the desired response of farmers and the actual response.

Studies within, but especially outside, 1/ the Fund do reveal that price elasticities of supply are generally positive, but that in the short run such elasticities can be quite low--that is much less than one--and at times even negative. The studies also show that long-run supply elasticities are generally larger than short-run elasticities. Evidence also supports the obvious perception that other factors are important in agricultural production. 2/

Even where the short- to medium-run elasticity of domestic supply to real exchange rate changes is significantly positive and where domestic marketing and other nonprice constraints do not counteract the supply response, foreign market conditions play a role in determining the incremental sales realized from the augmented domestic supply as well as the amount of additional foreign exchange receipts that ensue from these sales. In this regard, the foreign price elasticity of demand faced by a

1/ See Ghatak and Ingersent (1984) pp. 203-13 for a recent listing of the most important studies of supply elasticities by crop and by region in various developing countries.

2/ See, e.g., Bond (1983) and Rao (1986).

country, and the state of the world economy, are important, as is the nature of protection encountered in foreign markets and the requisite marketing arrangements for foreign sales, particularly the sort of contracts and contracting usual in the appropriate market. ^{1/} With some notable exceptions, the assumption usually made is that the individual developing country faces an infinite price elasticity of demand for its product. Hence the usual procedure is to lean heavily on the commodity price forecasts of the staffs of the Fund and the Bank in making projections, within the framework of Fund-supported adjustment programs, except where a country has explicit contracts or highly specialized (sometimes preferential) relationships with its trading partners or is a relatively substantial supplier to the world market.

4. Efficiency

One of the most difficult aspects in programming for adjustment that affect agriculture is the exact mix of policies to improve efficiency and increase the productivity of resources in agriculture, thereby increasing farmers' response to price changes or reducing their costs per unit of output. There are two broad elements here: intersectoral efficiency and intrasectoral efficiency. Three guiding principles generally condition whatever specific approach is taken.

First, there is the optimal structure of relative prices. In general, under normal conditions for any two commodities i, j , it would be considered optimal to equalize the ratios of prices to marginal costs. Hence with P and MC being prices and marginal costs, respectively, the approach would, as a first approximation, seek to set $P_i/MC_i = P_j/MC_j$. In practice, with

internationally-traded goods, and with controlled prices or protected domestic markets, the efficiency criterion becomes one of equating the relative domestic prices with the relative international prices--given, of course, that the country is a pricetaker in all the international markets concerned. Hence if P_w is the world or international market

price in domestic-currency terms, and if P_d is the domestic price (with controls or protection), then the optimal policy is to set $P_{di}/P_{wi} =$

P_{dj}/P_{wj} . As long as only prices are controlled domestically the

domestic producers will then adjust their quantities in line with their marginal costs, so that, in equilibrium, we will have

^{1/} See Kirmani, Molajoni and Mayer (1984), Chu and Morrison (1986), Bond (1987), and various papers cited in those studies.

$$(17a) \quad \frac{P_{di}}{P_{wi}} = \frac{P_{dj}}{P_{wj}} \text{ and}$$

$$(17b) \quad \frac{P_{di}}{MC_i} = \frac{P_{dj}}{MC_j} .$$

The satisfaction of conditions (17a) and (17b) also implies that the so-called nominal protection coefficients will be equalized among commodities. 1/

Second, as regards subsidies particularly to inputs and to agricultural imports, the Fund-supported program would not only subject the subsidies to the usual financial balance considerations, but would also try to contain their distortionary effects on relative prices. Hence, given similar impact on equity and budgetary balance, subsidies that do not affect relative prices (e.g., lump-sum transfers) would be considered superior to those that do.

Third, in allocating investment resources, the equalization of the marginal social rates of return among sectors would be considered optimal. The social rate of return incorporates external economies and diseconomies. From a national point of view the social rates of return are related to sectoral or subsectoral incremental output-capital ratios. If y represents real output (GDP) and I real investments, then the ideal would be to equate the growth rate effect of the marginal investment among the different sectors. Hence, for investment in any two sectors i and j , we will have

$$(18) \quad \delta \hat{y} / \delta \hat{I}_i = \delta \hat{y} / \delta \hat{I}_j$$

1/ See Bale and Lutz. The nominal protection coefficient can be specified in our framework as $\frac{P_{di} - P_{wi}}{P_{wi}}$ for any commodity i .

a. Intersectoral efficiency

Intersectoral efficiency is intimately connected with the questions of terms of trade and supply response that we have discussed above. With intersectoral efficiency, the allocation of resources between agriculture and nonagriculture is optimal, and the ratio of value added in agriculture relative to GDP is also optimal. In short, the idea is to ensure that resources go where they are most productive--that the normal neoclassical conditions for optimal use of resources are satisfied. In practical terms this has meant trying to create an environment ensuring, to the extent possible, that the values of the arguments in equation (16)--the Q_m function--are conducive to wealth maximization from the society's resources. It may be quite possible and easy to show how Q_m can be increased x percent by reducing P_v/P_a or raising DC_a/P_a or lowering P_n/P_a etc. But it is usually much more difficult to demonstrate that the budgetary, relative price and other effects on the nonagricultural sectors do not then engender an overall adverse effect on economic growth.

As regards intersectoral efficiency, therefore, the aim would be to facilitate an allocation of resources between agriculture and non-agriculture such that conditions (17) and (18) are satisfied, where one can think of agriculture as being sector i and nonagriculture as sector j. The typical approach taken in Fund-supported adjustment programs is one of deference to the World Bank and caution in introducing specific policy measures--a sort of minimum information approach. Deference to the World Bank takes place especially in drawing inferences about the satisfaction of equation (18); in fact it is common practice to request an explicit evaluation by the World Bank of the public investment programs or the capital budgets of countries seeking Fund assistance.

In general, as in other areas of Fund-supported programs, there are usually both structural and demand management policies involved. In the case of structural policies the emphasis has been on improvements in the functioning of markets--labor, capital and commodities; improvement in the global efficiency of public investment; better banking facilities in the rural areas, thereby encouraging rural households to save through the banking system; and making changes in the composition of budgetary revenue thereby facilitating a more equitable structure of taxation.

On the demand-management side, the challenge has been to establish producer prices and rates of expansion of bank credit to the agricultural sector so as to minimize the risk of sub-optimal adjustment (from the viewpoint of neoclassical efficiency) of Q_m . Producer prices are generally set with reference to the effective taxation implied by different price

schedules. ^{1/} As regards bank credit, in practice a sort of real bills doctrine has prevailed as a guide; that is, credit programmed for agriculture is determined by expected agricultural marketed output and the anticipated price. The traditional level of credit per unit value of marketed output usually is determined at a micro level between bankers and customers; this traditional level is then used as a parameter in the macro decision process. Hence, in the working out of domestic credit ceilings, the credit available for agriculture is often explicitly taken into account in the calculations, in the manner described above--the more so as the weight of agriculture in exports increases. In this exercise, of major concern is that the seasonal credit requirements of agriculture are sufficiently taken into account in the phasing of credit expansion.

b. Intrasectoral efficiency

The desired levels of the arguments of Q_m in equation (16) are determined in the light not only of intersectoral efficiency of productive resources but also of intrasectoral efficiency in the use of resources within agriculture. As a result, it is common to find policies designed to attain five broad goals: abating waste in public investment projects in agriculture; removing transport and marketing bottlenecks; improving agricultural extension services; rationalizing the pricing of agricultural inputs such as fertilizers; and enhancing the efficiency of management of parastatals in the agricultural sector. In each of these categories, the Fund and country authorities have worked closely with the World Bank in designing appropriate policies. Indeed the assessment of the Bank has been an important input into the Fund staff's evaluation of a set of policies as being adequate, if fully implemented, to tackle the relevant problems in the area of intrasectoral efficiency.

Waste in public investment has occurred in a wide variety of projects, including crash crop programs and projects to facilitate the attainment of self-sufficiency in certain food items, particularly involving state farms. Various land settlement schemes and integrated agricultural development projects have also manifested waste, especially the credit aspect of such programs, with loans to numerous small farmers

^{1/} Let t_a represent the effective tax rate on the agricultural sector commodity. Then

$$t_a = 1 - \frac{pc_a}{PS_a(1-mc_a)}$$

where PS_a and mc_a are the sales price and marketing costs (as a fraction of PS_a sales price) respectively, of the state enterprise (marketing board).

often becoming uncollectible. Moreover, capital projects such as dams and irrigation networks are sometimes made bigger or more expensive than would have been warranted if reasonable cost-benefit calculations had been made. Naturally, the waste that can be abated in the framework of a Fund-supported program would relate to future investment activity.

Storage and transport facilities have contributed to the failure of agricultural policies in many countries. Inadequate warehouse and refrigeration facilities have, in certain circumstances, helped slow down progress in the fish, meat, and poultry industries and significantly circumscribed the extent of marketing of domestically-produced grain. The transport situation often becomes troublesome at every stage--roads, vehicles and spare parts, and fuel. The construction and maintenance of trunk and feeder roads are often allowed to wane, usually due to serious constraints on both foreign exchange and the government budget, but sometimes also due to deficient operation of foreign exchange control schemes and inefficient allocation of public resources. Modification, or rationalization, of foreign exchange and government budgetary allocations often emerge, therefore, as an essential element of the adjustment program.

The questions of budgetary allocation and efficiency of resource use also arise with respect to extension services and the pricing of agricultural inputs supplied by state enterprises or subsidized by the government. In the case of extension services the desire is to ensure that supply response of farmers to prices do not get muted by lack of knowledge or by overestimation of risk as a result of insufficient or inappropriate extension services. 1/ In recent years, especially, research and experimentation have been taking place to improve knowledge on the subject of reforming extension systems. 2/ Fund-supported programs have sometimes included modification of extension systems.

Rationalization of the pricing of agricultural inputs handled by public enterprises (or subsidized by the state) as well as methods to improve the management of public enterprises have been interrelated issues that have been tackled in some Fund-supported programs. In this

1/ Farmers in low-income countries are often thought of as being concerned with safety-first, i.e., survival, or disaster avoidance, instead of profit maximization [see Lipton (1968), Shahabuddin and Mestelman (1986)].

2/ The current vogue appears to be the training and visit system. Here again the Fund staff has relied heavily on the expertise of the World Bank staff. See Feder and Slade (1984) and the references cited there for an introduction to the training and visit system.

regard, three types of policy measures have been included in such programs. First there have been policies designed to promote more "economic pricing" of inputs and other services provided by state enterprises, partly for the beneficial budgetary consequences, and partly to improve the efficiency of use of resources. Apart from reducing the disparity between supply price of an input or service and its average cost it is not usually spelled out in greater detail what economic pricing means. There is apparent reluctance, for instance, to impose a marginal-cost-pricing rule (setting price equals marginal cost) or even an average-cost-pricing rule (price equals average cost). The undertaking to pursue more economic pricing becomes a loose rule that is interpreted and applied as follows: to the extent possible, set price equal to marginal cost, and, in any event, reduce significantly any negative difference between price and average variable cost.

Another type of policy measure in Fund-supported programs has been to encourage privatization, or, more loosely, a greater role for the private sector. This does not necessarily mean that the state enterprises or government departments cease operations in the particular area of activity concerned. It can simply mean that certain activities get subcontracted out to the private sector or that management contracts are given to the private sector to operate state-owned organizations and enterprises. ^{1/} In the agricultural sector the two areas where a greater role has been sought for the private sector are marketing and extension services.

More frequently--and indeed this tends to be the initial reaction to inefficiency in state enterprises--the undertaking is to streamline and reorganize the state organization so as to enhance its management capability and cut down on waste. Sometimes as part of this process, new management teams are put in place, and certain units or branches are closed down. At other times decentralization is thought to be the key to improving management. Whatever the process it can become part of the Fund-supported program.

5. Investment, macroeconomic measures and private returns

Direct pricing policies and improved efficiency contribute to raising the marginal social and private returns to resources in agriculture. But various credit, investment and fiscal measures also have positive effects on marginal private returns in agriculture and hence on the Q_m function.

Various measures are generally included in Fund-supported programs that serve to reduce the cost of credit to farmers (lowering i_a and raising DC_a). These include direct interest rate subsidies or limits; credit

^{1/} See Berg (1982).

guarantees on loans made to agricultural producers; and the redirection of credit from outside to inside official money markets thereby lowering the average cost of private loans to agricultural producers.

Investment in infrastructure and in human capital (health, education) also raise returns to agriculture. The former do so mainly by lowering marketing cost while the latter help to raise the productivity of labor in agriculture. As a result, Q_m is raised for any given w_a/P_a ; also m_a in equation (16) is reduced.

The provision by the government of various commodities and services used as inputs by farmers tend mainly to lower P_v/P_a . Value added per unit of output is raised for the farmer tending to increase equilibrium Q_m .

Preferential treatment in the area of exchange and trade policies can also effectively lower P_v/P_a . Or such preference can lower P_n/P_a by raising the effective producer price or lowering the effective price received by nonagricultural activities. Preferential treatment can also facilitate rapid increases in capacity or shorter gestation periods by permitting imports to be made on a timely basis. Particularly relevant are policies eliminating quotas and licensing restrictions on imported inputs for agriculture as well as preferential access to foreign exchange in a regime of tight foreign exchange controls.

IV. Recent Experience

Stand-by arrangements with 36 member countries were current during the financial year May 1, 1985-April 30, 1986. ^{1/} As discussed above, the associated programs emphasized macroeconomic policies and measures that were expected to have remedial effects on the balance of payments, growth and inflation. All sectors, including agriculture, were thereby to be affected. It was not found necessary, in certain cases, to mention the agricultural sector in particular. But, as stated before, in certain other cases the performance of the agricultural sector was so important for the overall macroeconomic developments in the economy that certain policies directed at that sector were considered an essential part of the program designed to achieve the macroeconomic targets. A survey of these 1985/86 programs reveals that the agricultural sector was mentioned particularly in areas that can be classified as follows: (1) pricing policies; (2) credit policies; (3) public investment and private investment; (4) supply and structural adjustment measures; (5) miscellaneous institutional reforms; (6) fiscal policies; and (7) exchange rate policies (see Table 1 for a summary).

^{1/} See International Monetary Fund, Annual Report 1986, p. 76.

1. Pricing policies

Various pricing policies or measures were included in the programs with Bangladesh, Belize, Central African Republic, Cote d'Ivoire, Dominican Republic, Equatorial Guinea, Ghana, Guinea, Jamaica, Kenya, Madagascar, Mali, Nepal, Niger, Panama, Senegal, Sudan, Togo, and Zambia. The most common policy was the raising of marketing board prices; sometimes the rationale was explicitly stated as an attempt to improve the incentive for production of (domestic or export) crops. Minimum procurement and support prices were also mentioned as being adjusted--usually upward.

Food prices were touched upon in connection with subsidies or liberalization measures. In particular, to improve the financial position of public enterprises engaged in the importation of foodstuffs while simultaneously encouraging the domestic production of substitutes, price structures were to be revised, price controls lifted or prices were to be adjusted more frequently in line with costs particularly in the event of exchange rate changes.

When public enterprises were important in agro-industry--for example in the operation of sugar mills--they were discussed in the programs. The policy undertakings in this area included the raising of prices to permit some increase in (accounting) profits with the aim of supporting needed investment projects in the enterprises concerned.

In a few programs fertilizer price policy was to be modified. Retail prices of fertilizer were to be raised either in order to cover costs more adequately or as part of a general policy of government to phase out fertilizer subsidies.

2. Credit Policies

Given the economic circumstances of farmers, and the institutional environment for credit expansion, it is often felt that special policies are needed to ensure adequate financing for agriculture at reasonable cost to farmers. Hence the agricultural sector came up for special treatment in the area of credit policy in the programs of Bangladesh, Central African Republic, Cote d'Ivoire, Equatorial Guinea, Ghana, Jamaica, Liberia, Mali, Mauritius, Nepal, Philippines, the Sudan, Togo and Zaire.

First, credit ceilings took account of the need to finance certain buffer stocks, as well as the seasonal credit requirements of the agriculture sector--both the private and public sectors. In one case credit policy also aimed at reducing the level of overdue loans including those to the agricultural sector.

Table 1. Policies Included in Stand-By Programs of 1985-1986
in Light of their Direct Effects on the Agricultural Sector

1. Pricing Policies

- a. Producer prices set by marketing board raised.
- b. Minimum procurement prices raised.
- c. Food prices liberalized or made more flexible in line with cost increases.
- d. Prices of public enterprises in agro-industries raised.
- e. Retail prices of fertilizer raised.

2. Credit Policies

- a. Financing needs of buffer stocks met.
- b. Seasonal credit needs of agricultural sector taken into account in setting quarterly credit ceilings.
- c. Overdue loans to agricultural sector reduced.
- d. In selective credit controls agricultural sector included among priority sectors.
- e. Attempts made to improve security of loans to farmers e.g., through guarantee fund or insurance scheme.
- f. Attempts made to improve farmers' access to banks.
- g. Foreign funds obtained to support loans to farmers.
- h. Preferential interest rate on credit for food crop production and marketing increased.

3. Investment Policies

- a. Public investment program aimed at increasing share of agriculture.
- b. Various measures designed to improve efficiency of public investment in agriculture.
- c. Technical packages restructured to make them more suitable to local conditions.

4. Supply and Structural Policies

- a. Measures to improve the distribution and quality of inputs to farmers.
- b. Revitalization of credit delivery, extension services, research, storage and milling capacity and other support services attempted.
- c. Diversification of agriculture explicit aim.
- d. Promotion of increased self-sufficiency attempted.
- e. Continued reliance on integrated rural development projects emphasized.

5. Miscellaneous Institutional Reforms

- a. Measures introduced to enhance privatization within agriculture.
- b. Price liberalization measures introduced.
- c. Various steps taken to improve management of public enterprises in agriculture.
- d. Measures to introduce more effective extension schemes started.

6. Fiscal Policies

- a. Import duties on fertilizers lowered.
- b. Lower-than-average rate of taxation set for agricultural incomes.
- c. Sales taxes on important tree crop lowered to 50 percent of standard rate.
- d. Gradual reduction of export taxation on agriculture started.
- e. Import bans on competitive products replaced by moderate import tariffs.
- f. Food subsidies (introduced the previous year) to be phased out.

7. Exchange Rate Policies

- a. Coordination of currency depreciation with producer price increases formalized more sharply.
- b. Policy changes made in various aspects of the exchange system to help bolster agriculture exports.
- c. Liberalization of imports destined for agriculture.
- d. Increased availability of foreign exchange resources for agriculture made possible.

Second, there were various selective credit control measures. For instance, agricultural sector borrowers were included among priority borrowers in order to prevent restrictive overall credit policies from placing "undue" constraint on them. The authorities in one country were intensifying their efforts to encourage banks to increase the flow of credit to the priority sectors. In that regard, the authorities believed that improvement in rural extension services should facilitate farmers' access to credit; also being considered was a guarantee fund for agricultural credit and an insurance scheme for agricultural production. In contrast, in another country, a preferential interest rate for food crop credit was increased in order to minimize the diversion of crop credit to other purposes--a process that was apparently being induced by the wide margin between the preferential and normal rates.

Third, the authorities as part of their adjustment program were, in at least one country, trying to increase the access of small farmers to institutional credit by supporting the establishment of commercial bank branches in remote areas. The ultimate goal was to provide an alternative to the traditional money lenders; in the process both the availability and cost of credit to the farmers were expected to be favorably affected.

Finally, in order to reduce the impact of agricultural loans on domestic credit expansion the authorities in a few cases obtained foreign funds to support loans to producers in the agricultural sector. This was accomplished through some fund (e.g., an Export Development Fund), a development bank, or a specialized bank such as an agricultural credit bank.

3. Investment policies

Investment policies in agriculture featured prominently in the programs of Central African Republic, Cote d'Ivoire, Dominica, Guinea, Nepal, Niger, Sudan, Togo and Zambia. The programs called for a greater share of resources for investment in agriculture and/or for an improvement in the efficiency of investment in that sector. The resources required were, inter alia, for irrigation facilities, improvements in the transport network, on-farm storage, and inputs for smallholders. Such investment was not only for additions to capital stock but also for maintenance and rehabilitation of existing facilities.

In the case of efficiency, mention was made of the need to improve the soundness of cost calculations and the realism of the market analysis connected with investment. In addition, efficiency was to be enhanced by the restructuring of projects to create technical packages more suitable to local conditions. Moreover, where applicable the programs referred to new or continued technical assistance being given by the World Bank to refine and strengthen investment programming procedures.

4. Supply and structural adjustment policies

Diverse supply and structural adjustment policies were contained particularly in the programs with the Central African Republic, Jamaica, Liberia, Madagascar, Mauritius, Nepal, Senegal, Sudan, Thailand and Togo. One favorite theme was the desire to improve the distribution and quality of inputs--seeds, fertilizers, etc.--to farmers. The rationalization and rehabilitation of various support services was also thought necessary to increase supply; in particular credit delivery, extension services, research, storage and milling capacity, were to be expanded or improved during the program period and beyond. All those supply policies were naturally to be coordinated with the public investment program. A further theme pursued in several programs was diversification of agricultural production. In one program, the importation of a domestic food crop was to be restricted in quantity in line with a policy to promote self-sufficiency. In another there was mention of efforts to improve farming methods especially in the direction of large-scale farming, while another program stated the government's desire to continue to rely on integrated rural development projects to stimulate agricultural progress.

5. Miscellaneous institutional reforms

Various institutional reforms were explicitly intended in the programs of Bangladesh, Belize, Central African Republic, Cote d'Ivoire, Equatorial Guinea, Korea, Madagascar, Mali, Morocco, Philippines, Senegal, Togo and Zambia. The most common policy measure was increased privatization, which usually was being pursued within a framework of enhanced liberalization of the economy. For instance, in one country private sector owners were being brought into a state-owned beef company while the government was actively seeking to divest the marketing board of its rice operations. In another country, the marketing agency for foodstuffs was being privatized and in a third country increased private participation in the forestry subsector was being pushed. General liberalization included amendment of a marketing board Act in one country--to eliminate the board's trading monopoly in one grain and in fertilizer--and the phasing out of pricing, marketing and other forms of administrative controls in another country.

Also common among institutional reform measures were various steps to improve the management of public enterprises. Although this was partly motivated by a general desire to improve efficiency, the urgency to act was usually felt when the financial performance of an enterprise was putting, or threatening to put, serious strain on the overall public finances, especially the government budget. This was the case for a mills corporation in one country, a grain management fund in another, and a price equalization and stabilization fund in a third.

Extension services also came in for reforms in a few countries. Hence in one country there was a general commitment to introduce more effective extension schemes while in another it was stated explicitly that a new training and visit system was being introduced.

Finally, various other reform measures were put in place or to be installed. For instance, in one country the cooperative system was being restructured, creating smaller units called "village units." In another country the regulatory framework for the exploitation of timber resources was being changed.

6. Fiscal policies

The agricultural sector was the focus of fiscal measures in a number of programs. Changes in import and export duties affected agriculture in Argentina, Belize, Equatorial Guinea, Jamaica, Liberia, Thailand and Zaire. As regards government expenditure, including subsidies and capital outlays, measures designed explicitly to affect agriculture were taken in Ghana and Jamaica.

Policies with regard to import duties, and export and income taxation were designed to influence after-tax profits, farmgate prices, and the efficiency (or competitiveness) of enterprises. To limit the rise in costs, import duties on fertilizers were lowered in one country while, in another country, imports of fertilizers and other agricultural inputs were exempt from additional tariff measures in the form of stamp duties. After-tax profits were also to be augmented in a third country by reinforcing the price incentive system with a lower-than-average rate of taxation on agricultural incomes.

To bolster farmgate prices, the sales taxes on an important export tree crop of one country were limited to 50 percent of the standard rate-- a measure that was also expected to encourage new investment in the sub-sector--while in another country the government was to continue its policy of gradual reduction of explicit export taxation of two important crops.

As an efficiency measure the government of one country was going to lift import bans that had been introduced to protect local production of certain foodstuffs and replace them with moderate import tariffs.

In one country, the tax measure directed at agriculture was designed to raise the effective export duties on major crops by increasing nominal rates somewhat but, more importantly, by reducing the ability of exporters to underinvoice and understate their tax liabilities. A system of reference prices was introduced as the basis on which to tax. From the viewpoint of macroeconomic adjustment, in this particular case, the beneficial effect of additional revenue for the government was thought to outweigh any negative effect of the higher effective tax rate on the export crops.

On the expenditure side, one country made cuts in the budget of the Ministry of Agriculture that were deeper than the average for all departments; in view of liberalization, price and other measures that were being introduced, these cuts were not expected to impinge on agricultural output in any significant way. In another country, as part of the attempt to reduce current budgetary outlays, food subsidies (introduced the previous year) were to be phased out. It was not stated if that was meant also to redound favorably on domestic food production.

7. Exchange rate policies

Although policies in the area of exchange rate, in particular, and the exchange system, in general, are usually taken in the light of the overall balance of payments effects, the agricultural sector seems to have been of special concern in designing exchange rate policies in Belize, Dominican Republic, Ecuador, Equatorial Guinea, Madagascar, Sudan, and Zambia. The policies were of four types. In one country, a currency depreciation was to be better coordinated with producer price increases in order to bolster incentives for agricultural exports. Second, there were policy changes in other aspects of the exchange system. In one country it was unification of the exchange system together with adoption of a freely floating rate to facilitate adjustment to falling export price of the major agricultural export. In another country, simplification of the exchange system was explicitly expected to help agricultural exports. Third, liberalization of the trade and payments regime were designed to affect agriculture. In one country, for instance, quotas and licensing restrictions for certain imports were to be eliminated; the imports included, inter alia, spare parts and packaging materials for certain agricultural export commodities. Finally, in one country it was clearly stated that the authorities would strive to increase the availability of foreign exchange resources for agricultural equipment and other related inputs.

V. Concluding Remarks--Some Critical Issues

Both the general macroeconomic policies and the specific policies directed at agriculture, which are incorporated in programs supported by IMF stand-by arrangements, are sometimes criticized on various grounds. It is not possible to do justice to the diverse criticisms here; but three are of great relevance for the thrust of this paper. The first is that Fund-supported programs are biased toward short-run to medium-run stabilization, and neglect longer-run development issues. The second is that the programs give excessive weight to external adjustment while all other welfare-augmenting goals such as output growth and income distribution are considered only as subsidiary to the primary goal. Third, in designing policies, the Fund-supported programs are thought of as being too oriented toward domestic price, domestic credit and exchange rate measures, while downplaying other policies and factors affecting production and exports.

These criticisms have been made not only in their general form but also directly with respect to agriculture. Indeed the criticisms in the latter case become criticisms of the traditional neoclassical approach. 1/

Hence Fund-supported programs in the eyes of some critics do not display sufficient awareness of the fact that rising agricultural productivity is brought about by an interplay of forces that include price incentives; changes in the social and institutional structure; and public investments in research, rural infrastructure and technological diffusion. The implication would be that Fund-supported programs should give more weight to institutional factors such as agrarian structures, contractual forms and the land market. In addition, such programs should give greater weight to the implementation of investment policies.

Although it is easy to reply that reforms in some of these areas take a long time to yield substantial benefits and that among the *ceteris paribus* (in deriving the Q_m function) must be certain institutions, the Fund does recognize, as we have seen, the usefulness of institutional reforms and of investment, in the enhancement of agricultural production and exports. Increasingly, not only do programs supported by stand-by arrangements include such measures but also in many low-income countries, particularly in Sub-Saharan Africa, more and more Fund-supported programs tend to be those that are designed to facilitate institutional reforms, improvements in investment and technological diffusion. 2/

Even ignoring longer-term influences on Q_m there is still the problem that serious attention may not be paid to all the arguments of Q_m in equation (16). This could result in a suboptimal combination of instruments to alter Q_m . In particular, a brief look at Fund-supported programs would leave one with the impression that serious attention is always paid to influencing the relative price of the agricultural commodity (P_n/P_a)-- particularly where prices are controlled--to the real credit to agriculture (DC_a/P_a), and to the level of the real interest rate. Much less critical analysis--in order to ensure optimal levels for them--appears to be made for some of the other variables. The reason is, partly, that such variables are often outside the direct control of the authorities (e.g.,

1/ See Rao (1986).

2/ In particular, in 1986 the Fund established the Structural Adjustment Facility (SAF). The members eligible to use the facility are the low-income countries that are currently eligible to receive IDA loans (see IMF Selected Decisions, pp. 132-45).

w_a/P_a , w_n/P_a , and m_a) or because the optimal levels of the variables are extremely difficult to determine (e.g. for P_v/P_a).

One advantage of general macroeconomic policies or certain structural policies directed, for example, at improving the functioning of markets, is that they tend to leave relative prices and relative quantities to be determined by tastes, technology and comparative advantage. A disadvantage is that they may not facilitate the exploitation of dynamic comparative advantage. Selective intervention, in contrast, is amenable to optimal use to assure development along the path of dynamic comparative advantage; but there is always the risk of authorities selectively intervening in favor of commodities or services for which dynamic comparative advantage does not objectively exist.

One of the potential problems with the sort of policies contained in adjustment programs supported by Fund standbys--i.e. setting instrument (or intermediate targets) such as P_v/P_a or P_n/P_a guided by short- to medium-term balance of payments objectives--is that the policy package can become one of selective intervention guided by static (rather than dynamic) comparative advantage and by the potential for immediate direct foreign exchange earnings (or foreign exchange savings) rather than by the overall long-run contribution to real GDP growth. Even when this risk is clearly appreciated, the fact remains that it is usually much easier and faster to identify static comparative advantage and to estimate the direct foreign exchange earnings or savings potential, of specific policy measures, than it is to assess dynamic comparative advantage and overall long-run contribution to output growth.

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