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THE IMPACT OF PRICE AND EXCHANGE  
RATE POLICIES ON AGRICULTURE IN  
SUB-SAHARAN AFRICA

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ABSTRACT

The purposes of this paper are two. Firstly, a review is undertaken of the available literature on the impact of price and exchange rate policies on agriculture in Sub-Saharan Africa. Secondly, an empirical analysis is undertaken using data for 31 Sub-Saharan African countries to test several of the common hypotheses concerning this policy impact.

The findings tend to confirm the predominate view that in Sub-Saharan Africa, price and exchange rate policy has an impact on agricultural production. With the exception of a few countries, the impact has been negative. However, the analysis suggests that these policies are not the most important factors affecting agricultural growth. Indeed these policies have a relatively small impact compared to other factors such as Government involvement in farm input supply, population growth, and Government's ability to operate and maintain its agricultural investments. Much of the variation in agricultural growth between African countries still cannot be explained. "Appropriate" price and exchange rate policy would have a relatively small impact on agricultural growth. The literature on this subject tends to suggest a general thrust of policy reform appropriate to all African countries. In this article it is argued that there is no stereotype price policy package suitable for all African countries. The reason is that the depth of the policy problem differs considerably between countries, as do policy objectives and other constraints (land, water, markets, social, political, etc). The policy package to remedy problems caused by poor price and exchange rate policy must therefore be adapted to each country. It should in particular adapt itself to the political situations of various countries. It must emphasize policies in addition to price and exchange rate reform. Donors should help by pushing reform in the right direction, but not expecting rapid achievement of optimal policy. Helping to establish an effective policy making process may be more important than achieving specific price and exchange rate targets.

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THE IMPACT OF PRICE AND EXCHANGE RATE POLICIES  
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I. INTRODUCTION: THE PROBLEM IN ITS CONTEXT

1. In analyzing policy the performance of agriculture in Sub-Saharan Agriculture must be born in mind. Firstly, agriculture is important in Sub-Saharan Africa contributing from 20 to 60 percent of GDP depending on the country, an average of 80% of employment, and 50 to 90 percent of exports. Much industry, trade, etc depends on agriculture. There is variation, but agriculture is clearly important. 1/

2. Food production in Sub-Saharan Africa grew by about 1.5% p.a. in the 1970's (up to 1979) compared to about 2.0% p.a. in the 1960's. Population growth was at 2.5% p.a. in the '70's. In 1979-82 food production grew faster in Sub-Saharan Africa: 1.9% p.a. But population growth continued at 2.5% p.a. There has therefore been a continued decline of food production per capita. This is the food crisis.

3. There is variation in this picture. 12 of the 40 major countries of Sub-Saharan Africa raised per capita food production over the period 1979-82 (Malawi, Rwanda, Niger, Ethiopia are examples). Performance has therefore varied.

4. Food Imports have risen very fast in Sub-Saharan Africa. One out of 5 inhabitants in Sub-Saharan Africa are now fed from imported food. The value of food imports averaged \$6.8 billion in 1980-82. Per capita imports are increasing. In 1970-72, 12.8 kg of commercial cereals per capita were imported into Sub-Saharan Africa. In 1980-82, this figure reached 23.7 kg. 2/ In addition, food aid has been increasing.

5. Agricultural exports increased at 1.9% p.a. in the 1960's (in real terms), but declined slightly in volume and value terms in the 1970's. Agricultural exports increased at 1% p.a. average between '79-82 (but still a decline in per capita terms). There has been a continued decline in Sub-Saharan Africa's share in world agricultural exports. The export performance in 1979-82 was uneven between agricultural commodities:

- (i) rapid increase in exports of cocoa, sugar, tobacco, sorghum;
- (ii) stagnation: coffee and tea;
- (iii) decline: cotton, sisal, rubber;
- (iv) rapid decline: oilseeds, bananas.

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1/ World Bank data.

2/ Ibid

6. The literature reviewed for this article (Annex III) overwhelmingly suggests that a major cause of the poor performance described above is the poor price and exchange rate policies almost universally applied in Sub-Saharan Africa. This article will support the view that such policies have had a generally negative impact on agricultural performance. However, it is found that there is considerable variation between African countries. Many maintain price and exchange rate policies which are roughly appropriate. In addition, the research done for this article suggests that such policies are not the most important factors explaining agricultural performance in Sub-Saharan Africa. Other factors are far more important. There remains a great deal that we do not know: we cannot fully explain the variation in agricultural growth between African countries. This article finds that the price policy remedies suggested in the literature are too stereotyped. The adaptation of appropriate policy to different country circumstances is not a simple task. Political, social, environmental, and economic constraints differ between countries in Sub-Saharan Africa. Policy should therefore differ from country to country as a function of these constraints.

7. A more sophisticated and in-depth analysis of the same issues studied here will begin during 1984 under the leadership of Ms Uma Lele of the World Bank. It will be of interest to compare the results of the in-depth country analysis with this cross-country analysis.

## II. TYPES OF PRICE AND EXCHANGE RATE POLICIES

8. The policies considered here are broad, involving hundreds of Government decisions and instruments. There is however a predominant policy package found in many African countries which is the object of considerable criticism in much of the academic literature and by the aid donors. There are variations, and some countries have significantly different policies. However, in general the package includes the following:

- (a) Official retail food prices for certain staples are typically artificially low. There are two main variants:
  - (i) low official prices paid to farmers by parastatals or marketing boards. The parastatals or marketing boards add their cost and sell to the consumer at a low price. The burden is on the farmer; or
  - (ii) relatively high price paid to the farmer by the parastatals, while the parastatal sells more cheaply to the consumer. The parastatals are financially supported by Government (in this case Government subsidizes the consumer), or by recourse to the banking system (in which case whoever finances the banking system subsidizes the consumer).

Parastatals may also import foodstuffs and sell at a loss, or transfer food aid to consumers at less than its commercial value.

- (b) Pan-territorial pricing is commonly applied in which farmgate prices are fixed at the same level everywhere in the country and throughout the year. Wholesale and retail food prices may also be separately fixed at the same level everywhere in the country and throughout the year.
- (c) Often there is an uncontrolled parallel market for food. This is usually discouraged by Government and sometimes actively so. In other cases Governments are indifferent to its existence. The parallel market (or free market) is rarely assisted by Government. Where it exists prices are relatively free, though influenced by prices paid by competing parastatals.
- (d) The exchange rate is often overvalued. This policy is often combined with import quotas and duties which protect manufactured goods produced locally against import competition (the exception is in the franc zone where the CFA franc is not now significantly overvalued). Exchange rates are however periodically adjusted by Government. A country's exchange rate is also adjusted as other foreign currencies move relative to that to which the local currency is pegged, or when domestic price inflation differs from price inflation in countries which are trading partners.
- (e) Farm inputs are typically subsidized (low interest rate on credit, subsidized fertilizers, subsidized irrigation water and high yielding variety seed, free livestock health services, Government supported extension and research).
- (f) There is often a tax on agricultural exports. This is often combined with fixed official prices paid to producers of agricultural exports designed to stabilize the domestic price compared to the more volatile international price. The price paid to the farmer will be below or above the international price depending mostly on the movement of the latter in its cycle and the efficiency of the parastatal enterprise or marketing board acting as an intermediary.
- (g) Land taxes are generally not used in Sub-Saharan Africa.
- (h) Formal income tax is almost always avoided by farmers or not applied to farmers. In some countries a poll tax is applied. It is to be noted that the implicit tax on farmers caused by the above exchange rate and price policy often amounts to an income tax, to the extent that farmers have no alternative free market on which to sell.

III. THE IMPACT OF AGRICULTURAL PRICE POLICY

A. The Issue

9. Why are retail food prices often set artificially low by Governments? One objective sought in fixing low retail prices for food staples is to provide food to the poor at a price they can afford in order to assist them in meeting minimum nutritional needs. Another is that the urban population (who are often not the poor) which benefits most if not entirely from low food prices is often a source of potential social/political instability, and a source of support to political leaders. Assuring low prices for staples is therefore seen by many Governments as one instrument among many for maintaining social and political stability. <sup>1/</sup> A third objective is to reduce price inflation. All three objectives are legitimate. The question is what is the cost, and are there cheaper ways to attain the same objectives?

B. Low Retail Food Prices, High Farm Producer Prices

10. Some Governments have attempted to maintain both low retail food prices and high farm producer prices. This is done through parastatal enterprises which buy crops at high prices and sell to consumers (or retailers) at low prices. Parastatal financial losses are subsidized by Government. The benefit of this strategy is that low retail food prices are maintained without penalizing farmers. The cost of this policy involves the often enormous financial transfer from Government to parastatals which is required to maintain the low prices. The result is that Government has less to invest and to operate existing investments. In Tanzania for example, the financial losses of agricultural parastatals in 1980/81 amounted to twice the recurrent budget for agriculture. In Upper Volta, such subsidies amounted to 20% of agriculture's recurrent budget (1979). In Cameroon, subsidies to the cotton parastatal alone amounted to 20-30% of agriculture's recurrent budget. In Zambia, subsidies to agricultural parastatals (of which there are 47) are several times the Ministry of Agriculture's current budget.<sup>2/</sup>

11. A second cost of the low retail food price policy has involved the substitution in consumer diets of subsidized foods for non-subsidized foods. Often, subsidized wheat and maize flour and rice is substituted for unsubsidized cassava, millet and sorghum. Where the latter is cheaper to produce, this "crowding-out" effect has an economic cost. Wheat, rice, and maize must often be imported.

<sup>1/</sup> A more blatantly political motivation is argued convincingly by Robert Bates in Markets and States in Tropical Africa, the Political Basis of Agricultural Policies, University of California Press, Berkeley, 1981. Mr Bates' arguments will be returned to in the last chapter of this paper.

<sup>2/</sup> Source 43. Source number refers to references listed in Annex III.



Producers suffer because the market for cassava, millet and sorghum shrinks. There is a counter-argument which asserts that changes in relative consumer prices have little impact on demand for various foodstuff. This counter view sees the shift in urban consumption from cassava, millet and sorghum to wheat, rice and maize to be the result of urbanization, the spread of Western consumption habits, and the intrinsically better taste and preparatory characteristics of maize, wheat, and rice. It is impossible to resolve this debate empirically. However, all evidence (such as that to be cited below) suggests that Africans, like people on other continents, respond to changes in prices. As the price of wheat, maize and/or rice falls relative to cassava, millet and sorghum, they will tend to substitute the former for the latter in consumption. An interesting example is found in Senegal:

"There is a pervasive conventional wisdom to the effect that millet is not a substitute for rice for most urban consumers. In 1975, however, and subsequent to the increase in the consumer price of broken rice from CFAF 60 to CFAF 100/kg, imports of rice which had previously been at about 200,000 tons/year fell to 100,000 tons. The late 1974 millet harvest of 700,000 tons was by far a new record; yet the fragmentary evidence on producer prices suggests that millet was traded in the illegal market at CFAF 50/kg or more in contrast to the official price of CFAF 35/kg. All available indication point to a considerable switch in demand from rice to millet, sufficient to challenge the conventional wisdom of very imperfect substitutability between the two commodities and to illustrate the power of relative price policy." 1/

Here was a case of the rice subsidy being diminished, and urban consumers quickly responding by consuming less rice and more domestically produced millet.

C. Low Retail Food Prices, Low Farmer Producer Prices

12. A second method of maintaining low retail prices for staples is to pay artificially low prices to farmers. All empirical analysis reviewed for this paper indicates that farmers are responsive to changes in input and output prices facing them. Studies show supply elasticities of individual cash crops (percent change in output in response to a one percent change in real prices) of .1 to .8 in the short term, .2 to 1.2 in the long term. 2/

1/ Source Number 43.

2/ See source number 37, page 29 for summary of a large number of these studies. See also source numbers 3, 17, 20, 21, 24, 32, 33 and 44. Finally, Marian Bond summarizes the results of many agricultural price response studies in "Agricultural Responses to Prices in Sub-Saharan African Countries", IMF Staff Papers, Vol 30, no 4, December 1983.

Supply elasticities will vary by crop, by farmer circumstance and other factors. As an example the lowest supply elasticities by commodity quoted in an article by Ms Marian Bond, "Agricultural Responses to Prices in Sub-Saharan African Countries", IMF Staff Papers, are as follows:

<u>Crop</u>	<u>Country</u>	<u>Short-Run Elasticity</u>	<u>Long-Run Elasticity</u>
Cocoa	Ghana	.39	.77
Coffee	Africa	.12	.44
Cotton	Uganda	.25	.25
Groundnuts	Nigeria	.24	.24
Palm Kernals	Nigeria	.22	.22
Palm Oil	Nigeria	.29	.29
Rubber	Liberia	.14	.22
Sisal	Tanzania	.06	.48
Tobacco	Malawi	.48	.48

13. The above results suggest for example that on average, a 1% increase in the real price of cocoa paid to Ghanaian farmers increases production by .39% in the short term, .77% in the long term. A reduction in price reduces production by as much. This reduction occurs because with a lower price, farmers switch land, labor, and inputs into other crops.

14. Evidence that farmers respond to changing commodity prices by producing more or less of individual crops tells us little about the elasticity of aggregate agricultural production. If for example, coffee prices in Kenya decline relative to maize prices, coffee production is likely to decline, and maize production to increase. But if all crop prices were increased simultaneously, would aggregate production increase? Most of the literature on this subject either states or implies that the answer to this question is yes. But the basis of this assertion is usually the empirical evidence on individual commodity responsiveness to price such as that presented above. This evidence is inadequate.

15. The intuitive arguments for the assertion that aggregate agricultural production is responsive to aggregate relative agricultural price levels, are compelling. They run as follows. The greater the importance in farm output of the products for which official prices are set artificially low, the greater the tendency for farmers to return to subsistence farming, to smuggle crops to neighbouring countries where controls are less rigorous or where prices are higher, and/or to leave the land for the city in the pursuit of relatively higher income. The result is a decline in aggregate production. Conversely, where prices are high on aggregate, farmers will be drawn into the cash economy, will intensify production, and will be less attracted to incomes available in the city. This will have a positive impact on aggregate production. An extreme example is that of Tanzania where official farmgate prices are quite depressed and all of the above responses are documented. <sup>1/</sup>

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<sup>1/</sup> Sources 23 and 43.

The argument continues that the immediate production decline in response to low official farmgate prices is exacerbated in the longer-term because farmers have less income from which to save and invest in agriculture. In addition, low prices and the resulting lower farm income serves to reduce farmer credit-worthiness making it more difficult to obtain credit, farm inputs and equipment. Investment in agriculture declines. Hence the long term aggregate production response to variations in aggregate farmgate prices will be more pronounced than in the short run.

D. Empirical Analysis of the Aggregate Impact of Low Farm Prices on Agricultural Growth

16. The above intuitive arguments have rarely been tested, because they are difficult to analyze statistically. An aggregate supply response cannot be obtained by merely adding or averaging individual commodity supply responses. In addition, if prices for cash crops are increased on aggregate, cash crop production may increase at the expense of production of subsistence crops. Subsistence crop production is often not measured. For these reasons, using time series aggregate cash crop production data for a single country, and relating it to an agricultural producer price index, does not provide reliable results. Nevertheless, there have been attempts to do this, the most notable of which was done by Ms Marian Bond (reference above). Using FAO data for nine African countries she obtains an average price elasticity of agricultural production equal to .12. This is much lower than that obtained for individual crops. She also finds that "the average long run price elasticity for nine countries that were examined is only slightly larger than their average short run elasticities." This significant finding is explored below.

17. The methodology used for the present article in measuring agricultural production response to price policy is quite different from that used by Ms Bond. It attempts to get around the problems of using single country time series data in relating production changes to price changes.

18. The method required firstly the determination of the degree of price discrimination against farmers in a sample of 31 Sub-Saharan African countries. This was measured by comparing farmgate prices with import and export parity prices adjusted to the farmgate. This measurement is known as the nominal protection coefficient. The methodology is described in Annexes I and II. Average farm level nominal protection coefficients are given for the 31 country sample in Annex II. <sup>1/</sup> The data base was derived from virtually every World Bank Agricultural Sector Survey undertaken in the last 5 years in Sub-Saharan Africa, and other documents. A total of 37 documents were used. For the reasons discussed in Annex II, the number representing the average relationship between

<sup>1/</sup> Sources: World Bank Reports: reference numbers 42 and 44 for agricultural growth rates; World Bank Agricultural Sector Surveys, Country Economic Reports and other literature from which distortion level and relative prices were assessed (Sources: 1, 14, 22, 23, 29, 43, 44, 45).

farmgate and import or export parity prices is subject to a large margin of error. Data covered a large number of commodities and several years in the 1970-1981 period in each country. The data does represent the best that could be found by a large number of World Bank missions and independent researchers. It probably represents the best source of such data available. Using these data the categorization of countries into those with low, medium and high levels of price discrimination against farmers was possible. 1/ The term "price discrimination" is used rather than price distortion because no country in the sample has average levels of farmgate prices above the import or export parity price. Hence the price distortion is in one direction only, in which there is some discrimination against agriculture. At best there is parity between farmgate prices and world prices appropriately adjusted. 2/

19. The following tables provide data for 31 Sub-Saharan African countries relating agricultural growth rates (1970-1981) to average degree of agricultural producer price discrimination. The countries are divided into three groups, characterized by low, medium and high farm level price discrimination.

1/ High discrimination is arbitrarily judged to exist where farmgate prices are more than 40% below import or export parity prices on average. Low discrimination occurs if farmgate prices are not more than 15% below import parity. Medium discrimination occurs in between. High, medium and low discrimination is thus a relative concept.

2/ There is evidence of improvement in the situation in some African countries. Messrs D Ghai and L Smith in a study entitled "Food Policy and Equity in Sub-Saharan Africa" found that for some food commodities in some African countries, producer prices have been increasing faster than world prices. This was hypothesized to result from increasing demand for food relative to supply, putting upward pressure on producer prices. For exported commodities the situation as reported by Ghai and Smith is not improving. A summary of their results is as follows:

Domestic producer price increasing significantly faster than World Price (1969-1980)

	<u>Number of Countries out of Sample Number</u>		
Maize	15	of	23
Wheat	3	of	12
Rice	7	of	22
Groundnuts	6	of	17
Cocoa	2	of	10
Coffee	1	of	15
Seed Cotton	3	of	18

Source : Dhanan Ghai and Lawrence Smith, "Food Policy and Equity in Sub-Saharan Africa", World Employment Research Program, ILO, Geneva, August 1983.

Countries with Low or No Farm  
Price Discrimination

Average Growth Rate of Agricul-  
tural Production(1970-81) (% p.a.)

Chad	0.7
Malawi	4.1
Upper Volta	1.4
Rwanda	3.0
Somalia	-0.6
Central African Rep.	2.3
Kenya	4.2
Lesotho	4.3
Zimbabwe	-0.5
Cameroon	3.9
Botswana	8.5
Congo	2.1
Ivory Coast	4.7
Average	<u>2.9</u>

Countries with Medium Farm  
Price Discrimination

Mali	4.0
Burundi	2.2
Niger	-3.0
Sudan	2.3
Senegal	2.6
Liberia	5.0
Zambia	1.8
Nigeria	-0.4
Average	<u>1.8</u>

Countries with High Farm  
Price Discrimination

Zaire	1.5
Ethiopia	.9
Uganda	-.8
Tanzania	3.3
Guinea	-0.7
Benin	0.0
Sierra Leone	2.4
Madagascar	.3
Togo	1.5
Ghana	0.0
Average	<u>.8</u>

20. Scrutiny of this table shows two notable characteristics. Firstly there has been extraordinary variation in agricultural growth performance.. Secondly there is great variation between African countries in the degree to which policy discriminates against farm producer prices. The "typical" price policy scenario described in para 8 has characterized the countries having high farm price discrimination, and to a lesser extent the countries with medium farm price discrimination. Low discrimination countries have had fewer of these characteristics although even in these countries some farm price distortions exist.

21. Secondly, the data shows African countries with low farm producer price discrimination to have averaged 2.9% p.a. agricultural growth during 1970-81. Those with medium discrimination averaged 1.8% p.a. agricultural growth. Those with high discrimination averaged .8% p.a. growth. The difference between these three categories would be even more marked if the three of the low price discrimination countries having low agricultural growth (Zimbabwe, Somalia and Chad) were excluded. Low growth in these three cases is associated with prolonged and destructive war which of course destroys all chance of growth even in the best of price policy environments.

22. The above analysis was explored further using statistical regression techniques. The methodology was to regress the agricultural growth rates for the 31 countries on the nominal protection coefficient (which is equal to the average ratio of farmgate prices to world prices adjusted to the farmgate). The lower the nominal protection coefficient, the higher the discrimination against agriculture. However, in no country was the coefficient greater than 1 (which represents parity between farmgate and world prices). Thus, the results are relevant for situations of some discrimination against agriculture. Data is shown in Annex II. The regression result was as follows:

$$\begin{array}{l} \text{(Agricultural} \\ \text{Growth Rate)} \end{array} = -1.7 + .05 \text{ (Nominal Protection Coeffi-} \\ \text{cient measured from 1 to 100\%)} \end{array}$$

$$\begin{array}{l} \text{T statistic} \\ \text{R}^2 \end{array} = \begin{array}{l} (1.0) (2.4) \\ .13 \end{array} \quad \text{F(1,29) = 5.58}$$

A T statistic equal to 2.4 is significant at the 99% probability level for 29 degrees of freedom. A 1% increase in the net protection coefficient (i.e. a reduction of price discrimination at farm producer level) is associated with a .05% increase in the agricultural growth rate. The price elasticity of agricultural growth implied by this equation is significantly greater than zero, but is quite low. In addition, the correlation coefficient is extremely low, suggesting that only 13% of the variation in

agricultural growth rates is explainable by the nominal protection coefficient. Other factors are of greater importance in explaining variation in agricultural growth. 1/

23. Additional factors likely to affect agricultural growth were investigated statistically. These include:

(a) average fertilizer use per ha, (the greater the fertilizer use the greater is agricultural growth hypothesized to be);

(b) movement in terms of trade between a countries' exports and its imports (declining export prices relative to import prices suppress growth). This movement has been unfavorable. Oil price jumps in 1973/74 and in 1979 increased the oil bill. Primary product price declines also occurred during these periods. This situation has steadily worsened. Through 1983 there was a serious decline in export prices relative to import prices for all African countries except oil exporters. 2/ Since exports tend to be agricultural it means that relative changes in international prices are generally hurting African farmers. In addition, worsening terms of trade puts pressure on balance of payments. Such pressure usually has served to cause Governments to tighten the import regime. Often this meant among other things less access by farmers to imported farm inputs.

(c) Population growth (the greater the population growth the greater is agricultural growth, though per capita agricultural growth may be slower);

(d) degree of concentration of exports in a limited number of commodities (the greater the concentration the greater the vulnerability to swings in foreign markets);

(e) adult literacy (the more literate the population, the more amenable is that population to technical advance in agriculture);

1/ Some unknown amount of the unexplained variation in agricultural growth rates is explained by data error. This problem is common in all empirical work on African agriculture, and is the source of much of the controversy over results obtained in various studies. The defense of the data used here is that it represents the reflection of a large number of economists studying agriculture in a large number of African countries. Since the data is taken from World Bank Agricultural Sector Reports it has in principle been subjected to considerable scrutiny and review.

2/ World Bank data.

(f) the share of public consumption in GDP (the greater is Government "consumption" (recurrent expenditures) the less remains for investment and the lower is agricultural growth); and

(g) the degree of intervention of Government in farm input supply (the greater the intervention the lower the growth).

24. The statistical tests incorporating the above factors did improve the statistical explanation of the cause of agricultural growth. Factors not important according to the data used (no statistically significant relationship with agricultural growth) include fertilizer use, adult literacy, terms of trade, and export concentration. In order of importance in explaining agricultural growth are:

1. the degree of private and mixed control of farm input supply;
2. population growth;
3. the share of Government consumption (recurrent expenditure) in GDP (the greater the share the greater the agricultural growth);
4. the level of farm price discrimination.

25. The equation is:

$$\begin{array}{cccccc}
 \left[ \begin{array}{c} \text{Agricul-} \\ \text{tural} \\ \text{Growth} \end{array} \right] & = & -3.9 & + & .02 \left[ \begin{array}{c} \text{Nominal} \\ \text{protec-} \\ \text{tion co-} \\ \text{effici-} \\ \text{ent} \end{array} \right] & - & 1.2 \left[ \begin{array}{c} \text{Degree of} \\ \text{public} \\ \text{involve-} \\ \text{ment in} \\ \text{farm in-} \\ \text{put supply} \end{array} \right] & + & .15 \left[ \begin{array}{c} \text{Percent} \\ \text{of Go-} \\ \text{vernment} \\ \text{current} \\ \text{expend.} \\ \text{in GDP} \end{array} \right] & + & .74 \left[ \begin{array}{c} \text{Popu-} \\ \text{lation} \\ \text{growth} \end{array} \right]
 \end{array}$$

$$\text{T statistic} = (1.7)(1.2) \quad (1.6) \quad (2.4) \quad (1.3)$$

$$\bar{R}^2 = .31 \quad F(4,26) = 4.5$$

All variables are significant according to the T statistic at the 85% probability level or above. See Annex 2 for data. The degree of public involvement in farm input supply is measured as a dummy variable, with high involvement represented as a 1, low as 0.

26 Price distortions are important as a determinant of agricultural growth, but not preponderate. The most important factor among those tested appears to be the degree to which the public sector involves itself in farm input supply. The greater such involvement, the lower is agricultural growth. Countries which leave farm input supply to private and mixed ownership enterprises tend to have higher rates of agricultural growth. 1/

1/ This is a different area of research to that pursued here. Analysis which tends to support this finding may be found in sources 38, 43 and 44.



Consistent with findings from other studies, the higher the rate of population growth, the higher the rate of agricultural growth. This is explainable by the fact that in near subsistence and smallholder agriculture, labor is the most important factor of production. Higher population growth furnishes labor at an increased rate, stimulating agriculture. <sup>1/</sup> The third most important factor is the share of Government's recurrent expenditure to GDP, which is positively related to agricultural growth. The direction of causality of this variable is difficult to determine. There is some evidence to suggest that in Africa, Government recurrent budgets inadequate to operate and maintain investments inhibit agricultural growth. <sup>2/</sup> Governments which allocate more to operation and maintenance may indeed obtain better performance from agricultural investments, and hence more growth. On the other hand, it may be that more rapid agricultural growth finances more rapid growth of Government consumption. In this case the direction of causality is opposite to that described above. Finally, the lower the effective taxation of agriculture through price policy (i.e. the higher the nominal protection coefficient), the higher the agricultural growth. However, the coefficient is lower (the elasticity is .02%), than was the case when no other variables are represented in the equation.

27. Despite the above enlargement of the explanation of agricultural growth, the four factors listed above "explain" only 30% of the variation between countries in agricultural growth. Seventy percent of the variation is still unexplained. The literature was searched for other possible explanatory factors. Many were found, but are difficult to quantify. These are discussed below.

28. General economic deterioration in Africa was probably a factor causing agricultural deterioration. There is a close correlation between economic growth and agricultural growth in Sub-Saharan Africa, but the direction of causality is difficult to determine. Agriculture is partly dependent on imported inputs: fertilizers, pesticides, equipment. Balance of payments crises have caused reduced imports of inputs and equipment, perhaps causing a reduction in agricultural production.

<sup>1/</sup> It also stimulates consumption, which creates problems particularly if the consumption stimulus exceeds the production stimulus.

<sup>2/</sup> Most World Bank agricultural sector reports record situations in which largely donor financed agricultural and rural investments are not maintained for lack of Government resources, inhibiting agricultural growth. The severity of this situation varies considerably between countries. This variable may measure the impact of variations in this situation.

29. Food aid may have a negative impact on production. Firstly, if food is in short supply, this would normally stimulate increases in producer prices, stimulating subsequent production. Food aid dampens price increases and hence probably dampens production increases. Since most food aid comes in the form of wheat and rice, it has probably also contributed to shifting consumer tastes to such commodities and away from commodities more easily and more widely produced in Africa (millet, sorghum, cassava, pulses). However, this explanation would normally have been captured in the measurement of nominal protection (food aid reduces nominal protection of agriculture). As we have seen, this explains little of the variation in agricultural growth.

30. Many argue that there is a poor resource base in Africa for agricultural production. The data related to this question are poor. FAO data suggest that:

45% of Africa is poorly endowed for agricultural production;  
20% of Africa is moderately endowed;  
35% is well endowed.

However, countries such as South Korea are poorly endowed, yet have shown rapid agricultural growth. It is not clear in the literature how much importance this factor has had; and it was not possible to capture the impact of this variable statistically.

31. There is a common argument that agricultural growth in Africa is inhibited by its low level of agricultural services: agricultural research and extension, input supply, credit and marketing, etc. The argument is that such services are essential for agriculture to flourish, as seen by the experience of developed countries. In reflecting on this it is interesting that the limited output expansion which has occurred in Sub-Saharan Africa has been largely the result of expansion in areas under cultivation: not in amounts produced per unit area (yields). Yields have been largely stagnant (although crop yields increased by 2% p.a. in the 1960's). There are exceptions such as the hybrid maize experience in Kenya. However, research, extension and the use of modern inputs have not generally permitted more to be obtained per unit area since the 1960's. The problem with dependency on expansion of cultivated area is that arable land is increasingly unavailable (there are notable exceptions such as Zaire and Zambia). More cultivation of marginal areas is causing soil erosion and desertification in many African countries. The problem is that agricultural research is not coming up with many new agricultural technologies, and extension services are not extending the few technologies available. The adequacy of services proved impossible to differentiate adequately between African countries; and could not therefore be included in the equation. However, it appears plausible that this factor explains some of the 70% of the variation in agricultural growth not explained by the equation.

32. Another problem often mentioned is poor donor advice to African governments. Donor aid provides about 55% of African investment. The comparable figure in Asia is 14%. Donors are important in Africa. Unfortunately, most have their own ideas about African agriculture, and these ideas have varied considerably from one donor to the next. Some donors insist on more private sector oriented policy and investment. Some support parastatals, others cooperatives and others the Government Administration. The resulting "noise" may be difficult for most African governments to sort through. Actual government practice often combines most of this advice, depending on the particular project. Again this variable is impossible to quantify.

33. The "parastatal" problem is often hypothesized to have hindered growth in agriculture. This has been partially tested statistically above in showing that heavy Government involvement in farm input supply is associated with lower agricultural growth. This involvement, along with Government involvement in agricultural marketing and processing, is often undertaken through parastatal enterprises. These have proved inefficient with remarkable regularity. Parastatals tend to be managed on the same principles as the Civil Service, leading to lack of entrepreneurship due to poor management and inflexibility, a tendency to over-man, escalating costs and poor service. The lesson has been that it is difficult to adapt bureaucratic procedures to commercially oriented operations. The financial losses of parastatals have also in effect transferred resources from possible investments and operations benefitting agriculture, to simple maintenance of the parastatal inefficiencies.

Political interference in parastatal operations is frequent. <sup>1/</sup> Often private marketing agents could be (or are) more competitive and efficient than parastatals. Private traders have an economically close relationship with farmers. Skill requirements in managing typically small private enterprises are lower than those for parastatals. When private traders are harassed or banned, a negative impact on product marketing usually results. In extreme cases where the private marketing network is destroyed and the public marketing parastatals are very inefficient, agriculture tends to revert back to subsistence (as in Tanzania).

34. Finally there is the problem of politics. The most obvious political problems are war and civil strife. The continuing political fragility in some Africa countries has induced many political leaders to pursue the immediate objective of reducing tensions and creating consensus through a series of short term measures (such as food subsidies, allocation of political favors to particular tribes or elites, etc). Long term objectives (such as a price policy which stimulates production) are often delayed. Too little in resources may have gone to rural areas in most African countries due to the weakness of rural populations in defending their interests. <sup>2/</sup> Again, this hypothesis was not tested empirically.

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<sup>1/</sup> See source 42 for an interesting exposition of this argument.

<sup>2/</sup> This is the thesis of Robert Bates: Source number 10.

E. Summary

35. Fixed retail food prices are often low relative to what the market would create and relative to world prices. To permit low retail prices, either farmer prices are kept low, or parastatal enterprises trading these commodities trade at a loss. In the second case Government financial resources are used to subsidize the parastatals, reducing the amount remaining for development expenditure. In the former case, an artificially low farmgate price of a particular commodity has a negative impact on the production of that commodity. However, the impact on aggregate production of keeping many farmgate prices low is considerably less than is generally thought. Other factors are much more important in determining aggregate agricultural production in Sub-Saharan Africa. <sup>1/</sup> Nevertheless, avoiding price discrimination against agriculture will have some positive impact on aggregate production. <sup>2/</sup>

<sup>1/</sup> Economic research should look more vigorously than it has to date at the relative importance of these various factors.

<sup>2/</sup> A different area of argument relates to the policy of fixing agricultural producer prices at all (as opposed to the argument about fixing them at low levels). A policy of fixed agricultural producer prices is often partly intended to stabilize farm income. Experience shows that in reality fixed prices de-stabilize farm income. When output falls due to low rainfall or other production problems, and prices are fixed, farm revenue will decline. If prices had been free when output fell, prices would have increased. Farm revenue would have declined less. In a market where producer prices are free to move in response to supply and demand, prices will tend to increase when supply is low, and decline when supply is high, thus stabilizing farm income (as long as the elasticity of supply is greater than zero, which it is according to the empirical studies cited above). The available evidence also suggests that the maintenance of the same price throughout the year makes it unprofitable for farmers to store crops on the farm, encouraging them to sell immediately after the harvest. This is because the farmer does not receive a higher price later in the year when supply is not so abundant as at harvest time. There is thus no incentive for on-farm storage. Unless the parallel market is active, the tendency to sell immediately after the harvest over-taxes transport networks and parastatal handling and storage capacities since all official sales occur at the same time. Prices which are allowed to increase with time would serve to reimburse farmers (and middlemen) for storing. This would relieve pressure on the transport network and on parastatals marketing firms.

IV. EXCHANGE RATE POLICY, AND AGRICULTURAL GROWTH

A. The Problem

36. One possible explanation for variation in agricultural growth between African countries was not cited above; and that is exchange rate over-valuation. Exchange rate over-valuation is common in Africa outside of the franc zone. The IMF's 1982 World Economic Outlook reported that "Real effective exchange rates for currencies for African countries have on average appreciated over the period 1973-81 by 44%" (page 122). Exchange rate over-valuation is rarely intended by Governments. It is most often the result firstly of expansionary fiscal and monetary policy directed at maximising economic growth. A side effect of expansionary monetary and fiscal policy is price inflation which when more rapid than the price inflation of principal trading partners causes real exchange rates to appreciate. Secondly exchange rate over-valuation is often a side effect of a strategy to promote industrial growth as a motor of development. Governments pursue industrial growth by imposing high duties and quotas on imports of industrial goods which compete with domestic manufactures. This serves to increase domestic prices of industrial goods relative to world prices. In this circumstance, the official exchange rate will typically over-value the local currency relative to foreign currency, compared to the real purchasing power of the local currency (because domestic prices will be higher than foreign prices at the official exchange rate). The assertion common in the literature is that this policy has had a negative impact on agricultural growth. This assertion will be tested here.

37. Agricultural exports are hypothesized to be curtailed by over-valued exchange rates. The exchange rate determines how much in local currency is received by the exporter in return for foreign currency earnings. If the exchange rate is over-valued, the exporter will receive less in local currency for exported produce than would otherwise be the case. If the exporter is the farmer himself, the farmer's incentive to produce export crops will decline, or he may be encouraged to smuggle these crops into a neighbouring country. The individual cash crop supply elasticities shown in paragraph 12 are relevant here. A change in the exchange rate can have a price impact on the producer identical to that of changing a crop procurement price. Empirical studies overwhelmingly show a high response of export crop production to variation in price. Typically the response is lower in the first year of a price change particularly for tree crops. The response increases over time (is lagged). Hence the impact of an over-valued exchange rate is the same as the maintenance of artificially low retail food prices discussed above. Either producer prices are kept artificially low by the over-valued exchange rate, or a parastatal (or marketing Board) receives Government financial support to maintain adequate producer prices (or what amounts to the same thing: agricultural exports can be directly subsidized by Government to compensate for the implicit tax of exchange rate over-valuation).

38. A second negative effect of an overvalued exchange rate on agriculture is that it reduces the domestic currency cost of imported foodstuff. Since food is often imported duty free, domestic producers must compete with artificially cheapened foreign food supplies. This puts a downward pressure on domestic price, discouraging local production of importable food.

B. An Empirical Analysis of the Impact of Exchange Rate Over-Valuation on Agricultural Growth in Sub-Saharan Africa

39. To statistically test the importance of exchange rate policy on agricultural growth, the analysis in Chapter III of the effect of farm price distortions was extended. The 31 countries of Sub-Saharan Africa for which data is available were separated into two groups: those with a positive real rate of currency depreciation during 1970-81, and those having a real rate of currency appreciation. Real rates of depreciation or appreciation were obtained by adjusting for the rate of domestic price inflation. According to the reasoning of Section A above, countries whose currencies were depreciating should tend to have higher agricultural growth rates than those whose currencies were appreciating. 1/

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1/ Data on rates of depreciation and appreciation are taken from the IMF International Financial Statistics. Domestic inflation rates were obtained from the 1983 World Bank World Development Report. Data sources are discussed in Annex II. It should be noted that the definition of real exchange rate changes used here is not the conventional one. The measure is the exchange rate divided by a domestic inflation rate. The conventional measure is the trade weighted change of the exchange rate adjusted for the difference between the domestic inflation rate and the trade weighted average inflation rate of trading partners.

Countries with a positive rate of real currency depreciation

<u>Country</u>	<u>Rate of real currency depreciation (% p.a. average)</u>	<u>Agricultural growth rate</u>
Chad	2.4	0.7
Ethiopia	4.2	0.9
Mali	0.1	4.0
Malawi	0.3	4.1
Upper Volta	0.3	1.4
Benin	0.4	0.0
Sierra Leone	0.9	2.4
Kenya	2.0	4.2
Senegal	1.9	2.6
Lesotho	1.4	4.3
Liberia	1.1	5.0
Zambia	3.4	1.8
	Average	2.6

Countries for which currency appreciated (negative real depreciation)

<u>Country</u>	<u>Rate of Depreciation</u>	<u>Agricultural Growth Rate</u>
Zaire	-3.3	1.5
Uganda	-11.7	-0.8
Rwanda	-4.1	3.0
Somalia	-3.7	-0.6
Tanzania	-0.5	3.3
Guinea	-5.5	-0.7
Central African Republic	-2.8	2.3
Madagascar	-0.8	0.3
Niger	-2.4	-3.0
Sudan	-1.8	2.3
Ghana	-16.8	0.0
Nigeria	-5.6	-0.4
Zimbabwe	-0.4	-0.5
Cameroon	-0.8	3.9
Botswana	-0.1	8.5
Congo	-2.1	2.1
Ivory Coast	-3.2	4.7
	Average	1.5
	(Average excluding Botswana)	(1.1)

40. The hypothesis appears correct. Countries whose currencies appreciated had lower agricultural growth than those whose currencies depreciated. Statistical analysis suggests that the rate of currency depreciation has a slightly greater impact on agricultural growth than does farm price distortions. If the rate of currency depreciation is substituted for the degree of farm price distortion in the equation reported in para 25, the following results:

Agricul- tural Growth	=-1.8 + .15 Rate of Depre- ciation	+.11 % of Public Expendi- ture in GDP	+1.0 Population Growth	-1.5 Public Involve- ment in Input Supply
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T Stat = (1.0)(1.5)                      (1.6)                      (1.7)                      (2.3)

$$\bar{R}^2 = .34 \quad F(4,26) = 4.79$$

All variables are significant at the 90% level or above except the constant term. A 1% p.a. increase in the rate of currency depreciation is associated with a .15% increase in agricultural growth. The common assertion that over-valued exchange rates have a negative impact on agricultural growth appears to be correct. However, as in the case of nominal protection, the exchange rate regime explains little of the variation observed in agricultural growth.

41. Because the rate of currency depreciation and the degree of farm price distortion are related (the latter incorporates to some extent the former), both cannot be included as independent variables in the same equation. Their relationship is expressed in the following:

$$\left[ \begin{array}{l} \text{Nominal} \\ \text{Protection} \\ \text{Coefficient} \end{array} \right] = 72.6 + 1.2 \left[ \begin{array}{l} \text{Rate of} \\ \text{Deprecia-} \\ \text{tion} \end{array} \right]$$

T Stat =                      (2.2)                      (1.4)  
 $\bar{R}^2 = .04$

The higher the rate of depreciation the higher the nominal protection coefficient (i.e. the lower the policy discrimination against farmer prices).

42. The conclusion is that currency over-valuation does agriculture no good. Currency depreciation will have a significant, but not very large impact on agricultural growth.

C. The Argument for Intentionally Discriminating against Agriculture using Exchange Rate Policy and Import Duties/Controls

43. There is an argument that discrimination against agriculture such as that obtained by an over-valued exchange rate might be in the interest of some countries, because it is the inevitable consequence of an industry led growth strategy. This line of reasoning is as follows.



World prices of agricultural commodities are volatile, and are falling over the long-term. Long-term dependancy on agricultural exports is therefore risky at best. Perhaps in the past agriculture had some comparative advantage and industry received excessive attention. But long-term dynamic comparative advantage suggests that export agriculture be de-emphasized. Presently, world prices are at a cyclical low, and it may be the time to diversify quickly out of such sectors into industry and into production of food crops for the domestic market. The policy package described as typical in para 8 above can be construed as pursuing this strategy. Export taxes and an over-valued exchange rate discourage agricultural exports and agricultural growth, but encourage some domestic food production. Diversification into protected industry is also promoted. What is the validity of this argument?

44. In analyzing the argument the first question involves the future trends of international prices for agricultural commodities. World Bank international commodity price projections are presented below:

Quarterly Average Price (World Market) 1/

	Average 1977 2/	Average 1981	Average 1982	1983	Projected 1990	Projected % Price Increase in constant 1981 Prices from 1983 to 1990 3/
.....(current US \$).....						
Cocoa \$/kg	3.79	2.08	1.74	2.12	2.26	- 54
Coffee "	5.17	2.82	3.09	2.90	4.14	- 15
Tea "	2.69	2.02	1.93	2.30	2.87	- 32
Beef "	1.51	2.48	2.39	2.45	3.90	- 3
Cotton "	1.62	1.87	1.61	1.87	3.22	5
Rubber "	0.92	1.25	1.01	1.24	2.26	11
Rice \$/ton	272.00	483.00	293.00	279.00	663.00	45
Maize "	95.00	131.00	109.00	136.00	222.00	0
Wheat "	116.00	196.00	167.00	170.00	297.00	6
Palm Oil "	530.00	571.00	445.00	502.00	909.00	10
Sugar "	179.00	374.00	186.00	187.00	372.00	89
Bananas "	275.00	401.00	374.00	430.00	509.00	- 39
Logs (Ln) \$/cm	90.00	145.00	145.00	140.00	258.00	11

1/ World Bank Half Yearly Revisions of Commodity Price Forecasts, January 16, 1984 and World Bank "Price Prospects for major primary commodities", July 1982.

2/ Year in which most primary commodity prices peaked.

3/ This percentage equals the projected price of the commodity in 1990 deflated to 1981 prices with an international commodity price index, compared to the average price in 1983, deflated to 1981 constant prices. This measures the percentage "real" price change expected in 1990.

Source: World Bank, "Half Yearly Revisions of Commodity Price Forecasts", January 16, 1984.

45. Prices for nearly all commodities have declined or stagnated on world markets since 1981. More detailed data show that the decline began in 1978/79. Some commodity prices began to improve in late 1982 and early 1983. However, average world prices were also increasing so in "real" terms the improvement has been less. The last column shows price projections from 1983-1990, in constant 1981 prices (i.e. deflated to 1981 with the World Bank's international commodity price index).

- (a) Five of the agricultural commodities shown in the table are projected to have continued declines in world price (computed in constant 1981 dollars): cocoa, coffee, tea, bananas, and beef. Maize prices are expected to stagnate in real terms.
- (b) Seven of the commodities are projected to have increased world prices (in constant 1981 dollars). Cotton and wheat prices will increase in real terms, but at a relatively low rate. Prices of palm oil and rice are projected to increase rapidly in real terms. However, to a large extent, these rapid real price increases are the result of the low base on which the percentage increases are computed (the world prices of these commodities were at extremely low levels in 1983). Other commodities are projected to have moderate gains in world prices.

46. The above projections suggest considerable variation in price performance between commodities, making generalizations difficult. The extremely low level of international prices for most agricultural products in the last several years has been a temporary phenomenon for some, permanent for others. The premise of the argument in para 43 appears too general: the long-term trend of world agricultural prices is downward for only some commodities. Countries dependent on exports of the commodities for which projections are poor should diversify if there is something to diversify into. Even for these products, production should be reduced only if cropland is scarce and other higher value crops can be substituted. Nevertheless, the above projections do suggest that improved agricultural price and exchange rate policy may be at least partly offset in some countries by declining world agricultural prices.

47. The second part of the argument in para 43 is that in many African countries, export and import substituting agriculture has no comparative advantage. This is not true according to most studies. In nearly every Sub-Saharan African country, agriculture and agro-industry have comparative advantage over most other sectors in contributing to economic development. Agriculture uses relatively abundant resources (land, rainfall/water, sun, unskilled labor, locally manufactured tools and equipment) which are relatively cheap to these countries, although it also uses some scarce resources such as fertilizer, to produce essential products for consumption and/or for export. Many non-agricultural import substituting industries require more costly and scarce inputs (skilled

labor, imported inputs) to produce often less essential industrial goods (often consumed by middle and upper classes). Therefore a price and exchange rate policy which discriminates against agriculture and promotes import substituting industry is a strategy which makes less use of local resources in most African countries. It is a costly strategy 1/.

48. Findings of several studies (such as the World Bank's 1982 World Development Report) suggest that high economic growth is associated with high agricultural and/or high export growth (in developing countries other than oil exporters). An IMF study of the impact of exchange rate changes in eleven African countries found the same degree of agricultural importance 2/. The data from the 31 Sub-Saharan countries referred to above shows a very high correlation between agricultural growth and overall economic growth (.56 correlation coefficient).

49. Because of the arguments developed in paras 44-48 above, most of the literature prescribes an exchange rate devaluation, reform of the trade regime, and price policy reform. These reforms would make export and import substituting activities more profitable, encourage economic diversification and in most cases encourage agriculture. The devaluation must come with fiscal and monetary policies designed to keep domestic price inflation no higher than international price inflation. Terms of trade it is argued will shift in favor of agriculture (and exports), and against import substituting industry. Those industries like agriculture and agro-industry with greater comparative advantage will expand, those which exist only due to protection will disappear. The analysis above supports the direction of these arguments. The problem is in the speed and magnitude of the changes. If agriculture is slow to respond positively to the policy reform, while the manufacturing sector contracts rapidly, then the dislocation in the short term can be substantial. If added to this is a tendency for the world prices of principal agricultural exports to decline, the benefits to agriculture of the price policy reform may be offset, at least in part, by movements in world prices. This makes the short term dislocation even worse. This may explain why such policy reform is so difficult to sustain in Africa. This argument should not be construed as supporting continued sub-optimal price and exchange rate policy. It does have implications for the way in which reform is pursued.

1/ For evidence see studies 4, 6, 7, 14, 15, 17, 21, 26, 27, 33, 37, 38, 42, and 44.

2/ Source 41.

V. TOWARD AN APPROPRIATE PRICE AND EXCHANGE RATE POLICY

A. Summary of the Impact of Typical Price and Exchange Rate Policy on Agriculture

50. In summary, the work reported in this article finds that the direction and type of impact on African agriculture of the typical policy package described in paragraph 8 is similar to that described in the literature (see bibliography). To look at this further, the conventional wisdom is set out in summary form below.

- (a) Low retail prices for some food staples stimulate the consumption of those staples, over time replacing consumption of non-subsidized staples. Non-subsidized staples are "crowded out" in urban areas (typically wheat and maize flour, and rice crowd out cassava, millet and sorghum). The urban poor benefit somewhat, the urban middle class benefit a great deal, and the rural population is hurt.
- (b) A combination of low producer prices and Government subsidies of parastatals, required to maintain low retail food prices, causes agricultural production, investment and growth to decline. Subsidies to parastatals reduce the resources available for development expenditure. Greater dependency on food imports results. <sup>1/</sup>
- (c) Over-valued exchange rates combined with duties on agricultural exports reduce production of agricultural products, or if supported by Government financed parastatals, requires Government subsidy to maintain. In the latter case, resources available for development expenditures are reduced because of the subsidies. An over-valued exchange rate also encourages food imports, discouraging production of import substitutes unless tariffs are established to protect domestic production (as is often done for industry but rarely for agriculture).
- (d) Policy discrimination against agriculture reduces agricultural growth. This makes a country less self-sufficient in food, and reduces economic growth. The short-term industrial expansion typically resulting from such policy has not compensated for the decline in agriculture. Income distribution becomes more negatively skewed since industry employs only a few while agriculture is a potential large employer. Income is also distributed to cities and out of the countryside. Rural-urban migration is exacerbated.

<sup>1/</sup> Commercial cereal imports into Africa increased at 9% p.a. during the 20 year period 1961-1982 (World Bank data).

- (e) Social/Political stability and the meeting of minimum nutritional needs may be served in the short-term but in the long-term the slowing of economic growth and the skewing of income distribution away from the rural population (and in favor of a small industrial elite) will increase social/political instability. The resource base from which the nutritional needs of the poor is met will shrink as economies stagnate.

B. The Appropriate Policy Reform

51. The conventional wisdom advocates a general policy package to address the above problems. This package, distilled from the literature, is set out below.

52. Producer prices for non-exported agricultural products should be left free where there is no domestic marketing monopoly or oligopoly. At most, indicative prices might be established to assist the market-place in setting prices. Official prices would be negotiated for official transactions. Where there is a significant marketing monopoly or oligopoly (either public or private), producer prices should be fixed by Government high enough to stimulate production, savings and investment in agriculture. Typically such prices should be at long-term world price levels for similar products (adjusted for internal handling and transport costs). This can be assisted by allowing private marketing enterprises to compete with parastatals, removing administrative barriers to agricultural trade, and providing assistance (credit, market information, necessary infrastructure such as roads) to help private traders.

53. Producer prices for exportables should be free to move in response to world markets. If administratively feasible, there is an argument for supporting producer prices of exportables against short-term world market instability through stabilization funds. Prices should be set to match long-term average world prices. However, when world prices are above the long-term average, stabilization funds should be permitted to accumulate reserves.

54. Taxes on agricultural exports should be minimized.

55. In the long-term, income taxes (or expenditure or value added taxes) should replace import and export duties as major revenue sources. Import duties should be as uniform as possible (uniform non-discriminatory rates). Land taxes should be imposed where feasible.

56. Exchange rates should be managed to assure purchasing power parity of the local currency with that of major trading partners. This will require frequent change in exchange rates since major currencies are now floating which means that most country's currencies are appreciating or depreciating in part independently of internal events or policy objectives. (Currencies pegged to the dollar have appreciated during the last three years, those pegged to the French franc have depreciated). An alternative to managed rates which may be more practical for some countries is to allow the exchange rate to float.

57. In the franc zone, where exchange rates cannot be managed, Governments should pursue fiscal policy and credit expansion at a rate which will not cause domestic price inflation to exceed price inflation in France (and increasingly other trading partners). Where exchange rates are over-valued in franc zone countries because domestic price inflation exceeds international inflation, a second best solution should be considered in which subsidies are provided to exports and duties on imports to offset the effect of over-valuation. Compensatory subsidies on primary goods exports may however have to be limited because of Government fiscal constraints.

58. Farm input subsidies should be provided only for short periods to assist in introducing new inputs. Input subsidies should be otherwise phased out. Governments should pursue recovery of costs of services.

59. Consumer food subsidies should be removed. In their place should be limited direct food transfers to the truly needy in urban areas. The best strategy for assisting the poor is a maximum economic growth strategy, with interventions designed to distribute the benefits of growth over the maximum number of people.

C. The Conventional Wisdom regarding the likely Impact of the Proposed Reform

60. The literature suggests that the recommended policy package should in the medium- and long-term do the following.

61. Domestic and export agricultural production would be stimulated in proportions reflecting the country's comparative advantage (and hence depending on the magnitude of supply elasticities). Comparative advantage would change over time, and development expenditures must be planned and directed to take advantage of new possibilities and new sources of growth.

62. By reducing Government outlays on consumer subsidies, parastatal subsidies and farm input subsidies, more will be available for development expenditure. Increased development expenditure (both for operation and maintenance of existing investments, and for new investment) can be directed to agricultural and economic diversification and long-term development according to an analysis of dynamic comparative advantage. Some of the savings would be channelled to providing food to the truly needy and, in the short term, to supporting domestic prices of agricultural exports. Some of the savings will be lost due to reduced revenue from export and import duties. However, land taxes, increased expenditure taxes and income taxes combined with reduced subsidies can make up for this.

63. Exports would increase and imports decline due to devaluation, exchange rate management, and to fiscal and monetary policies designed to keep the real exchange rate from appreciating (and in the franc zone due to export subsidies and import duties on agricultural products).

64. Industrial production will decline in the short-run (due to devaluation, reduction of import barriers, greater income taxes). This negative impact on economic growth should be more than made up for by greater agricultural growth, and in the longer-term by greater industrial growth consistent with country comparative advantage (again depending on supply elasticities). The net effect on economic growth would be positive in the medium- and long-term.

65. Employment would increase (agriculture uses more labor than industry).

66. The rate of rural-urban migration would possibly decline (due to higher relative rural incomes).

67. Food prices would increase in the short term, industrial goods prices would decline. Real urban income would decline, real rural income would increase. The urban poor would not be worse off due to direct food distribution. The urban middle and upper class would be worse off in the short- and medium-term. This will result in political pressure to reverse policies in the short-term. It is therefore the short-term which will be difficult and will require foreign aid to assist the transition.

#### D. The Critique and A Recommendation

68. The empirical analysis undertaken for this article gave results consistent with both the conventional wisdom regarding the impact of price and exchange rate discrimination against agriculture, and the appropriate policy response. However, the results suggest that the impact of the policy response summarized above may not be as great as much of the literature suggests.

The magnitude of the impact summarized in paras 61 to 67 above may be exaggerated. Other factors such as inefficient Government involvement in farm input supply and marketing, population growth, the effort made by Government in operating and maintaining agricultural investments, resource endowment, the efficiency of agricultural research, extension, and credit services, politics, and other as yet unidentified factors are of much greater importance in determining agricultural growth. Indeed, there is still a relatively large area of ignorance regarding causes of agricultural growth. The expansionary impact of reform on agriculture may be slower to work than the negative impact on the existing (protected) manufacturing sector. It follows that it may be deceptive to predict large structural changes to occur from reform of price and exchange rate policy, especially in the short term.

69. The empirical analysis undertaken here also underlined the tremendous variation in performance and constraints facing different African countries. It follows that the policy package prescribed should be adjusted to fit particular country circumstances. Variations in country objectives, resource endowments, location, policy distortions, etc. make it impossible to prescribe a single set of price and exchange rate policy reforms appropriate to all Sub-Saharan African countries.

70. In addition, political constraints reduce the flexibility of some Governments in implementing the full range of policy changes represented above as the optimal package. The importance of this argument cannot be over-emphasized. Robert Bates in Markets and States in Tropical Africa argues that the kinds of distorted price policy described in paragraph 8 as typical in many countries of Sub-Saharan Africa are the result of short-term decisions made by political leaders on the basis of calculation about how their political interests are best served. <sup>1/</sup> The price policy reform package described above is usually seen as inconsistent with these political interests. This is exacerbated by the short term cost of reform as described above. Therefore, reforms are not implemented despite the quality of the technical arguments to reform and pressure by the IMF, World Bank and other donors. The price distortions described above are seen by Bates as generating Government controlled revenue which can be reallocated from the politically unimportant (farmers), to the politically important (the urban population receiving food subsidies, the bureaucracy including that in the marketing parastatals which requires revenue to maintain itself and grow, industrialists and their employees benefitting from protection etc). In some cases, some of this revenue (or rent) <sup>2/</sup> can be acquired directly by political leaders (i.e. corruption). These latter groups have power and influence. Farmers (particularly small farmers) are typically unorganized and have little power or influence. The groups which benefit become vested interests which resist reform.

<sup>1/</sup> Source number 10.

<sup>2/</sup> This concept of an administratively generated rent or value created by causing scarcity of a commodity or controlling its distribution is in Krueger's: "The Political Economy of the Rent Seeking Society", American Economic Review, 1974 No 3:291-303.



71. In some countries, price policy reform may be impossible until political situations change. Again Bates finds that where the political elite is engaged in food production, policies tend to be less discriminatory against agriculture (Kenya and Ivory Coast are examples of this situation). <sup>1/</sup> Such farmers tend to be large farmers. Large farmers are in a better position to bring pressure to bare on Government to reduce policy distortions which discriminate against agriculture. Other groupings of farmers (cooperatives, associations such as the Kenya Farmers' Association) have the same interest group effect. Similarly, agro-industry dependent on farmers may serve as a pressure group for policy reform benefitting agriculture. Without pressure from such groupings or from large farmers, price policy reform benefitting agriculture will rarely occur. It will be resisted by those vested interests identified above.

72. If the above is correct, fundamental policy reform of price and exchange rate policy is likely to come slowly in most of Africa, evolving with the development of agriculture itself. As agriculture develops, larger more influential farmers will emerge, farmers' groups will develop, agro-industrial interests will in some cases lobby for the interests of agriculture. Institutions of development assistance must be aware of this situation in their advocacy of policy change.

73. If one accepts the above reasoning as generally applicable in Sub-Saharan Africa, and combines it with the finding that the desirable but contentious price and exchange rate policy package alone will only have a relatively small and slow impact on agricultural production, and that we are still relatively ignorant about the causes of agricultural growth in Africa, then there are some operational conclusions which emerge. Firstly, where there is a political constraint to price policy reform which is impossible to overcome (perhaps due to the significant social and political instability which would result from reform), a much slower reform process than is usually prescribed should be pursued. In the first instance, other instruments affecting agricultural growth (such as improved research, extension, input supply, marketing and/or credit systems) might be established. Price policy reform might then be pursued as a second step. Secondly, donor institutions could exploit their situations as a lobby group which can indirectly help reform by aiding the development of farmer organizations, agro-business and cooperatives which lobby for reform. Donors might also be more neutral toward large farmers which form the backbone of the farmer lobby in pursuing reform. Such groups may ally themselves with donors in advocating reform. Donor institutions will have to be more realistic in establishing reform targets. Compromises with the optimal package presented above will often be politically necessary in the short-term. An evolution of policy in the right direction will in itself begin the process of creating agricultural wealth, and in so doing creating agricultural

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<sup>1/</sup> Bates, source number 10, page 45.

interests which will push for further reform. An immediately optimal or near optimal package will rarely be feasible, and in any case will not have the large and rapid agricultural impact generally expected. Donors should act in such a way as to influence policy to evolve in a technically desirable direction, which for price policy is that described in paragraphs 54-61. This suggests that the creation of an institutionalized process under which reform is analyzed and pursued may be more important than achieving policy reform targets involving specific price or exchange rate levels. Prices or exchange rates can always be changed again, in the wrong direction. However, solidly established processes for analyzing and implementing policy reform may have a more durable impact in the long term. <sup>1/</sup> In addition, the process of analyzing may uncover some of the unknowns regarding agricultural growth. Thus the reforms pursued should be regarded as a process, rather than a condition to be achieved.

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<sup>1/</sup> One minimum package possibly appropriate in difficult countries was suggested in a written comment by Wilfred Candler. It would be responsive to the political constraints, and provide a push in the right direction. It would include: (a) establishment of an institution in Government which analyzes policy issues, and provides technical recommendations to Government (i.e. technical advocacy), (b) dual exchange rate to apply at the margin, (c) retention by exporters of sufficient foreign exchange to meet their import requirements, (d) some improvements to producer incentives, including better prices and more incentive goods, (e) creation of a strategic food reserve, (f) improved agricultural research and extension. There are other minimum packages which may be more appropriate depending on the country context. It is this type of compromise which will be required however.

METHODOLOGY FOR MEASURING REFERENCE PRICES,  
POLICY DISTORTIONS AND COMPARATIVE ADVANTAGE

A. Reference Prices

1. Long-term world prices can be used as reference prices in determining whether domestic prices are artificially low or high. A projection should be made of the world price, and this "long-term" world price is used in order to exclude temporary world market conditions. The use of world prices as reference does not mean that such prices represent free trade, or best, prices. World prices are not free trade prices. They are distorted by trade barriers, the price policies of major supply countries, dumping, monopoly practices etc. But looked at from the point of view of the individual small country, world prices are what that country must pay for its imports or receive for its exports. Such prices represent opportunity costs. For example, the value to country X of producing a ton of wheat is the foreign exchange saved in not having to import it. This is measured at the world price. Similarly the value of a ton of wheat exported by country X is its likely price in foreign exchange <sup>1/</sup>. For goods and services not traded internationally, the "opportunity cost" to the domestic economy of using that good or service is its appropriate price. Appropriate exchange rates are generally those which would assure purchasing power parity with the currencies of trading partners. This is calculated by pricing comparable sets of commodities and services between the country for which the exchange rate is being computed, and trading partners. These price relatives are combined with quantity weights in determining appropriate exchange rates.

2. For products which are imported, the appropriate reference price in country X is the product's c.i.f. price delivered to country X. If exported by country X, the appropriate price is the product's f.o.b. price when exported from country X <sup>2/</sup>.

<sup>1/</sup> The rationale is described in considerable detail in sources numbers 31, 37 and 40. Applications of the methodology are numerous. Several applications are given in sources numbers 2, 4, 12, 14, 18, 19, 26, 29, and 30.

<sup>2/</sup> If however country X's increased demand for an import would affect the international price for the commodity, and if world supply and demand for the commodity are not perfectly elastic, the reference price should equal the marginal import cost. A similar proposition holds for exports (use marginal export revenue). For imports this may be estimated as the c.i.f. price multiplied by  $(1 + 1/e)$  where (e) is the elasticity of foreign supply. Marginal export revenue is measured as the f.o.b. export price multiplied by  $(1 - 1/x)$  where (x) is the elasticity of foreign demand.

3. The opportunity cost of labor in a particular use is measured as the value of production foregone elsewhere in the economy as a result of employing the laborer in that use. This can be measured as the weighted average of the marginal productivity of labor in agriculture, in industry, in Government, and among the unemployed.

4. The opportunity cost of capital is the rate of return on the marginal investment in the economy. One can distinguish between the opportunity cost of Government and of private sector investment, or of investment in other sectors.

5. Goods which are not traded on world markets are broken down into their cost of production. Inputs used to produce these non-traded goods are valued at world prices. Labor, capital and land inputs are valued at opportunity cost. The resulting total cost of production of a non-traded good at world prices and opportunity is taken to be its value.

B. Measuring Policy Distortions

6. The most common measure of the impact of policy on value added is the effective protection coefficient. Value added is the value of output less the value of purchased inputs, less depreciation. The sum of value added in an economy equals GDP. Effective protection measures the percentage increase in the value added of an industry (or enterprise or sector) which results from price/tax/subsidy/exchange rate policy. Specifically it equals value added in domestic prices divided by value added measured in border prices and at a purchasing power exchange rate  $\frac{1}{e}$ . If effective protection exceeds 1, then policy provides a positive incentive to produce the commodity (or invest in the industry or sector). This is because value added is being increased by policy over what it would have been had prices been defined by the world market. If effective protection is less than 1, policy discriminates against the commodity (i.e. domestic value added is less than it would have been had world prices been applicable). The analysis in Chapter IV D of farm level price distortions, measured distortion as the average rates of farmgate prices to world prices adjusted for internal handling. This is called the nominal protection coefficient.

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1/ Interesting examples of effective protection analysis are given in source numbers 4, 14, 15, 19, 22, 26, 37.

C. Measuring Comparative Advantage

7. The measurement of comparative advantage is similar to the measurement of the economic viability of a project. Each measures the net value of a specific production line, investment, project, etc. to an economy, relative to other possible production lines, investments or projects. In investment and project analysis, nearly universal use is now made of an economic rate of return to measure economic impact. This is the rate of return on a stream of net benefits generated by an investment (or project) which are measured as:

benefits	:	value of production in world prices
costs	:	cost of inputs valued in world prices for tradables, opportunity costs for non-tradables.
foreign exchange	:	is valued in local currency at a purchasing power parity exchange rate.

The resulting economic rate of return is compared to the opportunity costs of capital in the country (i.e. the likely return if the investment was made in the most likely alternative activity). If the rate of return exceeds the opportunity cost of capital, the investment or project is judged economically viable. The measurement of comparative advantage can be similarly undertaken. Those activities (sectors, industries) which contribute most to an economy (having the highest rate of return) are those in which that economy's comparative advantage lies. Industries with economic advantage have an economic rate of return investments higher than the opportunity cost of capital.

8. To obtain an idea of the structure of comparative advantage in an economy, economic rates of return to investments in various industries can be compared. Another method frequently used is to analyze the net economic benefit per unit of output of various industries in a single year for which an economic census exists. This shows value added per unit of output in world prices and opportunity costs. Industries having the highest value added per unit of output contribute most to the economy. To obtain an idea of future or dynamic comparative advantage, this same calculation is undertaken substituting projected world prices, opportunity costs, and physical costs.

9. Another common short-measure of comparative advantage is the domestic resource cost coefficient. It is an arithmetic derivative of the economic rate of return and net economic benefit coefficients. It is measured as the ratio between the opportunity cost of domestic resources used in production (by an enterprise, an industry or project), divided by net foreign exchange earnings or savings created by the enterprise measured in world prices. This ratio can be interpreted as the domestic cost of a dollar earned or saved through domestic production. This ratio computed for any enterprise (industry or project), can be compared to a purchasing power parity exchange rate. If the cost of domestic resources used to produce a dollar in net foreign exchange earnings or savings is greater for an enterprise (industry or sector) than the value of foreign exchange in terms of domestic currency defined by the purchasing power parity exchange rate, then the enterprise (industry or project) is not viable. It has no comparative advantage 1/.

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1/ This kind of analysis is undertaken in sources numbers 15, 18, 19, 17, 18, 22, 26, 29 and 37..

DATA

1. The attached tables show the following data for 31 countries in Sub-Saharan Africa.

(a) Agricultural Growth Rates, 1970-81. The source is the World Bank Development Report 1983 (Source 44), except for Tanzania (Source 43), Guinea (Source 43), Chad, Malawi, Benin, Lesotho, Liberia, Botswana (Source 43).

(b) Rate of Currency Depreciation, 1970-81. This measure is the percentage annual rate of currency depreciation (appreciation is represented by a minus), minus the annual rate of price inflation. Data on depreciation is taken from the IMF International Financial Statistics, except for Guinea where the source is number 43. Price inflation data is from source 44.

(c) The rate of increase of public consumption (1970-81): Source 44, except Chad, Somalia, Zimbabwe, Lesotho, Botswana, and Guinea (Source 42 and 43).

(d) The percentage of Government consumption in GDP (1981) (Source 44), except Chad, Uganda, Somalia, Sudan, Lesotho, Botswana (Source 42).

(e) Annual growth in barter terms of trade (1970-79) (Source 42), Guinea (Source 43), Lesotho and Botswana (Bank estimates).

(f) Adult literacy rate (1980) (Source 44).

(g) Population growth rate (1970-81) (Source 44).

(h) Percent share in exports of three principal exports (1976-78) (Source 44).

(i) Supply of fertilizers, seed, chemicals and equipment by Government (Sources 41, 44).

2. Farm Level Price Distortions. This was measured as the average coefficient of farmgate price to world price adjusted to the farmgate. Data sources are 1, 13, 21, 22, 28, 43, 44, 45. This data distills an extremely large number of studies and measurements. The measure has some margin of error for the following reasons:

(a) for most countries, the degree of price distortion has varied during the 1970-81 period. This variation cannot be captured in a single coefficient. Coefficients dating from the mid-seventies were used, or averages over a series of years for which data is available;

(b) for some countries price data is sparse (for others it is rich);

(c) there is considerable variation in price distortions between commodities in the same country. The average figure averages these out, but the variation between commodities is also important;

(d) data on average internal handling costs is usually inaccurate;

(e) in many studies of domestic price/world price comparison, adjustment of world price for exchange rate over-valuation is not done. This distorts the coefficients (which should account for over-valuation of local currency);

(f) the importance of the parallel market on which official prices have a limited impact is in most countries impossible to measure. This affects the degree of aggregate price distortions. Usually, there is little or no price distortion on such markets. To the extent that these markets are very important, price distortions decline. This is why in Zambia for example where official prices have been very distorted, the aggregate price distortion is only medium. Much is traded on the unofficial market.

3. The measurement of price distortion would be improved if net effective protection were used, which accounts for input price distortions.

4. Despite the measurement problem, the measurement of farm price distortions was statistically related to agricultural growth. This suggests that the measurement does not merely consist of random numbers. Secondly, if the measure were more accurate, the statistical relationship with agricultural growth would be even stronger.



<u>COUNTRY</u>	<u>AGGROW</u>	<u>DEPREC</u>	<u>PUBCGR</u>	<u>BARTOT</u>	<u>NPC</u>
Chad	.7	2.4	-1.7	1.6	1
Ethiopia	.9	4.2	3.4	2.4	.5
Mali	4	.1	7.3	-.6	.8
Malawi	4.1	.3	2.2	-.5	1
Zaire	1.5	-3.3	-.2	-7.8	.5
Uganda	-.8	-11.7	-.9	3.1	.5
Burundi	2.2	-1.3	3.1	-.9	.8
Upper Volta	1.4	.3	7.1	-1.3	1
Rwanda	3	-4.1	11.8	6.3	.9
Somalia	-.6	-3.7	11.7	-2.7	.9
Tanzania	3.3	-.5	6.5	.7	.7
Guinea	-.7	-5.5	4.5	-.6	.3
Benin	0	.4	2.4	-2.8	.6
Central African Republic	2.3	-2.8	-2.9	1.3	1
Sierra Leone	2.4	.9	-1.9	-1.6	.5
Madagascar	3	-.8	1.3	-.9	.6
Niger	-3	-2.4	2.6	-2.2	.8
Sudan	2.3	-1.8	6.9	1.4	.75
Togo	1.5	.9	9.9	9	.5
Ghana	0	-16.8	4.7	6.9	.6
Kenya	4.2	2	9.2	2.2	.9
Senegal	2.6	1.9	5.9	1.4	.7
Lesotho	4.3	1.4	15.4	0	.9
Liberia	5	1.1	2.2	-4.1	.8
Zambia	1.8	3.4	.8	-9	.7
Nigeria	-.4	-5.6	11	17.2	.7
Zimbabwe	-.5	-.4	9.7	0	1
Cameroon	3.9	-.8	3	6.1	.85
Botswana	8.5	-.1	16.9	0	1
Congo	2.1	-2	2.3	1	.85
Ivory Coast	4.7	-3.2	10.1	3	.85

AGGROW: Agricultural Growth Rate p.a. 1970-81

DEPREC: Rate of real currency depreciation 1970-81 (a - sign signifies real appreciation) : (% p.a.)

PUBCGR: Growth rate p.a. of public consumption 1970-81 (% p.a.)

BARTOT: Annual change in barter terms of trade 1970-79 (% p.a.)

NPC : Nominal Protection Coefficient: average 1970-81

<u>COUNTRY</u>	<u>FERT</u>	<u>POPGR</u>	<u>LITCY</u>	<u>INFL</u>	<u>PUB%</u>
Chad	3	2	15	7.4	18
Ethiopia	40	2	15	4.1	15
Mali	60	2.6	10	9.7	26
Malawi	141	3	25	10.3	10
Zaire	13	3	55	35.3	16
Uganda	1	2.6	52	41.2	4
Burundi	8	2.2	25	11.6	16
Upper Volta	40	2	5	9.5	15
Rwanda	1	3.4	50	13.4	17
Somalia	23	2.8	60	12.6	19
Tanzania	69	3.4	79	11.9	14
Guinea	2	2.9	20	4.6	19
Benin	17	2.7	28	9.4	13
Central African Republic	5	2.3	33	12.6	13
Sierra Leone	10	2.6	15	12.2	11
Madagascar	29	2.6	50	10.6	16
Niger	8	3.3	10	12.2	9
Sudan	65	3.1	32	15.9	11
Togo	30	2.5	18	8.9	17
Ghana	43	3		36.4	11
Kenya	262	4	47	10.2	21
Senegal	36	2.7	10	7.9	22
Lesotho	154	2.4	52	10.5	26
Liberia	92	3.5	25	8.9	21
Zambia	157	3.1	44	8.4	28
Nigeria	57	2.5	34	14.2	12
Zimbabwe	655	3.2	69	10.1	18
Cameroon	51	2.2		10.6	7
Botswana	0	3.6	35	11.6	25
Congo	8	2.9		11.8	12
Ivory Coast	137	5	35	13	18

FERT : Fertilizer consumption per ha arable land 1980 (kg/hg)

POPGR: Average annual rate of population growth 1970-81

LITCY: Adult literacy rate in 1980 (%)

INFL : Annual rate of price inflation (1970-81) (% p.a.)

PUB% : Public consumption to GDP (%) in 1981

<u>COUNTRY</u>	<u>XCONCTR</u>	<u>GDPGROW</u>	<u>PUBSUPI</u>
Chad	82	.5	1
Ethiopia	82	2.2	1
Mali	56	4.6	1
Malawi	83	5.6	0
Zaire	91	-.2	0
Uganda	96	-1.6	0
Burundi	95	3.2	0
Upper Volta	44	3.6	0
Rwanda	87	5.3	1
Somalia	91	3.9	1
Tanzania	55	5.1	1
Guinea	73	3	1
Benin	32	3.3	1
Central African Republic	54	1.6	0
Sierra Leone	79	1.9	1
Madagascar	48	.3	0
Niger	80	3.1	1
Sudan	71	4.1	0
Togo	81	3.2	1
Ghana	63	-.2	1
Kenya	53	5.8	0
Senegal	50	2	1
Lesotho	100	8.4	0
Liberia	82	1.3	0
Zambia	96	.4	1
Nigeria	97	4.5	0
Zimbabwe	22	1.8	0
Cameroon	63	6.3	0
Botswana	99	6	0
Congo	82	5.1	1
Ivory Coast	68	6.2	0

XCONCTR: % shares in exports of three principal exports 1976--78

GDPGROW: Annual growth of GDP 1970-81 (% p.a.)

PUBSUPI: Supply of fertilizer, seed, chemicals, equipment predominantly  
Government (1) or private/mixed (0)

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Ethiopia	Malawi	Togo	
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