Incentive Policies and Export Performance in Sub-Saharan Africa

BELA BALASSA*
Johns Hopkins University, Baltimore, Maryland
and
The World Bank, Washington, DC

Summary. — The paper presents the results of an econometric investigation which shows that exports in general, and agricultural exports in particular, are responsive to price incentives in sub-Saharan Africa. It is further shown that, within sub-Saharan Africa, market-oriented countries generally gained, and interventionist countries lost, export market shares. The differences in export performance are even greater if comparisons are made between private market economies and étatist countries in a three-fold classification scheme that puts some countries in an intermediate category.

This paper examines the experience of sub-Saharan Africa with economic incentives in general, and agricultural incentives in particular, and analyzes the effects of these incentives on economic performance. Section 1 of the paper reports on the findings of an econometric investigation on the responsiveness of exports to incentives. Section 2 reviews changes in the export market shares of sub-Saharan African countries pursuing different development strategies. Section 3 examines changes in export market shares for four sub-Saharan African countries, Tanzania, Kenya, Ghana, and the Ivory Coast. Sections 4 and 5 provide a comparative analysis of agricultural policies and performance in two pairs of these countries: Tanzania and Kenya (Section 4) and Ghana and the Ivory Coast (Section 5).

1. THE RESPONSE OF EXPORTS TO PRICE INCENTIVES

Table 1 reports the results of estimates for the exports of goods and services and for merchandise exports, obtained by the use of a reduced form equilibrium equation, for 16 sub-Saharan African countries.[1] The estimates pertain to the 1965–82 period and to the 1965–73 and the 1974–82 subperiods.

The real exchange rate variable has the expected sign and it is statistically significant at the 1% level in the equations for the 1974–82 subperiod and the entire 1965–82 period, but not for the 1965–73 subperiod. In the latter case, the regression coefficient is significant at the 10% level for the exports of goods and services and does not reach this level of significance for goods alone.[2]

Limiting attention to the values taken by the regression coefficients which have a high level of statistical significance, we find that the coefficients vary between 0.78 and 1.01. Since the variables have been expressed in terms of rates of change, this means that a 1% change in the exchange rate is associated with a 0.8–1% change in the ratio of exports to output.

The coefficients for the real exchange rate variable are uniformly higher for the sub-Saharan African countries than for all developing countries, for which estimates are presented in Balassa (1989). For the 1974–82 subperiod and for the entire 1965–82 period, respectively, the differences between the two sets of estimates are 0.13 and 0.24 percentage points for merchandise exports and 0.20 and 0.40 percentage points for the exports of goods and services.[3]

The results conflict with popular notions, according to which changes in the real exchange rate would have less of an effect on the exports of sub-Saharan African countries than in countries at

*The author is Professor of Political Economy at the Johns Hopkins University and consultant to the World Bank. He is indebted to Uma Lele for helpful comments and to Shigeru Akiyama for research assistance. He alone is responsible for the contents of the paper, however, that should not be interpreted to reflect the views of the World Bank.

Table 1. *Regression equations for export-output ratios in sub-Saharan African countries**
(*t*-values in parentheses)

	Constant	Real exchange rate	Foreign income	N	F	R^2
1. 1965–73						
(a) exports of goods and	−0.05	0.37	1.21	128	2.43	0.022
nonfactor services	(−0.87)	(1.97)†	(1.07)			
(b) merchandise exports	−0.14	0.27	3.39	128	2.81	0.028
	(−1.77)†	(1.04)	(2.17)‡			
2. 1974–82						
(a) exports of goods and	−0.02	0.78	0.95	128	24.44	0.270
nonfactor services	(1.13)	(6.60)§	(1.45)			
(b) merchandise exports	−0.02	0.91	1.79	128	10.28	0.127
	(−0.65)	(4.07)§	(1.46)			
3. 1965–82						
(a) exports of goods and	0.01	0.88	0.04	272	36.98	0.210
nonfactor services	(0.76)	(8.49)§	(0.08)			
(b) merchandise exports	0.02	1.01	0.52	272	18.83	0.116
	(0.54)	(5.93)§	(0.71)			

Source: World Bank database.
*The variables have been expressed in terms of rates of change between successive years for individual countries combining time-series and cross-section observations.
†Statistically significant at the 10% level.
‡Statistically significant at the 5% level.
§Statistically significant at the 1% level.

higher levels of development. But, they are consistent with the observation that African countries, which let their exchange rate become greatly overvalued, experienced considerable losses in export market shares.

In contradistinction with the case of all developing countries, however, the level of significance of the foreign income variable is very low; it reaches 5% only in the case of merchandise exports in the 1965–73 period. This result may be explained by the high share in sub-Saharan exports of foods, the exportation of which responds little to income changes in the developed countries. Also, coffee exports, accounting for a large proportion of the exports of several sub-Saharan African countries, are determined by quotas under the International Coffee Agreement, which bear little relationship to changes in incomes in the developed countries.

Comparable estimates have been made for agriculture (see Table 2). The results again show the responsiveness of exports to changes in the real exchange rate. The regression coefficients for the export-output ratio range between 1.08 and 1.35; they are statistically significant at the 1% level for the 1974–82 subperiod and the entire 1965–82 period, and at the 10% level for the 1965–73 subperiod.

As in the case of merchandise exports, the regression coefficients of the real exchange rate

variable for agricultural exports are uniformly higher for the sub-Saharan African countries than for all developing countries. In fact, the differences are larger in the present case, ranging from one-half for the 1974–82 subperiod to a near doubling in the 1965–73 subperiod and the entire 1965–82 period.[4]

At the same time, for the countries of sub-Saharan Africa, the regression coefficients for agriculture are substantially higher than for merchandise or for goods and services. This result again conflicts with conventional wisdom, which holds that agricultural exports are less responsive to prices than industrial exports.

In turn, the statistical significance of the foreign income variable does not even reach the 10% level for the countries of sub-Saharan Africa. This result may be explained by reference to the low income elasticity of demand for foodstuffs and, in particular, for tropical beverages as noted above in conjunction with merchandise exports.

The coefficient of determination is lower for agricultural exports than for merchandise exports or for the exports of goods and services. The differences in the results may be explained by nonprice factors which affect agricultural production.[5] Nevertheless, apart from the 1965–73 period, the *F*-statistics are high.

The adjusted R^2s and the *F*-statistics are sub-

Table 2. *Regression equations for agricultural exports in sub-Saharan African countries**

	Constant	Real exchange rate	Foreign income	N	F	R^2
		Export-output ratio				
1. 1965–73	0.04 (0.22)	1.08 (1.87)†	0.43 (0.13)	128	1.75	0.012
2. 1974–82	−0.02 (−0.36)	1.15 (4.00)‡	2.52 (1.58)	128	10.24	0.127
3. 1965–82	0.04 (0.85)	1.35 (5.26)‡	0.68 (0.61)	272	14.79	0.092
		Net export-output ratio				
1. 1966–73	1.65 (0.61)	−4.73 (−0.52)	−42.65 (−0.77)	128	0.42	−0.009
2. 1974–82	0.12 (0.15)	16.43 (3.55)‡	6.62 (0.26)	128	6.57	0.081
3. 1965–82	0.07 (0.11)	11.47 (2.96)‡	−7.72 (−0.46)	272	4.39	0.024

Source: World Bank data base.
*The variables have been expressed in terms of rate of change between successive years
for individual countries combining time-series and cross-section observations.
†Statistically significant at the 10% level.
‡Statistically significant at the 1% level.

stantially lower in the equation utilizing the net export ratio as the dependent variable. This result may be explained in part by the fact that errors in the export and the import data are amplified when one takes the difference between the two, and in part by the effects on imports of changes in foreign exchange receipts and in the availability of food aid.

In the net export equation, the real exchange rate variable is statistically significant at the 1% level in the second subperiod as well as in the entire period. It takes values of 16.4 in 1974–82 and 11.5 in 1965–82. The results again provide evidence of the effects of changes in the real exchange rate on trade in agricultural products.

2. ALTERNATIVE POLICIES AND EXPORT PERFORMANCE

In this section of the paper, we analyze the effects of policy choices on export performance in the case of merchandise exports and agricultural exports. In so doing, alternative classification schemes have been used in regard to the policies applied by the countries of sub-Saharan Africa.

Distinction has first been made between market-oriented and interventionist countries on the basis of available information on the extent of public

interventions in capital, labor, and foreign exchange markets. The first group includes Botswana, Cameroon, Ivory Coast, Kenya, Malawi, Mauritius, Niger, Togo, and Upper Volta while the second comprises Benin, Ethiopia, Ghana, Madagascar, Mali, Senegal, Sudan, Tanzania, Zaire, and Zambia. A three-fold classification scheme has also been utilized, with Botswana, Cameroon, Ivory Coast and Mauritius included in the group of private market economies; Benin, Ethiopia, Ghana, Madagascar, Mali, Tanzania and Zambia in the group of étatist countries; and Kenya, Malawi, Niger, Senegal, Sudan, Togo, Upper Volta, and Zaire in an intermediate group.[6]

The policies applied greatly affected export performance in the countries under consideration. This is evidenced by changes in export market shares for each country's merchandise exports as well as for its agricultural exports. The results reported in Table 3 show the ratio of average export market shares in the 1974–78 period to the average for the 1971–73 base period.

The range of increases in average export shares was 9–81% in market economies, except for Cameroon, Niger, and Togo that experienced declines of 4–22%. In turn, interventionist countries generally lost export market shares, with the losses exceeding one-fourth in Benin, Ethiopia, Ghana, and Tanazania, where policy-induced dis-

Table 3. *Changes in export market shares in sub-Saharan African countries**

Country	Merchandise exports† 1974–78	Traditional agricultural exports‡ 1974–78
Botswana	181.2	120.7
Cameroon	96.0	107.7
Ivory Coast	118.9	134.9
Mauritius	108.1	89.1
Kenya	109.0	123.8
Malawi	152.3	150.1
Niger	77.8	47.1
Togo	91.4	61.6
Upper Volta	121.9	102.0
Senegal	103.2	119.3
Sudan	83.6	90.3
Zaire	76.9	63.1
Benin	41.8	35.8
Ethiopia	60.2	60.2
Ghana	72.8	79.7
Madagascar	82.4	88.9
Mali	106.6	89.1
Tanzania	71.4	99.4
Zambia	87.4	—

Source: World Bank data tapes.
*The results show the ratio of a country's export market share in 1974–78 to its share in 1971–73.
†The average ratio for merchandise exports has been derived as the weighted average of the ratios calculated for traditional primary exports, defined as accounting for more than 1.5% in total exports in 1971–73, taken individually for nontraditional primary exports, for fuel exports, and for manufactured exports.
‡For traditional agricultural exports, the average pertains to agricultural products within the traditional primary export group.

tortions — in particular, the overvaluation of the exchange rate — were the most pronounced. Among the interventionist countries, only Mali and Senegal experienced small gains (7–13%) in export market shares.

The effects of the policies applied on export performance are also apparent in weighted averages calculated for the various groups. Thus, market-oriented countries had an average gain of 5% and interventionist countries an average loss of 19% in export market shares during the 1974–78 period. Using a three-fold classification scheme, and distinguishing among private market economies, intermediate, and étatist countries, the corresponding figures are +15, −10, and −24% (Balassa, 1984).

Table 3 further provides information on the performance of individual countries in regard to tra-

ditional agricultural exports, defined as accounting for at least 1.5% of export value in 1971–73. The results confirm the findings pertaining to total merchandise exports.

Apart from Mauritius, Niger, and Togo, private market economies in sub-Saharan Africa increased their market shares of traditional agricultural exports; the largest gains were observed in Malawi (50%), the Ivory Coast (35%), Kenya (25%), and Botswana (21%). In turn, apart from Senegal, all interventionist countries lost export market shares, with a nearly two-thirds loss in the case of Benin and over one-third in Ethiopia and Zaire. As shown in Table 3, the differences are even more pronounced if private market economies and étatist countries are compared.

All in all, market-oriented countries generally gained, and interventionist economies lost, export market shares during the 1973–78 period, when the former group of countries did not appreciably discriminate against exports and adopted realistic exchange rates while the latter group strongly biased the system of incentives against exports and let their exchange rates appreciate in real terms. The differences in policies, and in export performance, are even greater if comparisons are made between private market economies and étatist countries in a three-fold classification scheme that puts some countries in an intermediate group.[7]

These results are supported by the findings of a World Bank study on agricultural exports in Eastern and Southern Africa. According to the study, industrial protection and overvalued exchange rates adversely affected agricultural exports in this region during the 1965–83 period (Gulhati, Swadesh and Atukorala, 1985).

Another Bank study found that, in sub-Saharan Africa, countries with a high degree of price discrimination against agriculture had an average agricultural growth rate of 0.8% in the 1970–81 period, while the corresponding growth rates were 1.8% and 2.9% in countries with medium and low price discrimination against agriculture (Cleaver, 1985). This result was confirmed by an econometric analysis of the relationship between the extent of price distortions and agricultural output growth in these countries (Cleaver, 1985), although the small number of observations limits the validity of the results.

The same author examined the implications of overvalued exchange rates for the growth of agricultural production in sub-Saharan Africa. He found that, on the average, agricultural growth rates were higher in countries whose currency depreciated, than in countries whose currency appreciated, in real terms. In the 1970–81 period, the average annual growth rate of agricultural pro-

duction was 2.6% in the first group and 1.5% in the second (Cleaver, 1985).

3. CHANGING EXPORT MARKET SHARES: THE EXPERIENCES OF FOUR SUB-SAHARAN AFRICAN COUNTRIES

Table 4 reports estimates on changes in export market shares for Tanzania, Kenya, Ghana, and the Ivory Coast for the 1974–78 and the 1979–81 periods. Changes in market shares have been expressed as the ratio of actual exports to hypothetical exports, calculated on the assumption that the country maintained its share in world markets in the 1971–73 and 1976–78 base periods, respectively.

Table 4 provides information on the traditional agricultural exports of the four countries, defined as accounting for at least 1.5% of their total merchandise exports in the base period. The table also shows weighted averages for these exports, the weights being each country's base period export values. Information is further provided on nontraditional primary exports, defined as primary products that individually accounted for less than 1.5% of total exports in the base period, which in their great bulk are agricultural commodities. Finally, the average for total merchandise exports has been calculated from data for traditional agricultural and nonagricultural primary exports,[8] nontraditional primary exports, fuel exports, and manufactured exports.

The data show a 1% average decrease in Tanzania's market shares in its traditional agricultural exports in 1974–78, followed by a 19% decline in 1979–81. This contrasts with increases of 24% and 19% in Kenya in the two periods, respectively.

Losses in market shares in Tanzania were much larger for annual crops than for tree crops (coffee and tea). The only major annual crop where Tanzania made gains in export shares, tobacco, reached only one-half of its production target, despite large injections of capital. Among minor exports, cashew nuts and pyrethrum experienced a decline by two-thirds from peak levels (Ellis, 1985). In the exportation of coffee and tea, as well as in that of agava fiber, where the two countries are in competition, Kenya's export performance was much superior to that of Tanzania. The differences between the two countries are even greater in regard to nontraditional primary exports. While in Kenya average losses of 4% in 1974–78 gave place to a gain of 8% in 1979–81, Tanzania experienced losses of 44% in the first and 40% in the second period.

Tanzania also did less well than Kenya in the exportation of manufactured goods. As a result, Tanzania's average market share in merchandise exports fell by 29% in 1974–78, followed by a decline of 60% in 1979–81. Average gains for Kenya were 9% in the first period and 1% in the second, when it lost manufactured exports due largely to the closing of the Tanzanian border.

Among Ghana's traditional agricultural exports, data for 1974–78 period show average

Table 4. *Changing export market shares:* Tanzania, Kenya, the Ivory Coast, and Ghana

| | Tanzania | | Kenya | | Ivory Coast | | Ghana |
	1974–78	1979–81	1974–78	1979–81	1974–78	1979–81	1974–78
Merchandise exports	71.4	59.8	109.0	101.2	118.9	125.4	72.8
Nontraditional primary exports	56.4	60.0	96.0	108.0	116.1	214.8	76.2
Traditional agricultural exports	99.4	81.1	123.8	118.7	134.9	132.4	79.9
Coffee	104.9	94.6	130.5	121.2	140.1	109.1	
Tea	119.1	128.1	123.2	143.5			
Cotton	82.7	57.7			125.2	203.3	
Sisal	101.2	95.0	215.7	204.1			
Oilseed cake	57.7	33.7					
Tobacco	146.6	101.3					
Meat, prepared			92.0	23.9			
Maize			53.3	24.4			
Cocoa beans					139.4	205.1	81.1
Cocoa paste					87.1	39.7	
Cocoa butter					127.7	126.5	66.9
Bananas					89.6	72.9	
Palm oil					141.2	63.3	

Source: World Bank data base.
*The results show the ratio of a country's export market share in the period under consideration to its share in the base period. For 1974–78 the base period is 1971–73; for 1979–81, it is 1976–78. On the method of calculating changes in market shares for merchandise exports, see Table 3.

losses in export market shares of 19% in cocoa beans and 33% in cocoa butter. Ghana experienced even larger losses in its market shares in traditional nonagricultural exports and in non-traditional primary exports, bringing the decline in its average market share in merchandise exports to 27%. While there are no comparable data for the 1978–81 period, available information points to the continuation of these trends.

By contrast, the Ivory Coast increased its export market shares in cocoa butter and cocoa paste by 39% and 27%, respectively, in the 1974–78 period. And, while the two countries have similar climatic conditions, the Ivory Coast diversified its agricultural exports during the 1960s and made gains in the subsequent period in cotton and palm oil, although not in bananas.

Taken together, the Ivory Coast had an average gain of 35% in its traditional agricultural exports in 1974–78, compared with a loss of 20% for Ghana. The Ivory Coast also increased its market shares in nontraditional primary exports by 16%, compared with a loss of 24% for Ghana. The Ivory Coast made further gains in this commodity group in 1979–81, bringing the average gain for all merchandise exports to 25%, exceeding the 19% gain in 1974–78. In turn, Ghana experienced a 27% loss in merchandise exports in 1974–78; data for 1979–81 are not available.

4. AGRICULTURAL POLICIES AND PERFORMANCE IN TANZANIA AND KENYA[9]

An important factor contributing to losses in export market shares in Tanzania was the increasing overvaluation of the real exchange rate. Thus, Kenneth Meyers has estimated that the ratio of exports to agricultural value added in Tanzania would have been 18% higher in 1982 if the exchange rate remained at its 1973 level in real terms. Yet, the appreciation of the real exchange rate by 44% in the 1973–82 period followed an appreciation of 32% between 1965 and 1973.

Changes in the real exchange rate do not fully reflect the adverse effects of the incentive system on agricultural exports, which contributed to the decline in the ratio of exports to agricultural value added in Tanzania from 41% in 1973 to 14% in 1982. Other important influences were the increase in marketing margins of the parastatals that led to reductions in the ratio of producer to border prices, in particular for coffee and tea; increasing shortages of agricultural inputs, machinery spares, and consumer goods; and the deterioration of transport facilities (Lele, 1984).

Exports were further discouraged as the prices of export crops declined by one-third, compared with the prices of domestic crops, between 1969–70 and 1979–80 in smallholder production. Yet, the average real price of domestic crops, derived by deflating the index of producer prices by the consumer price index, also decreased by 16% between 1970 and 1980.

The adverse changes in the incentive system led to a fall of Tanzania's agricultural exports by 6.5% a year between 1970 and 1981. In turn, among domestic crops, marketed production declined at an average annual rate of 20.8% in the case of rice and 3.8% for wheat in the 1970–82 period. Also, while average increases were 3.6% a year for maize, production in 1981 and 1982 did not reach one-half of the peaks attained in 1978 and 1979.

At the same time, although it has been claimed that sales in informal markets rose rapidly in Tanzania, increases in imports indicate that domestic production was less and less able to provide for the needs of the population. Thus, the combined imports of maize, rice, and wheat were 388 thousand tons in 1981–82, compared with 13 thousand tons in 1970–71 (Lele, 1988, p. 168).

In Kenya, the ratio of agricultural exports to value added was 33% in 1973 and 31% in 1982. The relative constancy of this share may be largely attributed to the constancy of the real exchange rate and the lack of discrimination against exports in the agricultural sector. Thus, prices for export crops and domestic crops moved in a parallel fashion during the period; nor was there much variation among domestic crops. Also, the average real price of both export and domestic crops increased by 13% between 1972–73 and 1982–83 (Jabara, 1985).

The system of incentives applied may explain why Kenyan agricultural exports rose by 2.6% a year between 1970 and 1981. In turn, marketed production increased at average annual rates of 2.3% in the case of maize, 2.1% in the case of rice, and 1.7% in the case of wheat (Lele et al., 1985).

The situation is even more favorable if all domestic crops rather than only staple cereals are considered. Between 1972–73 and 1982–83, the production of domestic crops rose by 137% while the increase for all crops was 126% (Jabara, 1985).

Taking 1979–80 as the terminal year, comparisons may further be made with Tanzania. Between 1972–73 and 1979–80, the production of export crops rose by 18% and that of domestic crops by 104% in Kenya, with an average increase of 95%. In turn, between 1973–74 and 1979–80, the 23% decline in the production of export crops in Tanzania was barely compensated by the rise in the production of domestic crops, with an average increase of 8% (Ellis, 1985 and Jabara, 1985).

5. AGRICULTURAL POLICIES AND PERFORMANCE IN GHANA AND THE IVORY COAST[10]

Changes in export market shares in Ghana and the Ivory Coast represent a continuation of trends since independence. Between 1963–64 and 1979–80, cocoa production fell from 443 to 275 thousand metric tons in Ghana, while it increased from 99 to 379 thousand metric tons in the Ivory Coast. In Ghana, a further decline to 107 thousand metric tons had occurred by 1983–84 (Stryker and Brandt, 1985).

The results may be explained by reference to the price policies applied in the two countries. In 1984, Ghanaian cocoa farmers received 20% of the world market price while the corresponding ratio was 84% in the Ivory Coast (Stryker and Brandt, 1985). Although the results for Ghana represent a deterioration of the situation from earlier periods, high taxes were levied on cocoa from the early 1960s onwards.

Relatively high producer prices provided incentives in the Ivory Coast for the expansion of cultivation, the upgrading of varieties through replanting, and the careful husbanding of cocoa trees. In turn, in Ghana, a number of existing plantations were abandoned and new high-yielding cocoa varieties were not introduced in cases when replanting did occur.

Nor did Ghana experience a diversification of exports, so that the decline in the exports of cocoa was not compensated by increases in other agricultural exports. In fact, between 1970 and 1982, the ratio of exports to agricultural value added fell from 32 to 2%.

High industrial protection and the increasing overvaluation of the exchange rate contributed to these results. Thus, between 1975 and 1982, the real exchange rate appreciated by 80% in Ghana.

Import-substitution crops, in particular cereals, produced mainly on large farms, were protected by quantitative import restrictions. These crops, however, are at a comparative disadvantage in Ghana. Also, they suffered the consequences of the deterioration of physical infrastructure, in particular transportation facilities, and the scarcity of imported inputs, such as fertilizers and insecticides. Thus, the production of cereals declined by 62% between 1970 and 1983, while the production of starch staples fell by 40%.

These figures indicate the adverse effects of the policies applied to Ghanaian agriculture. While the intention had been to syphon off revenues from cocoa production to the benefit of other sectors of the economy, foreign exchange earnings decreased as a result, eventually leading to a decline in other production activities that were unable to obtain the necessary inputs.

By contrast, the Ivory Coast adopted a balanced system of incentives while encouraging the inflow of foreign capital and the immigration of labor from neighboring countries. As a result, agricultural production continued to rise at a rapid rate, with average increases of 3.8% in value added between 1970 and 1980. Within agriculture, the production of domestic crops and export crops grew in a parallel fashion, maintaining the share of exports at about three-fourths of the total.

With value added in manufacturing rising by 8.2% a year, the gross domestic product of the Ivory Coast increased at an average annual rate of 6.4% between 1970 and 1980, following a growth rate of 8.0% between 1960 and 1970. By contrast, increases of 2.2% a year in the 1960s gave way to an average annual decline of 0.5% in the 1970s in Ghana. Measured in terms of purchasing power parities, per capita incomes increased from $779 in 1960 to $1,410 two decades later in the Ivory Coast, while a decline from $1,009 to $762 occurred in Ghana (Summers and Heston, 1984).

Policy performance deteriorated in the Ivory Coast toward the end of the 1970s as high-cost investments were undertaken, particularly in sugar. The exchange rate became increasingly overvalued as domestic inflation accelerated while parity vis-à-vis the French franc was maintained in the framework of the franc area. Important policy reforms were introduced in subsequent years, however, which are expected to lead to the resumption of rapid economic growth.

In Ghana, the Economic Recovery Program was launched in April 1983, involving a devaluation of the currency by 1,900% and the adoption of a flexible exchange rate system. Also, producer prices have been raised to a considerable extent. However, in the pursuit of self-sufficiency, the incentive system continues to favor import-substitution crops. Further increases in cocoa prices would be necessary for the full exploitation of Ghana's production potential.

6. CONCLUSIONS

This paper has provided evidence on the effects of the policies applied on economic performance in sub-Saharan Africa, with emphasis given to agriculture. It has been shown that exports in general, and agricultural exports in particular, are highly responsive to changes in the real exchange rate. In fact, exports are more responsive to price incentives in sub-Saharan Africa than in developing countries in general.

It has further been shown that market-oriented countries generally gained, and interventionist

countries lost, export market shares as the former, but not the latter, group of countries maintained realistic exchange rates and did not appreciably bias the system of incentives against exports. The differences in policies, and in export performance, are even greater if comparisons are made between private market economies and étatist countries in a three-fold classification scheme that puts some countries in an intermediate group.

Kenya and the Ivory Coast exemplify market-oriented, and Tanzania and Ghana interventionist, countries in sub-Saharan Africa. The paper has made pair-wise comparisons between Kenya and Tanzania and between the Ivory Coast and Ghana, indicating the superiority of the market-oriented approach in promoting exports and agricultural production.

NOTES

1. The underlying model and the derivation of the estimating equation are presented in the appendix to the paper.

2. As will be seen below, the level of statistical significance of the regression coefficients for the estimates for the 1965–73 subperiod is low for agricultural exports as well. A possible explanation is the low variability of the real exchange rate variable for this subperiod characterizd by fixed exchange rates for much of its duration. But, the regression coefficients of the exchange rate variable are highly significant for the entire 1965–82 period.

3. The regression coefficients of the real exchange rate variable in the developing country equations, with *t*-values in parentheses, are as follows. Exports of goods and services: 1965–73, 0.25 (3.19); 1974–82, 0.58 (9.79); 1965–82, 0.48 (9.84). Merchandise exports: 1965–73, 0.71 (8.50); 1974–82, 0.78 (9.93); 1965–82, 0.77 (12.63).

4. The regression coefficients of the real exchange rate variable for agricultural exports in the developing country equations are as follows. Equations with the export-output ratio as dependent variable: 1965–73, 0.55 (3.54); 1974–82, 0.79 (7.44); 1965–82, 0.68 (7.47). Equations with the net export-output ratio as the dependent variable:

1965–73, 0.42 (0.21); 1974–82, 7.89 (2.45); 1965–82, 4.96 (2.38).

5. The importance of nonprice factors is emphasized by Lele (1988).

6. The classification schemes have been established on the basis of available studies, World Bank reports, and discussions with experts on sub-Saharan Africa. As to the latter, there is a remarkable uniformity of views regarding the classification of the countries concerned.

7. For a detailed discussion of the results obtained, see Balassa (1984).

8. Tanzania and Kenya did not have any traditional nonagricultural exports; this category includes sawn and veneer logs in the Ivory Coast and Ghana, sawn wood in the Ivory Coast, and sawn wood and aluminum in Ghana.

9. Unless otherwise noted, the data originate in Meyers (1985 and 1986).

10. Unless otherwise noted, the data originate in Sherbourne (1985a and 1985b).

REFERENCES

Balassa, B., "Economic incentives and agricultural exports in developing countries," in Nurul Islam (Ed.), *The Balance between Industry and Agriculture in Economic Development* (London: Macmillan, 1989), pp. 181–196.

Balassa, B., "Effects of exchange rate changes in developing countries," *Indian Journal of Economics,* Vol. LXVIII, No. 269 (October 1987) pp. 203–222.

Balassa, B., "Adjustment policies and development strategies in sub-Saharan Africa, 1973–78," in M. Syrquin, L. Taylor, and L. E. Westphal (Eds), *Economic Strategy and Performance, Essays in Honor of Hollis B. Chenery* (New York: Academic Press, 1984), pp. 317–340.

Cleaver, K. M., "The impact of price and exchange rate policies in agriculture in sub-Saharan Africa," World Bank Staff Working Paper No. 728 (Washington, DC: World Bank, 1985).

Gulhati, R., B. Swadesh, and V. Atukorala, "Exchange rate policies, in Eastern and Southern Africa, 1965–1983," World Bank Staff Working Paper No. 720 (Washington, DC: World Bank, 1985).

Jabara, C. L., "Agricultural pricing policy in Kenya," *World Development,* Vol. 13, No. 5 (May 1985), pp. 611–626.

Lele, U., "The role of price and non-price factors in explaining sources of growth in East African agriculture: Some lessons for governments and donors," Mimeo (Washington, DC: World Bank, January 1988).

Lele, U., "Tanzania: Phoenix or Icarus?" in A. C. Harberger (Ed.), *World Economic Growth* (San Francisco: Institute for Contemporary Studies, 1984), pp. 159–196.

Meyers, K., "Agricultural policy and performance in Tanzania," Mimeo (Washington, DC: World Bank, September 1986).

Meyers, K., "Agricultural policy and performance in

Kenya," Mimeo (Washington, DC: World Bank, September 1985).

Sherbourne, L., "Agricultural policy and performance in Ghana," Mimeo (Washington, DC: World Bank, September 1985a).

Sherbourne, L., "Agricultural policy and performance in the Ivory Coast," Mimeo (Washington, DC: World Bank, September 1985b).

Stryker, J. D. and L. E. Brandt, "Price policy in Africa," Mimeo (Washington, DC: Associates for International Resources and Development, September 1985).

Summers, R. and A. Heston, "Improved international comparisons of real product and its composition, 1950–80," *Review of Income and Wealth*, Vol. 30, No. 2 (June 1984) pp. 207–262.

APPENDIX: MODELING THE RESPONSE OF EXPORTS TO PRICE INCENTIVES[1]

In this appendix, a simple model consisting of (foreign) export demand and (domestic) export supply equations will be put forward for estimating the effects of price incentives, and of other relevant variables, on exports. Foreign demand for a country's exports (X^F) will be affected by changes in its international competitiveness. This may be indicated by changes in the index of the real exchange rate, derived as the nominal exchange rate (R) adjusted for changes in the prices of traded goods (defined in terms of wholesale prices[2]) in foreign countries (P_T^F) and in the domestic economy (P_T^D).[3] Introducing foreign incomes (Y^F) as an additional variable affecting exports, we obtain equation (1).

$$X^F = f(R \cdot P_T^F/P_T^D; Y^F) \qquad (1)$$

In turn the supply of a country's exports (X^D) will be affected by changes in relative incentives to traded versus nontraded goods. This may be indicated by an index of relative prices in the domestic economy, derived as the ratio of domestic price indices for traded goods (P_T^D) and for nontraded goods (P_N^D).[4] Introducing a domestic capacity variable (C^D), we obtain equation (2). Finally, equation (3) represents the equilibrium condition.

$$X^D = g(P_T^D/P_N^D; C^D) \qquad (2)$$

$$X^D = X^F \qquad (3)$$

Estimating this system of equations directly has not been successful. Correspondingly, a reduced form equation has been estimated. In view of the existence of inter-correlation between exports and domestic capacity, the export-output ratio has been used as the dependent variable. The estimated equation is shown in (4).

$$X = h(R \cdot P_T^F/P_T^D; P_T^D/P_N; C^D; Y^F) \qquad (4)$$

The index of relative prices in the domestic economy has not been statistically significant and has been omitted from the reported results. The estimates refer to the exports of goods and nonfactor services, merchandise exports, and agricultural exports, defined in terms of dollar value. Domestic capacity has been defined as the gross domestic product in the equations for the exports of goods and nonfactor services, and for merchandise exports and agricultural value added in the agricultural export equation. The gross domestic product of the developed countries has been used as a proxy for world income.

Estimation has been done by expressing all variables in terms of rates of change between successive years and combining time-series observations for the individual countries. Experimentation with lag structures has not been successful; hence, the reported estimates utilize data in an unlagged form.

NOTES TO APPENDIX

1. The system of equations is presented in Balassa (1989).

2. Wholesale price indices are superior to consumer price indices that include the prices of nontraded goods and are affected by price controls applied in a number of developing countries. The former, but not the latter, objection also applies to the use of the GDP deflator in the calculations.

3. On alternative concepts of the real exchange rate, see Balassa (1987).

4. Ideally, one would need to consider the price of value added (the effective rate of protection) rather than product prices.