Export Growth and Economic Performance in Developing Countries:
Further Evidence from Africa*

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Several studies have established that a significant positive relationship exists between export expansion and economic growth. In this study we examine the effect of export growth on factor productivity in Africa. It is seen that export expansion significantly enhances economic growth in Africa.

I. Introduction

The export sector is very important to the African economy. As a result, export expansion represents an important source of economic growth. Most African countries have small and poorly developed domestic markets and must rely on foreign markets for the sale of their excess production. In addition, a lot of what is produced in these economies is either not suited for local consumption or does not have any substantial local demand.

During the colonial period, many African economies were structured to serve as suppliers of raw materials to European economies.[1] Since independence, many of these economies have continued to produce primarily for export. The pattern of trade in many African countries has not changed significantly since colonial times. In those economies in which substantial changes have taken place, the results have been the

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[1] Rudin (1968), pp. 248ff.

displacement of agriculture as the anchor of the economy by mining and quarrying activities.[2]

African economies were also used during colonial times as markets for the sale of excess European production. The tastes in European manufactured goods developed during colonization remain, and as a result, many of these countries continue to import large quantities of European goods, making it more difficult for domestic producers to penetrate local markets. Production in many African countries today is directed towards exports as evidenced by the rising importance of cash crops such as coffee, cocoa, rubber and tea, which have very little local demand.

In this study we shall attempt to determine the relationship between export expansion and economic performance in Africa. In Section II, we shall briefly examine the influence of international trade on African economies. Next we take a look at the importance of agricultural production in Africa's export trade. The statistical relationship between export growth and economic performance is examined in Section IV. In Section V, we analyze the variable affecting export expansion in the continent. A summary and concluding statements and some policy recommendations appear in Section VI.

II. International Trade and African Economies

Small and poorly-developed markets in Africa have been very instrumental in forcing African policy makers to seek foreign markets for the sale of excess production. During colonial times, regional trade was neglected in favor of trade with Europe. Thus, a pattern in which the colony traded primarily with the European country that had annexed it, was created. Such trade links were preserved after independence, despite attempts by some African leaders to develop regional trade. Through the formation of trade communities, the trade links between the newly-independent African countries and Europe were maintained. It is interesting to note that Guinea, which had opted out of the French community, still carries most of its trade with France and the European Economic Community (EEC). In 1985, for example, 89 percent of merchandise exports from Guinea went to the industrial market economies, primarily the EEC.[3]

In 1965 the share of exports (goods and nonfactor services) in gross

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[2] World Bank (1988), pp. 244-245.
[3] World Bank (1987), p. 226.

domestic product (GDP) in Africa ranged from a low of 8 percent to a high of 50 percent. By 1986, as much as 63 percent of the GDP in some African countries was accounted for by exports. In terms of export growth, Africa, especially Sub-Saharan Africa, has not been doing very well. Between 1965 and 1980, exports for Sub-Saharan Africa grew at a weighted average annual rate of 6.6 percent, but between 1980 and 1986, the rate had fallen to -2.1 percent. Many African countries continue to register negative rates of growth in their export sectors.[4]

III. Dependence of African Export Trade on Agriculture and Other Primary Commodities

Most exports from Africa consist primarily either of agricultural products or some other primary commodity such as petroleum, copper, phosphates, urnaium, diamonds, or some other precious metals. Such a dependence unnecessarily subjects the economy to the uncertainties of the world commodity markets.[5]

For many poor countries, especially those in Africa, agriculture represents the only sound way to sustainable economic growth. How well this sector of the economy is managed will determine the extent of economic growth and development. A more efficient and productive agricultural sector should provide the impetus for economic development.

In Africa, agriculture employs about 70 to 80 percent of the labor resources in many low-income countries. This sector is also a strong contributor to GDP, accounting for 40 to 45 percent of national output in these countries.[6]

When fuels and minerals are taken into consideration, it is seen that upwards of 80 percent of merchandise exports from many African countries consist of agricultural products, fuels, and minerals. In other words, most of Africa depends on primary commodities for a significant percentage of its export earnings.[7]

IV. Export Expansion and Economic Growth in Africa

One can view the role of exports in economic performance as an exten-

4 World Bank (1986), pp. 182 and 196, and World Bank (1988), pp. 242-243.
5 See Schnitzer (1987), pp. 378-405 and 466ff., and World Bank (1988), pp. 244-245.
6 World Bank (1986), p. 3, and World Bank (1988), pp. 226-227.
7 World Bank (1988), pp. 244-245.

sion of the neoclassical theory of comparative advantage. Accordingly, we would expect economic performance to be positively affected by export trade due to a better allocation of resources. Ram (1985) states that radical economists view international trade as a process through which the industrial market economies exploit the less developed countries (LDCs).[8] Michaely (1977) studied a sample of forty-one LDCs and concluded that economic growth tended to be affected significantly by exports "only once countries achieve some minimum level of development."[9]

Belassa (1978) studied the effect of export growth on economic performance for eleven countries and found a significant positive effect of export growth on factor productivity.[10] Tyler (1981) examined 55 middle-income LDCs to determine the relationship between export expansion and growth in output and concluded that export expansion significantly enhances gross national product growth.[11]

Kavoussi (1984) used a sample consisting of 73 countries to examine the relationship between export growth and economic performance. He found "higher rates of economic performance" to be "associated with higher rates of export growth."[12] He also stated that the positive relationship between export growth and GNP results from the increase in total factor productivity which is likely to occur as a result of export growth.[13]

Following Kavoussi, we use a simple production function to examine the effect of export expansion on total factor productivity. Assuming disembodied technical change, we can write the following function:[14]

(1) $Q(t) = f(K(t), L(t), t)$,

where

Q = gross national product (GNP),
K = stock of capital,
L = labor force,
t = time.

Additionally, assuming elasticities of output with respect to capital and

[8] Ram (1985), p. 415.
[9] Michaely (1977), p. 52.
[10] Balassa (1978), pp. 186-187.
[11] Tyler (1981), pp. 128-129.
[12] Kavoussi (1984), p. 249.
[13] Kavoussi (1984), pp. 241-249.
[14] Kavoussi (1984), pp. 241-249.

labor to be constant and a Hicks-neutral technical change with a constant rate, we can express equation (1) in growth terms, viz:

(2) $Qgrowth = \beta_0 + \beta_1 Kgrowth + \beta_2 Lgrowth,$

where

Qgrowth = average annual rate of growth of GNP,
Kgrowth = average annual rate of growth of capital stock,
Lgrowth = average annual rate of growth of labor force.

Letting the rate of technical change be a linear function of the growth rate of exports (Xgrowth), we can test the hypothesis that export expansion has a significant positive effect on total factor productivity. We can write the following equation:

(3) $Qgrowth = \beta_0 + \beta_1 Kgrowth + \beta_2 Lgrowth + \beta_3 Xgrowth.$

We use the average annual growth rates of GNP, investment, labor force, and exports between 1970 and 1981. We shall use the growth rate of investment based on the assumption that it corresponds to the growth of capital.[15] If the model is properly specified, the estimate of β_3 should indicate the impact of export expansion on economic performance in Africa.

A. The Data

The models discussed above were estimated using data on 37 African countries for the period 1970-1981. The data was obtained primarily from World Bank sources (*World Development Report, 1983; World Tables, 1983, Vol. I; World Tables, 1980, Vol. I*). We have made an effort to include all the African countries for which data were available. First we report estimates for the entire sample of 37 countries without distinguishing between the low-income and the middle-income countries. Afterwards, we report results for the two groups of countries separately. The distinction between low-income and middle-income is based on a grading system employed by the World Bank. Low-income countries in this study are those, which in 1981, had a GNP per capita not exceeding U.S.$400.[16]

B. The Regression Results

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[15] See Kavoussi (1984), p. 246 and Tyler (1981), p. 127 also see Landau (1985), p. 462.
[16] World Bank (1983a), and World Bank (1980 and 1983b).

The main OLS regression results are given in Table 1. As Table 1 indicates, the R^2 increases slightly from 0.631 to 0.696 when Xgrowth is added to the equation. The coefficient of export growth (Xgrowth) is positive and significant, indicating that export expansion positively affects economic performance in Africa. To further examine this relationship between export growth and factor productivity, we disaggregate the sample. We then examine the effect of export expansion on economic performance in low- and middle-income African countries.

Table 1 shows that export expansion significantly enhances the growth of output in both groups of African countries. It must be noted, however, that the coefficient of export growth in the sample representing the middle-income countries is almost twice as high as that for the low-income countries. Thus, export expansion's contribution to growth appears stronger in the middle-income countries.

Table 1

OLS REGRESSION WITH Qgrowth AS THE DEPENDENT VARIABLE**

Country Group	Eq	N	Constant	β_1	β_2	β_3	R^2
Total Sample	1a	37	1.329	0.398 (5.76)*	0.300 (0.42)		0.631
	1b	37	0.597	0.262 (6.10)*	0.552 (1.17)	0.177 (2.65)*	0.696
Low-income Countries	2a	19	1.446	2.210 (4.18)*	0.217 (0.31)	0117 (1.53)*	0.630
	2b	19	1.992	0.230 (4.57)*	0.023 (0.03)		0.572
Middle-income Countries	3a	18	0.934	0.309 (7.30)*	0.293 (0.59)		0.703
	3b	18	0.062	0.313 (3.93)*	0.647 (0.94)	0.227 (1.80)*	0.759

* Coefficient estimate is significant at the 0.1 level or better.
** The figures appearing in parentheses are the absolute values of the t-statistics.
β_1 = coefficient of Kgrowth,
β_2 = coefficient of Lgrowth,
β_3 = coefficient of Xgrowth,
N = number of observations.

Some researchers (e.g. Ram) have criticized the procedure of employing equation (2) and using the rate of growth of investment as a proxy for the rate of growth of the capital input. Cognizant of this criticism, and following Ram, we develop a model that replaces growth in investment with the investment-income ratio.[17]

First we write the aggregate production function as follows:

$$(4) \qquad Q = f(L, K, X)$$

where

Q = real output,
L = labor input,
K = stock of capital,
X = exports.

Taking total derivatives of (4) and solving, we get the following expression:

$$(5) \qquad \dot{Q} = \beta_0 + \beta_1 \dot{K} + \beta_2 \dot{L} + \beta_3 \dot{X},$$

where a dot over a variable indicates its growth rate.

If $\dot{K}$ is replaced by $\Delta K / Q$, an approximation of the investment-output ratio, equation (5) becomes:

$$(6) \qquad \dot{Q} = \beta_0 + (\partial Q / \partial K)(K / Q)(dK / K) + \beta_2 \dot{L} + \beta_3 \dot{X}$$

and replacing dK by I, we get

$$(7) \qquad \dot{Q} = \beta_0 + \alpha_1 (I / Q) + \beta_2 \dot{L} + \beta_3 \dot{X}$$

where α_1 is the marginal physical product of capital. β_3 should indicate the direction and magnitude of the impact of export expansion on factor productivity. The results of the OLS regressions are reported in Table 2. Comparing the regressions of equation (7) to those of equation (3) we see that although export growth is still seen to significantly impact factor productivity, the R-squareds have fallen significantly indicating a reduction in the explanatory ability of each equation. Note, however, that the coefficient of export growth has almost doubled in both the complete sample and that representing middle-income countries.

[17] Ram (1985), p. 417.

Although the relationship between export growth and economic per-
formance in low-income African countries, as shown by Table 2, is
positive, it is not significant at the traditional 5 percent level of
significance. Using the formulation in equation (2), where growth in in-
vestment is used as a proxy for growth in the capital stock, it is seen that
the coefficient for export expansion is significant at the 10 percent level
(see Table 1). In attempting to examine the impact of export expansion
on economic growth, there seems to be little difference between the two
formulations given by equations (2) and (7).

V. Factors Affecting Export Expansion in Africa

Export growth in Africa continues to be stunted by various obstacles.
One of the most important constraints to export expansion in Africa is
political instability. Three types of political instability are recognized:
elite, communal and mass instability. In this study, we are primarily con-
cerned with elite political instability. This type of instability involves the
forceful removal, from office, of the leaders of a country's government.

Table 2

OLS REGRESSION WITH $\dot{Q}$ AS THE DEPENDENT VARIABLE
AND I/Q REPLACING GROWTH IN INVESTMENT AS ONE OF
THE EXPLANATORY VARIABLES**

Country Group	Eq.	N	Constant	α_1	β_2	β_3	R^2
Total Sample	4	37	−1.83	0.159	0.603	0.243	0.479
				(2.84)*	(0.93)	(2.78)*	
Middle-income Countries	5	18	−2.687	0.143	0.91	0.407	0.562
				(1.48)	(0.94)	(2.60)*	
Low-income Countries,	6	19	−1.096	0.161	0.37	0.133	0.351
				(1.88)*	(0.40)	(1.27)	

* Coefficient significant at the 0.1 level or better.
** The figures appearing in parentheses are the abosolute values of the t-statistics.
α_1 = coefficient of I/Q.
β_2 = coefficient of L,
β_3 = coefficient of X,
N = number of observations.

Elite instability may result from a coup d'état, an attempted coup, or a plot to overthrow the incumbent government.[18]

Following McGowan and Johnson (1984), we shall index elite instability by the number of successful coups d'état, attempted coups, and plots to displace the government during a given period of time. Assuming that each one of the behavior types named above is qualitatively different, we assign weights to each and then sum to derive a measure for elite political instability. Giving successful coups a weight of 5, attempted coups a weight of 3, and plots a weight of 1, we produce a measure for elite political instability. We shall call this variable INST and posit that it will have a negative effect on export expansion.[19]

Between 1956 and 1984, Sub-Saharan African countries suffered over fifty coups d'état.[20] Many of them were conducted by soldiers who proceeded to establish military regimes in the affected countries. In the more than twenty-five years that many African countries have enjoyed independence, the armed forces have increasingly become an important part of the government of many of these countries. As a result, military expenditures have become an important part of government appropriations. To see how the burden of military expenditures affects factor productivity and as a result, export expansion, we include military expenditures (MEXP) as an explanatory variable in the regression. We expect MEXP to have a negative effect on export expansion.

Government regulation of the economy significantly affects factor productivity. Such regulation has been classified as follows: (1) external sector controls; (2) goods market controls, and (3) credit market controls.[21] Some African governments are known to subsidize and promote exports and discourage imports in an attempt to improve domestic economic growth. If the government actively promotes exports, we may expect government activities in the economy to have a positive effect on export expansion. If, however, government regulation of the economy, as is common in many African countries, involves the taxation of exports (in an attempt to raise revenues for social programs), then state activities in the economy will have a negative impact on export expansion. In many African countries, the bulk of agricultural exports is handled by marketing parastatals or public sector agencies which often place high taxes on the goods when they are purchased from the farmers for sale overseas. This results in a transfer of wealth away from the strategically important agricultural sector

[18] Mbaku (1988), pp. 91-92, and McGowan and Johnson (1984). pp. 633-666.
[19] McGowan (1975). p. 47 and Mbaku (1988). p. 103.
[20] McGowan and Johnson (1984). p. 633-666. and Mbaku (1988). p. 89.
[21] Sharif and Whalley (1984). pp. 392ff.

and leads to a reduction in production. Since the agricultural sector provides the bulk of exports for many African countries, such government activities in this sector impact negatively on export expansion. We shall let the growth of public expenditures (PUBEXP) represent government involvement in the economy. We posit that the regression estimate of the coefficient of PUBEXP will have a negative sign.

We shall also include, as an explanatory variable, the growth rate in the overall labor force (Lgrowth) and expect its coefficient estimate to be positive.

The stock of capital in the economy will have a significant effect on factor productivity. It is expected that growth in the stock of capital will significantly impact on export expansion. As a result, we include growth in investment (as a proxy for growth in capital stock) as an explanatory variable and expect its coefficient estimate to have a positive sign.

It has been posited that flows of foreign economic assistance can be used to augment domestic savings and as a result, raise the level of capital formation, allowing for increased productivity in the economy (See, for example, Millikan and Rostow (1957)).[22] If this is true, then we expect flows of foreign development aid to have a positive impact on export expansion.

Two factors, which may have a destabilizing effect on the economy are also included in the regression as explanatory variables. These are the average annual rate of inflation (INFLAT) and the level of the country's debt burden (DEBT). We expect both variables to have a negative effect on export expansion.

In order to determine the factors affecting export expansion in Africa, the following model shall be estimated:

(8) $Xgrowth = \beta_0 + \beta_1 Kgrowth + \beta_2 Lgrowth + \beta_3 INST + \beta_4 MEXP$

$\beta_5 NODA + \beta_6 INFLAT + \beta_7 DEBT + \beta_8 PUBEXP$

where

Kgrowth = average annual growth rate of capital stock (the rate of growth of investment is used as a proxy for growth in capital stock), 1970-1981,
Lgrowth = average annual growth rate in labor force, 1970-1981,
INST = indicator of elite political instability for the period, 1970-1981,

[22] Millikan and Rostow (1957).

MEXP = military expenditures as a percentage of the GDP; average for the
         period, 1970-1981,
NODA = net official development assistance as a percentage of the GDP;
           average for the period, 1970-1981,
INFLAT = average annual rate of inflation, 1970-1981,
DEBT = total public debt as a percentage of GDP, 1981,
PUBEXP = average annual rate of growth in public expenditures, 1970-
           1981.

A. The Data

The data were obtained primarily from the following sources: (1)
World Bank (*World Development Report, 1983 and World Development
Report, 1980; world Tables, 1983,* Vol. I; *World Tables, 1983,* Vol. II;
Accelerated Development in Sub-Saharan Africa: An Agenda for Action);
(2) Organization for Economic Cooperation and Development (*Develop-
ment Cooperation-Reviews,* several issues: 1973-1984; *Distribution of
Financial Flows to Developing Countries 1981/1984*); (3) U.S. Arms Con-
trol and Disarmament Agency (*World Military Expenditures and Arms
Transfers,* several issues); (4) George Thomas Kurian, *Encyclopedia of the
Third World,* Vols. I & II.

B. The Regression Results

The regression results are reported in Table 3. As expected, inflation,
political instability, and military expenditures impede export expansion in
Africa. Political instability's negative impact on export growth, however,
is only significant at the 15 percent level of significance. We had expected
the flow of development assistance (NODA) to have a positive effect on
export expansion. The regression results show, however, a negative rela-
tionship between economic aid and export expansion. Growth in the
labor force (Lgrowth) has a negative and significant impact on export ex-
pansion. We had anticipated that increases in the labor force will enhance
export expansion. The behavior of growth in investment (acting as a proxy
for growth in capital stock) was as expected. It has a positive impact on ex-
port growth. That relationship, however, is not significant.

We had also hoped to use the regression analysis to determine the
effects of both public expenditures and public debt on export expansion.
We had expected both to have a negative effect on growth in exports. The
results, however, show that both public debt (DEBT) and public expen-
ditures (PUBEXP) have a positive but insignificant effect on export expan-
sion.

Table 3

ORDINARY LEAST SQUARES REGRESSION WITH AVERAGE
ANNUAL RATE OF GROWTH IN EXPORTS (XGROWTH)
AS THE DEPENDENT VARIABLE
(N = 37)

Independent Variable	Coefficient	t-statistic
DEBT	0.035	1.141
Kgrowth	0.068	0.51
Lgrowth	-0.282	1.838*
INST	-0.085	-1.154
MEXP	-1.078	-3.058*
NODA	-0.158	-1.451*
INFLAT	-0.263	-1.961*
PUBEXP	0.118	0.617
CONSTANT	13.381	3.722*
R-SQUARED	0.539	
ADJ.R-SQUARED	0.407	
F-Statistic	4.091	

* Coefficient estimate significant at the 0.1 level or better.
N = number of observations.

VI. Summary and Conclusions

In this study, we have attempted to examine the effect of export growth on economic performance in Africa. We investigated the impact of export expansion on economic growth in both the low-income and middle-income countries. While exports continued to have a significant effect on growth in the middle-income countries, that effect was not as strong in the poorer countries.

Part of the study was devoted to an examination of factors affecting export expansion in Africa. The results show that political instability, inflation, and military expenditures have seriously stunted export growth in the continent. Growth in the labor force was seen to have had a negative impact on export expansion. This could have resulted from the failure of each economy to raise its capital stock high enough to prevent a fall in the capital-labor ratio as the labor force was expanding. As a result, some of these economies may have suffered decreases in productivity that significantly affected the export sectors. Net official development assist-

ance was also seen to have a negative effect on export expansion. It is possible, as some researchers have argued, that flows of foreign economic aid may have a negative effect on domestic savings, and subsequently lead to a reduction in investment expenditures. If this is true, then foreign flows in these countries may have a negative impact on export expansion.[23]

The export sector is very important to the African economy. In order to improve its productivity, it is recommended that policy makers attempt to develop policies that allow entrepreneurs freer access to the economy and rely more on the market for the allocation of resources. This approach should reduce political instability which appears to be generated by agents fighting to enter economies that are closed to all, but a few privileged households.

[23] See for example, Griffin (1973), and Griffin and Enos (1970).

Appendix
Countries Used in this Study

1. Angola
2. Algeria
3. Benin
4. Burundi
5. Cameroon
6. Central African Republic
7. Chad
8. People's Republic of the Congo
9. Egypt
10. Ethiopia
11. Ghana
12. Guinea
13. Ivory Coast (now known as Côte d'Ivoire)
14. Kenya
15. Lesotho
16. Liberia
17. Madagascar
18. Malawi
19. Mali
20. Mauritania
21. Morocco
22. Mozambique
23. Niger
24. Nigeria
25. Rwanda
26. Senegal
27. Sierra Leone
28. Somalia
29. South Africa
30. Sudan
31. Tanzania
32. Togo
33. Tunisia
34. Uganda
35. Burkina Faso
36. Zambia
37. Libya

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