

AGRICULTURAL SUPPLY RESPONSE TO STRUCTURAL ADJUSTMENT POLICIES: THE PRICIST VERSUS STRUCTURALIST VIEWS IN THE ETHIOPIAN CONTEXT

Dejene Aredo

1. INTRODUCTION

"A specter is haunting Africa: the specter of pricism¹". These words of Michael Lipton (quoted in Beynon, 1989:323) signify the essence of structural adjustment programmes (SAPs²) in Africa. Pricism was the major thrust of the Berg Report (World Bank, 1981). And, agricultural pricing conditionality has remained central to structural adjustment lending (FAO, 1990:92-93). A fundamental assumption of the pricist approach in Africa is that a change in the internal terms of trade in favour of agriculture will lead to a shifting of income away from those who tend to be net consumers of tradables (urban people, the service sector) to producers of tradables (farmers) (Delgado, 1988:1). It has been asserted that price incentives play the following roles in agricultural development: (1) higher prices will lead to an increase in the provision of privately provided inputs, which are fixed in the short-run (e.g., leading to an increased use of labour by slowing down the rate of out-migration); (2) responsive prices will lead private agents to make investments in storage, transportation, and delivery of both inputs and output; (3) the increase in the privately provided inputs brought by higher prices will render publicly provided inputs more productive; and, (4) the removal of price controls will lead to the release of often overextended administrative resources which could be used in the management of publicly provided inputs (Schif, 1987: 387).

The pricist argument has been high on the agenda of the World Bank in its policy dialogue with Ethiopia [World Bank 1983, 1987a 1987b,1990]. For example, in its country report of 1987 the Bank asserted that:

The primary justification for devaluation in Ethiopia is to enable an increase in producer prices which should make production of exportables and efficient import substitutes more profitable. The increased profitability should lead to an increased desire to produce more and generate a higher export surplus. Increased producer prices should ultimately lead to an increased production and higher exports (World Bank, 1987b: 94-95).

True to the recommendations of the Bank, the Transitional Government of Ethiopia has substantially devalued the Birr; what remains to be seen is whether the devaluation could "lead to an increased desire to produce more and generate a higher export surplus".

The structuralist view, on the other hand, argues that technological and structural backwardness is at the root of the problem, and that until steps are taken to free African agriculture from constraints that these impose, the supply response to increased price incentives will be minimal.

The purpose of this paper is to discuss whether peasant agriculture is responsive to changes in producer prices (Section 2), describe constraints on supply response (Section 3), and draw broad policy implications (Section 4). The literature review of the problematic of supply response to SAP is situated in the Ethiopian context. This paper argues that in poor developing economies non-price variables are more important than prices in stimulating agricultural production.

2. IS PEASANT AGRICULTURE RESPONSIVE TO PRICE CHANGES?

The policy response of agriculture has been primarily addressed in the supply response literature (Binswanger, 1989:231). Three alternative hypotheses of supply response on the part of developing country farmers to agricultural prices changes can be postulated (Yotopoulos and Nugent, 1976:135): (1) farmers in developing countries respond to relative price changes normally; (2) farmers respond to relative price changes "perversely"; and (3) farmers' response to price incentives is insignificant.

The test for the three alternative hypotheses consists of measuring the elasticity of supply with respect to price. Hypotheses (1), (2), and (3) predict, respectively, that the price elasticity of supply of agricultural products in developing countries is positive, negative, and zero.

In discussing supply response elasticities it is important to make a distinction between the short and long run. It is also important to make a distinction between elasticities for individual crops and the aggregate supply elasticities. It has been noted that "the difference between individual and aggregate elasticities is a standard microeconomic lesson that World Bank staff too often ignore" (Binswanger, 1989:233).

Supply response elasticities for individual crops can be highly responsive to changes in relative crops (Beynon, 1989:326; Askari and Cummings, 1976; 1977; Bond, 1983; Binswanger, 1989). However, response for individual crops may be possible at the expense of other crops as resources are taken away from other crops. The price elasticity of agriculture overall is very low in the short run, because the main factors of production are fixed. Aggregate output can grow only if more resources are devoted to agriculture or if technology changes (Binswanger, 1989:231). The upshot of this point is that "partial supply response is not an issue" (Delgado, 1988:2); what matters is how aggregate output responds to changes in relative producer prices. This response takes time to materialize, and "like all other dynamic processes, how long it takes is central to whether one actually gets there" (Delgado, 1988:2). Delgado puts the time horizon for elastic aggregate response to changes in the internal terms of trade at about ten years or even more for countries with adequate physical infrastructure and human capital (e.g., Argentina, Chile).

Countries with adequate infrastructure and well-developed human capital may experience low aggregate supply elasticities. Thus, "in the formulation of agricultural policy it is not enough to know if the aggregate supply response is high (or low), but high (or low) relative to what" (Chibber, 1989:55). If farmers cannot respond sufficiently to higher prices because of constraints imposed by non-price variables (e.g., infrastructure, human capital, R&D), then improvement of these variables may do more for agriculture than a policy of higher farm prices (Chibber, 1989:55).

In an important review of the literature, Chibber (1989:56) concluded that aggregated supply elasticities are low in countries where non-price variables are binding constraints:

On the basis of the available evidence, the review shows that the long run aggregate supply elasticity with respect to prices lies in the range 0.3-0.9. It is not greater than 1.0 as is sometimes claimed by those who ascribe primacy to price policy, or low as zero, according to those who view price policy effects as insignificant. However, in poor countries with inadequate infrastructure facilities its value is lower, around 0.3-0.5. The supply elasticity with respect to non-price factors is likely to be much higher; around 1.0 in countries with inadequate infrastructural facilities, imperfect markets, and lack of capital and private research organizations.

The methodological and conceptual problems of estimating aggregate supply elasticities are discussed and estimates are provided in several works (see Chibber, 1989; Bond, 1983; Binswager, 1989; Yotopoulos and Nugent, 1976:135-143; Beynon, 1989).

Regarding Ethiopia, the World Bank (1987b), using the Nerlovian method (Nerlove 1958), estimated the short- and long-run aggregate supply elasticities, respectively, at 0.24 and 0.56. Surprisingly enough, these coefficients are much greater than those for sub-Saharan Africa (0.18 and 0.21 for the short- and long-run, respectively) although non-price variables are more binding in Ethiopia than in sub-Saharan Africa as a whole³.

The import of the foregoing discussion is that it is not clear either theoretically or empirically that changes in internal terms of trade in Africa in general, and Ethiopia in particular, are *by themselves* strong enough to bring about significant increases in agricultural production. Therefore, the following section discusses the importance of the non-price variables.

3. WHY THE AGGREGATE SUPPLY RESPONSE IS SO LOW?

Factors constraining aggregate supply response in developing economies in general, and in Ethiopia in particular can be discussed under the following headings:

- 1) *Limited Proven Innovations:* An increase in the relative prices of agriculture does not automatically lead to adoption of modern farm technologies. In Ethiopia there are limited proven innovations for different localities. The R&D capability of the country leaves much to be desired. The timely supply of chemicals and improved seeds (where available) has been constrained by bottlenecks in the distributional system. In a country where less than 14 per cent of the farmers use chemical fertilizers, it is too presumptuous to expect significant improvements in the use of modern technologies in the short term simply due to improvements in agriculture's terms of trade.
- 2) *Inadequate Institutions:* Supply response can also be constrained by the inadequacy of institutional mechanisms (Streeten, 1989:7; Beynon, 1987: 329-330). The growth of Ethiopian agriculture has been constrained also by shortages of credit facilities, inadequacy of research institutions and extension services and by problems created by existing land tenure.
- 3) *Low Levels of Human Capital:* Many peasants are too malnourished and unhealthy to work harder or longer in response to higher price incentives (Beynon, 1989:329). Obviously, this problem is prevalent in Ethiopia.
- 4) *Land Constraints.* A rise in the aggregate supply of the agricultural sector in response to agricultural prices can be severely limited by the relatively inelastic supply of land (FAO, 1990:96; Smith, 1989:27, Beyon, 1989:328). In Ethiopian agriculture, land has become the binding constraint to increased production. Population pressure over land has given rise to the shortening of the fallow period, progressive diminution of the size of the operational holding, deterioration in the quality of land, and to the cultivation of marginal land as the frontier is increasingly closed⁴.
- 5) *Labour Constraints:* The aggregate supply response can also be constrained by inelastic supply of labour despite growing population (Beynon, 1989: 329; FAO, 1990:96; Smith, 1989:27). Micro-level studies undertaken by the present writer indicate that household labour supply is constrained by peak periods of intense labour activity, the need to attend to social and cultural obligations, the requirements that women have to devote a more or less fixed time to household chores, and labour diversion from farm activities due to such factors as school attendance by children and frequent labour campaigns for communal and civic activities (Dejene, 1989,1992a, 1992b, 1992c).
- 6) *The Imperfect Nature of Markets:* In sub-Saharan Africa, a substantial portion of goods and resources are not traded (Beynon, 1989:328). In Ethiopia, land is not a commodity; rural labour market rarely exist and the marketed surplus accounts for less than 25 per cent of the total agricultural production. Many markets that do exist are extremely fragmented. As a result, the effectiveness of the price mechanism is highly limited.

- 7) *Unavailability and Higher Prices of Consumer Goods:* The availability of consumer goods pushes the marginal utility of additional cash earnings close to zero which had been common in rural Ethiopia. Cross-section studies have generated negative elasticities arising from the negative response of agricultural incomes that resulted from higher output prices (Beynon, 1989:327-328). Similarly, the attempt to raise agricultural prices may set off an inflationary pressure in the non-agricultural sectors, thus reducing farmers ability to purchase consumer goods and services [Streeten 1989:8; Smith, 1989:26]. It is also possible that farmers' share in the retail prices of agricultural products may decline as the distributive margin widens as a result of a rise in the costs of transportation. The latter may be affected by the very policy instruments which are meant to improve the incentive structure of agriculture. For example, the devaluation of the domestic currency can push up transport costs as the prices of imported fuel rise.
- 8) *Inadequate Rural Infrastructure:* Inadequacies in the provision of the physical infrastructure (e.g., feeder roads, storage facilities) can inhibit the ability of farmers to respond to higher prices.
- 9) *Limits Imposed on the Size of the Marketed Surplus by the Need to Increase Own-account Consumption:* This is an important point often neglected by researchers (perhaps the only exception is Livingstone; 1977). Most farmers place priority on securing their own food production. Price policy instruments such as devaluation per se are unlikely to affect this "food security syndrome". The effect of a change in price on the surplus marketed of a staple crop will depend on the producer's income elasticity of demand for own-account consumption (Livingstone, 1977). This proposition may apply even to coffee whose domestic consumption requirements are quite high. The high income elasticity of demand for food in rural Ethiopia (around 0.8) is likely to give rise to an increased demand for on-farm consumption. The marketed surplus is bound to remain low.
- 10) *The Domination of Nature over Agricultural Activities:* This is another important factor often neglected by researchers. Agricultural activities involve biological processes, the growth of plants and animals. Man, in particular in pre-industrial societies, has limited power to influence these processes. The timing of agricultural operations (say, planting or harvesting) is determined by natural factors such as the moisture content of the soil and temperature. The gestation period of crops (e.g., four to five years for coffee) is determined outside the economic system and beyond the reach of policy variables. The sequential patterns of agricultural activities (e.g., clearing the land, then planting seeds, and then weeding) imposes restrictions on the functional division of labour in the labour process. Agricultural settlement patterns in Ethiopia are such that millions of small producers are spread over wide areas (as determined by the availability of suitable land) thus making it difficult for policy makers to communicate policy reforms to farmers. This type of settlement patterns create difficulties in the

marketing of agricultural products and in the distribution of inputs. The quality and quantity of agricultural output can be strongly influenced by the prevalence of plant and animal diseases. The coffee berry disease (CBD) alone claims as much as 20 per cent of the potential output. Perhaps, in Ethiopia, the eradication of the CBD is more effective than the devaluation of the birr in stimulating coffee exports.

- 11) *Shortages of Draft Oxen:* As much as 30 per cent of all farmers in Ethiopia are without an important complementary input, draft oxen. Shortage of oxen is one of the binding constraint in many parts of the country. Farmers without draft oxen may not perform farm operations at the right time. It is well-known that yield actually decline as specific farm operations (e.g., planting seeds) are delayed. The oxen-purchase credit of the Agricultural and Industrial Development Bank has so far brought about limited positive results.

The variables discussed above can tentatively be classified into two broad categories: (a) those indicating the inelastic supplies of inputs (items 1 to 5); and (b) those reflecting the limitations of the assumptions of a competitive market (items 6 to 10). This shows that why the pricist argument does not work in poor developing countries is basically due to the limited role that the price signal can play and due to the inelastic supplies of farm inputs. To argue that raising the relative prices of agriculture can automatically lead to the removal of these two constraints is tantamount to putting the cart before the horse.

4. DISCUSSION AND POLICY IMPLICATIONS

Four basic questions can be raised pertaining to the pricist views of agricultural supply response. Firstly, whether the underlying assumptions of the pricist school is tenable in the context of African realities. Secondly, whether price reforms can be communicated to farmers. Thirdly, whether the internal terms of trade actually improves in favour of agriculture resulting from the reform. Fourthly, whether agricultural production can positively and significantly respond to improved terms of trade. Let us take up these questions one by one.

One of the underlying assumptions of the pricist school is in the neo-classical economic theory which postulates that the objective of the firm is to maximize profit and that the price signal plays a key role in co-ordinating the decisions of various economic agents and in allocating resources. These assumptions are more relevant to advanced economies than to backward economies. For example, in peasant agriculture, the producer's primary objective may be risk-aversion than profit maximization. If the assumptions of the neo-classical economic theory have limited relevance to peasant agriculture, more intensive and systematic micro-level research is required to understand the economic behaviour of the peasant and patterns of resource allocation.

The pricist school, as spearheaded by the World Bank group, takes it for granted that the panacea for agricultural growth is an across-the-board use of unproven innovations, in particular chemical fertilizers, largely disregarding location-specific limitations and potentials of peasant agriculture. In the Ethiopian case, there is no firm empirical evidence supporting the assertion that everywhere production is primarily constrained by shortage of purchased inputs. The few micro-level studies indicate that the peasant world is radically different from what the World Bank group imagine it to be (e.g. see Dejene, 1992). Again more research is required to identify and prioritize location-specific potentials and limitations of peasant agriculture.

The World Bank group, mainly based on the relative size of the purchase prices of the now defunct parastatal, the AMC, and fertilizer prices, takes it for granted that the relative prices of agricultural products in Ethiopia are systematically depressed. Again, more research is required to investigate whether the internal terms of trade is *actually* biased against agriculture.

Price reforms (e.g., the effect of the devaluation of the Ethiopian birr) may not automatically be transmitted to farmers. This may be due to wide distributive margins, indirect taxes (e.g., the coffee surtax in Ethiopia rises with the New York unit price), and due to weakness of the administrative machinery to implement the reform. For example, it is highly unlikely that the recently announced guaranteed minimum price for coffee be implemented.

Increases in producer prices may be communicated to the farmer, and yet the terms of trade may not improve in favour of agriculture. This may be due to possible inflationary pressure arising in the non-agricultural sector. It should also be noted that a considerable proportion of the rural poor in Ethiopia consists of food buyers. In addition, a price reform programme may, perhaps, be marginal to the agricultural sector since the reform affects only a small portion of the total agricultural output (i.e., the marketed surplus, which is not more than 20% in Ethiopia).

Even if the effects of price reforms are transmitted to farmers and the terms of trade is improved in favour of agriculture, yet it is possible that the objective of stimulating production fails due to the limitations imposed on agricultural production by structural constraints as described in Section 3. Increasing the supply of public goods (e.g., transportation, R &D, irrigation) may be necessary to remove most of these constraints.

In the poorest countries, such as Ethiopia, "a boost to public investment is the key element in a correctly designed structural adjustment programme" (Mosley). And investment in R & D and infrastructure may take years to give fruits.

Ironically, meeting macroeconomic conditionality requirements has frequently worsened the scarcity of such public goods, because governments have had to severely curtail public-sector investment and recurrent expenditures in order to reduce fiscal deficits. Thus, unless the agricultural sector is given high priority in the allocation of public-sector investment, agricultural growth may be further slowed down during the adjustment

process, despite improvement in agriculture's internal terms of trade (FAO, 1990:96; Delgado, 1988:5; Binswanger, 1989; Smith, 1989: 28-30).

Moreover, the need for public investment grows as an economy declines (Mosley, p. 239, 242). And the irrelevance of the price signal to a declining economy is acknowledged by one of the very senior economists working with the World Bank:

Conventional text-book economics is not written for economies in decline, but for static or growing economies. One can structurally adjust an economy which is growing but growing inefficiently, or one that is static. But an economy in cumulative decline forces one to confront a systematic problem. Such an economy requires transformation of a Keynesian type, in which the emphasis is on the quantity and quality of investment, particularly the stimulative role of public sector investment. The Bank's structural adjustment programmes however are rooted in the marginality theories of neo-classical text-book economics with their emphasis placed on price incentives, exchange rate adjustments, and trade liberalization (cited in Mosely, p. 239).

Therefore, if conventional text-book economics has limited relevance to our declining economy, then what alternative theories can we propose for peasant agriculture? Is there any lesson we can draw from the Japanese experience of agricultural development during the last quarter of the last century? I believe there is something we could learn from the improvement approach to agricultural growth (see Dejene, 1991).

NOTES

1. It seems that the term "pricism" was coined by Michael Lipton (1987) with reference to the attempt to explain agricultural crisis in Africa in the 1980s in terms of the argument that the value of agricultural exports, in terms of domestic currency, has been reduced resulting from the disincentive structure created by lower producer prices. Parastatals and overvalued exchange rates are blamed for the depressed producer prices (see Beynon, 1989:324).
2. In this essay, structural adjustment programme (SAP), as contrasted to stabilization, is understood as that part of development policy which is devoted to achieving a boost to the supply side of an economy by the removal of market imperfections (Mosley, p. 223). But any structural adjustment programme "is not an application of economic principles but rather an improvisation, a gamble based on the premise that if past macroeconomic policies have yielded unsatisfactory results, an alteration of those policies may help (Mosley, p. 227; see also Lipton, 1987: 209-210).
3. The econometric and economic flaws in the World Bank's methodology is given in Dejene Aredo, *Methodological Problems in Estimating Agricultural Supply Elasticities* (forthcoming).
4. It is doubtful whether the ongoing process of liquidation of collective farms and the devillagization process can have any significant impact on the availability of agricultural land.

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