

Have Transport Costs Contributed to the Relative Decline of Sub-Saharan African Exports?

Some Preliminary Empirical Evidence

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Sub-Saharan African countries often attribute their poor export performance to foreign trade barriers, despite lack of evidence to support that view. More attention should be focused on how African countries' own policies — especially policies affecting transport — have hurt African exports.



Summary findings

From the mid-1950s to 1990, Sub-Saharan Africa's share of global exports fell from 3.1 to under 1.2 percent, a decline that implies associated export earning losses of about \$65 billion annually. Previous studies show that foreign trade barriers do not account for this poor performance. Indeed, African exports enjoy important OECD tariff preferences that provide significant competitive advantages over similar goods shipped from other countries.

In the Sub-Saharan African countries, too high a proportion of foreign exchange earnings — earnings that *should* be invested in productive capacity building — is paying for Africa's high export transport costs. Amjadi and Yeats demonstrate that relatively high transportation costs — especially for processed products — often place African exporters at a serious competitive disadvantage. Nominal freight rates on African exports are normally considerably higher than those on similar goods shipped from outside the region. Also, these charges often incorporate very high rates of effective transport

protection against Africa — a point that significantly reduces incentives for investment and the location of export-oriented industries in the region.

African countries must use a far larger share of their foreign exchange earnings to pay for international transport services than other developing countries do — and the relative importance of those payments has been increasing. In 1970, for example, net freight payments to foreign nationals absorbed 11 percent of Africa's export earnings; that ratio had increased to 15 percent by 1990. And for landlocked African countries, the freight cost ratio exceeds 30 percent, as exports must transit neighboring territories.

Why are Africa's transport costs so high? Ill-advised policies on the part of some African governments seem to have played a role, as their cargo reservation policies produced high "rents" for lines that have been shielded from the effects of competition. The failure to maintain or improve port and transport infrastructure has also played a role.

This paper — a product of the International Trade Division, International Economics Department — is part of a larger effort in the department to identify factors affecting the export earnings of developing countries and to anticipate important changes that may occur. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Sarah Lipscomb, room N5-058, telephone 202-473-3718, fax 202-522-1159, Internet address slipscomb@worldbank.org. December 1995. (37 pages)

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**Have Transport Costs Contributed to the Relative Decline of African Exports?
Some Preliminary Empirical Evidence**

by,

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Have Transport Costs Contributed to the Relative Decline of African Exports? Some Preliminary Empirical Evidence

Azita Amjadi and Alexander Yeats*

I. Introduction

From the mid-1950s to 1990 Sub-Saharan Africa's share of global exports fell from 3.1 to under 1.2 percent -- a decline that implies associated export earning losses of about \$65 billion annually. Recent investigations show protectionism in OECD markets does not account for the relatively poor export performance of Sub-Saharan African (SSA) countries. For example, Erzan and Svedberg (1989) found tariffs on the regions non-oil exports to the EEC and United States average under one-half of a percentage point, and in Japan these duties were less than 2 percent. The conclusions about the relative unimportance of external protectionism were extended by another study (Yeats 1994) showing African exports receive important OECD trade preferences under the Lomé Convention, Least Developed Country Preferences, or Generalized System of Preferences (GSP) that provide significant competitive advantages relative to similar goods shipped from many other countries. A subsequent investigation by Amjadi and Yeats (1995) also determined that few important nontariff measures are applied to African exports, although sugar, beef and clothing face some restrictions.

Although foreign (government imposed) trade barriers do not account for Africa's declining share in world trade, little or no attention has been given to the influence of other market access barriers such as international transportation costs.¹ Transport costs have an impact similar to tariffs in

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¹The neglect of transport costs may be due to a lack of information on their incidence, or to the (erroneous) assumption these charges could not be influenced by policy makers. Another reason may have been the presumption that nominal transport costs, relative to tariffs or nontariff barriers, were small. Empirical studies show these views should be re-examined. For example, two analyses of Indian and Indonesian market access barriers determined ad valorem freight costs on these countries' exports to the United States were four to five times pre-Uruguay Round tariffs (Yeats 1976, 1977). For some products groups like woven textile fabrics, textile yarn and thread, footwear, or leather manufactures nominal freight costs ranged from 20 to 30 percent. These investigations also show countries may be able to substantially reduce freight costs by adopting more efficient technologies in port and handling procedures, removing barriers to competition for transport services, or organizing shippers to make the more efficient use of liner conference services.

that they impose additional charges foreign producers must absorb to penetrate export markets, although in some situations (which generally exclude African products) they may be borne by importers (see Box 1). However, in contrast to tariffs, major differences in the incidence of freight charges on individual exporting countries can occur. General Agreement on Tariffs and Trade (GATT) provisions require tariffs be assessed on an (equal) most-favored-nation basis while international transport costs for similar goods may vary markedly across countries. Those which are geographically disadvantaged, or have pursued inappropriate national policies relating to the transport sector, may experience important adverse freight rates.² From the viewpoint of African trade policy, relevant points to consider are whether these countries' nominal freight costs are significantly different from their competitors, how have they influenced the location of manufacturing (processing) activity in Africa, and to what extent could they be altered by government policies or freight cost saving measures that individual shippers might adopt.

In spite of the attention devoted to the influence of transport costs on intra-OECD trade flows (Sampson and Yeats 1976, 1977), or on the exports of developing countries in Asia and Latin America (Brodsky and Sampson 1979, Yeats 1976, 1977), no similar analyses has been conducted for sub-Saharan Africa. This study undertakes such an investigation. The objective is to determine whether relative differences in freight costs between Africa and other countries contributed to the former's relatively poor export performance over the last two or three decades, and what influence these costs currently have on

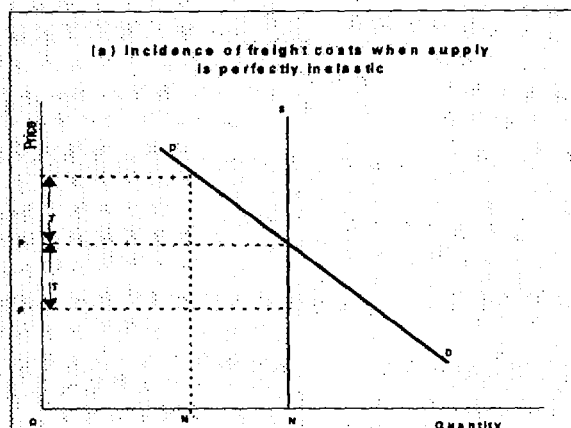
²An interactive effect between tariffs and freight costs may further worsen the competitive position of an exporters facing above average freight rates. Most countries apply tariffs on the cost-insurance-freight (c.i.f.) value of imports (the United States and Canada are important exceptions) so exporting countries which have higher freight costs will, *ceteris paribus*, pay higher import tariffs. Stated differently, if African exports generally experience adverse freight rate differentials their competitive position would be further eroded by c.i.f. tariffs.

Box 1

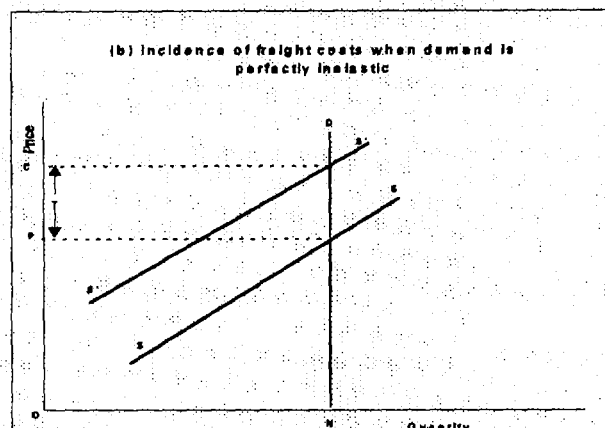
The Incidence of International Transport Costs on Exporters and Importers.

While transport costs are formally paid by exporters when goods are sold on a c.i.f. basis, and by the importer when purchases are f.o.b., the party paying the freight bill does not necessarily bear the transport cost. In practice, the exporter can be regarded as bearing freight costs if the delivered price in the importing market is not affected by changes in transport costs. Conversely, the importer bears the cost of transport if the commodities price in the export market remains the same irrespective of changes in shipping costs.

panel (a)



panel (b)



Factors that determine the incidence of transport costs are illustrated in panel a (above) which depicts a situation in which the delivered price schedule (SS) for an export is inelastic with respect to price. In the absence of freight costs, quantity ON would be consumed in the importing market at price OP. Assuming that shipping costs of T per unit are introduced they would not influence the market clearing price. Any attempt by exporters to add these charges to prices, necessitating an increase from OP to OC, would be frustrated by a shortfall of demand relative to supply. Excess supply would force the market clearing price back to OP where the f.o.b. price received by exporters is OP'. Thus, in a situation where supply is perfectly inelastic exporters bear the entire burden of freight costs.

Panel b illustrates a situation where an inelastic demand curve for an export combines with a less than perfectly inelastic supply schedule. In the absence of freight costs, quantity ON clears the market at price OP. However, if freight costs of T per unit are introduced, supply shifts leftward by an amount equal to the transport charge. Thus, SS represents the f.o.b. supply curve, while S'S' is the c.i.f. schedule. The market clears at the same quantity (ON), but at a higher price (OC) born by importers. Therefore, when demand is perfectly inelastic the supply schedule does not influence who bears freight costs -- importers bear the full brunt of transport costs, or any changes in these charges.

In practice, completely inelastic demand or supply schedules are seldom observed -- these limiting situations are employed to indicate tendencies for freight costs to fall on exporters or importers. Normally, the incidence of transport costs on buyers or sellers is determined by respective elasticities of demand or supply. When supply is relatively inelastic (a likely normal situation for many African products in the short run) the exporter bears the major part of the freight bill, and the price he receives falls below the "zero transport cost" price roughly by approximately the full extent of shipping costs.

With a less than perfectly inelastic supply, any reduction in the elasticity of demand shifts some of the transport burden to the importer. When demand and supply schedules have equal elasticities, shipping costs are shared equally by buyers and sellers. As demand grows progressively less elastic, the share of freight costs born by importers rises, with the elasticity of demand determining the extent to which quantity exchanged falls below that traded in the absence of freight charges. A key point to note is that the African countries are generally small suppliers in world trade so the demand for their products should be quite elastic. As the above figures show, this suggests that the incidence of transport costs (or changes in these costs) will fall most heavily on African exporters.

the location of industrial activity in Africa.³ This investigation also attempts to determine whether the *structure* of freight costs on African exports has influenced on the composition of goods shipped, i.e., are these charges biased (say) against processed goods in favor of primary commodities?

The paper proceeds as follows. First, balance-of-payments statistics for African and other developing countries are compared to determine if the former utilize a significantly higher share of their foreign exchange earnings as payments for international transport services -- and not for productive capacity building investment. Trends in the African payments ratios are also examined to determine if the situation is, or is not, improving. Next, nominal air and vessel freight costs for African exports are compared with similar charges on competing goods shipped from outside the region. The objective here is to determine whether freight costs generally place African exports at a competitive disadvantage, whether the cost differences vary across product groups, and whether the cost differences are smaller for air as opposed to vessel transport. Nominal transport costs are also converted into effective rates of protection in order to analyze their influence on the location of processing (manufacturing) industries in Africa. Finally, the paper provides several possible explanations as to why abnormalities in Africa's transport cost profile occur, and also discusses various policy options African governments might utilize for reducing international freight costs.

³Over twenty-five years ago Little, Scitovsky and Scott (1970, p. 310) suggested capital intensive transport technologies (such as containerization) could place some developing countries at an important cost disadvantage. They noted "because competitive pressures in developed countries are stronger, containers, and possibly other innovations in transportation, will be introduced there first, and will not spread to developing countries' trade for a long time. This might be accompanied by a fundamental change in the whole system of rate fixing, since it would seem rational to base the charge on the container rather than on its contents. The result might be a big reduction in freight on exports of manufactures between developed countries, putting exports from developing countries at a severe disadvantage. There are already appreciable economies of scale in shipping, and these may be increased by the introduction of containers. Small volumes of traffic coming from small ports cost more to handle than big volumes from big ports."

II. Transport Costs and African Balance of Payments

One way to analyze the importance of transport costs from an African prospective is to examine net freight and insurance payments within the context of national balance-of-payments (BOP) statistics. The relative importance of these payments can be assessed by expressing their ratio to some relevant numeraire -- such as a foreign trade variable. Table 1, for example, shows net freight payments as a share of total exports of 30 sub-Saharan African countries for which BOP data were available in 1970, 1980 and 1990 or 1991 (whichever was the latest year available). The export statistics serve as a crude gross measure of foreign exchange availability (aid donations may also be of major importance for these countries) while the freight cost data reflect net foreign exchange payments (i.e., payments to foreign suppliers of these services less any similar payments received) for international shipping services. To contrast the African situation with other countries, similar statistics are shown for all developing countries as a group, and, separately, for those in Asia and the Americas.

Before proceeding several points should be made concerning these comparisons. First, trends in the freight payments ratio have direct policy relevance for Africa since many countries in the region adopted (anti-competitive) cargo reservation policies to stimulate the development of national fleets and also to preserve foreign exchange (see Box 2 for details and Iheduru for an incisive analysis of these policies). Analyses of changes in this ratio can provide useful insights into how well the policy objective relating to foreign exchange savings is being achieved. Second, it is also recognized that differences in individual country's payments ratios may reflect a variety of factors including differences in the types of goods exported, the country's geographic location, whether or not it is land-locked, or whether it does, or does not have, a comparative advantage in shipping. However, studies conducted by the World Bank (see Bennathan *et. al.*, 1989) indicate that factors such as national policies which severely restrict competition for transport services have a major influence on the level of freight rates. If the African payment ratios differ significantly from those of other developing countries this would indicate more

Table 1. Sub-Saharan African Countries' Payments for Transport and Insurance as a Percentage of the Total Value of Exports, 1970, 1980 and 1990/91.

Country	Exports of Goods (\$million)			Net Freight & Insurance Payments (\$million)			Net Freight Deficit as a Percentage of Exports (%)		
	1970	1980	1990/91	1970	1980	1990/91	1970	1980	1990/91
ALL SUB-SAHARAN AFRICA ¹	4,940.4	17,788.1	25,778.6	-541.2	-2,676.3	-3,890.7	11.0	15.0	15.1
of which:									
Benin	58.0	164.0	291.4	-3.7	-40.9	-72.7	6.3	24.9	25.0
Burkina Faso	24.6	160.6	283.2	-9.6	-78.0	-108.1	39.0	48.6	38.1
Cameroon	218.7	1,657.5	1,841.2	-39.9	-101.1	-10.8	18.2	6.1	0.6
Central African Rep.	43.4	147.2	150.5	-10.6	-55.9	-71.7	24.4	38.0	47.6
Chad	39.8	70.9	193.9	-13.8	-1.7	-117.4	34.7	2.4	60.5
Congo	122.2	910.5	1,135.7	-2.9	-74.6	-107.1	2.4	8.2	9.4
Cote d'Ivoire	497.1	3,012.7	2,803.9	-23.7	-353.1	-207.4	4.8	11.7	7.4
Ethiopia	122.3	419.1	301.7	-25.9	-102.4	-166.0	21.2	24.4	55.0
Gabon	173.7	2,084.4	2,272.9	-18.9	-135.7	-154.5	10.9	6.5	6.8
Gambia	17.8	48.3	110.6	-1.0	-23.2	-23.4	5.6	48.0	21.1
Ghana	427.0	1,103.6	890.6	-30.6	-50.5	-94.0	7.2	4.6	10.6
Kenya	285.5	1,261.4	1,053.7	-24.8	-268.4	-225.7	8.7	21.3	21.4
Liberia	394.4	600.4	374.9	-40.8	-72.8	-41.2	10.3	12.1	11.0
Madagascar	145.0	436.0	344.0	-22.0	-154.9	-49.0	15.2	35.5	14.2
Malawi	58.9	280.7	297.0	-9.9	-129.0	-166.9	16.8	46.0	56.2
Mali	32.9	205.0	354.5	-9.1	-126.2	-186.6	27.7	61.5	52.6
Mauritania	97.2	196.3	447.9	-11.7	-39.8	-31.4	12.0	20.3	7.0
Mauritius	69.8	433.7	1,194.5	-7.2	-88.2	-131.9	10.3	20.3	11.0
Mozambique	na	280.7	162.3	na	12.5	-29.7	na	*	18.3
Niger	46.7	576.1	283.9	-13.1	-106.8	-58.7	28.1	18.5	20.7
Nigeria	1,248.0	25,934.3	12,254.0	-84.0	-722.3	-1,024.0	6.7	2.8	8.3
Senegal	158.7	421.7	903.2	-19.5	-110.0	-151.0	12.3	26.1	18.8
Sierra Leone	100.0	213.5	139.5	-10.5	-39.9	-21.9	10.5	18.7	15.6
Somalia	31.1	133.3	67.7	-5.7	-57.1	-51.7	3.2	42.8	75.5
Tanzania, Rep. of	245.9	582.7	407.8	-27.2	-162.8	-165.5	11.1	27.9	40.6
Togo	68.0	475.8	511.9	-7.5	-87.8	-68.8	11.0	18.5	13.4
Uganda	261.6	319.1	169.6	-26.6	-54.7	-120.6	10.2	17.1	71.1
Zaire	800.0	2,268.6	2,138.0	-90.0	-283.7	-292.0	11.3	12.5	13.7
Zambia	942.0	1,456.4	1,340.0	-84.0	-201.7	-161.0	8.9	13.8	12.0
Zimbabwe	na	1,445.5	1,664.9	na	-61.0	-102.6	na	4.2	6.2
ALL DEVELOPING COUNTRIES	54,985	554,563	787,352	-4,307	-34,311	-46,016	7.8	6.2	5.8
Developing Asia	23,399	341,367	557,921	-1,952	-20,746	-92	8.3	6.1	--
Developing Americas	16,537	105,780	133,791	-1,198	-5,146	-6,547	7.2	4.9	4.9

¹Totals exclude the oil exporting countries, namely, Angola, Congo, Gabon and Nigeria. If 1990/91 data are not available the latest annual statistics are shown.

*Mozambique had a surplus on the freight and insurance account in 1980.

Source: UNCTAD, *Handbook of International Trade and Development Statistics*, (New York: United Nations, various issues).

attention and analyses should be given to the cause of the differences including anti-competitive African cargo reservation schemes.

Overall, sub-Saharan Africa's net freight and insurance payments were about \$3.9 billion in 1990/91 -- a figure which represents approximately 15 percent of total value of the region's exports. However, the individual country's statistics reflect a wide degree of variation around this average. Net transport and insurance payments average more than 25 percent of total exports for 10 of the 30 countries, with the ratio exceeding 70 percent for Somalia and Uganda. While net freight payments were expected to be higher for the landlocked African countries, whose trade must transit neighboring territories and, therefore, incur additional foreign exchange costs, the size of the margins reflected in Table 1 are surprising. The 1990 net payments averaged 42 percent for the 10 landlocked African countries (namely, Burkina Faso, Central African Republic, Chad, Ethiopia, Malawi, Mali, Niger, Uganda, Zambia and Zimbabwe) which is almost 25 percentage points higher than the (unweighted) average (17.5 percent) for other African countries.

Table 1 strongly suggests Africa's situation regarding international transport costs differs from that of most other developing countries in two important respects. First, the African ratio of net freight costs to total exports is much higher. For all developing countries as a group these payments average 5.8 percent, a figure which represents about one-third the corresponding African ratio.⁴ Second, the trend for Africa is different from that of other developing countries. For developing countries in Asia the transport ratio fell from over 8 percent in 1970, to the point where these charges and receipts are almost in balance. Transport and insurance payments also declined in importance for all developing countries as a group. In contrast, at 15 percent Africa's net payments ratio is now four percentage points higher

⁴Balance of payments statistics for the Republic of South Africa (not shown in Table 1) reveal a different pattern from that of the sub-Saharan African developing countries. The ratio of South Africa's net freight payments to exports (4.3 percent) is less than one-third the latter's average. Also, the ratio is currently about half what it was (8.2 percent) in the early 1970s.

than it was in the early 1970s. Thus, in terms of their level and trend the importance of Africa's transport payments problems are considerably different from other developing countries. An important question is what factors are responsible for Africa's special situation.

III. The Evidence from National Customs Statistics

Aside from BOP information, data compiled by some national customs services provide another perspective on the importance and incidence of African transport costs. Since 1974 the United States has tabulated imports, by-product-by-country, on a joint free-alongside-ship and cost-insurance-freight (c.i.f.) basis. The f.a.s. valuation includes the purchase price of the product plus all charges incurred in placing merchandise along the vessel at the port of exportation.⁵ In contrast, the c.i.f. valuation measures the value of imports at the port of entry in the United States and includes all freight, insurance, and other charges (excluding import duties) incurred in bringing the merchandise from the port of exportation and placing it alongside the carrier.⁶ Since this detailed freight cost information is available for almost two decades it can be used to determine how African freight rates compare with those for other countries,

⁵An important limitation of these data is that they do not reflect the cost of inland transportation -- which may be very high for some African countries -- or port charges. The importance of the latter should not be underestimated. For example, World Bank data compiled by Tyler Biggs show port charges for clearing a 20 foot container in Abidjan (Cote d'Ivoire) and Dakar (Senegal) were \$1,100 and \$910 respectively. In contrast, the ocean freight cost for shipping the container to the Hamburg/Le Havre ranged between \$1,350 to \$1,430.

⁶The c.i.f. to f.a.s. ratio can be used to measure nominal international transport and insurance charges for exports of product i from country j (F_{ij}) from:

$$(1) \quad f_{ij} = (V_{c,ij} - V_{f,ij}) \div V_{f,ij} \\ = (V_{c,ij} \div V_{f,ij}) - 1$$

where $V_{c,ij}$ represents the c.i.f. and $V_{f,ij}$ is the f.a.s. value of exports of tariff line level product i from country j to the United States. The measure understates the true importance of transportation costs for land-locked African countries. Since the f.a.s. value is measured alongside the ship at the exporting country it excludes costs incurred by a land-locked country in transiting its neighbors.

and how these charges have changed over time.⁷

Several points should be noted regarding the available transport cost data. First, although the United States ranks below OECD Europe as a destination for Sub-Saharan countries exports, this trade exceeded \$10.8 billion in 1993 which places it ahead of any other market. For some countries like Angola, Congo, Liberia, Nigeria, Sierra Leone, and Zaire over one-fifth of total exports went to North America. Second, although U.S. imports are concentrated in fuels, foods, and raw materials, some labor intensive manufactured goods were of sufficient importance that freight costs can be analyzed for these products. As such, the United States transport cost information should provide a useful "base" for assessing the importance of the comparative level and changes in African freight costs.

Table 2 provides summary statistics on 1993 tariffs and transport costs for African exports to the United States. In the interest of brevity the data are compiled for specific regional-income level country groups employed by the World Bank (i.e., low income East and Southern Africa, middle income West Africa, etc.) and for the largest African exporters in each group. Given the Republic of South Africa's level of industrialization, which could allow it to utilize more sophisticated and cost efficient transport technologies, similar statistics are also provided for this country's exports. The table also shows nominal freight rates facing all other countries (with the exception of Mexico and Canada) exporting the same underlying tariff line level products.⁸ These data are included to help determine whether African

⁷United States import statistics tabulate the f.a.s. and c.i.f. values of goods imported by air and ocean vessel separately so nominal freight rates for both these modes of transport can be estimated. A further point is that equation (1) likely will not reflect port costs as it primarily measures "at sea" charges. Several related studies suggest that port costs and port problems in many African and other developing countries often are of key importance for exporters (see Hans Jurgen Peters (1989)).

⁸The very disaggregate level of these comparisons is reflected in the fact that United States customs schedules differentiate between some 8,500 individual tariff line level products. The reader should note the data in Table 2 are trade weighted averages based on African exports. Canada and Mexico are not included in the "other countries" group since their exports may pass directly into the United States through common border crossings and not incur international transport costs. Similarly, other sub-Saharan African countries are excluded from the "competitors" group since the objective was to determine whether African freight costs differ from those of exporters outside the region.

Table 2. African Transport Costs for Exports to the United States Compared with Competing Nations.

African Group and Major Supplier(s)*	Value of Exports (\$ millions)	Average Tariff (%)	Average Nominal Freight Rate (%)	
			African Group	Other Countries
ALL SUB-SAHARAN AFRICA	1,737.6	0.5	8.7	7.2
Low Income East and Southern Africa	778.9	1.1	6.8	5.3
Kenya	92.3	0.6	8.8	6.5
Malawi	84.2	11.1	10.0	5.4
Zaire	240.7	0.5	5.4	4.9
Zimbabwe	142.3	3.2	9.2	6.0
Low Income West Africa	418.7	0.3	11.4	10.0
Benin	15.7	0.7	7.5	7.2
Ghana	208.5	0.0	4.7	4.4
Guinea	113.0	0.0	25.2	22.0
Middle Income East and Southern Africa	253.1	12.8	6.7	5.6
Mauritius	196.4	14.4	7.1	5.8
Middle Income West Africa	287.0	0.6	11.3	9.9
Cameroon	101.2	0.8	9.7	8.5
Senegal	7.5	2.6	12.1	7.4
Oil Exporting Countries	8,833.1	0.7	6.4	7.6
Nigeria	5,309.5	0.7	5.8	7.6
Republic of South Africa	1,851.0	1.6	4.5	4.3

*The country group definitions are as follows:

(i). The all sub-saharan group includes all countries listed below except the oil exporting countries (Angola, Congo, Gabon and Nigeria) and the Republic of South Africa.

(ii). Low income East and Southern Africa includes: Burundi, Comoros, Eritrea, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Rwanda, Somalia, Sudan, Tanzania, Uganda, Zaire, Zambia, Zimbabwe.

(iii). Low income West Africa includes: Benin, Burkina Faso, Central African Republic, Chad, Equatorial Guinea, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Sao Tome and Principe, Sierra Leone and Togo.

(iv). Middle income East and South Africa includes: Djibouti, Namibia, Swaziland, Botswana, Mauritius, Mayote, Reunion, and the Seychelles.

(v). Middle income West Africa includes: Cameroon, Cape Verde, Cote d'Ivoire and Senegal.

(vi). The oil exporting countries include: Angola, Congo, Gabon and Nigeria.

Source: Nominal transport costs computed from United States Department of the Census trade tapes. Pre-Uruguay Round tariff averages are from Erzan and Svedberg (1989).

countries' transport cost profiles are substantially different from their competitors.

The key points reflected in Table 2 are as follows. First, average ad valorem transport costs for all sub-Saharan countries exports (about 8.7 percent) are more than 8 points higher than the average tariff on these goods (0.5 percent).⁹ Freight costs are, therefore, a far more restrictive barrier to African exports than tariffs, a point that should direct increased attention to transport cost saving measures. Second, a high degree of variation exists in the incidence of transport costs across the African countries which, at least in part, are influenced by differences in the goods exported. Nominal freight rates for Guinea average about 25 percent, largely due to a high concentration of exports (over 80 percent) in unprocessed aluminum ores, a bulky relatively low value product. In contrast, Ghana's relatively low freight rate (under 5 percent) reflects the high share of diamonds (about 35 percent) in this country's total exports. Seemingly, very different values and stowage factors for the goods being exported explain some of the cross-country variation in African freight costs.

A third point reflected in Table 2 is that average nominal freight rates for African exports are consistently higher, with the exception of the oil exporters, than those on similar goods shipped from other countries.¹⁰ For all sub-Saharan countries combined, ad valorem freight costs are about 20 percent higher on average. However, these aggregate figures conceal the true importance of adverse freight rates

⁹The sub-Saharan totals reported here, and in the subsequent tables, exclude the African oil exporting countries (Angola, Congo, Gabon and Nigeria) since their relative importance in global energy trade may have led to the development of transport systems and infra-structure that was significantly different from other African countries. A second point is that some of the tariff averages reported in Table 2 warrant explanation. The 11.6 percent duty on Malawi's exports is due to the fact that over 55 percent of exports consist of stemmed tobacco which has a 14.4 percent import tariff. Similarly, tobacco and various clothing products (which do not receive GSP preferences in the United States) account for the 12.2 percent average shown for Zimbabwe. The high concentration of Mauritius' exports in textiles and clothing accounts for the 16.2 percent tariff average.

¹⁰The reversal is due to the fact that Africa (particularly Nigeria) exports a light high quality crude to the United States which generally commands a price premium over crude petroleum shipped from other regions. For example, the U.S. Department of Energy (1995, p. 112) estimates that in 1993 the average price per barrel of Nigerian crude was \$17.79 as opposed to an average price of \$14.78 for all OPEC shipments. As a result of this African price premium the nominal freight rate (i.e., actual freight charges as a percentage of product price) is lower than average.

on specific products due to the overall importance of gemstones, gold and other precious metals in African exports. Freight is typically a very small share of these high value, easily transportable products, so wide variations in their nominal transport costs will not occur. Also, many products like coffee, cocoa, petroleum and metal ores can be transported by bulk carriers, tankers, or tramp shipping as opposed to liners. This study will later argue that government policies relating to the liner trades plays an important role behind Africa's adverse freight costs.

A. The Magnitude of Cross-Product Variation in Freight Costs

An important question concerns the magnitude of the variance in African transport costs across products -- particularly manufactured goods. If sectors exist where the nominal freight costs are low, or the adverse African margin narrows (or is even reversed), their identification may be helpful for "flagging" potentially promising areas for investment and promotion of future export ventures. A related question is whether the adverse African transport cost differentials generally extends to different types of *carriers*. Since the United States data distinguish between air and vessel shipments African freight rates for each mode of transport can be analyzed separately (air freight currently accounts for about 25 percent of all United States imports in terms of value). This is a potentially important consideration, particularly for the land-locked African countries. If air freight is commercially feasible for some products this could allow them to avoid costly land transport across their neighbors territories.

Table 3 addresses this point by showing the value of exports along with sub-Saharan African air and vessel freight rates for each two-digit Harmonized System (HS) product groups. In addition, the average African freight rate margin is shown along with the value of exports utilizing each mode of transport. Over 20 percent of African exports (by value) enter the United States by air with the balance shipped by vessel. However, for almost one-quarter of the two-digit product groups the share of sub-

Table 3. Air and Vessel Rates for Sub-Saharan African Countries Major Export Products to the United States

HS Code	Description	Exports (\$000)		Exports by Air		Exports by Vessel		All Exports	
		Air	Vessel	Freight Rate	African Margin	Freight Rate	African Margin	Freight Rate	African Margin
01	Live animals	4,538.6	0.0	20.2	3.1	.	.	20.2	3.5
03	Fresh or frozen fish	618.5	9,082.9	42.9	3.0	9.1	-1.6	11.2	-0.4
04	Dairy products and eggs	6,369.5	382.7	2.9	-1.5	7.3	1.0	3.1	-1.4
05	Animal parts and skins	246.4	66.9	5.8	-4.2	13.8	-1.6	7.5	-5.3
06	Live trees and plants	572.0	295.0	40.9	16.9	27.1	7.5	36.2	13.7
07	Edible vegetables and roots	47.3	749.1	92.6	41.4	30.3	7.5	31.9	7.3
08	Fresh or dried nuts and fruits	0.0	11,363.9	.	.	5.1	1.2	5.1	0.3
09	Coffee, tea and spices	1,702.7	100,012.9	3.2	-4.2	7.9	1.7	7.2	0.7
11	Products of milling industry	0.0	116.1	.	.	19.3	5.0	18.4	-3.7
12	Oil seeds and nuts	1,310.3	929.9	1.8	0.0	25.2	15.6	11.5	7.0
13	Raw vegetable suited for dyeing	16,391.3	11,186.9	2.5	-1.9	5.6	0.3	3.7	-1.2
14	Vegetable products	0.0	864.6	.	.	24.4	10.5	24.4	10.7
15	Animal and vegetable oils	0.0	603.9	.	.	9.8	1.0	9.9	0.4
16	Preserved foods	6.4	5,180.5	11.7	.	3.8	-2.4	3.8	-2.4
17	Sugars and sugar confectionery	0.0	27,010.7	.	.	12.4	2.0	12.4	2.3
18	Cocoa beans and chocolate	0.0	165,099.0	.	.	11.7	-0.8	11.7	-0.8
20	Preparation of vegetables	0.0	1,887.5	.	.	6.2	0.8	6.1	0.6
21	Miscellaneous prepared foods	0.0	845.6	.	.	6.3	2.4	6.3	0.1
22	Beverages	1.4	708.3	91.5	90.7	21.5	9.1	17.1	6.2
23	Animal feeds	0.0	2,966.5	.	.	56.1	20.9	56.1	20.9
24	Manufactured tobacco	9.4	88,003.3	50.2	0.0	14.5	8.5	11.2	5.8
25	Sulphur and related compounds	56.6	3,469.0	19.6	-1.8	20.2	5.7	19.7	4.8
26	Ores and concentrates	0.0	135,128.3	.	.	24.9	3.0	24.9	3.5
27	Mineral fuels and oils	0.0	293,483.0	.	.	9.5	1.3	9.5	1.2
28	Inorganic chemicals	1.6	10,584.0	10.8	6.7	5.1	1.2	4.1	0.7
29	Organic chemicals	1,390.0	192.0	1.1	-0.1	46.1	39.5	6.6	4.5
30	Pharmaceutical products	29.9	33.2	5.1	1.9	2.8	-6.4	5.1	3.4
31	Fertilizers	0.0	487.8	.	.	29.2	10.6	28.4	9.9
32	Tanning and dyeing extracts	113.9	221.8	30.2	28.7	13.4	8.4	16.4	12.1
33	Essential oils and resinoids	352.9	1,169.9	9.3	5.1	5.5	1.9	6.4	2.9
34	Soap and washing preparations	22.9	43.7	15.4	-3.8	7.0	-1.3	9.9	1.5
35	Glues and substances	620.5	336.2	5.4	-0.3	2.6	-0.8	4.4	-1.1
38	Miscellaneous chemicals	68.5	331.8	3.9	0.3	3.3	-2.3	3.4	-1.9
39	Artificial resins and plastics	35.0	603.2	6.7	-6.8	8.1	-0.7	7.6	-1.8
40	Natural and synthetic rubber	21.0	10,933.2	4.6	-6.2	11.0	0.7	10.9	0.6
41	Hides, skins and leather	1,897.3	7,384.4	5.3	-0.5	2.0	-1.5	2.6	-1.9
42	Articles of leather	457.4	726.9	12.7	0.8	3.5	-0.7	6.8	1.0
43	Furskins and artificial fur	371.7	72.1	9.4	3.7	10.1	6.0	10.1	4.4
44	Wood and wood articles	668.4	10,546.5	38.6	14.4	19.1	4.6	19.8	5.5
46	Manufactures of plaiting	212.1	342.5	47.0	10.3	22.5	0.5	31.9	9.9
48	Paper and paperboard	90.7	144.2	9.3	-11.9	11.5	3.2	10.6	2.4

49	Printed books and newspapers	75.6	138.3	23.3	13.7	8.2	4.3	12.5	8.0
50	Silk and waste silk	169.8	0.0	2.2	-1.7			2.2	-1.3
52	Fabrics of cotton	3,492.4	9,790.9	25.3	15.2	7.5	2.1	12.2	6.6
54	Flax and ramie	7.7	261.7	6.1	-4.8	4.2	0.3	4.2	-0.9
55	Cotton	73.9	329.1	33.3	27.8	5.2	1.2	10.4	5.8
56	Discontinuous man-made fibers	1.1	2,686.6	10.1	-58.3	19.2	10.1	18.5	9.3
57	Other textile materials	62.6	22.2	25.5	11.2	3.0	-1.2	17.1	9.8
61	Articles of apparel and clothing	3,926.9	78,761.1	16.3	5.2	5.7	2.1	6.2	0.6
62	Other textile articles	32,214.4	154,885.3	19.8	4.7	5.0	1.3	7.5	1.8
63	Old clothing and other textiles	161.8	1,375.8	46.9	30.9	4.7	0.5	9.1	4.0
64	Footwear	263.3	2,834.1	15.9	0.0	3.2	-0.7	4.3	-0.6
65	Headgear and parts	440.5	369.5	10.7	-2.0	6.8	-0.5	8.8	-1.3
66	Accessories like umbrellas	0.0	55.2			7.1	-0.7	7.1	-0.5
67	Skins of birds for wigs or beards	27.6	982.1	10.7	2.8	4.1	-2.1	4.3	-1.8
68	Articles of stone or plaster	247.1	1,679.6	45.8	29.9	13.4	0.5	17.5	5.1
69	Ceramic products	64.2	571.8	28.6	15.3	16.3	7.4	17.1	8.1
70	Glass and glassware	37.7	2,568.8	34.6	27.6	7.4	1.9	7.7	1.5
71	Pearls and precious stones	219,152.2	648.2	0.5	0.3	6.3	0.2	0.5	0.3
72	Ferrous products	0.0	23,137.7			4.5	-5.8	4.5	-5.8
73	Iron and steel	20.7	548.8	11.5	-10.7	7.2	0.5	7.3	-0.2
74	Copper and articles	128.9	30,000.9	14.2	2.7	3.9	1.3	4.0	1.0
75	Nickel and articles	0.0	8,489.4			3.1	1.1	2.9	0.9
76	Aluminum and articles	0.0	791.5			4.7	0.2	5.3	0.5
78	Lead and articles	0.0	447.6			8.1	2.4	8.1	-0.3
79	Zinc and articles	0.0	988.1			0.2	-5.1	0.2	-4.6
81	Other base metal products	71.4	45,864.5	14.0	11.0	0.8	0.1	0.6	-0.1
82	Tools and cutlery	25.7	166.6	4.2	-2.6	4.6	0.5	4.5	-0.1
83	Articles of base metal	192.1	285.1	26.5	12.6	13.1	6.4	17.4	11.0
84	Boilers and machinery appliances	3,348.8	1,029.9	2.5	-0.2	3.2	0.3	2.4	0.1
85	Electrical machinery	4,490.2	3,104.2	3.2	0.5	2.2	0.2	2.4	-0.7
87	Vehicles other than railways	3.6	1,060.8	14.1	-8.5	1.9	-2.1	1.8	-2.7
90	Scientific instruments	5,877.8	437.8	6.0	-0.2	1.1	-1.1	5.6	1.8
91	Clocks and watches	85.3	7.1	4.2	-5.2	23.7	15.4	6.6	3.0
92	Musical instruments	25.6	151.5	42.1	26.1	17.4	12.9	20.2	15.1
94	Furniture and parts	50.5	2,555.0	87.4	70.9	8.5	-1.2	10.8	1.0
95	Toys and games	520.1	912.9	11.0	-14.3	8.4	1.1	9.3	1.7
96	Miscellaneous manufactures	302.4	921.2	18.2	6.3	3.4	-0.6	7.0	1.6
97	Works of art	2,737.3	129.3	8.3	7.1	5.3	3.7	7.7	6.3
98	Special classification	16,119.8	5,909.0	3.7	2.6	8.5	5.3	3.8	2.4

Saharan exports by air actually equals or exceeds 50 percent. As might be expected these groups are composed mostly of high value non-bulky products i.e., scientific instruments, clocks and watches, pearls and precious stones, etc. Similar information on air-vessel shipments and cross-product transport costs for each of the regional African country groups is provided in the appendix tables.

The statistics in Table 3 show nominal freight rates pose an important barrier to African efforts to expand exports -- particularly for some manufactures where opportunities for increasing the value added content of traded goods may be most promising. For approximately one-quarter of the products listed African nominal freight rates exceed 15 percent, and for 10 product groups rates of over 20 percent occur. To put the importance of these figures in perspective, the average post-Uruguay Round tariff on United States imports from all sources is under 4 percent. In short, transports costs place African producers at a far greater competitive disadvantage *vis-a-vis* US producers than do tariffs. However, these nominal rates may understate the true importance of transport costs since they do not indicate their influence on African producers value added in export oriented production ventures. As a result of such high freight costs African producers may have to reduce payments to factors of production to such an extent that otherwise promising export the ventures are not viable (see the following section for more discussion of this point).

Table 4 provides another perspective on the profile of transport costs facing all sub-Saharan countries' exports as well as similar statistics for each regional group. Each groups nominal air and vessel freight rates were ranked in ascending order and the quartile values were computed along with these charges range. In addition, each groups median transport cost margin relative to competitors (positive values indicate an African disadvantage) is shown along with the margins range. Overall, the statistics in Table 4 confirm that Africa generally is at an important transport cost disadvantage relative to its competitors. For example, the median vessel nominal freight rate for "middle income West Africa" (10 percent) is approximately 2 percentage points above that paid by competitors. To put this

Table 4. Statistical Indices Relating to the Level, Distribution and Range in Regional African Countries' Exports to the United States in 1993.

African Region	Transport Mode	Nominal Freight Rate Level Distribution				African Margin (percentage points)	
		Quartile Values			Range	Median	Range
		First	Median	Third			
All Sub-Saharan Africa	Air	5.3	14.1	26.5	0.5 to 87.4	3.5	-13.9 to 71.2
	Vessel	4.6	7.5	13.8	0.2 to 56.1	1.1	-5.8 to 39.9
Low Income East and Southern Africa	Air	3.7	9.2	23.6	0.7 to 56.9	4.4	-11.9 to 44.9
	Vessel	4.2	7.1	13.8	0.2 to 55.9	1.2	-5.8 to 22.8
Low Income West Africa	Air	3.7	20.5	35.6	0.4 to 92.6	7.4	-0.9 to 41.5
	Vessel	3.5	9.3	19.4	0.2 to 89.7	1.1	-6.1 to 84.5
Middle Income East and Southern Africa	Air	2.5	8.0	16.4	0.9 to 29.7	0.9	-19.8 to 14.1
	Vessel	3.8	6.2	8.9	0.7 to 17.5	0.8	-4.3 to 7.0
Middle Income West Africa	Air	7.3	13.3	24.2	0.4 to 43.1	3.0	-18.8 to 20.4
	Vessel	4.9	10.0	12.8	2.3 to 50.6	1.9	-4.0 to 17.3
Oil Exporting Countries	Air	na	na	na	na	na	na
	Vessel	9.2	11.3	17.2	1.0 to 55.7	1.9	-7.2 to 29.6

Note: Trade Flows or less than \$50,000 have been excluded from the above comparisons. Insufficient data existed to make meaningful air freight comparisons for the African oil exporting countries.

Source: Nominal transport costs computed from United States Department of the Census trade tapes.

margin in perspective the recently completed Uruguay Round achieved a 2.4 percentage point reduction in industrial country tariffs (to 3.9 percent). The other important points evident from Table 4 are that in every instance a larger adverse margin occurs for air freight than for vessel shipments. African air transport, at first glance, appears to be relatively less cost efficient than vessel.¹¹ Finally, some of the third quartile values indicate that some African exports encounter very high transport costs. For example, 25 percent of sub-Saharan Africa's air exports encounter freight rates exceeding 26 percent -- about one-quarter of Low Income West Africa's vessel shipments have nominal freight rates of more than 19 percent.

B. Can Differences in African Transport Costs Be (Easily) Explained?

Is the cross-product variation in African transport costs observed in Tables 3 and 4 associated with several possible explanatory variables which might indicate why such high rates often occur? If so, this might provide some insights concerning policy measures to reduce these charges. For a test African nominal air and vessel freight costs, and the African freight margin for both types of carriers, were regressed on variables which reflect the relative importance of individual exported goods. The latter included the total dollar value of African exports, as well as Africa's share of all similar tariff line level products in global United States imports. The reasoning here was that if: (i) transport economies of scale exist, or (ii) if larger shipments provide some countervailing power to the liner conferences rate setting practices, or (iii) if African carriers have adopted a fairly common practice of extending quantity discounts, these factors this might be reflected in the African freight rates. Second, two dummy variables were used to distinguish between products where: (i) at least 25 percent, and (ii) 50 percent or more of

¹¹There is a problem in the proper interpretation of these data since air freight shipments may go directly to interior U.S. markets, and therefore avoid some inland transport costs in both the importing and exporting country. Also, air freight may also allow some African countries to avoid costly internal land transport costs if the servicing airfields are located close to the centers of production. In short, the air-vessel margin may significantly overstate the true difference in transport costs for these alternative modes of transport.

total African exports were shipped by air. This relation was tested to determine if heightened competition between different transport modes was associated with lower freight rates, or whether such competition reduced Africa's adverse freight differential.¹² Third, since similar absolute transportation costs will produce different proportionate (i.e., ad valorem) rates depending on the prices of the goods shipped, African export unit values were computed relative to those for other countries. These relative prices were then regressed on the African air and freight rate differentials. The expectation was that the lower the relative African unit value the higher, ceterus paribus, would be the regions nominal freight costs relative to other exporters.

Although it was expected that (at best) the relations would be weak, none of the regression tests were statistically significant. Several factors may be responsible for the lack of results. First, the overall value of exports may not be a reasonable proxy for consignment size if shipments are widely dispersed over numerous ports (airfields), or if many small shipments originate in a given port over the course of a year. Second, Africa's share of US imports of most products was generally low (under 2 percent). As such, the actual variation in the value term might not be sufficient to exert a significant influence on freight rates. Second, the association between relative export unit values and freight costs also was not significant. African unit values were higher than those of their competitors for about one-quarter of the products shipped (these products were concentrated in foods, fuels, ores and minerals) and many of these goods faced disproportionately high freight costs.

Perhaps a far more important reason for the lack of significant results is that the regression tests do not capture a major determinant of liner conference freight rate making practices. Numerous studies have determined that liner freight rates are essentially administered prices that are often determined by

¹²The justification for these tests rests in numerous "market structure performance" studies that show consumers in highly competitive markets typical pay lower prices, and firms make lower profits, than do those in markets where aggressive competition is absent. Although these initial investigations relate to domestic markets in industrial countries, Yeats (1991) provides empirical evidence that the relationship also extends to international markets.

the practice of "charging what the traffic will bear". Previous studies (see Ihedure, 1992 among others) the anticompetitive cargo reservation practices adopted by many African governments allow privileged liner operators to set inflated freight rates are considerably above those that would prevail in a competitive environment and to extend inferior quality services (see Box 2 for an indication of the extent to which cargo reservation schemes are employed by West African countries).¹³ In other words, the rates that are observed need not remotely reflect the true cost of carriage for various types of goods, but largely reflect conference objectives regarding rate making and desired profit levels.¹⁴

IV. Effective Transport Protection Facing African Exports

Economists recognize that nominal rates of protection may provide an inaccurate indication of the true importance of trade barriers (either tariffs, transportation costs, or nontariff restrictions). As such, many analyses utilize the effective rate of protection (ERPs) concept. Effective rates measure the protection for value added in a production process while nominal rates show the protection for the final good. Stated differently, ERPs indicate the reduction in returns to productive factors (labor and capital)

¹³Research undertaken within the World Bank (Bennathan 1989) shows national policies that restrict competition for shipping services may have a major negative impact on a country's international freight costs, and once these anti-competitive practices are removed transport costs may be reduced by as much as 50 percent.

¹⁴Regression analyses provide insights into the factors explaining liner conference freight rate making behavior. For example, Lipsey and Weiss (1974) showed the expected positive association exists between the distance a product is shipped and the level of its transport costs, although the amount of unexplained variation was higher than expected. An even stronger positive relation was found between freight rates and the unit value of exports -- which Lipsey and Weiss attribute to the monopoly pricing practices of the liner conferences (i.e., "charging what the traffic will bear"). Stowage factors had a strong positive impact on freight rates -- that is, transport costs for large bulky objects were higher than those for compact articles. Lipsey and Weiss employed a dummy for products, like grains, that could be shipped by both liners and tankers. The latter can be chartered in more open competitive international markets and the results showed a significant negative association for this term. These results were taken to indicate that the (non-cost related) pricing practices of liner conferences have a major positive impact on relative freight rates -- both across countries and products.

a foreign supplier must absorb in order to compete with domestic producers in the protected markets.¹⁵ For example, if the effective rate of transport protection for a specific good is 10 percent African producers would have to reduce payments to domestic labor and capital that much below what these factors earn in the United States in order to export competitively. While some of the margin probably could be absorbed in the wage bill, the scope for doing so may be more limited than often thought due to relatively low African labor productivity. Furthermore, the cost of capital in Africa is almost certainly considerably higher in Africa than in North America due to uncertainty and political instability. Given the profit maximizing objectives of many international firms even relatively low effective rates of transport protection may reflect a major disincentive for the location of export oriented production activity in Africa.¹⁶

¹⁵For early formulations and applications of the concept of effective protection see Balassa (1965) or Basevi (1966). Grubel (1971) provides a useful nontechnical discussion of the concept. The effective rate of transport protection in the US against African exports of product j , (Et_j) can be calculated from a modification of the normal formula,

$$(2) \quad Et_j' = \frac{r_j - \frac{\sum_{i=1}^n a_{ij}' r_i}{i=1}}{1 - \frac{\sum_{i=1}^n a_{ij}'}{i=1}}$$

where r_j is the nominal freight rate for African exports of product j to the United States, r_i is the average freight rate on all U.S. imports of product i used in the production of j , and a_{ij}' is the observed Leontief coefficient. Following Waters (1970) we utilized the observed production coefficients (and not the theoretically preferable zero transport cost coefficient). As a result, our ERP estimates will be downward biased. The information on production coefficients was drawn from the U.S. Census of Manufactures.

¹⁶The influence of even small variations in international transportation costs on the location of global production may not receive adequate recognition. For example, in a Nobel Symposium on the location of international economic activity Assar Lindbeck argued that "given other costs, firms chose between alternative international locations in order to minimize transport costs. These costs, therefore, may become low precisely because they have been highly important for location -- high transport cost locations are avoided if other costs are equal". Similarly, Jagdish Bhagwati observed that "even if transport costs for any alternative location were a small proportion of total product price, they could still affect location if they varied geographically more than other costs of production". See (Ohlin et. al. 1977, p. 276).

Table 5 provides estimates of nominal and effective rates of U.S. tariff and transport cost protection facing African exports of processed products for which required production and trade data were available. Considerable variation is evident as the transport ERPs range from about 7 percent for electrical machinery to over 90 percent for animal feeds. This suggests that freight costs will have a major differential impact on the specific types of products Africa might export successfully. Another noteworthy point is that some relatively modest nominal freight rates incorporate very high effective rates of protection -- for 6 of the 30 product groups the effective rates are more than double the nominal rate of protection. An extreme situation occurs for animal and vegetable oils where the transport ERP (56 percent) is more than 5 times higher than the corresponding nominal rate of protection.¹⁷ While Africa is an important producer of several types of oilseeds, like groundnuts and copra, that might be further processed for export, this activity almost certainly is constrained by the amount that local value added would have to be reduced to offset the effects of transport costs.

While many developing countries have expressed a strong interest in pursuing resource based industrialization strategies (i.e., the processing of domestically produced primary commodities to serve as a base for further industrialization and growth), it is generally held that tariff escalation in their major markets is an important obstacle to expansion of this sort of processing activity. In this context, the results in Table 5 assume special importance since effective transport rates exceed nominal freight rates for 28 of the 30 processed products. The properties of the ERP index are such that this will occur only when the average rates of protection on production inputs are lower than that for the final product (i.e., the rates increase or escalate with additional fabrication). As such, the statistics presented in Table 5 shows international freight costs generally are structured in a way that works against the local processing

¹⁷Since the ERP measures the percentage difference between value added in the presence of protection, and without trade barriers, relatively low nominal freight costs can produce quite high effective rates of protection for low value added products. That is, as equation (1) shows, the value added coefficient is the base for the ERP calculation and when this term takes relatively small values (say 10 to 15 percent as is the case with some vegetable oil products) quite high effective rate indices can result.

Table 5. Nominal and Effective Rates of Tariff and Transportation Protection Against African Exports of Processed Goods.

HS Code	Description	U.S. Value Added Coefficient	Nominal Transport Protection (%)	Effective Transport Protection (%)	Difference
11	Products of the milling industry	0.22	18.4	33.0	14.6
14	Vegetable products	0.38	24.4	36.1	11.7
15	Animal and vegetable oils	0.08	9.9	56.1	46.2
20	Preparations of vegetables	0.41	16.1	28.2	12.1
23	Animal feeds	0.52	56.1	87.2	31.1
24	Cured tobacco	0.10	11.2	32.3	21.1
31	Fertilizers	0.29	28.4	62.9	34.5
32	Tanning and dyeing extracts	0.66	16.4	20.4	4.0
34	Soap and cleansing preparations	0.52	9.9	12.1	2.2
42	Articles of leather	0.49	6.8	9.3	2.5
46	Manufactures of plaiting materials	0.42	31.9	62.6	30.7
48	Paper and paperboard	0.43	10.6	8.3	-2.3
52	Fabrics of cotton	0.41	12.2	16.9	4.7
56	Discontinuous man-made fibers	0.35	18.5	33.6	15.1
57	Other textile materials	0.55	17.1	24.1	7.0
61	Articles of apparel and clothing	0.56	6.2	14.5	8.3
64	Footwear	0.48	4.3	3.2	-1.1
65	Headgear and parts	0.56	8.8	12.1	3.3
68	Articles of stone or plaster	0.53	17.5	26.6	9.1
69	Ceramic products	0.58	17.1	22.8	5.7
70	Glass and glassware	0.64	7.7	10.2	2.5
73	Iron and steel	0.53	7.3	12.1	4.8
82	Tools and cutlery	0.60	6.9	8.1	1.2
83	Articles of base metal	0.34	17.4	36.8	19.4
85	Electrical machinery	0.56	2.4	7.1	4.7
90	Scientific instruments	0.68	5.6	7.7	2.1
91	Clocks and watches	0.40	6.6	11.2	4.6
92	Recorders and musical instruments	0.54	20.2	34.2	14.0
94	Furniture and parts	0.53	10.8	18.6	7.8
95	Toys and Games	0.58	9.3	16.3	7.0
	AVERAGE ALL ABOVE PRODUCTS	0.46	14.5	25.5	11.0

Source: Value added coefficients and effective rate estimates based on data drawn from the US Department of Commerce, Census of Manufactures. Nominal transport costs computed from Department of Commerce trade tapes.

of domestically produced African commodities.¹⁸

V. Policy Implications

Numerous economic analyses have analyzed factors contributing to the sub-Saharan African countries lackluster trade performance over the last two or three decades (Husain, 1993 provides an interesting overview of the discussion). No single factor is responsible for the deterioration as a wide range of inappropriate policies relating to monetary, fiscal, social and trade all contributed to the decline in Africa's global importance. This study's findings show that transport costs also have a negative impact which is more important than is generally recognized. Freight rates for African exports often are considerably higher than on similar goods originating in other countries, and these charges generally conceal very high rates of effective protection for processed goods -- a point that significantly reduces incentives for new investment in export oriented production activities. This combination of factors clearly limits African countries ability to fully utilize natural resource based industrialization strategies in their development process. A related disturbing finding is that African net payments for transport services is very high relative to other developing countries and has actually increased over the last two decades. This point is important since it shows a large share of foreign exchange earnings that might otherwise be employed in productive capacity building investments are diverted to payments for transport.¹⁹

¹⁸Tariff or transport cost escalation is held to exist when these charges increase, for a specific exporting country or group of countries, as the goods shipped experience further processing. Since the ERP calculations shown in Table 5 are based on: (i) nominal freight rates for African exports of processed products; and (ii) average nominal rates for the production inputs from all foreign sources, it describes a different situation. The latter is employed since it shows the margin by which domestic United States producers of the inputs may raise local prices and not be displaced by competing foreign suppliers. In other words, the figures show the margin by which transport costs allow US producers to raise returns to factors producing the processed good without being displaced by African exporters.

¹⁹Given the importance and implications of this study's findings more information is clearly needed on the incidence of Africa's international transport costs, particularly for exports to the EU and Japan, for policy analyses and research. Customs officials in these markets should make existing information available and improve procedures for the future collection, processing, and tabulation of transport cost data.

Box 2
Cargo Reservation Legislation in West Africa

To promote national fleets, and to counter perceived problems with the existing liner conference system, many African countries employ cargo reservation schemes such as those in UNCTAD's Code of Conduct for Liner Conferences. Article 2(4a) of the Code states "the group of national shipping lines of each of the two countries the foreign trade between which is carried by the conference shall have equal rights to participate in the freight and volume of traffic generated by their mutual foreign trade". Section 4(b) further stipulates that "Third country shipping lines, if any, shall have the right to acquire a significant part, say as much as 20 percent, in the volume of traffic generated by that trade". Developing countries interpret this to mean conference cargo be allocated on the basis of 40-40-20 – that is, 40% reserved for the lines of the exporter, 40 % is reserved for the importer, and 20 percent is subject to open competition. The following schemes were adopted in West Africa by the early 1990s.

Country	Legislation and Government Orders
Angola	--March 1976 decree gives priority to national line for imports and exports. Use of foreign flag vessel only with waiver from the government.
Benin	--Ordinance No. 49 and Decree No. 240 of 13/9/79 require cargo sharing on a 40-40-20 basis (whole trade. But inter-ministerial Order of 14/5/84 requires ships operated or chartered by COBENAM (national line) to have priority to all cargo and requires submission of freight manifests. Waivers granted where national flag unavailable.
Cameroon	--Decree No. 709 of 13/10/75 and Order No. 39 of 16/1/76 reserve government cargo to CAMSHIP (state line) unless 40-40-20 agreement divides the whole trade. Order No. 317 of 1977 requires all conferences to negotiate rates with the Cameroon National Shippers Council.
Congo	--Decree No. 85/045 of 22/1/85 divides conference trade on a 40-40-20 basis.
Cote d'Ivoire	--Law No. 75-940 of 26/12/85; Decree No. 617 of 3/9/75; and Decree No. 576 of 25/8/77 apply 40-40-20 principle to both conference and non-conference cargos, including bulk and other goods.
Gabon	--Decree No. 54 of 7/9/78 introduces 40-40-20 division of the trade.
Ghana	--The Ghana Shippers Council Amendment Law 1987 and Cargo Sharing Regulation 1987 extend the 40-40-20 principle to all cargos (liner and bulk) and reserves to the Shippers Council and national line (Black Star Line) control over the allocation of these cargoes.
Guinea	--National maritime law stipulates the 50 % of strategic exports like bauxite must be carried by the state line: Societe Navale Guineenne, GUINOMAR, and the West African Bulk Shipping Inc.
Mauritania	--The Code de la Marine Marchand et des Perches Maritimes, Law 78.430, Nouakchott, 28 February 1978, applies the 40-40-20 principle.
Nigeria	--Decree No. 13 of 1978 establishes the Nigerian Shippers' Council, while the National Shipping Policy Decree 10 of May 1987 applies the 40-40-20 principle. It, however, goes beyond this principle to share all non-conference and bulk cargoes on a 50-50 basis. The Decree also reserves to the National Maritime Authority control over the allocation of all export cargoes.
Senegal	--Decree 179 of 2/3/78 and Order 454 of 25/7/80 apply 40-40-20 to all cargoes.
Togo	--Decree No. 8 of 9/1/80 and Order No. 4 of 19/2/80 apply the 40-40-20 principle to all trade.
Zaire	--Ordinance No. 256 of November 1980 and 192 of December 1982 as implemented by Decree No. 1 of 17/1/83, apply the 40-40-20 principle to all cargos and grant the Zaire Office of Maritime Freight Management extensive powers including the fixing of freight rates

Although little evidence exists that cargo reservation has promoted African fleet development, other studies show that its anti-competitive effects may have a significant adverse effect on importers and exporters freight costs (Iheduru, 1992). In fact, studies show that freight rates may fall by as much as 50 percent when reservation schemes are abandoned and transport is subject to free and open competition (Bennathan, 1989). In short, the available evidence shows that the adverse African freight rates reported in this study are, at least in large part, due to inappropriate national transport policies pursued by African governments.

Two key questions relating to the present analysis are: (i) what factors account for the adverse African transport costs; and (2) what types of corrective policy measures might be employed to deal with them. While the question needs further in depth investigation evidence suggests (see Box 2) that the anti-competitive cargo reservation policies adopted by most African governments have had an important adverse influence on freight costs.²⁰ Recognition of the true effects of these anticompetitive measures carries with it the policy prescription for corrective action -- deregulation. World Bank studies for other regions show that deregulation, and the promotion of measures to stimulate competition for shipping services may reduce freight rates in the liner trades by as much as 50 percent (see, for example, Bennathan et. al. 1989). This point has wide reaching implications. African countries often have attributed their poor export performance to *foreign* trade barriers in spite of the fact that numerous studies fail to find any corroborating evidence. Rather, this analysis shows attention should focus on the negative impact of that the *African countries' own policies* have on their export performance.

A final point to note is that numerous investigations show that governments and traders generally have far more policy options for reducing transport costs than is generally recognized (UNCTAD 1975, Yeats 1985). These options cover such measures as cargo bulking to achieve transport economies of scale in transport, rationalization of shipping services and improved scheduling for liners, adoption of procedures to speed vessel turnaround, utilization of potentially lower cost tramp services where feasible, development or improvement of coastal feeder services, unitization and the adoption of new transport

²⁰An OECD (1992, p. 43) provides a description of these anti-competitive practices and the current situation regarding shipping in Africa in West and Central Africa. "In 1992, West and Central African states showed no indication of liberalizing their protectionist shipping policies based largely on the unilateral interpretation of certain provisions of the UN Liner Code Convention. On the contrary there were various moves towards enacting existing, but not yet implemented restrictive policies. These attempts met with opposition by OECD member countries and their shipping lines which considered this as both protectionist and discriminatory. However, the operation of some 50 shipping lines offering regular services to West Africa from most ports of the world was not only hampered by protectionism. Civil unrest, economic depression, a sharp increase in criminal activities towards vessels together with poor port management and severe and often discriminatory customs regulations were factors shipping lines had to struggle with.

technologies, promotion of shippers associations, or port and storage improvements to name a few. The precise corrective measures will require detailed analyses of African transport costs and systems at the country or regional level. This study's findings accent the importance of further analysis in this direction.

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APPENDIX TABLES**Transportation Costs for African Countries Classified by Region and Income Level**

Appendix Table 1. Air and Vessel Freight Rates for Low Income East and Southern Africa's Major Export Products to the USA

HS Code	Description	Exports(\$000)		Exports by Air		Exports by Vessel		All Exports	
		Air	Vessel	Freight Rate	African Margin	Freight Rate	African Margin	Freight Rate	African Margin
01	Live animals	928.2	0.0	35.7	21.7	.	.	35.7	21.7
03	Fresh or frozen fish	244.0	1,065.7	56.9	-2.0	5.6	-4.6	15.2	2.5
05	Animal parts and skins	211.9	66.9	4.0	-1.4	13.8	-1.6	6.4	-5.5
06	Live tree and plants	313.6	286.5	49.8	21.8	27.2	7.4	38.9	14.5
07	Edible vegetables and roots	0.0	127.8	.	.	18.8	1.5	14.3	-3.6
08	Fresh or dried nuts and fruits	0.0	8,133.4	.	.	5.6	2.0	5.5	1.9
09	Coffee, tea and spices	1,701.1	87,535.4	3.2	-4.2	6.4	0.4	5.7	-0.6
12	Oil seeds and nuts	1,287.2	824.5	1.7	0.1	26.4	17.1	11.4	7.2
13	Raw vegetable suited for dyeing	16,390.0	10,470.3	2.5	-1.9	5.8	0.4	3.7	-1.2
14	Vegetable products	0.0	834.5	.	.	23.5	10.2	23.5	10.4
15	Animal and vegetable oils	0.0	362.1	.	.	4.1	-2.1	4.1	-2.2
17	Sugars and sugar confectionery	0.0	4,570.9	.	.	12.6	2.7	12.6	3.1
18	Cocoa beans and chocolate	0.0	294.1	.	.	13.3	0.7	13.3	0.7
20	Preparations of vegetables	0.0	1,680.9	.	.	5.7	1.2	5.7	1.2
21	Miscellaneous prepared foods	0.0	533.3	.	.	4.2	0.9	4.2	-2.6
22	Beverages	1.4	72.9	91.5	90.7	35.4	22.6	21.5	11.5
23	Animal feeds	0.0	1,576.3	.	.	55.9	16.1	55.9	16.1
24	Manufactured tobacco	9.4	85,101.2	50.2	0.0	14.8	8.8	11.3	6.0
25	Sulphur and related materials	40.4	3,448.8	18.1	-2.5	20.3	5.7	18.7	5.2
26	Ores and concentrates	0.0	5,551.0	.	.	1.8	0.1	1.8	0.1
27	Mineral fuels and oils	0.0	137,817.3	.	.	8.7	1.0	8.7	0.8
28	Inorganic chemicals	1.6	2,615.3	10.8	6.7	0.9	-0.9	0.9	-0.9
29	Organic chemicals	0.0	92.2	.	.	2.0	-4.0	2.0	-4.1
32	Tanning and dyeing extracts	113.9	213.1	30.2	28.7	13.8	8.7	16.6	12.3
33	Essential oils and resinoids	345.2	607.7	9.2	4.9	6.7	2.4	7.6	3.8
34	Soaps and detergents	9.1	0.0	1.4	-3.1	.	.	1.4	-0.6
35	Glues and substances	620.5	0.0	5.4	-0.3	.	.	5.4	1.2
38	Miscellaneous chemicals	68.5	0.0	3.9	0.3	.	.	3.9	0.3
39	Artificial resins and plastics	23.7	61.8	2.7	-9.3	4.9	-2.9	4.3	-4.1
40	Natural and synthetic rubber	21.0	31.9	4.6	-6.2	5.9	0.0	5.4	-0.6
41	Hides, skins and leather	635.8	7,384.4	11.2	2.9	2.0	-1.5	2.6	-2.0
42	Articles of leather	274.0	377.3	11.8	2.2	2.9	-1.7	6.7	0.7
43	Furskins and artificial fur	140.6	0.0	12.6	8.4	.	.	17.3	12.4
44	Wood and wood articles	344.8	2,568.8	39.5	14.4	12.1	0.7	14.7	2.3
46	Manufactures of plaiting	199.4	253.0	46.4	10.3	22.5	1.0	33.1	11.5
48	Paper and paperboard	90.7	83.4	9.3	-11.9	10.2	-0.4	9.8	1.0
49	Printed books and newspapers	51.5	1.7	19.5	9.5	7.3	2.1	19.1	14.4
50	Silk and waste silk	167.0	0.0	2.2	-1.7	.	.	2.2	-1.3
52	Fabrics of cotton	8.9	6,374.8	50.2	40.5	8.6	2.6	8.7	2.8
56	Discontinuous man-made fibers	1.1	2,686.6	10.1	-58.3	19.2	10.1	18.5	9.3
61	Articles of apparel and clothing	1,210.7	33,666.5	17.9	7.4	4.8	1.4	5.2	-0.2
62	Other textile articles	10,282.4	51,676.1	26.3	10.5	4.5	0.9	8.1	2.6
63	Old clothing and other textiles	34.2	1,011.3	32.3	18.1	4.7	0.5	5.6	0.6
64	Footwear	145.4	12.3	11.7	-5.4	3.9	0.0	11.1	4.6

65	Headgear and parts	424.0	118.9	9.7	-2.8	3.8	-3.4	8.4	-3.1
66	Accessories like umbrellas	0.0	55.2	.	.	7.1	-0.7	7.1	-0.5
68	Articles of stone or plaster	247.1	1,676.3	45.8	29.9	13.4	0.5	17.5	5.1
69	Ceramic products	10.8	88.3	38.6	30.3	32.3	20.9	30.4	19.7
70	Glass and glassware	1.5	1,796.2	48.5	29.0	8.6	2.6	8.6	1.8
71	Pearls and precious stones	61,210.5	476.5	0.7	0.4	7.7	1.4	0.8	0.4
72	Ferrous products	0.0	23,137.7	.	.	4.5	-5.8	4.5	-5.8
73	Iron and steel	18.5	188.4	11.9	-12.0	9.4	2.4	9.6	1.9
74	Copper and articles	13.9	29,979.4	36.7	24.9	3.9	1.3	3.9	1.0
75	Nickel and articles	0.0	8,411.2	.	.	2.9	0.9	2.7	0.8
79	Zinc and articles	0.0	988.1	.	.	0.2	-5.1	0.2	-4.6
81	Other base metal products	71.4	45,853.5	14.0	11.0	0.8	0.1	0.6	-0.1
82	Tools and cutlery	20.8	105.3	4.7	-2.9	3.7	-0.2	3.8	-0.7
83	Articles of base metal	87.1	14.5	20.8	5.7	23.7	15.1	17.4	10.8
84	Boilers and machinery appliances	653.0	368.1	3.8	1.4	4.9	1.1	4.2	1.7
85	Electrical machinery	1,497.2	1,253.9	2.3	-0.2	2.8	0.6	2.6	-1.2
90	Scientific instruments	71.8	7.5	3.0	1.2	2.7	0.3	2.9	1.1
92	Recorders and musical instruments	7.2	53.2	36.6	30.4	17.5	13.0	19.8	14.9
94	Furniture and parts	9.7	201.1	78.2	54.7	16.1	6.3	18.0	8.1
95	Toys and games	120.8	96.0	12.4	2.5	9.9	3.4	10.6	5.4
96	Miscellaneous manufactures	201.5	65.8	19.5	9.0	10.5	2.9	17.3	9.0
97	Work of art	1,414.0	113.6	10.2	9.1	4.6	3.3	9.6	8.4
98	Special classification	6,879.5	134.6	3.6	2.6	3.5	0.2	3.6	2.3

Appendix Table 2. Air and Vessel Freight Rates for Low Income West Africa's Major Export Products to the United States

HS Code	Description	Exports (\$000)		Exports by Air		Exports by Vessel		All Exports	
		Air	Vessel	Freight Rate	African Margin	Freight Rate	African Margin	Freight Rate	African Margin
01	Live animals	1,599.0	0.0	20.5	9.4	.	.	20.5	9.4
03	Fresh or frozen fish	83.8	7,228.7	34.4	10.0	9.4	-1.9	9.6	-1.7
07	Edible vegetables and roots	47.3	589.4	92.6	41.4	31.6	7.7	35.7	9.2
09	Coffee, tea and spices	0.0	407.4	.	.	8.2	-0.5	8.2	-1.1
11	Products of milling industry	0.0	72.3	.	.	21.9	6.7	21.9	6.7
12	Oil seeds and nuts	0.0	74.0	.	.	19.3	4.8	19.3	5.3
13	Raw vegetable suited for dyeing	0.0	573.8	.	.	2.2	-1.9	2.2	-2.3
15	Animal and vegetable oils	0.0	123.0	.	.	20.9	8.0	21.1	6.8
16	Preserved foods	0.0	4,597.3	.	.	3.8	-2.9	3.8	-2.9
17	Sugar and sugar confectionery	0.0	92.1	.	.	3.3	-3.1	3.3	-3.3
18	Cocoa beans and chocolate	0.0	52,855.5	.	.	11.8	-1.1	11.8	-1.1
20	Preparations of vegetables	0.0	108.6	.	.	10.8	-0.1	10.8	-0.1
22	Beverages	0.0	82.1	.	.	32.6	19.6	32.6	19.4
23	Animal feeds	0.0	619.1	.	.	63.5	36.9	63.5	36.9
24	Manufactured tobacco	0.0	815.0	.	.	2.8	-1.8	9.2	-3.5
26	Ores and concentrates	0.0	129,534.7	.	.	25.9	3.1	26.0	3.7
27	Mineral fuels and oils	0.0	38,254.7	.	.	9.9	1.0	9.9	0.9
28	Inorganic chemicals	0.0	4,758.9	.	.	10.0	3.5	10.0	3.6
29	Organic chemicals	1,250.0	91.3	1.3	0.1	89.7	84.5	7.2	5.6
31	Fertilizers	0.0	482.4	.	.	28.9	10.3	28.7	10.2
35	Glues and substances	0.0	133.9	.	.	2.0	-2.1	2.0	-12.4
38	Miscellaneous chemicals	0.0	331.8	.	.	3.3	-2.3	3.3	-2.4
39	Artificial resins and plastics	1.9	276.8	26.1	-0.1	7.8	-1.0	7.9	-1.4
40	Natural and synthetic rubber	0.0	745.3	.	.	11.6	0.6	11.6	0.6
44	Wood and wood articles	229.5	2,325.5	36.8	13.4	24.6	8.0	25.6	9.4
49	Printed books and newspapers	6.8	100.6	5.6	2.6	10.0	6.2	9.5	5.4
52	Fabrics of cotton	1,111.4	1,289.3	29.3	19.3	6.0	1.2	16.8	11.7
55	Cotton	73.9	94.4	33.3	27.8	3.4	0.3	17.0	12.4
62	Other textile articles	705.9	1,314.5	14.4	-2.5	9.3	5.2	11.1	4.3
63	Old clothing and other textiles	117.8	18.1	51.4	34.7	11.1	5.1	46.0	39.5
64	Footwear	1.1	900.4	98.7	82.9	4.4	-0.2	4.5	-0.7
67	Skins of birds for wigs or beards	22.0	136.0	5.2	-2.8	0.2	-6.1	0.9	-5.1
70	Glass and glassware	31.3	457.5	36.7	30.1	2.7	-0.9	4.8	0.7
71	Pearls and precious stones	145,497.0	9.6	0.4	0.3	19.9	15.4	0.4	0.3
73	Iron and steel	0.0	173.7	.	.	6.8	-0.4	6.8	-2.1
76	Aluminum and articles	0.0	783.1	.	.	4.7	0.2	4.6	0.0
84	Boilers and machinery appliances	245.6	406.7	4.6	-2.3	2.6	-0.1	2.0	-1.1
85	Electrical machinery	105.9	69.9	2.7	-0.5	3.5	1.5	1.3	-1.8
87	Vehicles other than railway	0.0	62.2	.	.	7.5	3.6	7.5	2.6
92	Recorders and musical instruments	11.0	56.8	48.4	29.6	19.4	14.7	24.1	19.0
94	Furniture and parts	0.0	364.6	.	.	5.4	-3.5	5.4	-3.8
95	Toys and games	25.8	64.8	5.9	-7.9	10.7	3.4	9.4	2.4
97	Works of art	324.0	4.5	2.3	0.6	7.8	5.8	1.7	0.2
98	Special classification	4,156.0	1,219.1	4.9	4.4	1.9	-1.3	2.3	1.2

Appendix Table 3. Air and Vessel Freight Rates for Middle Income East and Southern Africa's Major Export Products to the USA

HS Code	Description	Exports (\$000)		Exports by Air		Exports by Vessel		All Exports	
		Air	Vessel	Freight Rate	African Margin	Freight Rate	African Margin	Freight Rate	African Margin
01	Live animals	1,442.1	0.0	15.1	-7.6	.	.	15.1	-7.4
03	Fresh or frozen fish	30.8	786.4	31.4	-22.6	11.0	5.8	11.5	4.2
04	Dairy products and eggs	6,369.5	350.9	2.9	-1.5	7.0	0.9	3.1	-1.4
06	Live tree and plants	252.2	0.0	29.5	10.6	.	.	29.5	11.6
09	Coffee, tea and spices	0.0	1,759.7	.	.	4.7	-1.2	4.7	-0.9
12	Oil seeds and nuts	23.2	13.9	8.3	-4.9	6.3	-1.1	7.6	-2.9
16	Preserved foods	6.4	583.2	11.7	.	3.8	0.8	3.8	0.5
17	Sugars and sugar confectionery	0.0	17,105.0	.	.	12.2	1.6	12.3	2.0
27	Mineral fuels and oils	0.0	2,894.7	.	.	12.2	5.2	12.2	5.2
28	Inorganic chemicals	0.0	3,209.8	.	.	1.3	-0.7	0.9	-0.7
33	Essential oils and resinoids	0.0	62.3	.	.	4.8	1.9	4.7	1.6
35	Glues and substances	0.0	202.3	.	.	3.0	-0.4	3.0	-0.5
39	Artificial resins and plastics	4.6	130.6	19.1	2.0	11.9	4.2	9.8	0.6
41	Hides, skins and leather	1,160.9	0.0	2.2	-2.5	.	.	2.2	-1.6
42	Articles of leather	1.4	143.5	58.2	52.9	2.1	-3.2	2.6	-3.8
43	Furskins and artificial fur	231.1	72.1	7.5	0.9	10.1	6.0	8.1	2.3
44	Wood and articles of wood	9.2	102.3	9.9	-12.9	17.5	7.2	16.8	6.1
47	Paper making material	0.0	1,746.2	.	.	12.1	0.7	12.1	0.7
54	Flax and ramie	0.0	188.9	.	.	4.8	1.1	4.8	-0.7
55	Cotton	0.0	234.6	.	.	5.9	1.6	5.9	1.4
57	Other textile materials	53.6	0.0	27.9	14.2	.	.	27.9	21.5
61	Articles of apparel and clothing	2,660.0	45,033.7	15.6	4.3	6.4	2.6	6.9	1.3
62	Other textile articles	20,996.1	101,818.4	16.8	2.1	5.2	1.5	7.2	1.4
63	Old clothing and other textiles	3.9	344.6	14.9	6.5	4.3	0.3	4.4	-0.4
64	Footwear	33.9	683.0	9.8	-1.2	2.7	-0.7	3.0	-1.2
65	Headgear and parts	9.2	189.4	28.6	5.6	8.4	0.8	9.3	1.4
69	Ceramic products	47.9	22.7	21.9	7.5	11.7	2.3	15.8	5.3
70	Glass and glassware	4.8	315.1	16.6	10.8	7.4	1.9	7.2	1.1
71	Peals and precious stones	9,334.2	162.1	0.9	0.2	1.3	-4.3	0.9	0.2
73	Iron and steel	0.0	135.8	.	.	4.0	-1.5	4.0	-1.8
74	Copper and articles	101.2	0.0	8.0	-3.2	.	.	8.0	1.4
78	Lead and articles	0.0	447.6	.	.	8.1	2.4	8.1	-0.3
83	Articles of base metal	0.0	184.7	.	.	12.6	5.2	12.6	5.0
84	Boilers and machinery appliances	2,029.3	244.7	1.7	-0.3	1.8	-0.3	1.6	-0.4
85	Electrical machinery	1,954.8	1,539.2	1.5	-0.8	1.3	-0.4	1.3	-0.6
87	Vehicles other than railway	0.0	518.1	.	.	0.7	-1.9	0.7	-2.6
90	Scientific instruments	5,758.3	374.8	6.0	-0.3	0.9	-1.3	5.7	1.9
94	Furniture and parts	36.0	1,836.5	96.1	81.3	8.3	-1.5	10.9	1.1
95	Toys and games	295.6	372.7	10.1	-20.6	8.5	0.9	9.2	0.8
96	Miscellaneous manufactures	93.3	776.1	16.0	1.5	1.8	-1.7	3.3	-1.0
97	Works of art	661.5	9.2	2.2	1.4	12.4	8.4	2.3	0.9
98	Special classification	4,485.3	1,341.5	2.7	1.0	6.2	3.4	2.7	0.8

Appendix Table 4. Air and Vessel Freight Rates for Middle Income West Africa's Major Export Products to the United States

HS Code	Description	Exports (\$000)		Exports by Air		Exports by Vessel		All Exports	
		Air	Vessel	Freight Rate	African Margin	Freight Rate	African Margin	Freight Rate	African Margin
01	Live animals	569.3	0.0	6.9	-18.1	.	.	6.9	-18.1
03	Fresh or frozen fish	259.9	2.0	33.8	7.7	92.8	87.5	30.6	7.4
08	Fresh or dried nuts and fruits	0.0	3,201.1	.	.	3.7	-0.5	3.7	-0.7
09	Coffee, tea and spices	1.6	10,310.4	9.4	-11.3	21.5	13.2	21.5	13.2
13	Raw vegetable suited for dyeing	1.3	142.8	74.4	68.4	5.0	1.1	5.7	1.8
15	Animal and vegetable oils	0.0	118.8	.	.	16.0	3.1	16.0	1.5
17	Sugars and sugar confectionery	0.0	5,242.6	.	.	12.9	2.9	13.3	3.7
18	Cocoa beans and chocolate	0.0	111,949.3	.	.	11.6	-0.7	11.6	-0.7
20	Preparation of vegetables	0.0	98.0	.	.	10.7	-3.8	10.7	-3.7
21	Miscellaneous prepared foods	0.0	299.7	.	.	10.0	4.8	10.0	4.7
22	Beverages	0.0	539.1	.	.	18.0	5.6	14.9	3.8
23	Animal feeds	0.0	771.0	.	.	50.6	17.9	50.6	17.9
24	Manufactured tobacco	0.0	2,087.1	.	.	6.8	-2.1	6.7	-2.4
27	Mineral fuels and oils	0.0	114,516.3	.	.	10.2	1.8	10.2	1.7
29	Organic chemicals	140.0	0.0	0.0	-2.1	.	.	0.0	-2.1
33	Essential oils and resinoids	0.0	499.9	.	.	4.0	1.2	4.0	1.1
39	Artificial resins and plastics	4.8	133.9	6.9	-5.4	6.3	-4.1	6.3	-4.3
40	Natural and synthetic rubber	0.0	10,152.4	.	.	10.9	0.7	10.9	0.6
41	Hides, skins and leather	59.3	0.0	4.3	1.4	.	.	4.3	1.9
42	Articles of leather	145.7	202.6	12.6	-3.9	5.2	2.6	7.8	3.0
44	Wood and wood articles	84.8	5,549.9	43.1	20.4	20.1	5.0	20.1	5.6
48	Paper and paperboard	0.0	56.1	.	.	11.0	6.3	11.0	4.9
52	Fabrics of cotton	2,372.1	2,126.8	23.4	13.2	4.9	0.9	14.6	9.5
54	Flax and ramie	0.0	72.8	.	.	2.7	-1.7	2.7	-1.8
61	Articles of apparel and clothing	53.0	60.5	17.3	1.4	2.4	-1.0	7.7	1.2
62	Other textile articles	230.0	76.4	9.6	1.7	6.3	2.4	8.7	3.3
64	Footwear	82.9	1,238.3	24.6	8.8	2.6	-1.0	4.0	-0.9
67	Skins of birds for wigs or beards	1.8	846.1	55.2	47.1	4.7	-1.4	4.8	-1.3
69	Ceramic products	0.0	422.6	.	.	13.2	5.2	12.8	4.6
71	Peals and precious stones	3,110.6	0.0	0.4	0.3	.	.	0.4	0.3
73	Iron and steel	2.3	50.9	8.7	-0.5	8.5	2.0	8.5	2.1
75	Nickel and articles	0.0	78.3	.	.	19.9	15.0	19.9	15.7
83	Articles of base metal	105.0	47.0	31.3	18.3	7.9	4.1	22.8	18.0
84	Boilers and mechanical appliances	420.9	10.5	3.7	-0.7	2.1	0.1	3.0	1.5
85	Electrical machinery	932.3	241.2	8.2	4.7	4.4	1.9	4.9	2.4
87	Vehicles other than railway	0.0	477.2	.	.	2.3	-3.1	2.3	-3.6
90	Scientific instruments	45.1	49.5	6.0	1.3	2.5	-0.2	4.1	0.7
94	Furniture and parts	4.8	152.8	40.8	26.0	9.2	-1.7	10.2	-0.9
95	Toys and games	77.9	379.3	14.0	-18.8	7.6	0.3	8.7	0.9
96	Miscellaneous manufactures	7.6	52.8	12.0	-8.8	12.0	6.6	12.0	4.6
97	Works of art	337.8	2.0	17.8	16.2	4.2	2.7	17.6	16.0
98	Special classification	599.0	3,214.0	3.8	2.4	12.1	8.9	10.8	8.9

Appendix Table 5. Air and Vessel Freight Rates for African Oil Exporting Countries Major Export Products to the United States

HS Code	Description	Exports (\$000)		Exports by Air		Exports by Vessel		All Exports	
		Air	Vessel	Freight Rate	African Margin	Freight Rate	African Margin	Freight Rate	African Margin
03	Fresh or frozen fish	519.4	4,786.9	63.2	17.5	10.6	5.8	15.7	7.1
05	Animal parts and skins	0.0	52.8	.	.	47.3	29.6	47.3	41.4
09	Coffee, tea and spices	0.0	401.2	.	.	21.4	1.1	21.3	0.0
13	Raw vegetable suited for dyeing	0.0	74.2	.	.	11.1	6.6	11.1	6.4
17	Sugars and sugar confectionery	0.0	2,927.9	.	.	11.2	1.2	11.2	1.7
18	Cocoa beans and chocolate	0.0	24,991.2	.	.	13.8	0.9	13.8	1.0
23	Animal feeds	0.0	1,489.9	.	.	55.7	33.3	55.7	33.3
26	Ores and concentrates	0.0	15,663.9	.	.	14.3	-6.4	14.3	-6.4
27	Mineral fuels and oils	0.0	7,238,253.2	.	.	6.6	-0.7	6.3	-1.2
31	Fertilizers	0.0	11,007.4	.	.	24.8	6.1	24.8	6.2
39	Artificial resins and plastics	10.0	868.6	20.3	8.2	9.2	5.6	9.4	5.0
40	Natural and synthetic rubber	0.0	18,447.1	.	.	10.7	-0.9	10.7	-0.9
41	Hides, skins and leather	150.0	718.4	9.4	5.9	2.0	-2.2	2.9	-2.8
44	Wood and wood articles	38.0	2,318.8	54.1	31.3	17.2	5.3	17.7	7.6
48	Paper and paperboard	0.0	72.8	.	.	12.1	1.2	7.9	-0.2
54	Flax and ramie	0.0	289.4	.	.	10.8	3.0	10.8	2.6
62	Other textile articles	287.9	0.3	20.8	6.6	2.1	-2.1	20.7	12.7
63	Old clothing and other textiles	6.6	151.2	79.2	53.5	11.8	2.1	14.7	4.9
71	Peals and precious stones	4,272.2	5.0	0.3	0.2	53.0	46.7	0.4	0.3
84	Boilers and mechanical appliances	242.6	745.9	1.8	1.0	5.3	1.9	4.5	1.6
88	Aircraft and parts	3.0	1,163.0	1.4	-0.3	1.0	0.3	1.0	-0.6
97	Works of art	604.8	30.4	1.0	-0.7	9.7	8.0	1.4	-0.2
98	Special classification	11,942.4	5,975.2	2.5	1.3	4.7	1.7	3.2	1.6

Appendix Table 6. Air and Vessel Freight Rates for the Republic of South Africa's Major Export Products to the United States

<u>HS Code</u>	<u>2 Digit HS Description</u>	<u>Exports(\$000)</u>		<u>Exports by Air</u>		<u>Exports by Vessel</u>		<u>All Exports</u>	
		<u>Air</u>	<u>Vessel</u>	<u>Freight Rate</u>	<u>African Margin</u>	<u>Freight Rate</u>	<u>African Margin</u>	<u>Freight Rate</u>	<u>African Margin</u>
01	Live animals	297.4	0.0	19.4	2.6	.	.	19.4	2.6
03	Fresh or frozen fish	335.0	25,512.4	19.6	3.8	6.9	1.3	7.0	1.3
04	Dairy products and eggs	505.6	0.0	7.4	3.1	.	.	7.4	3.0
05	Animal parts and skins	434.0	1,093.8	8.9	-0.9	1.9	-2.9	3.9	-3.8
06	Live trees and other plants	946.6	1,467.8	46.2	18.5	7.6	-3.3	22.7	5.2
07	Edible vegetables and roots	0.0	107.3	.	.	35.9	9.3	35.9	10.4
08	Fresh or dried nuts and fruits	9.4	11,268.0	50.0	38.6	4.9	-22.1	4.9	-22.2
09	Coffee, tea and spices	9.8	452.2	79.1	65.2	10.6	0.7	12.1	2.1
10	Cereals	0.0	105.1	.	.	17.4	9.1	17.4	9.0
12	Oil seeds and nuts	257.0	1,036.9	13.7	4.4	2.5	0.6	4.8	0.9
14	Vegetable products	0.0	123.3	.	.	12.9	-3.7	12.9	-3.8
15	Animal and vegetable oils	76.4	286.2	12.6	8.9	3.7	-3.8	5.6	-0.7
16	Preserved foods	132.8	1.6	33.0	1.7	8.4	4.7	32.7	24.7
17	Sugars and sugar confectionery	6.9	10,821.3	40.8	21.3	9.5	-0.5	9.5	-0.1
20	Preparations of vegetables	0.0	20,912.1	.	.	12.1	2.4	12.0	2.6
22	Beverages	0.0	2,500.2	.	.	7.9	0.2	7.7	-0.3
24	Manufactured tobacco	0.0	2,329.6	.	.	22.1	4.2	24.3	8.2
25	Sulphur and related compounds	1.7	17,948.9	90.5	83.3	18.5	-6.5	18.9	-6.7
26	Ores and concentrates	0.0	197,872.5	.	.	10.0	5.3	10.0	5.4
27	Mineral fuels and oils	0.0	13,107.2	.	.	15.8	-15.7	15.8	-15.7
28	Inorganic chemicals	917.1	26,258.1	2.8	-2.5	4.9	-0.1	3.8	0.0
29	Organic chemicals	7,060.7	18,802.5	1.4	0.8	7.4	1.1	5.7	0.8
30	Pharmaceutical products	100.7	285.8	5.0	1.0	4.0	-1.8	4.0	-1.1
31	Fertilizers	0.0	2,741.9	.	.	9.2	-9.3	9.2	-9.2
32	Tanning and dyeing extracts	1.8	12,258.4	9.1	-9.8	11.9	1.9	11.8	2.3
33	Essential oils and resinoids	99.6	639.2	6.2	3.1	7.0	3.9	7.1	3.7
34	Soap and washing preparations	0.0	77.5	.	.	14.0	6.6	14.0	5.6
35	Glues and substances	1,193.9	81.5	0.3	-5.4	5.9	1.8	0.7	-3.5
38	Miscellaneous chemicals	485.3	1,282.1	9.5	3.7	3.2	1.3	4.9	2.3
39	Artificial resins and plastics	1,472.1	3,761.7	12.3	0.9	10.4	4.1	10.9	3.8
40	Natural and synthetic rubber	62.9	5,074.1	13.2	2.8	14.8	4.1	14.7	3.9
41	Hides, skins and leather	15,537.3	144.7	1.6	-2.2	3.7	1.6	1.6	-1.9
42	Articles of leather	1,450.4	5.8	2.5	-5.1	11.2	9.6	2.5	-3.1
43	Furskins and artificial fur	205.5	3.4	17.8	8.2	7.5	3.9	17.6	9.3
44	Wood and articles of wood	69.0	3,002.7	25.0	2.5	10.1	-4.5	10.4	-4.0
47	Paper making material	0.0	36,266.8	.	.	10.2	-1.6	10.2	-0.6
48	Paper and paperboard	15.4	6,625.8	12.9	-3.7	13.1	1.5	15.1	3.6
49	Printed books and newspapers	393.2	171.5	13.6	0.4	9.9	5.8	12.5	6.1
51	Continuous man-made fibers	49.7	3,394.2	15.6	10.4	5.8	0.0	5.9	0.4
52	Fabrics of cotton	87.7	4,103.9	18.0	7.1	7.9	0.7	8.2	0.9
54	Flax and ramie	6.4	10,069.1	25.0	12.7	5.3	0.5	5.3	0.4
55	Cotton	16.0	1,461.4	38.3	27.6	9.0	1.5	9.3	1.8
56	Discontinuous man-made fibers	10.7	382.9	25.5	14.9	9.8	4.1	10.3	4.6
57	Other textile materials	110.8	123.2	32.3	20.9	5.8	3.0	18.2	13.8

58	Carpets	3,457.9	10.9	3.7	-3.3	2.7	0.2	3.7	-3.1
59	Twine, cordage and wadding	0.4	429.0	21.1	11.7	8.2	3.6	8.2	3.7
61	Articles of apparel and clothing	756.9	1,898.8	13.6	-0.3	5.8	1.5	8.1	2.1
62	Other textile articles	3,642.0	6,419.4	17.9	12.5	5.8	1.7	10.1	4.8
63	Old clothing and other textiles	186.1	393.4	14.5	-1.2	10.2	1.2	11.6	3.6
64	Footwear	1,101.9	93.2	3.5	-2.8	2.6	-1.3	3.4	-0.4
65	Headgear and parts	69.4	909.2	14.3	-0.8	3.7	0.5	4.4	-0.5
68	Articles of stone or plaster	41.7	2,989.5	14.4	4.6	12.4	-0.8	12.3	-0.7
69	Ceramic products	67.3	98.1	12.2	-2.4	13.9	4.3	11.7	2.3
70	Glass and glassware	5.6	16,320.2	55.2	47.0	8.0	2.1	8.2	1.6
71	Pearls and precious stones	816,540.0	702.3	0.2	-0.2	5.3	0.7	0.2	-0.2
72	Ferrous products	1.7	270,674.1	22.0	5.3	7.2	-2.4	7.2	-2.2
73	Iron and steel	67.7	22,049.6	17.9	4.6	11.3	-1.1	11.3	-1.1
74	Copper and articles	37.9	6,895.4	83.4	51.1	3.6	-1.4	5.0	-1.3
75	Nickel and articles	0.0	21,292.4	.	.	2.6	0.3	1.9	-0.3
76	Aluminum and articles	15.8	12,168.3	79.2	81.5	4.3	-0.8	4.4	-1.2
78	Lead and articles	0.0	465.4	.	.	8.2	2.8	8.2	1.8
79	Zinc and articles	0.0	238.1	.	.	5.9	-6.0	5.9	-5.6
81	Other base metal products	0.0	23,790.2	.	.	6.2	-0.5	5.9	-0.2
82	Tools and cutlery	326.6	624.5	9.2	4.0	6.4	3.7	7.3	3.5
83	Articles of base metal	29.3	945.8	20.8	8.0	9.3	3.2	9.7	3.3
84	Boilers and machinery appliances	4,551.9	30,515.7	8.0	4.2	6.8	2.5	6.8	2.4
85	Electrical machinery	1,298.6	1,000.5	4.8	0.7	4.6	2.0	4.7	1.9
86	Railway locomotives	140.0	1,597.7	6.9	-0.6	4.4	-0.8	3.8	-1.1
87	Vehicles other than railway	730.8	16,550.9	26.7	-0.2	4.1	-1.3	5.8	-0.1
88	Aircraft and parts	402.6	41.8	2.7	0.4	1.1	-0.6	2.6	0.6
89	Ships and boats	225.7	1,001.4	1.4	14.9	3.6	0.4	3.2	0.1
90	Scientific instruments	880.0	1,034.6	7.7	3.3	5.5	2.6	6.4	3.1
93	Rifles and military weapons	163.2	0.0	2.0	-2.8	.	.	2.0	-1.5
94	Furniture and parts	85.0	2,138.6	29.9	12.9	18.7	8.1	19.1	8.9
95	Toys and games	804.4	200.7	11.8	2.3	13.4	7.1	12.1	7.6
96	Miscellaneous manufactures	224.3	302.0	12.0	-2.0	4.0	-3.4	7.4	-0.4
97	Works of art	1,438.1	33.6	6.7	5.8	7.6	5.4	6.4	5.5
98	Special classification	30,532.2	13,783.8	1.6	0.3	5.2	2.4	3.5	1.9

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