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# Export Performance in Africa

Shahla Shapouri  
Stacey Rosen

Abstract  
Africa's export sector must play the key role in generating investment income for Africa's financial recovery. The average annual increase in real export earnings for the countries included in this study was less than 1 percent from 1980 to 1988. Along with slow growth, the instability of export earnings has a destabilizing effect on import capacity and economic growth. The coefficients of variation of export earnings averaged about 26 percent; an index of export diversification averaged about 10 percent. Commodity diversification was found to be a significant factor in improving export earnings growth and reducing export instability. Given the slow movement toward diversification, the performance of primary commodities, especially prices, and increased government incentives will remain the key factors in Africa's export and economic recovery.

Keywords: Africa, export earnings, exchange rates, primary commodities, nonagricultural exports, export diversification and stability, world commodity prices

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### Abstract

As the scarcity of foreign exchange continues, Africa's export sector must play the key role in generating investment income for Africa's financial recovery. The average annual increase in real export earnings for the countries included in this study was less than 1 percent from 1980 to 1986. Along with slow growth, the instability of export earnings has a destabilizing effect on import capacity and economic growth. The coefficients of variation of export earnings averaged about 26 percent; an index of export shortfalls averaged about 10 percent. Commodity diversification was found to be a significant factor in improving export earnings growth and reducing export instability. Given the slow movement toward diversification, the performance of primary commodities, especially prices, and improved government incentives will remain the key factors in Africa's export and economic recovery.

**Keywords:** Africa, export earnings, exchange rates, primary commodities, nonagricultural exports, export diversification and stability, world commodity prices

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# Export Performance in Africa

Shahla Shapouri  
Stacey Rosen

## Introduction

In the 1980's, financial conditions in less developed countries (LDC's) have severely strained their economic growth, investment climate, and potential economic viability. The very sharp increase in external debt has focused attention on LDC's financial situation and purchasing power. Among African countries, this is a severe problem and the struggle now is to reverse this trend. The slow resource flow to the region, along with a bleak investment outlook, has created an uncertain financial environment and has raised the specter of long-term malaise. Foreign credit continues to be scarce, thereby placing the onus on the export sector to play the key role in Africa's financial recovery. The role of exports, in addition to their direct contribution to the domestic economy, is to finance imports of essential commodities, inputs and capital investment, and support debt service payments in order to restore creditworthiness (1) (underscored numerals in parentheses refer to items in the References section).

In this difficult economic environment, the implication of reduced exports depends on their linkage to the economy. The larger the share of exports in the overall economy, and the higher the dependency on imported inputs, the stronger the impact of the export sector on the economy. Export instability, in addition to slow growth, burdens the limited economic management capacity of the countries. Volatility in foreign exchange earnings leads to large variations in import capacity which adversely affects economic planning and the economic growth process.

This paper focuses on the export sector as the key to African economic recovery and examines potential consequences of the performance of exports in the future economic growth of these countries. The study examines the factors affecting export growth and instability and their impact on countries' economic growth.

To understand the behavior of factors affecting export performance, we reviewed various characteristics, including the structure of exports in terms of commodity diversification, market concentration, and commodity composition. Then, we focused on performance determinants of one or two of the major export commodities in each study country. Our focus is on the trend behavior of the key variables: exchange rate policy and commodity prices. We estimate the commodity response to exchange rates and prices in detail and draw implications from the results.

This study includes data for 17 African countries for 1965 to 1986, including Algeria, Cameroon, Cote d'Ivoire, Egypt, Ethiopia, Kenya, Madagascar, Mali, Morocco, Nigeria, Senegal, Sudan, Tanzania, Togo, Zaire, Zambia, and Zimbabwe. Evaluation of performance or changes in the key variables are organized by two time periods, 1966-80 and 1980-86. Each period is distinct on both the local and international levels. For example, commodity prices and capital availability increased rapidly in the earlier period. The period after 1980, however, was characterized by declining commodity prices and increasing debt pressure.

### Export Performance

The performance of the export sector is crucial for the study countries both in terms of direct contribution to the economy and as a main source of foreign exchange to support imports of essential commodities. In this study, the two criteria selected to measure export performance are export growth and stability in export earnings.

#### Export Growth

Evaluation of export performance indicates that from 1966 to 1980, export earnings' growth (in nominal terms) in all of the study countries averaged more than 13 percent per year, reflecting the steep rise in commodity prices during this period (table 1). Nigeria, an oil exporter,

Table 1--Growth in export earnings

Country	Nominal		Real	
	1966-80	1980-86	1965-80	1980-86
	Percent per year			
Algeria	21.0	-6.9	1.5	0.9
Cameroon	17.5	-5.4	5.2	13.8
Cote d'Ivoire	16.8	2.1	5.6	3.5
Egypt	12.4	-4.9	2.8	7.4
Ethiopia	10.7	-2.0	-.5	-2.5
Kenya	12.8	-2.6	.3	-.9
Madagascar	11.4	-5.8	.7	-3.7
Mali	17.3	.90	11.0	7.2
Morocco	12.5	-.76	3.6	3.8
Nigeria	27.2	-20.3	11.4	-6.0
Senegal	9.6	3.7	2.4	8.7
Sudan	8.1	-16.3	.3	6.9
Tanzania	6.0	-1.3	-4.0	-9.8
Togo	15.6	-12.4	4.5	-6.6
Zaire	10.8	-.13	4.6	-4.3
Zambia	5.0	-12.5	1.7	-2.1
Zimbabwe	12.0	-4.2	3.5	-2.7
Average	13.3	-5.2	3.2	0.8



experienced the highest annual growth of more than 27 percent, while Zambia, a copper exporter, experienced the slowest, at 5 percent. Since 1980, export earnings have fallen an average of 5 percent each year in all countries. This again reflects the movement in international commodity prices. Export earnings rose in Cote d'Ivoire, Mali, and Senegal, but at a very slow rate. The largest decline was in Nigeria, 20 percent per year between 1980 and 1986, as oil prices fell dramatically. For example, between 1985 and 1986, oil prices were cut in half.

Real export earnings provide a more appropriate measure of the pattern of export earnings. The World Bank defines the growth rate of export earnings in constant terms which is calculated from the export value index and deflated by the corresponding price index. The indices are based on international prices for primary commodities and unit value indices for manufactures. In this case, real growth in export earnings is substantially different from that of the nominal rate: less in 1966-80 and greater in 1980-86. Export earnings of all countries increased an average of 3.2 percent per year between 1965 and 1980. However, there was a wide growth variation, from a decline of 4 percent per year in Tanzania to an increase of more than 11 percent per year in Nigeria. Between 1980 and 1986, real export growth averaged less than 1 percent per year (table 1). While real growth was slow, the average population growth rate was 3 percent per year in these countries. Therefore, real per capita export earnings have fallen since 1980 in nine countries, with Tanzania experiencing the largest decline of almost 10 percent per year. Export earnings in Cameroon increased at the highest rate in real terms, almost 14 percent per year. The performance of the components of export earnings, volume, and price was not always uniform due to the different supply and demand conditions influencing each component and the lag of the supply-price response.

Historical data on the volume of total exports are available for a limited number of countries in this study: Ethiopia, Kenya, Morocco, Nigeria, Togo, Zambia, and Zimbabwe (table 2). From 1966 to 1980, the growth in export volume ranged from a decline of 0.4 percent per year in Zambia to an increase of 8.3 percent per year in Nigeria. Since 1980, the pattern of export volume has varied significantly among countries. In Ethiopia, Nigeria, Togo, and Zambia, export volume declined with Togo experiencing the largest drop of almost 10 percent annually. Export volume expanded in Kenya, Morocco, and Zimbabwe.

Figure 1 illustrates the export volume changes in Sub-Saharan Africa relative to those in developing countries in Asia and Latin America (6). While Sub-Saharan Africa's export performance is certainly inferior to that of Asia, it is comparable to that of Latin America. From 1969-78, export volume expanded less than 2 percent per year in Sub-Saharan Africa and Latin America and close to 11 percent per year in Asia. While Asia maintained that rate in most years in the 1980's, export volume varied widely in the other two regions. Export volume in Latin America expanded at an average rate of 1.2 percent per year through the 1980's. In Sub-Saharan Africa, export volume increased 2.8 percent per year during the same period.

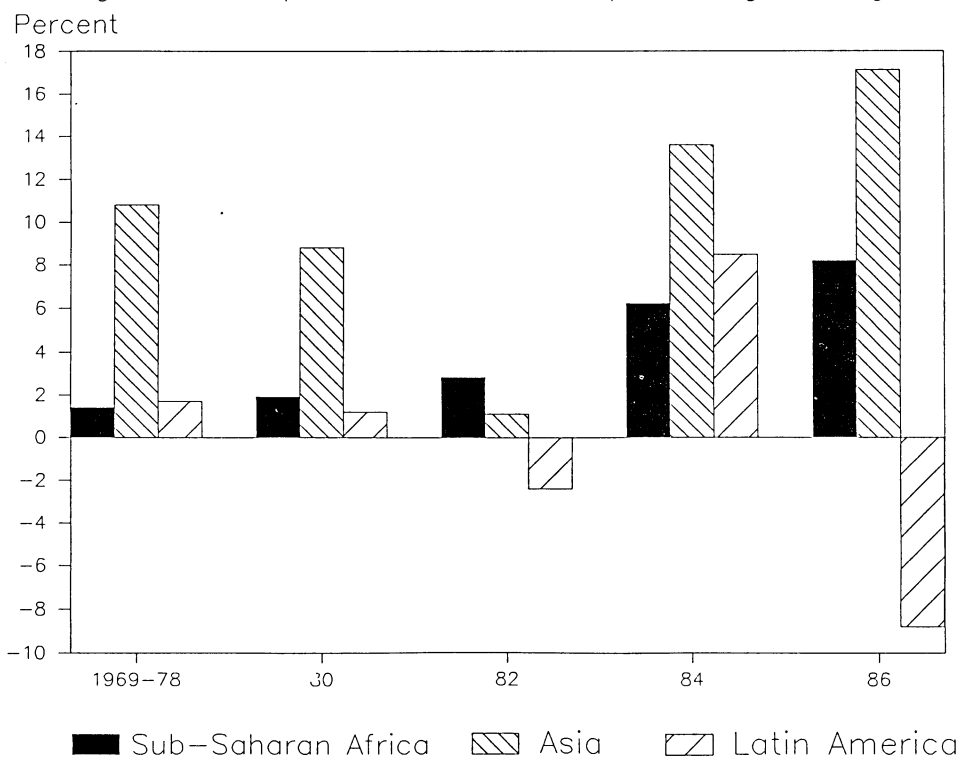
In terms of prices received, data on export unit values were available for seven of the study countries: Cote d'Ivoire, Kenya, Nigeria, Senegal, Tanzania, Togo, and Zambia (table 3). Growth in export unit values, in

Table 2--Index of export volume for selected countries

Year	Ethiopia	Kenya	Morocco	Zimbabwe	Nigeria	Togo	Zambia
1980=100							
1966	106	66	58	64	47	60	136
1967	107	63	57	66	38	53	138
1968	112	67	64	66	31	60	145
1969	120	80	69	75	35	70	165
1970	103	84	69	82	58	94	154
1971	118	64	73	90	81	92	144
1972	140	96	84	108	90	91	161
1973	153	112	102	110	104	83	151
1974	128	107	97	115	115	66	153
1975	114	97	74	107	90	41	144
1976	111	103	85	108	105	53	168
1977	82	107	116	102	108	71	149
1978	90	99	96	107	98	102	137
1979	137	97	99	105	116	74	162
1980	100	100	100	100	100	100	100
1981	102	94	104	95	64	62	92
1982	109	92	103	98	53	53	83
1983	118	88	115	102	50	48	80
1984	116	87	120	100	57	69	77
1985	93	91	121	96	65	57	75
1986	100	105	126	119	65	52	73
Percent change							
1966-80	0.05	3.44	4.16	3.86	8.29	3.89	-0.42
1980-86	-1.13	0.26	4.78	2.37	-5.77	-9.91	-6.48

Source: (6).

Figure 1--Export volume: Annual percentage changes



Source: (6).

Table 3--Index of unit value of exports (in terms of \$U.S.)

Year	Cote d'Ivoire	Kenya	Senegal	Tanzania	Nigeria	Togo	Zambia
1980=100							
1966	NA	25.4	28.6	30.7	5.3	25.7	66.8
1967	NA	25.4	32.7	30.4	5.3	25.3	63.0
1968	NA	25.7	32.5	30.0	5.3	26.2	69.6
1969	NA	26.0	26.6	30.0	5.3	27.8	85.9
1970	NA	28.5	27.8	30.4	5.3	26.9	86.0
1971	25.0	27.4	30.9	31.2	7.2	24.7	62.1
1972	25.8	28.5	33.1	30.0	7.8	26.3	61.1
1973	37.7	33.5	44.5	40.2	11.2	32.9	99.7
1974	44.8	43.4	78.3	64.7	31.7	77.5	121.6
1975	45.5	48.6	74.3	56.0	33.5	88.1	76.7
1976	54.3	57.6	65.1	60.6	36.3	59.3	82.5
1977	83.7	82.7	76.0	84.1	40.9	80.2	80.6
1978	78.9	74.8	89.4	85.3	39.5	89.4	84.4
1979	89.8	82.5	101.5	84.8	58.5	105.5	115.2
1980	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1981	70.2	89.9	106.6	NA	108.4	82.0	NA
1982	61.4	81.9	85.3	NA	99.4	70.7	NA
1983	60.4	80.6	88.5	NA	84.6	69.5	NA
1984	69.1	89.3	100.5	NA	83.3	83.6	NA
1985	74.5	77.3	NA	NA	NA	NA	NA
1986	81.1	NA	NA	NA	NA	NA	NA
Percent change							
1966-80	NA	10.11	9.43	9.06	21.02	11.17	3.39
1980-85	-5.89	-5.15	NA	NA	NA	NA	NA

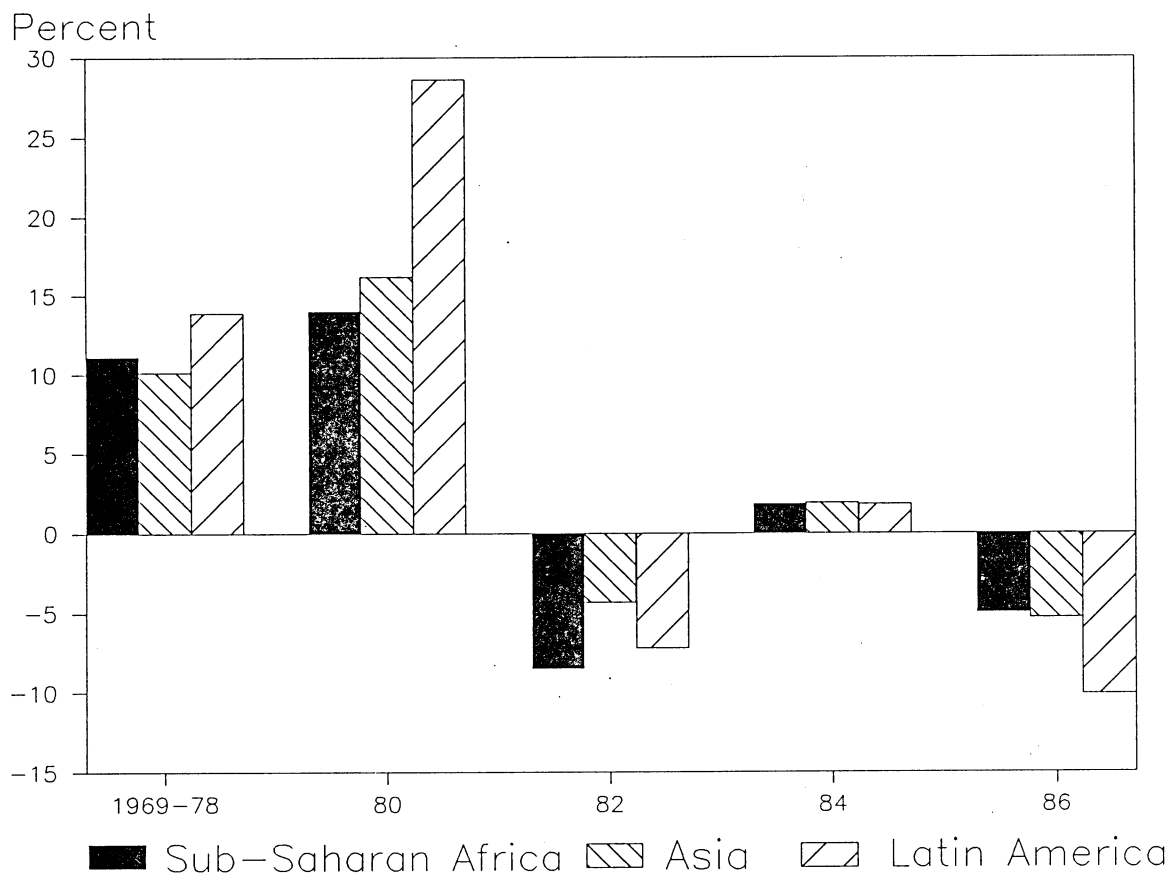
NA = not applicable.

Source: (5).

terms of U.S. dollars, ranged from 3.4 percent per year in Zambia to 21 percent per year in Nigeria (data for Cote d'Ivoire were not available before 1971). The sharp increase in Nigeria is a reflection of the shift from exports of cocoa and oilseed products to petroleum. Since 1980, the unit values of the major exports have declined in most of the countries for which data exist. For example, in Cote d'Ivoire and Kenya, export unit values declined more than 5 percent per year.

Figure 2 illustrates the movements in export unit values of Sub-Saharan Africa relative to those of developing countries in Asia and Latin America (6). During the 1970's, growth in the export unit values of Sub-Saharan Africa was very close to that of Asia and Latin America. Since 1980, however, there has been a marked change. Between 1981 and 1984, export unit values declined an average 6.6 percent per year in Sub-Saharan Africa, compared with declines of 2.9 and 4.2 percent per year in Asia and Latin America. Since 1984, changes in export unit values have been similar among the three regions. The decline in unit value, along with slower volume growth, clearly illustrates the problem faced by Sub-Saharan African countries.

Figure 2--Export unit value: Annual percentage changes



Note: Expressed in terms of \$U.S.

Source: (6).

### Export Instability and Shortfall

Along with slow export growth, the instability of export earnings has played a crucial role in economic growth. Export instability not only has a destabilizing effect on import capacity, but also may have a negative impact on export growth (4). Concentration of LDC exports in a few primary products is considered the main cause of earnings variation (8, 9). Supply and demand of these countries generally have no significant influence on world market prices. Therefore, their export earnings are influenced by fluctuations in world commodity prices and by changes in domestic output of export commodities. Production of agricultural commodities tends to be subject to large shortrun variation because of uncontrollable factors such as weather. On the demand side, shifts in foreign demand are the primary source of earnings variation.

Export commodity diversification should improve export performance because a decline in the price or the volume of one commodity is expected to have less disruptive impact on the country's overall receipts.

To indicate export instability, we calculated coefficients of variation of export earnings. These are defined as the difference in the actual observations from trend in export earnings divided by the mean of export earnings. By measuring instability around the trend, growth during the entire period can be separated from annual variations in the growth path, which is defined as instability (9).

The coefficients of variation of export earnings averaged almost 26 percent over all study countries and ranged from less than 14 percent in Ethiopia to almost 53 percent in Nigeria (table 4). The lower variation in Ethiopia relative to Nigeria could be due to the fact that the weather impact on coffee exports in Ethiopia was less than the impact of changing demand on Nigeria's oil exports. The high coefficients of variation can be explained by the fact that countries' earnings are concentrated in only a few commodities whose supply tends to be inflexible in adapting to changes in demand. Also, with high export concentration, the instability in one commodity could destabilize total earnings. On the other hand, with export diversification, instability in one or two commodities would not necessarily have as large an impact (10).

The coefficients of variation become even larger, averaging 35 percent, when export earnings are studied in real terms. In the case of Tanzania, export earnings vary the least, 21 percent. Coefficients of variation in Nigeria remain the highest at more than 70 percent.

To determine the changes in export variability over time, we calculate coefficients of variation for two time periods, 1966-80 and 1980-86. In Tanzania, low export variation during the entire period was primarily a result of the stable earnings in the 1966-80 period (14-percent variation in 1966-80 versus 45-percent variation in 1980-86). Conversely, in Nigeria, earnings were more variable in the earlier period, thus contributing to the high variation.

Table 4--Coefficients of variation of export earnings

Country	1966-80		Real		Country	1966-80		Real	
	Nominal	Real	1966-80	1980-86		Nominal	Real	1966-80	1980-86
					Percent				
Algeria	32	39	20	8	Senegal	27	31	26	15
Cameroon	30	34	16	15	Sudan	23	29	20	22
Cote d'Ivoire	28	31	15	19	Tanzania	23	21	14	45
Egypt	25	31	14	6	Togo	40	37	29	24
Ethiopia	14	26	21	12	Zaire	21	37	28	35
Kenya	23	31	14	20	Zambia	25	31	28	22
Madagascar	22	40	10	31	Zimbabwe	18	37	20	13
Mali	23	33	31	30					
Morocco	20	39	13	12	Average	26	35	21	22
Nigeria	53	71	38	40					

The coefficient of variation referred to above indicates that export earnings on average can vary 26 percent (average nominal coefficient of variation) around the export earnings' trend (for the agricultural exporting countries). It is the years in which earnings fall below trend that cause most of the concern. Export earnings are used largely as a source of financing imports. When exports fall from trend (assuming no build-up of reserves due to these countries' severe financial constraints), imports are certain to be cut, thus further hindering economic growth. An index of shortfalls was calculated by summing the shortfalls in each year they occurred (when actual export earnings fell below trend) and taking that total as a proportion of total export earnings. Arithmetically, the index is:

$$I = S / \sum_{t=1}^{t=n} y_t$$

where S is the sum of shortfalls defined as:

$$S = (\sum | -u_t | > 0)$$

where  $u_t$  is the deviation from trend and  $| -u_t | > 0$  is the shortfall in export earnings.

The index of shortfalls (using nominal export earnings) averaged almost 10 percent (table 5). The countries with the smallest shortfalls were Ethiopia, Mali, Morocco, and Zaire, all near 7 percent. As expected, Nigeria, where export earnings had the largest variation, had the largest shortfall. Like the coefficients of variation, the index of shortfalls increases when real export earnings are studied. The index of shortfall increased to almost 14 percent. Tanzania now has the smallest shortfall, while Nigeria continues to have the largest.

#### Export Performance and Economic Growth

The economic growth of a country depends on the performance of its different sectors. The performance of the export sector, depending on its size, will have direct impact through growth of the sector itself,

Table 5--Index of shortfalls of export earnings, 1966-86

Country	Nominal index	Real index	Country	Nominal index	Real index
Percent			Percent		
Algeria	13.13	14.40	Nigeria	19.72	28.82
Cameroon	8.07	11.71	Senegal	9.22	11.78
Cote d'Ivoire	9.15	13.35	Sudan	11.17	11.13
Egypt	10.07	10.56	Tanzania	10.25	8.76
Ethiopia	6.65	10.01	Togo	13.02	13.20
Kenya	8.55	13.01	Zaire	7.43	14.49
Madagascar	9.82	17.00	Zambia	10.37	11.40
Mali	6.77	13.70	Zimbabwe	7.23	15.59
Morocco	7.52	15.31	Average	9.89	13.78

but also individually by increasing overall productivity in the economy. Exports' main linkage to overall economic performance is to provide financial support to import essential commodities that are not produced domestically and are critical for the performance of import dependent sectors. If a country is able to build a strong, diversified export sector to finance imports, as in the case of some Asian countries, long-term economic growth is possible. Poor performance of the export sector, on the other hand, means less foreign exchange availability, reduced imports, reduced imported inputs, and finally a decline in the performance of the economy unless foreign credit is used to prevent import decline. In Africa, the sharp increase in import payments during the late 1960's and early 1970's was partly stimulated by the growth in exports and partly by external financing. In the 1980's, as financial difficulties grew, the high import growth halted. The combination of slow export growth and, in effect, import growth led to poor economic performance.

According to table 6, the average GDP growth for all countries studied declined in 1986 and was less than half of the 1965-80 average. The positive income growth during 1965-80 turned negative in four countries and amounted to less than 1 percent in five others. Per capita income declined in 11 of the 17 countries, assuming a 3-percent average population growth during 1980-86.

Table 6--Growth in imports, income, and export share

Country	Import growth		GDP growth		Export share of GDP	
	1966-80	1980-86	1966-80	1980-86	1965	1986
	-----Percent per year-----				--Percent--	
Algeria	24.0	-4.1	7.5	4.4	22	16
Cameroon	16.6	-10.1	5.1	8.2	25	23
Cote d'Ivoire	17.7	-10.8	6.8	-.3	37	40
Egypt	16.5	.4	6.7	4.7	18	18
Ethiopia	11.3	13.0	2.8	.8	12	13
Kenya	15.6	-10.6	6.4	3.4	31	27
Madagascar	11.5	-16.9	1.6	-.1	16	14
Mali	16.9	.9	4.1	.4	36	33
Morocco	17.0	-2.1	5.4	3.3	18	25
Nigeria	26.0	-24.6	8.0	-3.2	18	14
Senegal	13.1	-2.9	2.1	3.2	24	28
Sudan	10.9	-20.6	3.8	.3	15	9
Tanzania	12.8	-5.0	3.7	.9	26	10
Togo	19.2	-10.9	4.5	-1.1	20	33
Zaire	11.6	-4.4	1.4	1.0	36	33
Zambia	5.3	-17.4	1.8	.1	49	46
Zimbabwe	9.6	-10.0	4.4	2.6	24	26
Average	15.0	-8.1	4.5	1.6	25	24

In the study countries, the contribution of exports to GDP was in the range of 9 to 46 percent in 1986 and averaged about 25 percent. In 1986, the share of exports in GDP was more than 20 percent in 10 countries. The larger the share of exports in GDP, the more significant is its impact on the economy. When the export shortfall is included, for instance the average shortfall of 14 percent, the decline in GDP could be about 3.5 percent (25-percent average export share in GDP), assuming no change in the performance of other sectors. In a country such as Nigeria, with a less than average share of exports in GDP (14 percent in 1986), the large export shortfall (28.8 percent) could have similar effects on the economy. Export instability, in particular export shortfall, impedes economic planning and economic management, which are both crucial for economic growth.

To measure the impact of exports on the economic performance of the countries, we regress income growth against their export growth and export instability, as follows:

$$IG = f ( EXPG, EXPI )$$

where IG is GDP growth as reported by the World Bank (in real terms, in U.S. dollars), converted from domestic currencies by using a single year exchange rate, EXPG is real growth in exports, and EXPI is index of export instability. The indices of export shortfalls and coefficients of variation for the periods of 1966-80 and 1980-86 are used in separate equations to evaluate their destabilizing effects on economic growth. The estimated linear equations are based on cross-country data. The income-export equations are estimated using the average growth year of 1965-80 and 1980-86 (table 7).

As the results indicate, export growth showed a positive and statistically significant impact in all equations. The degree to which export growth is transmitted to economic growth generally depends on the strength of the linkage of the export sector to the rest of the economy.

Table 7--Income growth, export growth, and export instability

Income growth equation	Constant	Export growth	Coefficient variations	Shortfall index	R2
1966-80 elasticity	6.06	0.41** .31 (2.73)	-0.41* -.63 (-1.90)		0.35
1966-80 elasticity	4.42	.24** .28 (2.58)		-0.40* -.59 (-1.74)	.33
1980-86 elasticity	3.61	.17* .08 (1.75)	-.09* -1.12 (-1.79)		.51
1980-86 elasticity	4.11	.15** .07 (2.23)		-.34* -1.49 (-1.70)	.56

The "t" statistics are in parentheses.

\* Significant at 5 percent.

\*\*Significant at 1 percent.



Exports of primary commodities, which comprise the bulk of exports in the study countries, have linkages that vary over time with the rest of the economy which is shown by the size of the export-income elasticities, a range of 0.07 to 0.31. As the results show, the positive impact of growth in exports on economic growth of the countries seems to have declined through time, with elasticities in the range of 0.2 to 0.3 for the 1966-80 equations versus 0.07 to 0.08 for the 1980-86 equations. One possible explanation is that the growing allocation of export earnings to debt service payments during the latter period has reduced import capacity and consequently weakened the positive export-economic growth relationship.

Export instability, represented by coefficients of variation and an index of shortfalls, showed a negative and statistically significant impact on economic performance of the countries. These results confirm the earlier findings by Glezakos measuring the economic growth impact of export instability (coefficient of variations) for all LDC's (4). The negative impact of coefficients of variation on economic growth of the countries was larger in 1980-86 than in 1965-80, with elasticities of -1.12 and -0.63. The impact of export instability, especially the shortfall index, proved to be more detrimental to economic growth during 1980-86 than in the earlier period (1966-80), with elasticities of -1.49 versus -0.59. The explanation could be the availability of foreign credit in the earlier period which cushioned the impact of export variations. This means that as foreign financial support declines, instability induced by the export-import linkage is strengthened. The strong impact of export instability on economic growth provides more evidence in support of the argument that export instability affects the capacity to import investment goods which are crucial for the economic growth.

In conclusion, the empirical evidence presented here supports the earlier hypothesis that poor export performance, especially frequent shortfalls in export growth, has a devastating impact on a country's economic performance. This implies that in order to achieve steady economic growth, the behavior of factors affecting stabilization and growth of the export sector must be clearly understood to evaluate policy options.

### Export Structure and Performance

The structure of exports is expected to influence growth and stability of export earnings. This paper focuses on the main structural characteristics of exports which are believed to be the cause of the African countries' poor export performances. These characteristics are: composition of exports, commodity concentration, and geographic concentration.

#### Composition of Exports

The main export commodities of the study countries are agricultural and other primary products such as metals, fuel, and minerals (table 8). Therefore, the countries have been categorized into agricultural and nonagricultural exporting countries. In 10 of the 17 countries, exports of agricultural commodities had the largest share. These include Cote d'Ivoire, Ethiopia, Kenya, Madagascar, Mali, Morocco, Senegal, Sudan, Tanzania, and Zimbabwe. Among this group, the share of agricultural

Table 8--Major export commodities and their share of country's total exports,  
1984-86 average

Country	Export	Share	Export	Share	Export	Share
		Percent		Percent		Percent
<b>Agricultural</b>						
exporters:						
Cote d'Ivoire 1/	Cocoa	34.9	Coffee	20.5	Oil	9.2
Ethiopia	Coffee	68.4	Hides & skins	12.5		
Kenya	Coffee	32.1	Tea	21.6		
Madagascar 1/	Coffee	38.0	Vanilla	15.8		
Mali	Cotton	40.6				
Morocco 2/	Phosphates	21.2	Agri. prod.	26.0		
Senegal 3/	Groundnut oil	74.4				
Sudan	Cotton	45.9	Sesame	10.1		
Tanzania	Coffee	44.4	Cotton	9.8		
Zimbabwe	Tobacco	20.6				
<b>Nonagricultural</b>						
exporters:						
Algeria 3/	Oil	71.8				
Cameroon	Oil	55.0	Coffee	27.3	Cocoa	19.6
Egypt	Oil	59.0	Cotton	13.8		
Nigeria 1/	Oil	97.2				
Togo 1/	Phosphates	52.2	Cocoa	16.6		
Zaire	Copper	37.0	Coffee	14.0		
Zambia	Copper	87.0				

1/ Share is calculated for 1984-85.

2/ Agricultural products include citrus fruits, vegetables, beverages, and tobacco.

3/ Share is calculated for 1984.

Source: (5).

products in total exports declined from an average of 83 percent in 1965 to 67 percent in 1986. The nonagricultural exporting countries include Algeria, Cameroon, Egypt, Nigeria, Togo, Zambia, and Zaire.

Both groups of countries showed a positive and higher rate of real export growth during 1965-80 than in 1980-86. From 1965-80, 7 of the 10 agricultural exporting countries and all 7 nonagricultural exporters showed positive export growth, ranging from 0.3 percent in Kenya to 11.4 percent in Nigeria. From 1980-86, however, five agricultural exporting countries and four nonagricultural exporting countries showed negative export growth. The slowing of the growth in exports from 1980-86 was much sharper among nonagricultural exporters than agricultural exporters (from an average of 4.5 percent annual growth to 0.4 percent versus 2.2 to 1.0 percent). Ethiopia and Tanzania showed negative export growth during the entire period.

Earnings variations in the agricultural exporting countries which stem from fluctuations in prices of beverages and agricultural raw materials averaged 32 percent (coefficient of variation); prices of these commodities have been relatively volatile since 1980. Movements in oil

prices dictate patterns of export earnings in the nonagricultural exporting countries. The wide fluctuations in prices in the mid- to late 1970's resulted in high earnings variations, 40 percent.

The data in table 1 do not show consistencies in countries' export performances within and among the two groups of countries. For example, a similar experience, such as an increasing share of oil exports in Cameroon and Nigeria, led to different export performances. In Nigeria, a sharp increase in exports in 1965-80 (11.4 percent) was followed by a marked decline in 1980-86 (-6.0 percent), while the moderate export growth in Cameroon in the earlier period (5.2 percent) was followed by a much higher growth rate in the latter period (13.8 percent). This indicates that many other factors, both internal and external, influence export trends. Structural factors, such as commodity diversification, could have affected the export performance of these countries. If exports are concentrated in one commodity facing slow demand growth, export growth will be constrained. However, if more commodities contribute to total earnings, growth is less vulnerable to the performance of just one commodity.

Similar reasoning could explain the possible relationships between export performance and export destination. For example, if exports are directed to a small number of countries, they become more vulnerable to the economic and policy changes of those countries. On the other hand, if export destinations are diversified, changes in import demand in one set of countries could be offset by contrasting changes in others, thereby alleviating potential harm to the export sector.

#### Commodity Diversification

Commodity diversification tends to reduce fluctuations in export earnings (10). The more diversified the exports are, the smaller will be the tendency for changes in total export receipts due to export demand and supply variations.

To measure commodity concentration, we calculated the Hirschman-Gini coefficient:

$$C = (\sum X_i^2)^{1/2}$$

where C is the concentration coefficient and X is the proportion of merchandise exports by value of the three groups of agriculture, other primary commodities, and manufacturing. The higher the value of C, the greater the concentration (the lower the diversification).

Within the two groups of primary agricultural exporters and nonagricultural exporters, countries are classified into a low and high concentration index (C index). The countries with a less than 70-percent C index in 1986 are in the low index, while those with a more than 70-percent C index are in the high index. As table 9 indicates, on average, the C ratio declined in all agricultural exporting countries from 1965 to 1986. Manufacturing and textile exports grew the most, with some gain in the export share of fuel, minerals, and metals. In Morocco, Senegal, and Mali, the share of manufacturing and textiles increased significantly, from an average of less than 10 percent of total exports in 1965 to about one-third of exports in 1986.

Table 9--Commodity concentration

Country	1965	1986	Country	1965	1986
	C index			C index	
Agricultural exporters:			Nonagricultural exporters:		
Low C--			Low C--		
Morocco	0.68	0.60	Cameroon	0.79	0.67
Senegal	.89	.58	Togo	.70	.65
Zimbabwe	.60	.59	Zaire	.75	.67
Average	.72	.59	Average	.75	.66
High C--			High C--		
Cote d'Ivoire	.93	.86	Algeria	.69	.97
Ethiopia	.98	.97	Egypt	.75	.76
Kenya	.82	.73	Nigeria	.73	.94
Madagascar	.90	.82	Zambia	.97	.96
Mali	.96	.76	Average	.79	.91
Sudan	.98	.88			
Tanzania	.84	.81			
Average	.92	.83			

Among nonagricultural exporters, export diversification increased in Cameroon, Togo, and Zaire. In Egypt and Zambia, the C index did not change much. While Egypt's export composition has changed significantly through time, it continued to be dominated by a single export; in 1965, agriculture accounted for 72 percent of exports, while in 1986 oil accounted for 74 percent. Similarly, in the oil-exporting countries of Algeria and Nigeria, the share of agricultural exports declined to about 1 percent of total exports in 1986 and manufacturing also remained small, 2-3 percent.

#### Export Destination

For most countries, shifts in demand for their exports cause large fluctuations in export revenues. In addition, a high concentration of exports on a single major market or country (such as the United States), exposes the exporter to the economic and political whims in that country. Changes in demand of the country of destination will then have a more significant impact on export earnings than if the export destinations were more diversified. An even greater impact on the exporting country is possible when recipient markets are imperfect substitutes for one another because of commodity preference, trade agreements, or other restrictions to free trade.

The export market of the study countries is likely to be affected by the behavior and policies of developed countries (United States, EC-12, Canada, Australia, and Japan). In 1986, these countries' share of the study countries' exports was more than 80 percent (table 10). The U.S. share of the exports of agricultural exporting countries was about 10

Table 10--Export destinations

Country	Africa		Other industrial 1/		United States		Other developing	
	1966	1986	1966	1986	1966	1986	1966	1986
Percent								
Agricultural exporters:								
Cote d'Ivoire	9.95	2.00	71.78	75.01	16.96	15.56	1.30	7.42
Ethiopia	3.57	.98	41.67	74.62	45.68	18.81	9.09	5.58
Kenya	4.74	2.08	64.30	64.90	11.74	13.86	19.22	19.16
Madagascar	11.71	3.33	62.70	70.43	22.21	17.75	3.38	8.49
Mali	69.98	18.55	17.26	65.32	0	7.71	12.77	8.43
Morocco	3.80	1.04	84.93	84.31	1.99	1.91	9.28	12.74
Senegal	9.48	3.96	82.10	90.63	6.20	1.94	2.22	3.47
Sudan	5.89	24.19	70.37	42.17	3.77	5.64	19.96	28.00
Tanzania	1.25	1.03	69.72	76.45	10.20	3.06	18.82	19.47
Zimbabwe	43.54	3.57	44.58	76.36	4.94	9.59	6.93	10.47
Average	16.39	6.07	60.94	72.02	12.37	9.58	10.30	12.32
Nonagricultural exporters:								
Algeria	3.08	.86	92.26	72.06	.35	21.12	4.31	5.96
Cameroon	1.57	1.06	80.28	74.33	16.61	18.27	1.54	6.34
Egypt	5.80	0.57	51.93	81.48	5.92	4.22	36.35	13.74
Nigeria	1.13	.10	84.12	58.02	6.41	32.25	8.34	9.62
Togo	2.31	2.20	91.91	67.12	2.54	10.89	3.24	19.79
Zaire	1.03	.58	89.61	81.25	7.97	14.58	1.39	3.59
Zambia	1.62	.39	88.90	74.88	.43	10.16	9.05	14.58
Average	2.36	.82	82.72	72.73	5.75	15.93	9.17	10.52

1/ EC, Canada, Australia, and Japan.

Source: United Nations data base.

percent in 1986, a small decline from 1966. The share of exports of the agricultural exporting countries to the other industrial countries increased over time, from an average of 61 percent in 1966 to 72 percent in 1986. Mali and Zimbabwe accounted for most of this change.

Regional exports, as well as exports to the other developing countries, were limited. The average export share of the agricultural exporting countries to the region declined by 10 percentage points in the two decades, while the export share gained in other developing countries was only 2 percentage points, thus indicating more market concentration in the industrial countries. Only in Sudan was there a shift of exports to developing countries because of a gain in the livestock market in the Middle East and North Africa after the oil boom of the 1970's. In contrast, Zimbabwe's export destinations have changed since independence in 1980, from Africa (Republic of South Africa) to the industrial countries (72-percent gain during 1966-86).

The United States is a major market for the nonagricultural exporting countries, with a 16-percent share in 1986, a gain of about 10 percentage points since 1966. This change was due primarily to the growing U.S. oil imports from Nigeria and Algeria during the 1970's. At the same time, this group's exports to other industrial countries declined an average of 10 percentage points during 1966-86, with the exception of Egypt. Exports of nonagricultural exporting countries to developing countries were limited, with a small change in the average market share during 1966-86.

To measure the extent of the changes in recipient market concentration, we calculated an index--similar to the index of commodity diversification--for 1966 and 1986 (table 11). A decline in the index indicates recipient market diversification. For the agricultural commodity exporters, the index changed from 0.53 to 0.58, indicating an increase in the average market concentration of 10 percent from 1966 to 1986. Among these countries, Sudan experienced the greatest decline in market concentration (or increase in diversification) of 40 percent. Ethiopia and Zimbabwe increased their market concentration 50 percent. Among nonagricultural exporters, with the exception of Egypt, there was a move to a more diversified export market, as the index fell from 0.73 in 1966 to 0.58 in 1986 (a decline of 20 percent). Egypt's export market shifted from developing countries to other industrial countries, as the market concentration index increased 66 percent.

#### Impact of Export Structure on Performance

The structural characteristics of the export market include variables expected to influence export performance and could be altered by economic planning. On the basis of the preceding discussion, to measure the impact of export structure on export performance, we assume export growth and the export instability index to be a function of the share of agricultural exports of total exports, the index of commodity diversification, and the index of export market diversification.

Table 11--Index of export market concentration

Country	1966	1986	Country	1966	1986
Index			Index		
Agricultural exporters:			Nonagricultural exporters:		
Cote d'Ivoire	0.55	0.59	Algeria	0.85	0.57
Ethiopia	.39	.60	Cameroon	.67	.59
Kenya	.47	.48	Egypt	.41	.68
Madagascar	.46	.54	Nigeria	.72	.45
Mali	.54	.47	Togo	.85	.50
Morocco	.73	.73	Zaire	.81	.68
Senegal	.69	.82	Zambia	.80	.59
Sudan	.54	.32	Average	.73	.58
Tanzania	.53	.62			
Zimbabwe	.40	.60			
Average	.53	.58			

Through time, countries have changed the composition of their export mix. Some increased their commodity and geographic concentration, while others moved toward diversification in their exports. To measure the impact of these changes, we regress export growth and index of export instability against calculated market structural indices. The estimated regression equation is:

$$X = f( AS, CC, GC )$$

where X represents export performance: export growth, export shortfall, and export variation (export growth covers 1965-80 and 1980-86, the index of shortfall and coefficient of variations are calculated based on the entire 1965-86 period); AS is the average share of agricultural exports in total exports calculated for 1966-80 and 1980-86; CC is the change in the commodity concentration index from 1965 to 1986; and GC is the change in the geographic concentration index from 1965 to 1986. The cross-country estimated regressions have a linear functional form. The growth equation is estimated for 1965-80 and 1980-86.

As the results in table 12 show, the increase in the share of agricultural exports had a negative impact on the growth of export earnings in 1965-80 and 1980-86, but the impact was only statistically significant in the latter period. In the 1965-80 equation, commodity and geographic concentration had a negative and statistically significant impact on export growth. In 1980-86, the geographic concentration impact was not significant, while the growing commodity concentration did have a negative and statistically significant impact on export growth.

Export shortfall and variation did not diminish as the share of agricultural exports grew because neither variable was significant. This means that an increasing share of agricultural exports is not the cause of increasing export variation. Export earnings of other primary goods

Table 12--Estimates of export performance and structural relationships

Equation	Constant	Agricultural share	Commodity concentration	Geographic concentration	R2
Export growth 1965-80	1.56	-0.01 (-.85)	-0.14* (-1.96)	-0.09* (-1.82)	0.30
Export growth 1980-86	-3.32	-.05** (-2.01)	-.34** (-2.68)	.03 (.38)	.39
Export shortfall 1965-86	14.45	-.00 (-.20)	.18* (1.97)	-.03 (-.52)	.35
Export variation 1965-86	9.39	-.01 (-.88)	.34* (1.76)	-.10 (-.74)	.41

The "t" statistics are in parentheses.

\* Significant at 5 percent.

\*\*Significant at 1 percent.

are usually expected to have less variation because of volume stability. However, oil exporting countries (such as Nigeria) showed the highest export variation among the study countries because of the frequent change in their oil export volume quota and large price variations since 1973. In the mineral exporting countries (such as Zambia), variations in the level of imported inputs (due to variations in import capacity) were reported as the cause of export volume instability (1).

The increase in commodity concentration had a positive and significant impact in increasing export instability (significant at the 5-percent level in both the shortfall and export variation equations). Conversely, the growing geographic concentration did not have any significant impact on export instability.

Overall, the change in commodity concentration was the only variable that was significant in all equations. This means that countries which adopted export diversification policies since 1965 showed a significantly higher export growth and less export variation than countries which did not change their policies. A World Bank study (13) argues that the rigidity of economic structure of the African countries in terms of diversifying exports was one of the main reasons for poor export performance of the region in the 1970's.

The effect of increases in geographic concentration on export growth was negative and significant only during 1965-80. The market ties of the study countries followed the colonial relationships of the early 1960's. Some countries had taken advantage of the demand growth in developing countries in the 1970's and diversified their export markets. Sudan, for example, shifted its exports to the Middle East because of the dramatic import demand growth.

During the 1980's, the higher growth of traditional markets and the slow economic growth of developing countries eroded the effect of export market diversification on export growth. The geographic concentration showed a negative but insignificant effect on export stability, which means that market diversification does not reduce export variability. This could be because the traditional markets of developing countries have more stable demand relative to new markets of developing countries. The increase in the agricultural composition of exports proved to have no significant effect on export instability; it did, however, have a negative and significant effect on export growth in the recent period.

The problem of poor performance of the export sector is partly structural because, by nature, the market for primary commodities tends to grow more slowly than that of manufactured commodities. The major concern here is the loss of market share in the exports of primary commodities in the 1970's and 1980's among many study countries. Prospects for the slow movement toward diversification (13), coupled with the average market concentration index decline of only 4 percent in two decades (1965-86), lead to expectations of only marginal changes in the composition of exports, at least in the medium term. This means that a major shift from traditional commodity exports is unlikely to occur in the near future. Therefore, the performance of primary commodities will remain the key to the African export and economic recovery.



## Commodity Performance

Large capital and human investments in the production of traditional export commodities over long periods make changing the export structure very costly. Some argue that African countries have a comparative advantage in producing these primary commodities and if international policy distortions are reduced, demand growth could revive export prices. On the supply side, historical disincentive policies are blamed for the poor performance of the export sector. Therefore, policy adjustments, particularly exchange rate adjustments, are recommended to increase export incentives. In the following section, the performance of key commodities is examined and the export supply response to price and policy changes is analyzed.

### Commodity Supply Trend

For some commodities, such as oil, coffee, and cocoa, the producing and consuming (in the case of coffee and cocoa) countries limit exports in order to prevent price declines. In three of the study countries, oil contributes more than 50 percent of total export earnings. Two, Algeria and Nigeria, are members of the Organization of Petroleum Exporting Countries (OPEC). To protect prices, this organization sets export volume quotas for member countries based on world demand and price estimates. Nonmembers are encouraged to control their oil exports to prevent price declines. Oil exports are important for other study countries (Cote d'Ivoire, Cameroon, Kenya, Senegal, and Togo), but generally comprise less than 20 percent of total export earnings.

Coffee is one of Africa's primary exports and is faced with an internationally regulated market. Coffee contributes a significant portion of total export earnings in seven of the study countries. Major producing and consuming countries agree to limit trade in order to stabilize prices under the International Coffee Agreement (ICA). Each producing country has an export quota to the participating import markets. Surpluses can be sold only to nonparticipating countries. Nonquota markets include most OPEC countries, Eastern Europe, China, and noncoffee producing developing countries. Because nonquota markets are very competitive, the price received for exports is far below that received in quota markets (this is also due in part to the fact that lower quality coffee is sold to the nonquota countries). The simultaneous operation of the two markets has forced the regulated market to adjust quotas frequently in order to stabilize prices. The formula used to determine the quotas takes into account recent export levels, stocks, and the concerns of both consuming and producing countries (1, 2).

Cocoa, another internationally regulated commodity, is a significant export earner for Cameroon, Cote d'Ivoire, and Nigeria (in terms of agricultural exports). The level of enforcement of the cocoa agreement is far less stringent than that of coffee.

Export growth for commodities other than oil is shown in table 13. Reviewing export volume growth by country shows positive export commodity growth for Cote d'Ivoire, Kenya, Mali, Tanzania, Cameroon (coffee), and Zaire (copper) during the entire periods of 1966-80 and 1980-85. Performance was mixed in the other countries. In some, the 1966-80 positive rate of growth was followed by decline during 1980's. In

Table 13--Volume of commodity exports

Year	Cote d'Ivoire		Ethiopia		Kenya		Mali	Madagascar	Morocco	Senegal	Sudan	Tanzania	Zimbabwe	Cameroon	Egypt	Nigeria	Togo	Zaire	Zambia		
	Coffee	Cocoa	Coffee	Hides	Coffee	Tea	cotton	coffee	phosphates	oil	cotton	coffee	tobacco	Cocoa	Coffee	cotton	cocoa	phosphates	Coffee	Copper	copper
1980=100																					
1966	88	44	98	125	68	32	8	66	56	572	176	100	NA	80	74	212	85	34	50	78	107
1967	74	37	98	79	63	27	8	70	57	442	231	88	35	66	69	181	110	36	48	70	108
1968	104	43	106	97	47	38	13	77	62	569	248	96	25	62	80	161	92	45	57	81	115
1969	86	42	116	119	64	46	6	71	62	274	227	96	30	70	75	154	77	47	59	92	131
1970	95	50	111	99	67	49	23	75	70	257	308	87	40	68	68	174	87	53	74	90	123
1971	90	52	106	106	70	46	23	75	72	136	423	69	50	76	69	203	125	64	100	103	114
1972	91	56	108	141	79	64	36	81	82	319	357	107	60	77	72	180	102	64	105	112	128
1973	103	50	100	132	94	69	34	94	97	105	289	117	70	80	90	174	96	78	94	115	120
1974	128	72	73	105	90	67	32	94	113	145	88	80	80	84	110	142	84	92	107	109	121
1975	123	60	76	81	84	71	34	97	78	268	181	106	61	69	102	113	90	40	82	138	115
1976	156	69	89	100	97	80	57	105	89	485	233	113	82	65	108	101	103	85	156	126	134
1977	113	56	93	108	118	95	95	72	96	387	213	85	68	73	79	88	74	96	89	97	120
1978	111	86	87	101	107	115	75	79	105	92	136	99	82	84	84	81	88	99	113	105	106
1979	126	60	114	144	98	127	97	91	108	189	152	88	65	80	108	89	50	106	87	73	117
1980	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
1981	112	155	112	115	110	102	133	82	95	133	44	119	139	98	101	108	51	77	94	112	99
1982	110	115	110	98	126	108	138	78	86	205	77	107	93	75	84	122	66	71	94	118	111
1983	108	101	123	58	113	135	165	72	85	245	171	99	83	57	86	127	110	69	88	100	103
1984	91	158	114	81	121	123	217	74	90	126	138	102	89	92	112	106	66	95	106	97	94
1985	117	148	89	109	131	170	200	60	89	109	76	112	91	89	110	88	66	84	92	146	86
Percent change																					
1966-80	1.97	5.71	-0.03	1.14	4.49	10.50	18.47	1.98	4.85	-11.87	-4.36	0.09	8.41	1.99	2.25	-5.99	-1.56	8.13	5.50	5.50	-0.19
1980-85	1.04	4.15	-3.27	-1.31	7.98	12.04	13.48	-9.00	-3.14	-.68	-2.18	6.23	-6.81	-6.77	-.63	-4.03	-3.47	-2.21	-1.32	8.90	-4.22

NA = not available.

Source: (6).

others, the opposite occurred. Exports declined during the whole period in Ethiopia (coffee), Senegal, Egypt, Nigeria, and Zambia. The performance of these countries during the 1980's requires more attention because major policy changes toward improving export incentives were initiated during this period. According to the data, 12 countries showed a declining level of commodity exports in 1980-85, while in 1966-80 only 6 countries experienced export declines. In six countries, the 1966-80 positive rate of growth changed to negative in the 1980's.

### Commodity Price Trend

The oil price shock in 1973 was followed by an increase in commodity prices and a recession in the industrial world, which, in turn, lowered demand for primary commodities. However, following the second oil price increase in 1979, nonoil commodity prices did not recover. The overall index of nominal prices declined by almost 25 percent between 1980 and 1985. World prices for agricultural commodities were among the hardest hit of the different categories of primary goods. Between 1970 and 1980, coffee and cocoa prices grew at an annual average rate of more than 10 percent. Since 1980, they have declined approximately 3 percent per year. Copper prices peaked in 1980 and have fallen almost 7 percent per year since then. These price changes are even more drastic in real terms (fig. 3). The cocoa price in 1986 was only 30 percent of the level achieved in the late 1960's. The coffee price declined by about half during the same period. The drop in the copper price was the most severe, with the 1986 price only 15.5 percent of the 1969-70 level. In some cases, these lower prices were offset by an increase in the share of the world market (cotton, tea, and groundnut oil) (table 14) (3, 12).

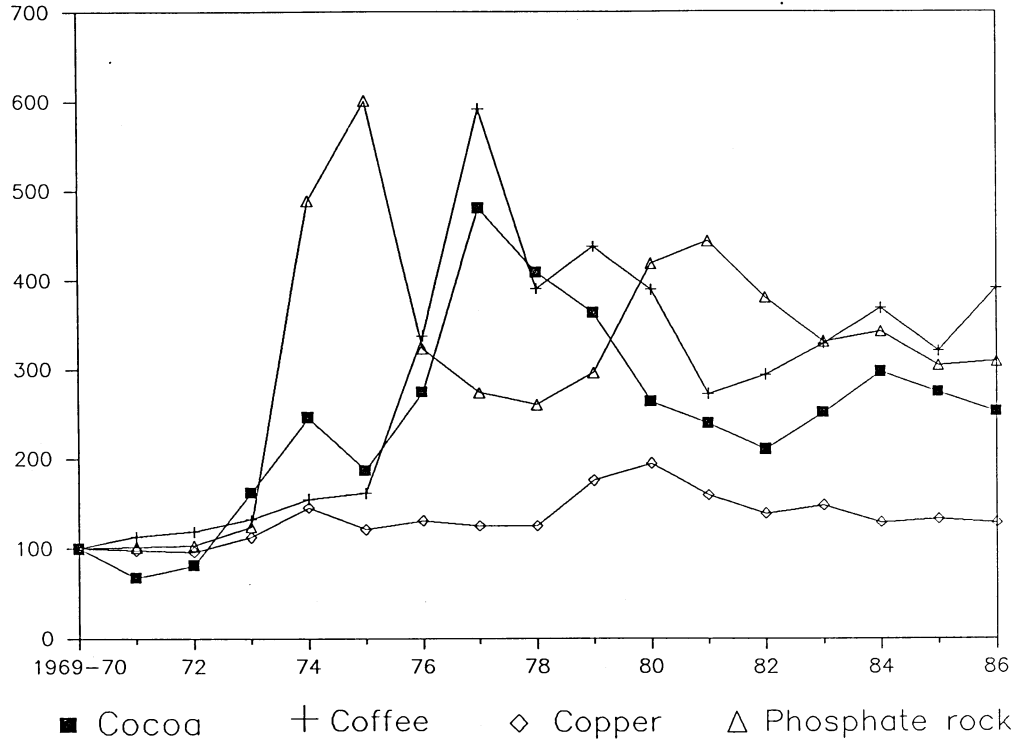
The longer term price prospects warrant closer examination because they are likely to have a lasting effect on the economic growth of these countries. A continuation of these price patterns will adversely affect these countries' abilities to support a significant increase in essential imports, which is the key to their economic growth.

Table 14--Sub-Saharan market share  
of world imports

Commodity	1980-82	1984-86
Percent		
Oil	8.4	11.0
Coffee	24.1	22.1
Cocoa	69.5	62.9
Copper	21.0	15.3
Cotton	15.0	19.0
Tea	14.7	15.9
Sugar	7.6	6.6
Tobacco	10.1	10.3
Groundnut oil	28.6	32.7

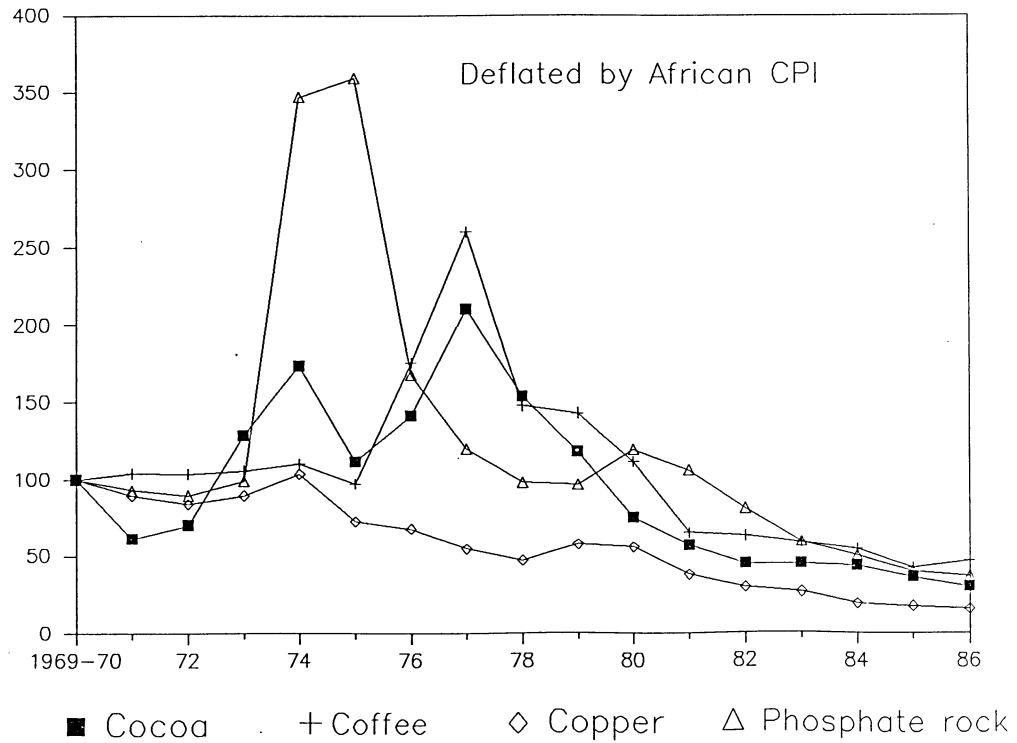
Figure 3--World prices for export commodities

1969-70=100



Source: (5).

1969-70=100



Source: (5).

The reason for falling agricultural commodity prices is increased output in the major producing regions. New technology, applied to various productive methods (especially in agriculture), led to supply growth. In addition, variations in the economic performance of the industrialized countries (the importing countries) affect the demand for commodities. This is particularly true for metals because they have higher income elasticities than do agricultural commodities. The movement toward light industry and service industries in industrialized countries has reduced demand for metals. Finally, the recent development of synthetic substitutes for many commodities has also lowered demand.

### **Trade and Exchange Rate Policy**

Exchange rate policy, which determines the international competitiveness of commodities and export incentives, is often the centerpiece of trade policy and has been viewed as the cause of the poor performance of the export sector in most developing countries. The argument is that overvaluation of a domestic currency acts as a tax on tradable goods by depressing prices (in domestic terms) relative to other goods. This distorts the export incentives and forces resources to move to production for the domestic market. The degree of competitiveness of the exchange rate, however, depends on changes in the real effective exchange rate (defined as the nominal exchange rate adjusted for relative movements in price levels between the home country and the major trading partner) rather than the nominal rate (which government controls directly).

Changes in the real effective exchange rate occur through movements in the nominal rate, or through foreign prices (price index of trade partners which is exogenous), or through changes in the general domestic price index. Therefore, there is not a one-to-one relationship between nominal and real effective exchange rates. If devaluation increases the real effective exchange rate by raising domestic prices relative to factor costs (domestic and imported inputs), the profitability to export increases. The longer the real effective devaluation persists, the greater the benefits. Other factors, such as structure of production, substitutability among factors of production, resource availability, and commodity response to relative price changes, could affect the final outcome.

In Africa during the 1960's, trade policies centered on developing industry. Pre-1970 industrial production growth was followed by slower growth in the 1970's and negative growth rates in the 1980's. The reason for the poor performance was resource misallocation, small economies of scale, an inadequate infrastructure, and disincentive government policies. The results were massive investments that consumed large amounts of foreign exchange and did not generate much income.

Most countries maintained overvalued exchange rates to reduce the cost of imported inputs. As foreign exchange shortages grew, tariffs and quantity import restrictions were imposed in order to protect domestic industry. Unsatisfied demand was channeled into the black market, thereby increasing the difference between the official and black market exchange rates, which, in turn, caused a reduction in government import tax revenues. To offset this loss, export taxes were instituted. The new taxes, in addition to the overvalued exchange rate, were strong disincentives to export.

Many countries began to reform exchange and trade policies as financial and demand pressures grew. The degree of exchange rate adjustments varied by country and through time, as the data indicate in table 15. In 1987, in all study countries, the rate of nominal depreciation was higher than depreciation of effective exchange rates, meaning that the rise in inflation eroded some of the impact of devaluation. Clear examples are Sudan, Tanzania, and Zaire.

In Kenya and Algeria, the first devaluation did not significantly change the exchange rate. In Zaire, Egypt, and Sudan, more than one exchange

Table 15--Exchange rate: Real effective and nominal

Country	Type of index	1978	1984	1985	1986	1987	Country	Type of index	1978	1984	1985	1986	1987
		1980=100							1980=100				
Agricultural exporters:							Nonagricultural exporters:						
Cote d'Ivoire	R	89.1	72.0	72.2	84.4	92.4	Algeria	R	98.8	143.6	152.3	132.3	115.8
	N	93.6	48.4	74.4	61.9	70.3		N	96.80	77.10	76.30	81.70	79.20
Ethiopia	R	103.6	136.2	162.4	120.1	102.3	Cameroon	R	102.7	94.5	98.8	109.5	122.6
	N	100.0	100.0	100.0	100.0	100.0		N	93.6	48.4	74.4	61.9	70.3
Kenya	R	104.2	102.1	101.0	87.5	97.1	Egypt	R	114.1	156.0	164.0	156.4	156.6
	N	96.0	51.5	45.2	45.7	45.1		N 1/	197.5	100.0	100.0	100.0	100.0
Madagascar	R	88.5	96.5	91.6	86.5	59.0	Nigeria	R	90.8	185.0	165.9	90.9	29.4
	N	93.6	36.6	31.9	31.2	19.8		N	86.6	71.5	61.6	40.8	13.7
Mali	R	103.7	91.5	94.7	97.3	90.9	Togo	R	100.0	84.3	80.7	87.1	86.4
	N	93.6	48.4	74.4	61.9	70.3		N	93.6	48.4	74.4	61.9	70.3
Morocco	R	103.0	79.4	74.1	70.9	68.5	Zambia	R	104.4	90.8	84.0	40.5	42.6
	N	94.5	44.7	39.2	43.3	47.1		N	98.8	44.2	29.2	11.1	8.9
Senegal	R	104.9	94.4	103.0	111.9	106.1	Zaire	R	141.7	45.6	41.3	41.2	35.3
	N	93.6	48.4	74.4	61.9	70.3		N	333.3	7.8	5.6	4.7	2.5
Sudan	R	113.3	106.9	99.2	98.4	92.0							
	N	113.0	38.5	22.0	20.0	17.8							
Tanzania	R	94.5	175.9	204.6	141.9	69.8							
	N	106.4	53.6	46.9	25.1	17.8							
Zimbabwe	R	100.5	103.4	91.9	84.8	80.7							
	N	94.7	51.2	39.7	38.4	38.5							

1/ The principal exchange rate.

Source: (6).

rate was used for a transitional period, with the goal of unification at a later period. This policy in Egypt led to a growing gap between rates and appreciation of the real effective exchange rate. Egypt has a very complicated exchange rate policy. In some years, as many as six exchange rates are used, depending upon the type of economic activity and commodity being exchanged.

Countries face different conditions in the CFA franc zone, which includes Cameroon, Cote d'Ivoire, Mali, Senegal, and Togo. As a part of a common currency zone, they can receive financial support from the French Government to finance their budget deficit. This instilled discipline in the monetary policies of these countries, but it also posed constraints on individual countries' policy instruments dealing with balance of payments problems.

The degree to which exports will respond to exchange rate adjustments is not clear. In Tanzania, Nigeria, Zambia, and Zaire, for example, where currencies were depreciated, nominal and effective rates should have dramatically improved export incentives. However, the real change in incentives refers to all aspects of the trade environment which affect the willingness to sell and includes important factors such as price predictability and stability of the marketing policy and arrangement.

#### Commodity Response to Price and Exchange Rates

The relationship between export supply and price is critical in a volatile price environment. High price responsiveness of commodity exports means a proportionally larger decline in export earnings as prices fall. Among the commodity markets discussed in this study, the oil market is the most complicated. The success of the oil cartel in maintaining high prices depends on supply control. However, producer rivalry for larger market shares, as financial pressures grow, creates a most uncertain international market, with both political and economic factors affecting price levels.

The oil price increases in the 1970's led to oil conservation on the demand side and increased output on the supply side. The oil price, which rose to \$34.50 per barrel in 1981, declined sharply to approximately \$14.50 per barrel in 1986 (a slight increase in nominal terms from a decade ago--\$12.50 per barrel in 1976).

Since 1985, the average world price has been significantly below the OPEC target price, reducing restraints on export volume. The low short-term price elasticity of oil demand (less than one) means that increases in production will result in lower earnings. World oil consumption is expected to rise at a moderate 1-1.5 percent per year in the next decade, according to estimates by the International Monetary Fund (6). Oil conservation and the replacement of oil with other forms of primary energy are expected to continue. OPEC exports are currently below their capacity and exploration continues. But with the sharp political differences among the major exporters, increases in exports invariably mean declining prices portending further financial difficulties for the oil exporting countries.

To measure the export supply-price relationship of nonoil commodities, we developed a simple model based on 1966-85 data. The functional form is

double log. Commodity exports are expected to respond to the price received by producers. Changes in world prices, however, may not transfer to the domestic market because of changes in the exchange rate. Effects of commodity price and exchange rate movements are also different because exchange rate movements, unlike those of prices, affect the cost of imported inputs and raw materials.

In this study, export equations were estimated using world prices and exchange rates as the principal variables in all country-commodity relationships (table 16). Prices are constant at the 1980 level and, for the most part, lagged 1 year; exchange rates are real (that is, the nominal rate divided by an index of domestic consumer prices). Depending on the country or commodity, other variables were used to reflect commodity or domestic market conditions. These variables include world commodity stocks (beginning stocks for coffee and cocoa) and dummy variables reflecting the impact of weather on agricultural exports or the impact of political change on the economic structure of a country. In the Ethiopian equations, the dummy variables are 1 for the period after 1973 (establishment of a socialist government). In the Moroccan equation, the dummy variable is 1 for the period after 1980 (the opening of a major plant to produce different types of fertilizer for both domestic use and export). In Egypt's cotton equation, growth in domestic income was used as a proxy for growing domestic use of cotton. The dummy variable reflecting drought is 1 in Mali for 1968-69, 1973-74, and 1981-83. In Sudan, the drought years for cotton were 1973-74 and 1981-82, in Senegal 1971-73 and 1981-83, and in Zimbabwe 1968-69 and 1982-83.

The summary of the estimated results by commodity indicates that for the internationally regulated market of coffee, prices had no significant effect on exports with the exception of Ethiopia (see table 16). Exchange rate movements had a significant effect on coffee exports in Kenya and Tanzania. Only the level of world stocks affects export volume. For cocoa, since regulations are not enforced, world stocks did not have any significant impact; however, exports were responsive to price changes. World prices of other agricultural commodities had, in general, a significant impact on exports. Also, exchange rate adjustments were a significant factor affecting exports in most nonregulated agricultural markets. The results for minerals indicate a lack of response to prices.

A detailed analysis of the results of the estimations by country follows:

Cote d'Ivoire and Cameroon--These two countries have a similar export structure. Both export coffee and cocoa, with oil exports becoming a major source of revenue in recent years (more so in Cameroon). The results indicate that coffee exports were not responsive to prices or exchange rates in either country. Only changes in world stock levels were significant in constraining exports. In the cocoa results, the level of world stocks did not have a significant impact on the exports of the two countries, reflecting a less effective role of the ICCA. In Cote d'Ivoire, both price and exchange rates were positive and significant factors on cocoa exports (0.68 and 1.25 elasticities). In Cameroon, the price was significant and positive (elasticity of 0.1), while the exchange rate did not have a significant impact.



Table 16--Results of commodity export estimations

Country and commodity	Constant commodity price	Real effective exchange rate	International stocks	Domestic Weather factors	R2	Country and commodity	Constant commodity price	Real effective exchange rate	International stocks	Domestic Weather factors	R2
Cote d'Ivoire:						Morocco:					
Coffee 2/	0.13 (.95)	0.09 (.41)	-0.22* (-1.90)		0.32	Phosphates 1/	0.10 (.80)	1.01* (2.33)		-0.47 (-2.02)	.31
Cocoa 2/	.68* (7.10)	1.25* (3.97)	-.02 (-.39)		.78	Nigeria:					
Cameroon:						Cocoa 1/	.08 (.49)	0.53* (3.54)	-0.01 (-.03)		.47
Cocoa 2/	.10* (1.84)	-.02 (.11)	-.02 (-.68)		.20	Senegal:					
Coffee 2/	-.05 (-.42)	.13 (.84)	-.29* (-3.06)		.41	Groundnut oil 2/	.84* (1.85)	.50* (1.98)		-.80* (-3.21)	.50
Ethiopia:						Sudan:					
Coffee 2/	.29* (2.02)	.51 (.65)	-.26 (-.98)	-0.22 (-1.67)	.34	Cotton	1.13* (2.01)	.37* (2.08)		-.88* (-3.56)	.68
Hides & skins 2/	.46* (1.81)	.34* (1.75)		-.10 (-.59)	.22	Tanzania:					
Egypt:						Coffee	-.12 (-1.21)	.25* (1.74)	-.30* (-2.14)		.31
Cotton 2/	.33 (.71)	1.37* (4.90)		4.89* (-1.99)	.84	Togo:					
Kenya:						Phosphates 1/	.05 (.34)	.20* (2.08)			.41
Coffee 2/	.13 (1.24)	1.13* (3.96)	-.41* (-2.37)		.85	Zaire:					
Tea 2/	.99* (6.07)	1.01 (1.66)			.72	Coffee 1/	.35 (1.57)	.34 (1.38)	-.88* (-2.14)		.45
Madagascar:						Copper 2/	.92* (5.10)	.28* (3.98)			.62
Coffee 2/	.80 (.89)	.25 (1.18)	-.41* (-2.57)		.30	Zambia:					
Mali:						Copper 1/	.24 (1.23)	.28* (2.28)			.33
Cotton 2/	1.55* (8.86)	1.08* (2.45)		-0.89* (-6.53)	0.93	Zimbabwe:					
						Tobacco 2/	.76* (3.70)	.40 (.81)		-.31* (-2.44)	.71

The "t" statistics are in parentheses.

\* Significant at 5 percent.

1/ Price is current.

2/ Price is lagged.

Ethiopia--Coffee and hides and skins, which contributed more than 80 percent of Ethiopian exports in 1984-86, showed a positive and significant response to international prices, with price elasticities of 0.29 and 0.46. Changes in the real exchange rate were significant only in the hides and skins equation (elasticity of 0.34). In Ethiopia, as in most countries in the region, exchange rates are regulated by the government. In Ethiopia, the dollar value of the exchange rate declined from 1966 to 1974 and since then has been kept constant. The unofficial exchange rate, or black market rate, rose to more than double the official rate at various times. The dummy variable, representing changes in the governing of the economic system, had a negative impact on export levels. The level of world coffee stocks did not have a significant impact on Ethiopian coffee exports.

Egypt--With oil gaining a greater share of exports, cotton has a much smaller role in Egyptian trade. Cotton, as a traditional major export, now faces a growing domestic demand as Egypt's textile industry develops. The government policy of delivering cotton to public sector factories below procurement prices has protected the cotton industry. In the estimated cotton equation, growth in domestic real income was a significant factor in reducing exports. The changes in cotton prices did not have a statistically significant impact on exports, probably because of the government's price control policies. Changes in exchange rates significantly affected the level of exports.

Kenya--Coffee and tea are Kenya's major exports, contributing almost 55 percent of total earnings in 1984-86. Kenya produces the high-valued Arabica variety. The effect of world prices on the export volume for coffee and tea was positive, but significant only for tea (price elasticity of 0.99). One likely reason for the insignificant coffee response is the organization of the marketing chain. Unlike tea, where there is only one agency between exporters and the auction (Tea Development Authority), coffee has different organizations such as the Planters Cooperative (in charge of hulling), a cooperative bank, a local cooperative union, and a cooperative society. Each link deducts its costs before passing the funds down the chain so that the farmer's share is the residual of international prices less domestic costs. Exchange rates, which are adjusted according to domestic costs, had a positive and significant effect on the exports of coffee (elasticity of about 1), meaning that increases in exchange rates will be directly transmitted to the growth of exports. The increase in world stocks of coffee had a negative and significant impact on Kenya's exports (elasticity of -0.41).

Madagascar and Tanzania--In Madagascar and Tanzania, coffee contributes an average 38 and 44 percent to export earnings. The estimated results indicate that world stock levels, which affect export quotas, are the primary constraint to expanding export volume (significant and negative relationships). The size of the export-stocks elasticity was -0.41 in Madagascar and -0.30 in Tanzania. The world price of coffee was not significant in affecting exports. Exchange rates were positive, but significant only in Tanzania. One problem in measuring the impact of exchange rates is historic exchange rate market distortions, where the black market or unofficial exchange markets function parallel to the official market.

Mali and Sudan--Cotton is the primary source of export revenue in Mali and Sudan. The estimated results showed that the explanatory variables price, exchange rate, and weather--for both countries were significant with the expected signs. The large size of the price elasticities, 1.55 in Mali and 1.13 for Sudan, indicates that further price reductions will have multiple impacts on earnings (directly and through volume response). In Sudan, the current policy is to move into special cotton export arrangements whereby payment is made partly in cash and partly in goods or debt service.

Morocco--Although agricultural commodities (such as citrus fruit and vegetables) contribute about 25 percent to total export earnings, phosphates alone contribute 20 percent. Morocco has the world's largest phosphates reserves and is the third largest producer. A state-owned monopoly is responsible for mining, processing, and exporting phosphates. The estimated results indicate that phosphate exports were not affected by the change in prices, but by exchange rate variations. The lack of a significant price effect could be due to keen competition among exporters who have large supplies to market.

Nigeria--Information on cocoa exports is limited to a commodity board that may not accurately reflect changes in trade outside the official marketing system. The only significant variable affecting cocoa exports was the exchange rate (elasticity of 0.53), according to the estimated results. The aging of cocoa plantations, coupled with diminishing profitability, accounts for part of the low impact of price and the sector's poor performance. This is also the case for most Nigerian agricultural exports.

Senegal--Groundnut oil exports contribute 74 percent of total export revenues in Senegal. Senegal's exports showed a positive and significant response to both world market prices of groundnut oil and exchange rates. The impact of drought was negative and significant on export levels.

Togo--Phosphate rock is Togo's main export commodity. Changes in the export price did not have a significant impact on exports, while the exchange rate impact was positive and significant (coefficient of 0.2), according to the estimated results. Togo's phosphate exports are far below production capacity. The lack of demand for phosphate fertilizers and strong competition limit exports. Togo's production costs are among the lowest in the world, which is a very important factor in absorbing price variations in competition with other exporters. Togo's currency is the CFA franc, which is pegged to the French franc. Export volume declined sharply in the early 1980's as the French franc depreciated relative to Togo's other trading partners. With the recovery of the exchange rate in 1984, the volume of phosphate exports increased almost 50 percent.

Zaire- Copper contributes 37 percent to export earnings. The study results show that the international copper price and the exchange rate were both positive and significant determinants of the volume of copper exports. International copper prices have been depressed over the last few years and a price recovery is unlikely because of the excess supply as well as the availability of substitutes. Therefore, an increase in

export volume will most likely occur as a result of continued exchange rate devaluation.

Coffee is another significant export of Zaire, with a 14-percent share of total earnings. The estimated results indicate that world coffee stock levels, which affect export quotas, are the primary constraints to expanding export volume (negative and statistically significant relationships). The size of the export-stocks elasticity was  $-0.88$ . The world price of coffee was not a significant factor affecting export volumes. The exchange rate was positive, but not significant.

Zambia--Copper contributes 87 percent of total export revenues. The estimated results indicate that copper exports were not affected by the change in world prices, but by exchange rate variations. World production of copper has grown much faster than consumption. The lack of a significant price impact on export volume could be due to keen competition among exporters which still have large supplies to market.

Zimbabwe--Of the countries studied, Zimbabwe has the most diversified export base comprised of agriculture, mining, and manufacturing. Tobacco is by far the most important agricultural export, and Zimbabwe is the world's third largest tobacco exporter (mainly flue-cured tobacco), after the United States and Brazil. Tobacco exports were responsive to the world price (elasticity of  $0.76$ ), but the exchange rate did not have a significant impact on export volumes, according to the estimated results. The exchange rate system in Zimbabwe (similar to non-franc zone) was set by the government for about two decades and only since 1983 has the exchange rate been determined by a trade-weighted basket of currencies.

These results have shown that commodity prices and exchange rates do not have a uniform impact on export volumes. For the most part, the volume of exports responds positively to price increases, as well as currency adjustments. In the study countries, a declining price trend coupled with a delay in policy implementation will lead to declining export volumes. This situation is likely to have a severe impact on the economic development of these countries.

### Summary and Implications

The combined impact of lower export earnings and reduced credit flows intensifies financial pressures on LDC's. As the scarcity of foreign credit continues, Africa's export sector must play the key role in generating investment income for Africa's financial recovery. The evaluation of export performance of the study countries showed an average annual increase in real export earnings of 3.2 percent during 1965 to 1980 and less than 1 percent growth from 1980 to 1986. In these countries, export revenue, in addition to contributing to the domestic economy, finances imports of essential commodities and supports debt service payments. Slow growth in export earnings constrains imports which, in turn, adversely affect economic growth.

Along with slow export growth, the instability of export earnings has a destabilizing effect on import capacity and economic growth. The coefficients of variation of export earnings (along the trend line)

averaged about 26 percent over all study countries, and an index of export shortfalls averaged about 10 percent. The empirical evidence in the study supported earlier arguments that a poor export performance, in terms of earnings growth and variability, particularly persistent shortfalls in export earnings, has a devastating impact on a country's economic performance. The larger the share of exports in GDP, and the stronger the export-import linkage, the more significant is their impact on the economy. In the study countries, the contribution of exports to GDP was in the range of 9 to 46 percent in 1986 and averaged about 25 percent over the study period. The evaluation of the impact of export performance on the economic growth of the study countries showed a positive and significant export-income growth relationship. Export instability, represented by coefficients of variation and an index of shortfalls, showed a significant and negative impact on economic growth. The implication is that in order to achieve sustained economic growth the behavior of factors affecting the export sector must be clearly understood so that policy options can be cogently evaluated.

The performance of the export sector depends on many factors, some of which are within the control of the economic planners. Others depend on the international trade environment. Effective policies can influence export structure and improve export performance. Examination of structural factors (such as export composition, commodity diversification, and export market diversification) showed that commodity diversification is the only variable that could significantly improve export earnings growth and reduce export instability. Among the study countries, 14 of the 17 showed a decline in the commodity concentration index during 1965-86. In Algeria, Egypt, and Nigeria, the index of commodity concentration increased, primarily because of the growing share of oil exports. The study also showed that in 14 countries, where a decline in export commodity concentration occurred, the change was slow, only 9 percent in more than two decades. A 1981 World Bank study points to the lack of investment in export diversification as one of the main factors for the poor export performance of the Sub-Saharan region (13).

Given Africa's current financial difficulties, the question is how to revive Africa's economic growth. The prospects for slow movement toward diversification (13) portend only marginal changes in export composition at best, in the medium term. This means that the performance of primary commodities, especially their prices, plus government incentives (especially for agricultural exports which responded positively to price changes), will remain key factors in Africa's export recovery and thus its economic recovery. Despite the expected minor change in market structure, significant room for improvement exists by raising the market share in the exports of primary commodities.

One key factor that could change the export trend is the direction of change in commodity prices. The study showed that, in addition to a direct impact, increases in commodity prices will have an indirect impact on the export volume of most study countries. However, the future of export prices is uncertain because of the slow world demand growth forecast for these commodities.

Prices for four of the six leading export commodities will decline in the short term, according to World Bank forecasts (14). In the longer term, 1995, prices are forecast to expand at a rate ranging from 0.8 to 5.4

percent per year (table 17). Long-term forecasts show that for five of the six commodities, the annual rate of growth will be less than 3 percent (the average population growth), meaning that if export volumes are not increased more than 3 percent, the per capita export earnings will decline in countries with a high commodity concentration index.

The increase in export volume depends on price prospects and government policies. In recent years, most African countries have become committed to the implementation of policy adjustments, particularly exchange rate adjustments. As the results of this study indicate, real exchange rate adjustments are expected to have a positive impact on the exports of most of the countries. However, if commodity prices decline, the net impact may not necessarily lead to increased export earnings (depending on the extent of price and exchange rate movements, and the respective size of the elasticities). One major concern is the impact of increases in aggregate supply in response to export incentives. If African countries expand the aggregate export volume of commodities such as cocoa or groundnut oil, it is not clear whether their earnings will rise because of their large collective share in the world trade.

Another critical question is whether the countries could successfully increase real exchange rates over a long period. A study of the economic impact of devaluation in developing countries showed that in the 3 years following devaluation, average inflation rates in 14 of the 17 countries exceeded those of the predevaluation period. High inflation rates, in excess of the average exchange rate adjustment, were reported in 5 of the 17 countries (11). Now, the concern is whether the implementation of these policies can improve the economic situation of the countries sufficiently before the mounting frustration of economic difficulty leads to unrest and civil violence. For example, a likely reason for riots in Zambia in 1986 was the increase in prices and stagnant wage levels (1). With the adoption of a foreign exchange auction, the value of Zambia's currency fell to one-seventh its value in 1 year. Zaire's reforms in 1985 were met with a severe setback because of depressed world copper prices and reduced aid. The fear of unrest led the Government of Zaire to suspend floating exchange rates (1).

The African countries face grim prospects of low world prices of their export commodities. The World Bank projects that by the year 2000, nonoil real prices will not grow much from their low 1985 levels (14).

Table 17--Annual percentage change  
in the real world price

Commodity	1987-90	1987-95
Percent		
Petroleum	-5.8	2.4
Coffee	3.5	2.6
Cocoa	-4.7	.8
Groundnut oil	3.9	5.4
Cotton	-2.5	2.8
Copper	-5.7	.9

This means that purchasing power will remain weak. Short-term commodity price fluctuations, combined with a long-term declining trend, mean that there is no easy solution to the economic problems of the region. Diversification of export commodities, which is recommended in almost all of the policy packages, is slow because of the lack of investments. In some countries, diversification means exports of a different mix of primary commodities. For example, Zambia attempted to diversify by including coffee and sugar, thereby exacerbating an already saturated world market. Similarly, Cameroon is investing in exports of palm oil and rubber, commodities in plentiful supply in the world market. A meeting of the Organization of African Unity in November 1986 concluded that Africa could not achieve economic recovery unless there was a change in the course of three key variables: debt, commodity prices, and inflow of resources. Reduction of debt service, if it is combined with a recovery of commodity prices, means more foreign exchange available to facilitate an economic recovery. An inflow of resources, aimed at increasing investment in export diversification, could be a long-term solution to African problems.

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