PRIMARY COMMODITY AND MANUFACTURING EXPORTS IN AFRICA: RELATIONSHIPS WITH FOREIGN AID, GEOGRAPHY AND RESOURCES

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Abstract

Several authors are of the view that aid, geography, education and resource endowments affect export diversification in Africa. This paper examined the association between these variables. It found that an increase in aid or geographic distance from markets is associated with less diversification. It also found that there is no co-movement between diversification and either education or natural resource endowments. Finally, there is strong evidence of co-movement between education and manufacturing value-added.

JEL Codes: F13; F35; O14

Keywords: Diversification; Geography; Aid; Resources

1. Overview

A very important aspect of the structure of African economies is their high export concentration and dependence on primary commodities (Table 1). In the 1960s and the 1970s, the sub-region shared this feature of dependence on commodities with most developing countries. However, in the past two decades, several developing countries have successfully transformed their export structure and are no longer dependent on primary commodities. For example, in the period 2000-2004, the share of manufactures in total exports was 33 percent in Sub-Saharan Africa compared to 57 percent in Latin America and the Caribbean, 78 percent in South Asia, and 80 percent in East Asia and the Pacific. For developing countries as a group, manufactures represent about eighty percent of their exports.

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An examination of export concentration indices for Africa also leads to the same conclusion. For example, in 1992 the export concentration index for the region was 0.57 compared to 0.25 for developing countries. For 2002, the figures were 0.49 and 0.23 for Africa and developing countries respectively (UNCTAD, 2004). That said, within the African region a few countries have made progress on diversification (Table 2). For example, in the period 2000-2002, the share of manufactures in total exports was 45 percent in Egypt, 46 percent in Rwanda, 52 percent in Morocco, 66 percent in Seychelles, 71 percent in Tunisia, and 73 percent in Mauritius.

Table 1: Main Exports of African Countries

COUNTRY	EXPORTS
Algeria	Oil, Gas
Angola	Oil, Diamonds, Minerals, Coffee, Fish, Timber
Benin	Cotton, Palm oil
Botswana	Diamonds, Copper, Nickel, Beef
Burkina Faso	Cotton, Animal Products, Gold
Burundi	Coffee, Tea, Sugar, Cotton, Hides
Cameroon	Crude Oil, Petroleum Products, Timber, Cocoa, Aluminium, Coffee, Cotton
Cape Verde	Shoes, Clothes, Fish, Bananas, Hides, Pozzolana (for making cement)
Central African Rep.	Diamonds, Timber, Cotton, Coffee, Tobacco
Chad	Cotton, Oil, Livestock, Textiles
Comoros	Vanilla, Cloves, Perfume oil, Copra
Congo, D. Rep	Diamonds, Copper, Coffee, Cobalt, Crude oil
Congo, Rep.	Oil, Timber, Plywood, Sugar, Cocoa, Coffee, Diamonds
Cote d'Ivoire	Cocoa, Coffee, Tropical woods, Petroleum
Djibouti	Re-exports, Hides and skin, Coffee (re-exported from Ethiopia)
Egypt	Petroleum, Petroleum Products, Cotton
Equatorial Guinea	Petroleum, Timber, Cocoa

Eritrea	Livestock, Hides, Sorghum, Textiles, Salt, Light manufactures
Ethiopia	Coffee, Hides, Oil seeds, Beeswax, Sugarcane
Gabon	Crude Oil, Timber, Manganese, Uranium
Gambia	Peanut & Peanut Products, Fish, Cotton lint, Palm kernels
Ghana	Gold, Cocoa, Timber, Tuna, Bauxite, Aluminium, Manganese ore, Diamonds
Guinea	Bauxite, Alumina, Gold, Diamond, Coffee, Fish, Agricultural products
Guinea-Bissau	Cashew Nuts, Shrimps, Peanuts, Palm kernel, Sawn timber
Kenya	Tea, Coffee, Horticultural products, Petroleum products
Lesotho	Clothing, Wool, Mohair, Food, Livestock
Liberia	Diamonds, Iron ore, Rubber, Timber, Coffee, Cocoa
Libya	Crude Oil, Petroleum products, Natural gas
Madagascar	Vanilla, Coffee, Sea food, Cloves, Petroleum products, Chromium, Fabrics
Malawi	Tobacco, Tea, Sugar, Cotton
Mali	Cotton, Gold, Livestock
Mauritania	Fish and Fish Products, Iron ore, Gold
Mauritius	Sugar, Clothing, Tea, Jewellery
Morocco	Minerals, Seafood products, Citrus fruits
Mozambique	Sea food , Cotton,
Namibia	Diamonds, Copper, Gold, Zinc, Lead, Uranium, Livestock
Niger	Uranium, Livestock products
Nigeria	Petroleum, Petroleum products, Cocoa, Rubber
Rwanda	Coffee, Tea, Hides, Tin ore
Sao Tome and Principe	Cocoa
Senegal	Fish, Peanuts, Petroleum products, Phosphates, Cotton
Seychelles	Fish, Cinnamon bark, Copra, Petroleum products

	(re-exports)
Sierra Leone	Diamonds, Rutile, Cocoa, Coffee, Fish
Somalia	Livestock, Bananas, Hides, Fish
South Africa	Gold, Diamonds, Metals & Minerals, Cars, Machinery
Sudan	Oil, Cotton, Sesame, Livestock & Hides, Gum arabic
Swaziland	Sugar, Wood pulp, Minerals
Tanzania	Sisal, Cloves, Coffee, Cotton, Cashew nuts, Minerals, Tobacco
Togo	Cocoa, Phosphates, Coffee, Cotton
Tunisia	Agricultural Products, Textiles, Oil
Uganda	Coffee, Fish & Fish products, Tea, Tobacco, Cotton, Corn, Beans, Sesame
Zambia	Copper, Minerals, Tobacco
Zimbabwe	Tobacco, Cotton, Agricultural products, Gold, Minerals

Source: Author´s compilation based on information obtained from various editions of country reports produced by the Economist Intelligence Unit.

While there is a big difference between Sub-Saharan Africa and other developing country regions based on the share of manufactures in total exports, a look at the share of manufacturing value-added in GDP presents a different picture.

With the exception of East Asia and the Pacific, there isn't really much difference between Sub-Saharan Africa and other developing country regions. For example, over the period 2000-2004 the average ratio of manufacturing value added to GDP was 14 percent in Sub-saharan Africa, 17 percent in Latin America and the Caribbean and 16 percent in South Asia. Furthermore, relative to the period 1980-84, there has been a significant decline in the share of manufacturing value-added in GDP in Latin America and the Caribbean. The ratio also fell in Sub-Saharan Africa but the magnitude is much less than in Latin America and the Caribbean.

Table 2: Classification of African Countries by Share of Manufactures in Total Exports

Range (%)	1985-87	2000-2002
0 - 15	Algeria, Angola, Burundi, Benin, Central African Rep., Cameroon, Congo Rep., Comoros, Gabon, Guinea, Kenya, Mozambique, Malawi, Niger, Nigeria, Rwanda, Sierra Leone, Swaziland, Seychelles, Zambia	Algeria, Angola, Burundi, Benin, Central African Republic, Congo Republic, Comoros, Cape Verde, Gabon, Guinea, Kenya, Mozambique, Niger, Nigeria, Sierra Leone, Swaziland
16 - 30	Cote d'Ivoire, Cape Verde, Madagascar, Morocco, Namibia, Senegal, Togo, Zimbabawe	Cameroon, Cote d'Ivoire , Malawi, Namibia, Senegal, Togo, Zambia, Zimbabwe
31 and above	Egypt, Mauritius, Tunisia	Egypt, Morocco, Madagascar, Mauritius, Rwanda, Seychelles, Tunisia

Source : World Development Indcators CD-ROM (2006).

Within Africa, some countries have made significant progress in the growth of manufacturing value-added since the 1990s (see table 3). For example, over the period 1991-2001, the average growth in manufacturing value-added was about 13 percent in Uganda, 9 percent in Ethiopia, 8 percent in Equatorial Guinea and Burkina Faso. In eight Sub-Saharan African countries the growth in manufacturing value-added was negative over the same period: Burundi (-5.8 percent), Comoros (-1.3 percent), Congo Republic (-1.2 percent), Congo Democratic Republic (-5.4 percent), Djibouti (-7.6 percent), Guinea Bissau (-3.5 percent), Malawi (-2.1 percent), and Mauritania (-1.1 percent).

Table 3: Manufacturing Value-added (MVA) in Sub-Saharan Africa

Country	MVA per capita (dollars)			Share of MVA in GDP %			MVA annual growth rates (%)	
	1981	1991	2001	1981	1991	2001	81-91	91-01
Angola	89	52	41	8.5	4.9	4.8	-.4	1.9
Benin	38	31	39	9.2	7.6	8.1	2.2	5.3
Botswana	103	154	192	6.2	4.9	4.8	8.7	4.5
Burkina Faso	48	46	72	16.9	14.2	18.2	2.0	7.7
Burundi	19	24	13	9.9	11.7	8.9	5.6	-5.8
Cameroon	138	147	146	11.9	14.8	14.9	2.2	2.8
Cape Verde	38	84	109	5.4	8.5	7.7	9.6	6.2
Central African R.	38	49	40	3.9	10.1	8.6	3.1	0.05
Chad	29	36	33	18.6	16.2	16.1	4.8	3.6
Comoros	12	16	15	3.5	3.8	4.1	4.1	-1.3
Congo, R.	76	102	78	6.6	8.2	8.2	5.2	-1.2
Congo,DR	38	21	7	11.9	9.4	8.6	-0.5	-5.4
Cote d'Ivoire	231	174	185	19.6	20.9	21.6	3.2	3.8
Djibouti	51	37	20	4.9	4.4	3.2	1.7	-7.6
Equatorial Guinea	8	6	11	1.4	1.3	1.3	1.9	8.3
Ethiopia	13	7	15	6.8	4.2	6.0	-0.7	9.1
Gabon	393	413	307	5.4	6.3	5.1	1.6	0.7
Gambia	14	19	15	3.9	5.5	4.4	7.2	1.2
Ghana	37	37	44	9.2	9.4	9.2	6.2	4.0
Guinea	17	21	20	3.4	4.5	3.7	5.5	2.1
Guinea Bissau	32	17	12	14.9	6.8	6.0	-5.3	-3.5
Kenya	33	37	34	9.6	10.3	10.4	5.1	1.9
Lesotho	15	41	58	5.0	10.6	12.4	13.1	5.5
Madagascar	32	26	25	11.4	11.3	10.8	2.2	2.7
Malawi	34	33	23	15.7	16.5	11.1	4.0	-2.1
Mali	17	23	23	6.1	8.6	7.5	7.1	2.6

Mauritania	52	50	36	9.2	9.7	6.2	2.4	-1.1
Mauritius	225	513	842	14.2	19.9	20.7	11.0	5.9
Namibia	207	190	216	9.2	9.9	9.7	2.7	2.9
Niger	19	20	18	4.2	6.1	6.4	4.3	3.9
Nigeria	25	22	18	6.7	5.7	4.9	1.6	1.1
Rwanda	74	60	55	17.7	15.5	15.7	1.2	5.4
Senegal	90	97	118	12.3	12.9	13.6	3.9	4.8
Seychelles	276	618	669	7.3	11.6	12.4	8.9	5.4
Sierra Leone	7	6	7	2.6	3.0	4.9	2.8	1.5
Somalia	…	…	…	…	…	…	...	
South Africa	777	618	597	20.7	20.7	19.3	0.8	1.6
St Tome & Principe	26	24	24	6.2	5.5	5.3	0.3	1.7
Sudan	98	89	112	8.9	8.7	6.6	1.3	4.5
Swaziland	110	329	362	13.6	29.6	28.8	17.9	2.9
Tanzania	18	14	13	10.9	8.5	8.0	0.7	3.3
Togo	48	48	41	8.9	10.5	10.1	3.1	3.4
Uganda	8	10	26	4.3	5.4	9.9	5.0	13.5
Zambia	56	56	59	9.5	12.4	15.0	4.5	2.3
Zimbabwe	192	146	139	22.1	20.0	19.1	3.1	0.3

Source: UNIDO (2004)

2. Alternative Theories

Several explanations have been offered for Africa's dependence on primary commodity exports. For example, the importance of geographical barriers in the determination of export structure and performance has been emphasized in recent papers (Redding and Venables, 2003; Radelet and Sachs, 1998). The idea is that transport costs are high in countries that are geographically isolated from large markets or suppliers and that this inhibits the successful development of manufacturing activities. More specifically, geographic distance or lack of proximity to key export markets can lead to lack of competitiveness and make it difficult for a country to export manufactured goods.

Another explanation for lack of diversification in Africa emphasizes the role of foreign aid (van Wijnbergen, 1985). The idea is that large aid inflows have the potential to increase the price of non-traded goods leading to a real exchange rate appreciation and loss of export competitiveness. This effect is likely to be more severe in economies with capital market imperfections and in the manufacturing sector—where there are externalities such as learning-by-doing. When there is learning by doing in a sector, productivity depends on cumulative output over time. Consequently, by appreciating the real exchange rate and reducing output in the export sector, aid leads to a loss of productivity and so has a negative effect on the development and expansion of manufacturing activities.

The third explanation for lack of diversification in Africa focuses on the role of education and natural resources. This follows the work of Wood and Mayer (2001; 1998) and the idea is that differences in export structure between Africa and other developing countries arise from differences in supplies of human and natural resources. They argue that African countries are land abundant relative to countries in Asia. In their model, abundant land raises real income and undermines competitiveness, through its adverse effect on the real exchange rate, thereby making it difficult for Africa to develop successful manufacturing export activities relative to land-scarce developing regions. Consequently, in this framework, Africa's excessive dependence on primary commodity exports is caused by low levels of education and abundant natural resources. Note that in this model land is used in a broad sense to include all sorts of natural resources—land area, oil, minerals etc.

3. Establishing Stylized Facts

In this section of the paper, we ask whether there is evidence of any co-movement between diversification and the three variables of interest, namely aid, geography and human or natural resources. Obviously, correlations do not imply causality but they do help to establish stylized facts. In general, the results reported in this section are based on a sample of 31 African countries for which we have

data on the relevant variables. However, for the correlations using measures of education and geography the sample size is less than 31 because some of the countries in the initial sample do not have data on these variables. In figure 1, we plot the share of manufactures in total exports against the share of aid in gross capital formation. The figure shows evidence of a negative relationship. That is, across countries an increase in the share of aid in gross capital formation is associated with a reduction in the share of manufactures in total exports.

Figure 1: Aid and Diversification

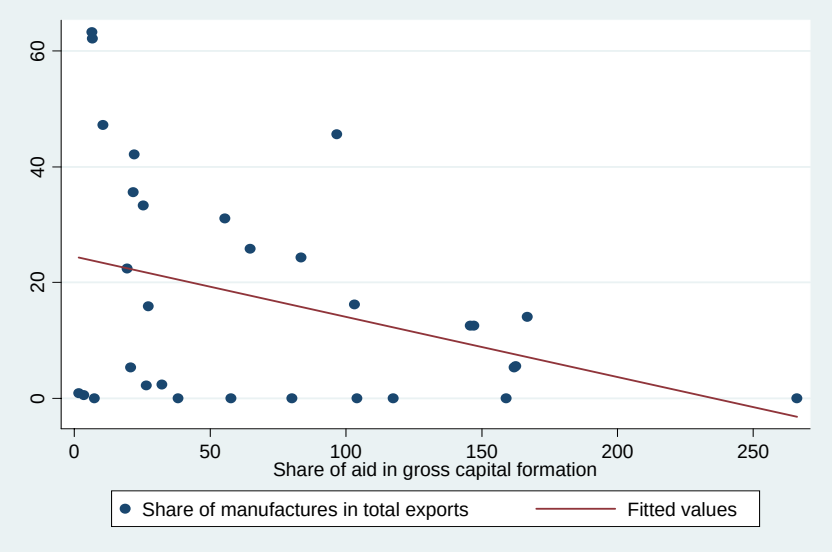


Table 4 presents the correlation between aid and the share of manufacturing in total exports. The correlation between the two variables is negative (36 percent) and is statistically significant at the 5 percent level. The results suggests that countries that depend heavily on aid should, on average, have less diversified exports than those that do not depend on aid. Note that in terms of per capita aid, the main aid recipients in Africa in 2004 were Cape Verde ($282), Sao Tome and Principe ($281), Seychelles ($124), Swaziland ($104),

and Zambia ($94) and Senegal ($92). However, in terms of the total monetary value of aid, the main recipients in the region in 2004 were Ethiopia ($1,823 million), Democratic Republic of Congo ($1,815 milllion), Tanzania ($1,746), Egypt ($1,458), and Ghana ($1,358).

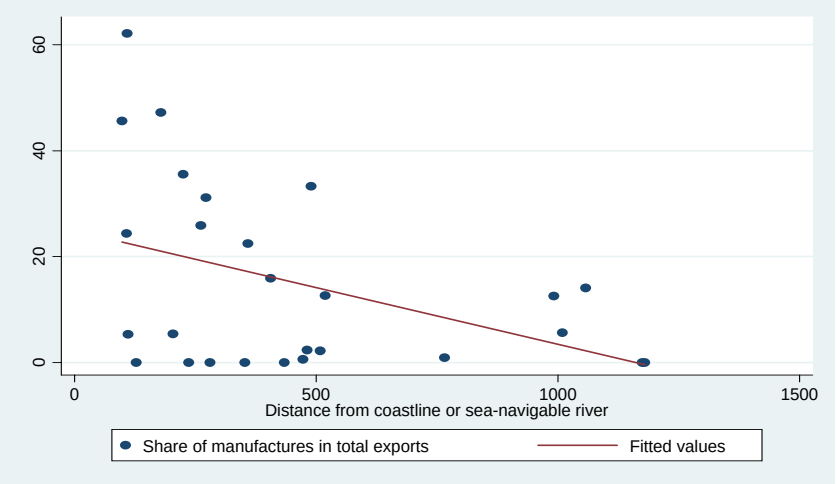
Table 4: Cross-section Correlations with Diversification

Variable		**Correlation Coefficient**	**No of countries**
Aid		-0.357 ** (0.049)	31
Education		0.253 (0.223)	25
Geography	Distcr	-0.416 ** (0.034)	27
	Troppop	-0.435 ** (0.024)	27
	Pop100cr	0.455 ** (0.017)	27
Land endowment		0.225 (0.224)	31

Regarding geography, the correlation between this variable and diversification is negative and statistically significant at conventional levels as suggested by various theories (table 4 and figure 2). In other words, there is evidence that an increase in geographic distance from markets is associated with a decrease in diversification across countries.

It is interesting to note that this result is robust to the measure of geography used in the correlation analysis. Three measures of geography were used in the analysis: the mean distance to nearest coastline or sea-navigable river (distcr); the percentage of the population in the geographical tropics (troppop); and the percentage of the total population within 100 km of ice-free coast or navigable river (pop100cr). The first two variables are expected to have a negative sign while the last variable is expected to have a positive sign and this is what we see in the correlation results.

Figure 2: Geography and Diversification



Turning to education, figure 3 suggests that there is a positive but weak correlation between the literacy rate (our proxy for education) and diversification. More specifically, the correlation coefficient between the two variables is low (25 percent) and is statistically insignificant at conventional levels (table 5). Consequently, the results suggest that there is no robust link between literacy and diversification. This may be because the literacy rate is not a very good proxy for the type of skilled labour that is assumed necessary for diversification into non-traditional exports. In our analysis, the literacy rate was used as a proxy due to data limitations.

Finally, we examined the correlation between land abundance, as measured by the share of arable to total land area, and diversification. Based on the theoretical models described earlier, there should be a negative relationship between land abundance and diversification. However, as figure 4 shows, there is no clear association between the share of arable to total land and diversification. The correlation coefficient between the two variables is positive (0.22) but is statistically insignificant at conventional levels.

Figure 3: Education and Diversification

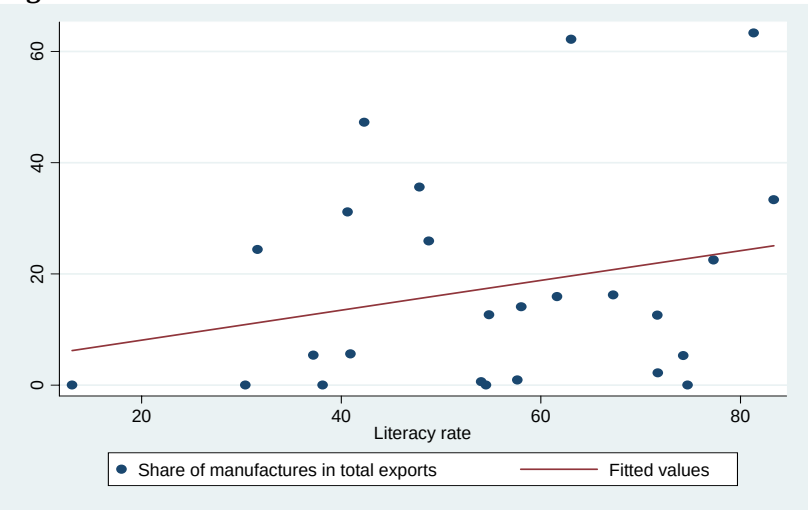
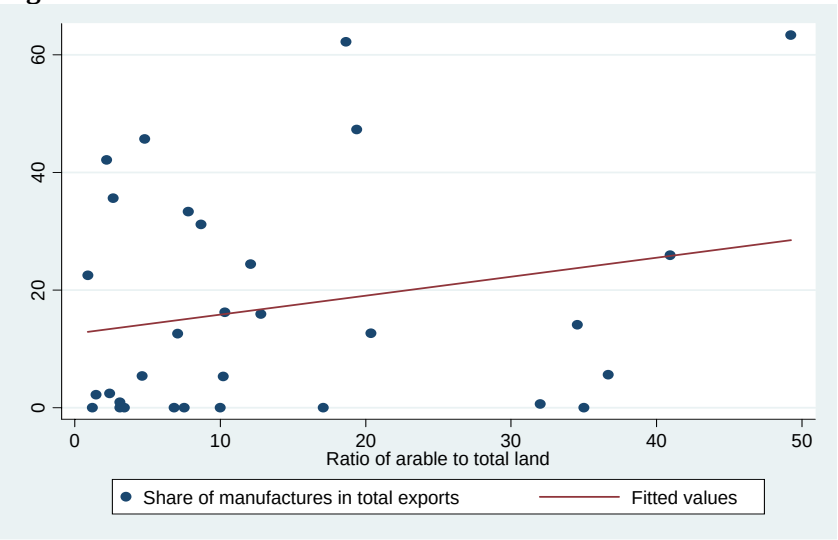


Figure 4: Land Endowment and Diversification



Since the manufacturing sector is the source of dynamic and sustained growth (UNCTAD, 2003), this part of the paper also examines the relationship between manufacturing value-added and our three key variables of interest, namely aid, geography and natural resources.

Table 5 presents the cross-section correlation between these variables. The key points that emerge from this table are as follows. First, there is no statistically significant relationship between aid flows and manufacturing value-added across countries in the sample. Second, the correlation between land endowment and manufacturing value-added is positive but statistically insignificant at conventional levels. Third, there is strong evidence of co-movement between education and manufacturing value-added. The correlation between these two variables is 43 percent and is statistically significant at 5 percent level. Finally, there is weak evidence that geography is negatively correlated with manufacturing value-added. However, this evidence is not robust because the result is sensitive to the measure of geography used. In particular, it is significant when we use the share of total population in the tropics as a measure of geography and insignificant when the other two measures are used.

Table 5: Correlations with Manufacturing Value-added

Variable		**Correlation Coefficient**	**No of countries**
Aid		-0.237 (0.199)	31
Education		0.430 ** (0.032)	25
Geography	Distcr	-0.135 (0.503)	27
	Tropical	-0.533 *** (0.004)	
	population	0.102 (0.614)	27
	Pop100cr		27
Land endowment		0.085 (0.650)	31

4. Concluding remarks

This paper shows that aid and geography, as measured by the distance from coasts or markets, are positively correlated with diversification in Africa. It finds no evidence of an association between either education or resource endowment and diversification. However, there is strong evidence of co-movement between education and manufacturing value-added. Osakwe (2007) examines the same issue using an econometric model and concludes that aid, infrastructure and resources endowments are robust determinants of diversification. It also found some evidence that institutional factors are important although it is not robust.

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