Center For Economic Research on Africa
School of Business
Montclair State University
Upper Montclair, New Jersey 07043

Do African Countries Pay More for Imports? Yes

December 1990
(pdf version September 2000)

Alexander J. Yeats
International Economics Department
The World Bank
Washington, D.C. 20433

Abstract

The debt crisis and declining living standards require careful husbanding of critically scarce foreign exchange in most African countries. But economic theory suggests that smaller countries, which import from only a few international suppliers and cannot support competitive markets and infrastructure, would be likely to pay more rather than less for imports. Analysis of import unit values for 1962-87 shows that the twenty African former French colonies paid a price premium of 20-30 percent on average over other importers for iron and steel imports from France. The losses associated with these adverse prices totaled approximately 2 billion dollars by 1987. The study also finds that similar price premia (of 20-30 percent) were paid by former Belgian, British, and Portuguese colonies in Africa for imports of these products from their former rulers. The author is an economist in the International Economics Department of the World Bank. He would like to thank Azita Amjadi for assistance with much of the empirical analysis and Paul Meo for many helpful comments and suggestions.

****

Technical assistance in the preparation of the present version of this document has been provided by Claudia Mocanasu, graduate assistant in the Department of Economics and Finance of the School of Business, Montclair State University.

Development of optimal trade and commercial policies in developing countries depends crucially on factors such as whether transnational corporations extract excessive profits, or whether multiple sources of supply will produce lower import prices. This is important because the poorest countries must pay the lowest possible prices for imports of industrial equipment and production inputs required for economic growth. However, if market imperfections exist, or if competition is less vigorous than it might be, some developing countries may pay more than competitive prices for imports, or receive less than competitive prices for exports (for examples of studies that have found evidence of this, see Hewett 1974, UNCTAD 1975, and Yeats 1978; for a review of the recent industrial organization literature on these issues, see Bresnahan 1989).

Institutional factors may prevent developing countries from attaining the best terms for imports. Helleiner (1978) argues that restrictive trade practices, national and international cartels, or some countries' lack of countervailing power may work against the efficient functioning of international markets. In addition, antitrust laws are often weak, nonexistent, or unenforceable at the international level. Similarly, Edwards (1972) documents the adverse effects of restrictive interfirm practices such as agreements for the allocation of territorial markets; pooling and allocation of patents, trademarks, and copyrights; fixing prices and discriminatory pricing; allocation of export business shares among firms; and establishment of reciprocal, exclusive, or preferential dealing. At the national level, interfirm agreements on exports extend not only to the allocation of foreign markets, but even to individual foreign customers, allocation of specific goods to be exported, fixing of prices and levels of bidding on foreign contracts, and the selection in advance of the firm that will submit the lowest bid. All of these factors can lead to higher prices than those that would prevail under more competitive conditions.

To determine if such "excess" prices are being charged to African importers, this article first examines the distribution of import prices paid by developing countries which have highly concentrated trade with a major exporting country (France) using extensive time series data on unit values for homogeneous goods. These prices are compared with those paid to France by other countries whose imports come from more diversified sources, and, where evidence of "excess" prices is found, the level of economic costs is quantified. In addition, the analysis employs correlation and regression tests to account for the influence on relative prices of other economic and institutional factors such as the degree of market concentration, or the size of the importing market. Next, the article examines the pricing policies of other European countries (Belgium, Portugal, and the United Kingdom) with their former colonies. I close with an overall assessment of the implications of these findings for developing countries' trade and commercial policies

and suggest related research that appears to have a high priority in addressing these issues.

I. The Methodological Approach

By comparing various European countries' share in the trade of their former colonies with similar data for a control group of developing countries, Kleiman (1976) develops an index of relative trade concentration. The results suggest that former colonial countries' trade with the United Kingdom was three times the normal level for developing countries, for the French associates about eight times as high, and for the Belgian, Italian, and Portuguese colonies even higher. As this might suggest, while France was selected as the main focus for study because of its very high trade intensity with its former colonies, the analysis will also show that the findings can be generalized to Belgium, Portugal, the United Kingdom, and, quite probably, other countries.

The first step in the empirical analysis was to compile annual data on the quantity and value of French exports (free on board, f.o.b.) on a joint product-by-country basis from U.N. Series D Commodity Trade Tapes, and to compute unit values for every five-digit Standard International Trade Classification (SITC) iron and steel product exported by France from 1962 to 1987. Where more disaggregated data were not available, similar statistics were drawn for several higher-level products (four-digit SITC). An effort was made to hold the four-digit items to a minimum, however, since their unit values can be affected by differences in their product mix. Several products had to be excluded from further analysis when tests showed they were exported to too small a number of countries, or when full 1962-87 value and quantity data were not available. This left eleven four- and five-digit SITC steel products that comprised 40-60 percent of French iron and steel exports over the twenty-five-year period. The products and the twenty African French-associated countries are listed in table 1.

Next, I estimated the size of any overall price margins that French-associated countries may have paid relative to other importers. Unit values, U, of good i imported by French associates, f (or the comparator group, g), were calculated as the total f.o.b. value, Vt, over the quantity, Q_t. Price margins for each good were compiled as the ratios of unit values for the French associates to unit values for the comparators:

$$M_i = \frac{V_{it} / Q_{it}}{V_{ig} / Q_{tg}}$$

To derive an aggregate across goods, $M_{t,g}$, the individual goods' margins were weighted by the share of the value of each good in the total value of the sampled iron and steel shipments imported by the associated French countries, VT_{Tf}, and summed:

(1) $$M_{f,g} = \sum \left(\frac{V_{if}}{Q_{if}} \div \frac{Q_{ig}}{V_{ig}} \right) x \frac{V_{if}}{V_{Tf}}$$

Equation 1 computes the aggregate price differential that French associates pay (positive or negative) relative to other countries, weighted by the value of shipments to the associates. The results are presented for two-year time periods in an attempt to smooth out the effects of any unrepresentative trade values that might influence annual figures.

A second measure of the costs (or benefits) of these price differentials, E_f, is derived:

(2) $$E_f = \sum \left(U_{if} - U_{ig} \right) \; x \; Q_f$$

where U_{if} and U_{ig} are unit values for the French associates and other developing countries (that is, the V / Q terms in equation 1) for the imported product. By multiplying the difference between the unit values of the two country groups times the quantity of imports, this equation computes how much more (or less) the associated countries pay for their total imports of the product. These calculations are then summed over all iron and steel imports, and are expressed in current and presen't value terms.

Several points about the export unit value statistics employed in this study should be noted. Analyses based on unit values must generally be treated with caution because differences among products grouped in the same SITC category, or differences in quality among otherwise homogeneous products, may be reflected as price differences. The statistics on some coated five-digit SITC steel products, for example, do not differentiate between zinc-coated, tinplate, and electric-sheet or other similar products. Several previous studies involving fivedigit iron and steel products, however, suggest that the overall effects of such variations may be minor. In fact, this homogeneity is such that studies by Stigler and Kindahl (1970), McAllister (1961), and others have used iron and steel unit values to assess the accuracy of wholesale price quotations employed by the U.S. Bureau of Labor Statistics.

Table 1

The Value and Destination of French Iron and Steel Exports, 1962-87

	French iron and steel exports			*Share by importing country groups (percent)* [a]							
							Developing countries				
	All products	*Sampled Products* [b]	*Sampled products' share*	*Developed Countries*			*Total less*				
	(millions of	*(millions of*			*of which:*		*French*	*Latin*		*French*	*Socialist*
Year	dollars)	dollars)	(percent)	All	EEC[c]	EFTA[d]	*associates*	*America*	*Asia*	*associates* [e]	*countries*
1962	$786.8	$461.1	60.00	68.4	48.0	11.4	12.7	4.7	2.9	11.7	6.0
1965	$966.4	$556.6	57.60	74.7	46.4	11.2	13.3	4.0	3.5	7.8	3.6
1968	$1,013.1	$561.0	55.30	73.9	48.0	9.7	10.7	3.7	2.0	8.2	6.0
1971	$1,532.1	$814.0	53.10	77.6	48.8	9.0	10.5	3.3	2.2	7.0	4.4
1974	$3,978.5	$2,181.6	54.80	73.8	48.4	8.4	11.1	3.1	1.4	7.2	6.8
1977	$4,279.3	$1,938.3	45.20	68.8	46.4	5.7	12.3	3.4	1.5	8.8	9.3
1980	$7,290.0	$3,035.2	41.60	69.9	51.7	6.8	14.4	5.0	1.5	7.5	8.0
1983	$4,854.1	$1,933.9	39.80	69.0	46.4	6.3	15.2	3.3	4.7	6.4	7.4
1986	$6,152.5	$2,446.5	39.80	75.7	53.0	6.2	12.2	2.7	4.1	4.8	7.1
1987	$6,642.7	$2,619.0	39.40	76.9	53.8	6.3	11.7	2.4	3.9	3.6	6.6

a. The developed, developing, and socialist country trade shares may not sum to 100 since the destination of some French exports is not shown in the database.
b. SITC numbers in parentheses: iron and steel simple wire excluding rod (677.01); iron and steel plates and sheets of other than high-carbon or alloy steel (674.81); bars and rods of other than high-carbon or alloy steel (673.21); tubes and pipes of iron other than case iron (678.3); plates and sheets, less than 3 mm thick, of other than high-carbon or alloy steel (674.31); iron and steel simple big sections (673.41); tube and pipe fittings of iron and steel (678.5); wire rod of other than high-carbon or alloy steel (673.11); heavy plates and sheets of iron and steel other than high-carbon or alloy steel ·674.11); medium-size plates and sheets, 3.5 mm to 4.75 mm thick, or other than tinned plates and sheets (674.21); angles, shapes, and sections, less than 890 mm thick, or other than high-carbon or alloy steel (673.51).
d. European Economic Community (ten member countries)
e. These are Algeria, Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Congo, Côte d'Ivoire, Gabon, Guinea, Madagascar, Mali, Mauritania, Mauritius, Morocco, Niger, Réunion, Senegal, Togo, and Tunisia. The declining importance of these countries as a destination for France's iron and steel exports is primarily the result of major reductions in France's share of the associates' total iron and steel imports. An additional factor was that the growth intotal import demand in these countries generally lagged well below that of other regions. See appendix table 1 for statistics on France's share of the associated countries' iron and steel imports.
Source: Author's calculations, based on U.N. Series D Commodity Trade Tapes.

An additional factor that could affect the quality of the trade statistics is the invoicing practices of importers and exporters. Exporters and importers may over- or underinvoice customs vouchers to reduce tariff liabilities, to evade restrictions on the use of foreign exchange, or to illegally obtain subsidies (Bhagwati 1967; Sheikh 1974; UNESCO 1974). In some situations it may be possible to uncover evidence of false invoicing by comparing reported exports with the partner country's reported imports. For several reasons this procedure cannot be used satisfactorily with African data: there are major gaps in many of the African countries' data, many of the records are U.N. estimates, and some African countries only report trade data at the three-digit level-only four report at the five-digit level employed here. While these factors cause major discrepancies in the official import statistics of many African countries (Yeats, forthcoming), the analysis in this study is based on French and other developed countries' official export statistics which are not subject to the same magnitude of error as the African data. It is unlikely that major incentives exist to induce the iron and steel exporters studied here to falsify their export vouchers.

II. The Empirical Findings

Initial comparisons of the relative prices paid by the French-associated and other developed and developing countries over the 1962-87 period are reported in table 2.

These statistics show that the French-associated countries are paying more for their imports than other developed or developing countries. For the full twenty-six-year period, the unit values for French-associated countries always exceeded those of developed countries with market economies (their average premium for this period was approximately 24 percent), and in only one two-year period (1976-77) did the associates' price fall below that for all other developing countries. The French associates paid an average premium of 23 percent above the unit value for other developing countries over the full 1962-87 period.

The total cost of the price differential of French associates relative to all other developing countries, calculated using equation 2, was about $430 million, or, in present-value terms, close to $900 million over the 1962-87 period. It should be remembered, however, that these are losses only from imports of the sampled steel products, which constituted only 39-60 percent of French Steel and iron exports. If the same pattern of price premia holds for all iron and steel shipments, the present value of the associated losses on imports would be approyimdtely $2 billion (1 billion equals 1,000 million). To place this (S2 billion) figure in context, note that it is equivalent to 60 percent of the total gross international reserves of eighteen of the twenty countries and exceeds the long-term debt of twelve of the associated countries in 1987.

Table 2

Comparative Unit Values for France's Exports of Iron and Steel Products

	French f.o.b. exports to associated countries		Premium or discount paid by French-associated countries compared with:				
					Developing countries		
Year	Value (thousands of dollars)	Unit value (dollars)	Total	All developed	All non-French	Latin American	Middle Eastern
1962-63	$118,446.0	$167.0	$37.9	$40.5	$36.9	$26.8	$50.6
1964-65	$98,593.0	$151.5	$27.5	$29.8	$21.8	$20.4	$23.5
1966-67	$86,042.0	$143.8	$24.6	$26.8	$21.0	$21.6	$18.9
1968-69	$101,180.0	$150.0	$28.5	$31.3	$23.9	$32.7	$14.2
1970-71	$119,695.0	$199.3	$29.6	$32.6	$16.7	$13.3	$13.0
1972-73	$187,362.0	$234.8	$23.0	$26.9	$18.6	$22.0	$16.6
1974-75	$368,537.0	$386.7	$18.1	$26.4	$8.1	$16.7	$17.2
1976-77	$341,378.0	$375.8	$13.1	$20.4	-$3.6	$10.2	$2.9
1978-79	$465,702.0	$496.6	$19.5	$19.8	$26.1	$24.1	$12.1
1980-81	$489,195.0	$581.2	$25.4	$28.6	$20.9	$26.3	-$11.2
1982-83	$350,566.0	$458.3	$6.6	$8.3	$8.6	$6.0	-$13.8
1984-85	$318,623.0	$442.9	$17.4	$15.7	$36.2	$34.2	$16.8
1986-87	$269,537.0	$668.0	$40.1	$37.0	$66.5	$54.7	$10.9

Net revenue gains or losses (thousands of dollars)

Actual dollar amount[b]: $432,199

Present value[c]: $876,183

Note : See Yeats (1989) for similar statistics for each of the four and five-digit SITC products included in these computations. The French-associated-country premium or discount (P/Dt) is calculated as: P/Dt = [(Ut-Ug)÷Ug]x100, where Uf is the unit value for the French associates and Ug is the unit value for the comparator countries. The premiums (or discounts) are averaged over all sampled iron and steel products.

a. Excludes the French-associated countries in Africa.

b. Calculated as: Adt = (ut-Ug)xQj, where Qt is the quantity of French-associated-country imports and Ut is the average unit value paid by all other developing countries. These values are then summed over the 1962-87 period.

c. The present value in 1987 of all annual gains or losses computed as above (Adt), discounted at 8 percent.

Source: Author's calculations, based on U.N. Series D Commodity Trade Tapes.

The average premia or discounts paid by individual associated countries for all imports of sampled iron and steel products are shown in table 3. As before, these price comparisons are based solely on French export unit values. For the full 1962-87 period the individual country premia average close to 27 percent; some of the lowest values were recorded for 1974-77 and 1982-83. The most striking point to emerge from table 3 is the extreme variance of average premia paid both among countries in any one period and by any one country over time. For example, over the twenty-six-year period these premia averaged 3.1 percent for Morocco, but for Algeria, Gabon, and Mauritania, they were at least fifteen times greater. The structure and size of markets in these countries are examined below to determine if they can suggest possible reasons for these price margins.

III. Analysis of Differences in Unit Values

Why are there such major differences between the f.o.b. export unit values for different countries of destination? Because these items are generally homogeneous, differences in product characteristics should have a fairly limited influence on unit values and, because these are poorer countries, one would expect that they would purchase lower-price, poorer-quality goods if any product or quality differentiation does exist within the categories.

The relationships of these unit value premia with seven possible explanatory factors are analyzed through simple pairwise correlations. The concentration of import supply among a small number of firms, for instance, could lead to oligopolistic pricing practices. To determine the extent of this concentration, I measured the share of iron and steel supplies originating in the three largest exporting countries. Because each country could have many exporting firms, these measures alone do not provide direct evidence on the potential for collusive practices and overpricing. In support of the country ratios, however, is the fact that because iron and steel production is generally among the most concentrated of industries in developed countries, the potential number of exporting firms is limited. Firms headquartered in the same exporting nation may have a greater opportunity and tendency to participate in cartel arrangements or collusive decisions on foreign prices. During the 1962-87 period there appear to have been only three or four French firms producing the sampled steel products for export, and at various times the links between these companies were reinforced by nationalization.

The size of the export market or export shipments might also be expected to influence the pattern of relative prices. In a study of U. S. machinery exports, for example, Hufbauer and O'Neill (1972) find evidence "that a small importing country pays a much

higher price for its machinery" (p. 272). Thus, the quantity of each country's iron and steel imports from France was computed to determine if larger shipments were associated with lower import prices. In addition, the absolute size of each nation's total imports from all sources was measured, to indicate whether there might be economies of scale associated with larger shipments, or whether French pricing policies are different for large export markets where countervailing power may be influential. The correlation of the number of alternative (country) suppliers with unit value differences is estimated to determine whether a large variety of contacts and potentially greater sources of information on competitive prices are related to import prices. Because quality differences in imports of machinery have been found to be positively associated with real income (Hufbauer and O'Neill 1972), the correlation of each country's gross national product (GNP) per capita with unit value differences was estimated. Finally, a dummy variable was used to designate transactions between France and another developed country, while a second dummy was used for shipments between France and a former colonial country.

Table 3

Average Unit Value Differentials Paid by French-Associated Countries Relative to Other Countries: Selected Iron and Steel Imports from France, 1962-87

(percent)

Importing country	1962-63	1964-65	1966-67	1968-69	1970-71	1972-73	1974-75	1976-77	1978-79	1980-81	1982-81	1984-85	1986-87	1962-87
Morocco	14.1	6.9	-2.1	4.7	3.2	3.5	0.3	0.9	10.9	0.9	-14.6	-5.6	17.0	3.1
Togo	17.2	21.0	11.7	2.7	-1.0	-4.2	-5.9	-14.3	-3.0	18.5	11.0	25.8	69.9	11.5
Burkina Faso	29.6	29.6	37.1	27.8	12.0	21.6	5.6	6.3	-1.0	2.8	-2.8	1.0	10.7	13.7
Senegal	21.5	22.8	23.2	17.2	9.8	7.2	5.6	-3.2	6.9	12.4	2.3	21.8	52.3	15.4
Réunion	18.2	20.9	20.6	24.2	13.2	9.4	-1.5	-1.5	10.6	14.4	8.1	26.4	55.5	16.8
Côte d'voire	28.2	27.8	34.7	28.8	16.0	5.9	8.0	0.5	0.2	40.0	8.0	17.4	36.9	19.4
Madagascar	22.1	31.9	26.5	18.0	3.0	-0.3	8.5	4.2	15.3	35.5	18.4	19.5	40.2	19. 5
Central African Rep.		29.8	28.0	28.0	19.9	11.3	-0.8	1.6	26.8	4.4	5.7	29.0	60.4	19.7
Benin	36.1	22.4	33.4	11.7	1.9	2.8	3.2	3.5	1.9	24.0	44.0	20.5	79.6	21.4
Mali	28.7	32.0	73.8	57.1	46.8	10.8	7.6	8.8	10.1	9.9	-2.5	2.4	16.3	22.8
Mauritius[a]	n.a.	-8.1	-17.7	-2.7	21.1	42.2	60.4	66.1	n.a.	n.a.	n.a.	24.9	n.a.	23.3
Chad	19.7	36.0	30.2	23.8	10.4	26.6	6.7	9.8	18.9	15.9	10.1	34.1	75.5	24.4
Cameroon	30.8	46.2	44.0	34.2	21.7	8.8	18.1	9.2	23.3	38.2	19.4	20.8	78.0	30.3
Congo	27.3	50.4	48.6	20.4	25.9	32.7	10.4	-0.8	22.0	20.6	40.7	46.8	97.1	34.0
Tunisia	15.1	31.3	45.8	48.5	68.4	46.1	42.4	22.1	31.9	18.3	-1.6	15.0	66.0	35.0
Niger	17.4	41.4	14.6	29.0	34.6	15.1	9.6	20.3	41.9	47.7	12.2	73.1	100.5	35.2
Guinea	43.8	55.0	59.2	38.6	45.5	66.0	51.0	29.2	30.8	45.7	49.4	36.6	34.4	45.0
Mauritania	28.3	60.0	49.0	36.3	35.3	35.7	35.1	20.4	62.9	30.8	27.1	48.4	132.6	46.3
Gabon	51.2	49.4	63.8	60.5	58.6	47.5	55.2	5.5	55.9	33.7	28.4	22.4	81.3	47.2
Algeria	77.9	41.0	43.6	50.5	70.8	60.7	33.2	135.9	65.2	58.3	18.1	27.0	22.9	54.2
Weighted average French associates	37.9	27.5	24.6	28.5	29.6	23.0	18.1	13.1	19.5	25.4	6.6	17.4	40.1	26.9

n.a. Not available.

Note : The selected products are listed to the notes to table 1. The relative price for associated country 1 (Rt) is measured by: Rt =[(Ut-Up)÷UP]100, where Ut and Up are the average French associate and other countries' unit values for the sampled iron and steel products.

a. For some years low import volumes precluded computation of a relative unit value.

Source: Author's calculations, based on U.N. Series D Commodity Trade Tapes.

The results of the correlation analysis are summarized for the 1968-69 and 1986-87 periods in table 4. Since 1968-69 France has considerably broadened its trade contacts and thus provides a larger base and range of country characteristics for the price comparisons than was available earlier. To provide the widest possible interval for the intertemporal comparisons of correlation results, the period 1986-87 was also selected. Although many of the 1986-87 correlations appear stronger than those for the earlier

period, the variables that were significantly correlated with prices and market structure in 1968-69 had a similar relationship in 1986-87.

As shown in the first column of the table, five variables had a significant relationship with relative French export prices in 1968-69, with all of the variables being significant in 1986-87. As is the case with industrial-country market studies, variables relating to market structure are strongly correlated with relative prices. For example, a highly significant positive relation (r = 0.384) exists between relative prices and the share of imports controlled by the three largest supplying countries in 1968-69, and the relation was even stronger (r = 0.472) in 1986-87. A significant inverse association also exists between relative prices and the number of trading partner (country) contacts. Thus, those importing countries maintaining trade relations with a larger number of exporters, and theoretically benefiting from greater competition and information on comparative prices, pay less for their imports. Unfortunately, from the view of development policy, there is evidence that small, poor countries may not be able to sustain a larger number of trading contacts because this variable was significantly and positively correlated with GNP per capita, market size, relative quantities purchased, and the developed-country dummy variable.

Table 4

Correlation between Iron and Steel Relative Import Unit Values and Indicators of Market Structure and Effective Size
1968-69 and 1986-87

Size and structure variables	Relative price		Market structure variables: Number of trading partners		Market structure variables: Share of three largest country suppliers		Market size variables: Relative quantity of imports		Market size variables: Total imports		Dummy variables: Associated countries		Dummy variables: Developed countries	
	1968-69	1986-87	1968-69	1986-87	1968-69	1986-87	1968-69	1986-87	1968-69	1986-87	1968-69	1986-87	1968-69	1986-87
Number of trading partners in selected products	-0.448*	-0.564*												
Share of three largest country suppliers of selected products	0.384*	0.472*	-0.762*	-0.569*										
Relative quantity of imports of selected products	-0.134	-0.708*	0.355*	0.711*	-0.150	-0.510*								
Total imports (value)	-0.157	-0.626*	0.474*	0.831*	-0.219*	-0.471*	0.842*	0.817*						
Associated-country group	0.604*	0.447*	-0.778*	-0.671*	-0.680*	0.407*	-0.216*	0.507*	-0.377*	0.753*				
Developed-country group	-0.200*	-0.633*	0.593*	0.558*	-0.441*	-0.423*	0.454*	-0.717*	0.598*	0.688*				
GNP per capita	-0.287*	-0.572*	0.560*	0.727*	-0.385*	-0.466*	0.575*	0.755*	0.716*	0.820*	-0.517*	0.745*	0.799*	0.748*

Note: The selected products are noted in table 1. An asterisk (*) indicates statistical significance at the 99 percent confidence level
a. Defined as the ratio of iron and steel shipments (in tons) to an individual country to the average tonnage shipped by France to all trading partners.
Source: Author's calculations, based on U.N. Series D Commmodity Trade Tapes

Somewhat surprisingly, although a strong, negative, and significant association between relative prices and both the market-size variables is evident in 1986-87, in 1968-69 these associations were lower, and only significant at the 95 but not the 99 percent confidence level. The indirect effects of size appear important in both periods, however, because table 4 shows that both these variables are strongly and significantly correlated with market structure, which in turn influences market prices.

While the correlations between relative prices and these variables are the primary focus of this analysis, some of the intercorrelations between the independent variables are also of interest. For example, in comparison with the developed countries, developing nations had significantly fewer trade contacts, smaller markets, and higher concentration ratios, all of which undoubtedly contribute to higher import prices.

IV. Additional Evidence from Other African Countries

The previous analyses raise the question of whether other industrial countries' exports show similar pricing patterns. For a test of this proposition, f.o.b. unit values were computed for the United Kingdom's exports of major iron and steel products to former African colonies (Gambia, Ghana, Kenya, Nigeria, Sierra Leone, Sudan, and Tanzania) as well as to all other developing countries. Next, similar computations were made for former colonies of Belgium (Burundi, Rwanda, and Zaire) and Portugal (Angola and Mozambique). These data were then used to compute the average premia or discount that the Belgian, British, or Portuguese former colonies paid over the 1962-87 interval reported in table 5.

Over the full 1962-87 period the average premia paid by the former Belgian and French colonies are remarkably close (23.7 and 23.2 percent, respectively), whereas the former British colonies paid a slightly lower premium of 20.0 percent. The same pricing pattern emerges during 1962-75 for Portugal's exports to its former colonies, but from 1976 on the premia more than tripled and averaged more than 120 percent. It appears that the hostilities in Angola were a major factor behind this dramatic rise as domestic firms may have employed excess pricing as a means of transferring resources out of the country. The statistics in table 5 are important, however, as they show that the payment of price premia for imports is widespread among African countries.

V. Alternative Hypotheses on the Causes of Price Differentials

The empirical approach employed in this paper has close parallels to previous structure-performance studies of industrial countries, which found that prices and profits were higher in markets where aggressive competition was absent. A series of other factors that could influence price margins include institutional arrangements at the national level between governments; transnational firm linkages or special commercial arrangements between enterprises; limits on access to international markets caused by constraints on information, transport, service, or marketing and distribution; and differences in financial risk.

Table 5
Premium or Discount Charged by Selected European Countries on Iron and Steel Exports to Associated African Countries, 1962-87

Average premium or discount charged associated countries

Years	Belgium[a]	France[b]	Portugal[c]	United Kingdom[d]
1962-63	20.7	36.9	12.7	4.0
1964-65	21.2	21.8	37.3	8.8
1966-67	25.7	21.0	25.6	14.4
1968-69	19.1	23.9	29.9	12.4
1970-71	15.2	16.7	43.7	13.0
1972-73	18.0	18.6	18.7	15.5
1974-75	26.4	8.1	42.9	9.9
1976-77	35.3	-3.6	n.a.	22.5
1978-79	37.0	26.1	n.a.	15.1
1980-81	17.1	20.9	n.a.	19.2
1982-83	25.5	8.6	n.a.	36.5
1984-85	16.0	36.2	n.a.	37.9
1986-87	31.5	66.5	n.a.	53.0

Note : Based on the four and five-digit SITC products listed in table 1. The average premium or discount (indicated by a negative value) has been calculated relative to the average unit value for each product paid by other developing countries.

a. Burundi, Rwanda, and Zaire

b. See table 3 for French-associated countries

c. Angola and Mozambique. From 1976-77 to 1986-87 the premiums on Portugal's exports rose dramatically and averaged more than 120 percent. It appears likely that the hostilities in Angola were a major factor in causing the large increase in prem9iums over those which prevailed during 1962-63 to 1974-75.

d. Gambia, Ghana, Kenya, Nigeria, Sierra Leone, Sudan, Tanzania, and Uganda.

Source: Author's calculations, based on U.N. Series D Commodity Trade Tapes.

An example of institutional arrangements at the national level which may adversely influence African import prices is the practice of tying bilateral aid, so that recipients must use the funds to buy goods produced in the donor country. Because they are in a sense "captive importers," the African countries may not be offered prices that would prevail in international markets more generally. The bargaining power of African countries may also be limited by the rules of origin under the Lome Convention. In order to qualify for preferential market access when they are exported to Europe, any assembled iron and steel or other fabricated products must use components produced in the European Community. Similarly, under "reverse preferences," imports from France or the United Kingdom were admitted into their former colonies at tariffs considerably below those paid by other exporters until the early 1970s. Such arrangements reduced competitive pressures on domestic European firms and allowed them to raise f.o.b. export prices above those of other (nonAfrican) countries.

A second set of factors that can influence relative prices arises when transnational operations or interfirm ties result in collusive practices. For example, subsidiaries of foreign firms may be required (formally or informally) to purchase from the parent company even when other international traders were offering goods of equal quality at lower prices (Kreinin *1988).* This tie was found to be particularly strong for Japanese enterprises. Such overpricing could, of course, be used as a means of transferring profits and capital out of Africa.

Price premia may also reflect weaker African infrastructure for domestic transport, marketing, distribution, service, and information systems. Smaller African markets and demand also may not be sufficient to support the required domestic distribution and service operations of more than one or a few foreign suppliers. And problems of language, finance, or size of operations all could limit active competition. In addition, existing international transport lines may limit African countries' ability to trade with some low-cost producers. Most African countries do not have direct access to North American or Far Eastern producers, and imports from these geographic areas may require costly offloading and reloading in foreign ports in transit.

A final set of factors that could affect relative prices derives from the extent, variability, and enforcement of government intervention in African markets. For example, taxes, government regulations, and currency controls create incentives to falsify customs invoices to transfer foreign exchange abroad. A related question is whether African countries are somehow riskier than others, which is a function of the reliability of market support systems, demand, and government policies. Exports of durable capital goods are often fully financed by the exporter, and the f.o.b. export prices reflect these costs of finance and insurance. If the African countries were generally considered riskier than most alternative destinations, their price premia may reflect these higher finance charges.

VI. Summary and Policy Implications

Using techniques which have been employed for the analysis of domestic market performance in industrial countries, this study established that African countries paid higher import prices for iron and steel shipments than did other developing or developed countries. The magnitudes of these excess prices indicated that they have been an important drain on foreign exchange: the overall premia for 1962 to 1987 had a present value of close to 1 billion dollars in 1987. If the same pattern of excess prices applied to all iron and steel imports (rather than just those products selected), the magnitude of the costs would approximately double.

The differentials calculated here are relative to average unit values for other developing-country importers of French products. If the equivalent price differentials were calculated relative to the lower-cost suppliers such as Japan, the total losses would be even greater. Whether collusive practices among importers, restrictive government polices, or higher unit costs in the smaller African markets prevented them from importing steel and iron at these lower prices, however, is not known.

The figures calculated here relate solely to iron and steel shipments, and a key question is whether such excess price margins also apply to other capital goods imports. There is some tentative evidence in support of this proposition. Yeats (1978, p. 178) compared four-digit S(TC product unit values for all French shipments to selected associated and nonassociated African countries for 196269 and found that unit values for the ex-colonials averaged between 13 and 18 percent higher. If this excess price margin applied to all manufactured imports, this would mean that the associates could have been overcharged by approximately 25 billion dollars. The fact that trade intensity ratios are lower for most iron and steel products imported by the French-associated countries than they are for other items (see appendix table 2) also suggests that the price margins found here may actually be less than those of other products for which supply is handled by fewer countries. Similar analysis is needed, however, to estimate such margins for other goods.

While this study established that African countries pay higher prices than other countries for iron and steel products, a question of key importance is why they do and have done so over such an extended period. As noted, the excess price margins are fully consistent with both economic theory on the functioning of markets and results from investigations of markets where monopoly elements exist. However, it was not possible within the scope of the current investigation to identify precisely the factors that were adversely affecting the African countries. Among the possible factors are the relatively small size of their markets, which could be important given economies of scale in distribution, financing, and insurance; the influence of factors that limit access to competitive suppliers, such as tied aid and established lines of international and domestic transport; a lack of information on competitive suppliers; the use of overpricing to facilitate graft and corruption; and transfer pricing by subsidiaries of foreign firms in the African countries. Definitive information on the relative importance of such factors will require a detailed analysis of the procurement practices and problems of African importers.

There are several lines that this related research might take. First, it would be useful to extend the procedures developed in this study to other types of homogeneous products (that is, glass, cement, nonferrous metals, and so forth) to see if further evidence of discriminatory pricing exists for these items. Second, trade intensity and other structural variables (see appendix table 1) could be computed for a large number of bilateral trade flows and the results used to distinguish outlier countries which may be subject to oligopoly or monopoly pricing. The procedures used in this study might then be applied to these specific countries to test for evidence of monopoly pricing. Third, the procedures should be applied to homogeneous goods exported from developing countries to determine if they may be receiving less than competitive prices for this trade.

APPENDIX

Measures of Trade Concentration

This appendix presents summary statistics relating to market shares, trade intensity ratios, and indexes of import concentration in the French associated countries' markets. Appendix table 1 shows the share of France in the associates' total imports of iron and steel products (SITC 67 and all goods for selected years from 1962-85. Because some of the associated countries did not report their imports for specific years, France's share and the trade intensity ratios could not be computed for these years. The table also gives a trade "intensity" index (I„) defined as the share of country t°s (France) exports to associate country j (X„/X,) relative to the share of i's imports *(M,)* in world imports net of i's imports ((Mw-Mi) That is,

(A-1) $$I_{it} = \frac{Xit}{Xt} \div \frac{Mt}{M_u - Mt}$$

The index can take values between 0 and ∞ with values above 1 indicating a greater intensity of trade between two countries than can be accounted for by the countries' importance in world trade. That is, a value of 2 would indicate that the intensity of trade between countries was twice as great as what would be expected on the basis of their share in world trade.

Appendix table 2 provides statistics on the concentration of associate countries' iron and steel imports from alternative major suppliers. A three-country import concentration ratio (C_{3j}) was computed:

(A-2) $$C_{3t} = (M_{3t} \div M_{Tj}) x 100$$

where M3, is the value of associate country J's iron and steel imports from the three largest supplying countries and M r, is the total value of imports.

The Hirschmann concentration index *(H,)* was also computed,

(A-3) $$H_t = \sqrt{\sum \left(X_{it} \div X_t\right)^2}$$

This index may take values ranging from 0 to 1 with the higher numbers indicating more concentrated markets. Similar statistics have been computed for the total imports of Brazil, the Federal Republic of Germany, the United Kingdom, the United States, and all developed and developing countries.

Market structure indexes like equations A-2 and A-3 have been used extensively in structure-performance studies of industrial countries which are based on data for individual firms. There is a potential problem in applying these measures to national trade data, because a high ratio at the national level may conceal a large number of (national) competing firms. In countries which belong to the Organisation for Economic Co-operation and Development, however, there are relatively few iron and steel firms (some of which are nationalized), so this should not be a major problem for the current study. Two important points clearly emerge from these indexes. First, France has maintained a dominant position in almost all the associated countries' markets (Mauritius is an exception), although many of the ratios declined over the period. The fact that fourteen of the twenty countries have higher bilateral trade ratios for all imports than for iron and steel in 1985 suggests that overpricing may extend beyond this one sector to all goods. Yeats ! 1978, table 4, p. 178) shows that the. average unit values for all four-digit SITC products imported by selected associate countries from . France are consistently higher than those of other African countries. Second, appendix table 2 shows that the markets of the ex-colonial countrie for iron and steel imports remain far more concentrated than those of developed or developing countries, although the market structure indexes also are falling. Still, by 1985 the three largest supplying countries controlled 70 percent or more (more than 90 percent in the case of Chad and Reunion) of the associates' imports. In industrial market studies such very high levels of concentration have consistently been found to be associated with higher seller prices and profits.

Appendix Table 1

The Shares of French Exporters in Associated Countries' Imports and Their Bilateral Trade Intensity Indexes, 1962-75

Country and product group	*Share of France in associates' imports (percent)*						*French-associate bilateral trade intensity ratio*					
	1962	1965	1970	1975	1980	1985[b]	1962	1965	1970	1975	1980	1985[a]
Algeria												
Iron and steel	n. a.	60.1	28.0	20.8	12.3	17.4	n. a.	4.4	2.4	2.1	1.0	1.6
All items	n. a.	70.4	42.4	33.5	23.2	26.0	n. a.	11.0	6.2	4.9	3.6	4.4
Benin												
Iron and steel	71.4	61.2	37.6	n. a.	33.0	25.7	4.4	4.4	3.2	n. a.	2.8	2.6
All items	59.3	54.8	42.2	n. a.	25.2	27.4	9.9	8.6	6.2	n. a.	3.9	4.1
Burkina Faso												
Iron and steel	83.1	89.1	49.2	64.0	72.5	50.5	5.2	6.5	4.2	6.3	6.1	5.1
All items	52.2	53.0	50.7	43.4	39.3	27.9	8.7	8.4	7.5	6.3	6.1	6.4
Cameroon												
Iron and steel	78.7	89.4	54.0	58.1	58.2	42.4	4.9	6.5	4.6	5.8	4.9	3.7
All items	54.5	58.1	50.5	46.3	44.7	42.1	9.1	9.1	7.4	6.7	6.9	6.2
Central African Republic												
Iron and steel	84.3	91.6	59.3	73.3	68.4	81.1	5.2	6.6	5.0	7.3	5.8	7.0
All items	60.5	60.9	58.4	57.0	60.7	52.7	10.1	9.5	8.6	8.3	9.3	10.0
Chad												
Iron and steel	91.9	97.1	47.3	52.3	72.5	86.7	5.7	7.0	4.0	5.2	6.1	8.7
All items	53.2	46.4	39.8	40.8	31.1	33.3	8.9	7.3	5.9	5.9	4.8	5.1
Congo												
Iron and steel	89.8	79.9	55.4	76.4	76.7	44.6	5.6	5.8	4.7	7.6	6.4	4.2
All items	67.7	61.2	55.1	49.7	47.8	45.5	11.3	9.6	8.1	7.2	7.4	7.7
Côte d'Ivoire												
Iron and steel	84.5	76.2	52.7	67.7	63.1	44.9	5.2	5.6	4.5	6.7	5.3	4.3
All items	66.7	62.4	46.2	39.1	40.8	32.1	11.1	9.8	6.8	5.7	6.3	5.4
Gabon												
Iron and steel	84.1	91.0	69.7	71.1	56.8	65.4	5.2	6.6	5.9	7.0	4.8	6.5
All items	61.9	58.5	56.6	66.9	58.4	54.2	10.3	9.1	8.3	9.7	8.5	9.6
Guinea												
Iron and steel	n. a.	n.a.	n. a.	n. a.	31.1	58.0	n. a.	n. a.	n. a.	n. a.	2.6	5.8
All items	n. a.	n. a.	n. a.	n .a.	32.6	32.3	n. a.	n. a.	n. a.	n. a.	5.0	5.3
Madagascar												
Iron and steel	93.1	88.9	59.1	67.1	45.5	78.2	5.8	6.4	5.0	6.6	3.8	7.4
All items	74.9	62.5	54.7	40.9	37.6	29.5	12.5	9.8	8.0	5.9	5.8	5.0
Mali												
Iron and steel	90.0	38.7	43.4	72.4	62.3	46.7	6.2	2.8	3.7	7.2	5.3	4.7
All items	39.2	24.1	38.4	34.1	36.3	25.3	6.5	3.8	5.7	4.9	5.6	4.2
Mauritania												
Iron and steel	97.2	90.5	57.6	78.0	81.1	41.4	6.1	6.6	4.9	7.7	6.8	4.1
All items	72.5	44.4	35.7	42.3	34.6	23.8	12.1	6.9	5.3	6.1	5.3	3.9
Mauritius												
Iron and steel	4.9	10.1	0.6	3.0	1.6	10.4	0.3	0.7	0.1	0.3	0.1	1.0
All items	4.8	5.7	6.9	8.6	10.7	11.8	0.8	0.9	1.0	1.3	1.7	1.9
Morocco												
Iron and steel	75.1	73.8	41.8	50.4	31.7	31.2	4.7	5.3	3.5	5.0	2.7	3.0
All items	42.7	38.0	31.0	30.4	24.8	22.8	7.1	5.9	4.6	4.4	3.8	3.9
Niger												
Iron and steel	95.0	84.6	73.4	73.5	64.6	30.1	5.9	6.1	6.2	7.3	5.5	3.0
All items	54.1	53.2	45.8	30.3	39.1	46.2	9.0	8.3	6.7	4.4	6.1	7.6
Reunion												
Iron and steel	92.7	67.7	67.9	80.0	68.7	66.0	5.8	4.9	5.7	7.9	5.8	6.2
All items	68.8	67.6	62.1	62.6	65.3	65.0	11.5	10.6	9.1	9.1	10.1	11.1
Senegal												
Iron and steel	90.6	90.5	71.5	52.8	71.7	74.1	5.6	6.6	6.0	5.2	6.1	7.4
All items	65.0	53.1	51.2	41.5	34.1	43.2	10.8	8.3	7.5	6.1	5.2	7.1
Togo												
Iron and steel	51.0	52.2	32.4	30.7	54.8	30.1	3.2	3.8	2.7	3.1	4.6	3.1
All items	33.5	31.2	29.5	35.1	25.0	19.6	5.6	4.9	4.4	5.1	3.9	3.2
Tunisia												
Iron and steel	70.4	37.3	43.5	59.9	33.5	22.4	4.4	2.7	3.7	5.9	2.8	2.1
All items	52.2	39.0	34.7	34.4	25.2	27.6	8.7	6.1	5.1	5.0	3.9	4.7

n.a. Not available.

a. The index represents the share of France in all exports to the associated country divided by the share of France in world trade (see equation 3). A value greater than unity indi-ate, a greater intensity of trade than would be expected on the basis of France's share in world trade.

b. Because more recent information was not available for Benin, Burkina Faso, Central African Republic, Chad, Gabon, Guinea, Mali, Mauritania, Mauritius, Niger, Senegal, and Togo, the statistics shown in these columns are for 1983. Because 1985 data were not available for Cameroon, the information shown relates to 1986 trade.

Source: Author's calculations, based on U.N. Series D Commodity Trade Tapes.

Appendix Table 2

Supplier Share and Concentration Indexes for Iron and Steel Imports, 1962-85

	Share of imports from three largest suppliers (percent)						Import supply concentration index					
Country	1962	1965	1970	1975	1980	1985	1962	1965	1970	1975	1980	1985
Algeria	99.3	92.1	57.5	62.3	60.0	57.8	0.98	0.86	0.40	0.49	0.39	0.39
Benin	99.9	98.4	93.0	84.2	81.0	72.0	0.82	0.71	0.55	0.51	0.50	0.47
Burkina Faso	99.3	95.0	87.8	88.2	89.2	71.5	0.92	0.83	0.73	0.73	0.73	0.48
Cameroon	95.8	88.9	80.5	84.4	73.6	75.7	0.82	0.77	0.52	0.62	0.64	0.65
Central African Republic	98.7	97.4	92.6	93.0	93.7	88.9	0.87	0.90	0.69	0.70	0.68	0.69
Chad	99.0	98.0	86.9	97.0	88.4	96.2	0.96	0.92	0.63	0.66	0.74	0.63
Congo	97.7	91.4	77.7	84.6	93.2	70.8	0.90	0.79	0.56	0.69	0.79	0.45
Côte d'Ivoire	96.9	98.2	81.1	88.2	79.5	85.2	0.87	0.79	0.58	0.74	0.66	0.61
Gabon	97.1	96.2	84.6	87.6	86.8	54.1	0.90	0.90	0.66	0.71	0.65	0.67
Guinea	45.7	91.9	96.9	90.8	83.1	70.5	0.75	0.81	0.74	0.60	0.53	0.49
Madagascar	98.5	95.0	89.7	95.0	87.3	81.9	0.94	0.86	0.66	0.76	0.63	0.61
Mali	99.9	99.7	98.2	94.5	93.8	74.6	0.97	0.71	0.58	0.69	0.72	0.51
Mauritania	99.9	98.1	82.0	94.7	87.8	86.1	0.97	0.85	0.66	0.86	0.81	0.57
Mauritius	76.7	68.4	64.6	72.1	87.7	87.5	0.88	0.88	0.79	0.78	0.84	0.84
Morocco	97.8	94.6	71.5	76.6	81.3	82.7	0.84	0.84	0.53	0.55	0.53	0.49
Niger	99.0	91.0	95.7	88.1	63.4	64.9	0.98	0.82	0.81	0.74	0.58	0.44
Reunion	98.0	97.2	92.1	98.6	96.4	97.6	0.59	0.43	0.44	0.52	0.55	0.70
Senegal	99.0	95.9	92.5	71.1	89.6	83.1	0.92	0.82	0.71	0.54	0.76	0.60
Togo	91.9	90.9	83.0	79.1	88.6	75.3	0.58	0.82	0.54	0.52	0.62	0.46
Tunisia	93.3	73.1	69.4	82.8	78.8	72.3	0.79	0.49	0.52	0.68	0.50	0.45
Brazil	67.4	65.4	67.6	69.7	65.3	64.7	0.41	0.42	0.43	0.46	0.39	0.40
Germany, Fed. Rep.	78.2	67.7	64.2	58.7	53.7	48.7	0.51	0.45	0.43	0.39	0.37	0.33
United Kingdom	38.2	43.3	41.1	44.0	49.5	52.6	0.26	0.31	0.34	0.34	0.35	0.38
United States	52.9	63.8	66.8	67.5	63.6	55.9	0.34	0.45	0.48	0.49	0.44	0.38
All developed countries	58.6	49.7	46.6	50.2	46.4	40.2	0.37	0.34	0.33	0.34	0.31	0.30
All developing countries	52.6	53.7	611.7	64.1	59.9	57.4	0.37	0.37	0.43	0.47	0.46	0.47

Source: Author's calculations, based on U.N. Series D Commodity Trade Tapes.

References

Bhagwati, Jagdish. 1967. "Fiscal Policies, the Faking of Foreign Trade Declarations. and the Balance of Payments." *Oxford Bulletin* of *Economics .end Statistics 30,* no. 1 (February): 61-7 7 .

Bresnahan, Timothy F. 1989. "Empirical Studies of Industries with Market Power." In Richard Schmalensee and Robert D. Willig, eds., *Handbook of Industrial Organization, vol.* 2. Amsterdam: North-Holland.

Edwards, Corwin. 1972. "Barriers to International Competition: Interfirm Competitive Behavior." In R. Hawkins and Ingo Walter, eds., *The United States and International Markets.* Lexington, Mass.: Heath.

Helleiner, G. K. 1978. *World Market Imperfections and Developing Countries.* Washington, D.C.: Overseas Development Council.

Hewett, E. A. 1974. *Foreign Trade Prices in the Council for Mutual Economic Assistance.* Cambridge, England: Cambridge University Press.

Hufbauer, G. C., and J. P. O'Neill. 1972. "Unit Values of U.S. Machinery Exports." *Journal of International Economics* 2: 265-76.

Kleiman, Ephraim. 1976. "Trade and the Decline of Colonialism." *Economic journal* 86 (September): 459-80.

Kreinin, Mordechai. 1988. "How Closed Is the Japanese Market? Additional Evidence." *World Economy 11,* no. 4 (December): 529-42.

McAllister, Harry. 1961. "Statistical Factors Affecting the Stability of the Wholesale and Consumer Price Indexes." In U.S. Congress, Joint Economic Committee, Gov*ernment Price Statistics Hearing.* Washington, D.C.: U.S. Government Printing Of*fice.*

Sheikh, Munir. 1974. "Underinvoicing of Imports in Pakistan." *Oxford Bulletin of Economics and Statistics* 36, no. 4 (November): 287-96.

Stigler, George J., and James K. Kindahl. 1970. *The Behavior of Industrial Prices.* New York: Columbia University Press.

UNESCO (U.N. Economic and Social Council). 1974. *International Trade Reconciliation Study* (E/CN.3/454). Geneva: United Nations.

UNCTAD (U.N. Conference on Trade and Development). 1975. *The Control of Transfer Pricing in Greece.* Geneva: United Nations.

Yeats, Alexander. 1978. "Monopoly Power, Barriers to Competition, and the Pattern of Price Differentials in International Trade." *Journal of Development Economics* 5 (June): 167-80.

___. 1989. "Do African Countries Pay More for Imports? Yes." World Bank Policy, Planning, and Research Working Paper 265. Washington, D.C. Processed.

___. Forthcoming. "On the Accuracy of Economic Observations: Do Sub-Saharan Trade Statistics Mean Anything" *World Bank Economic Review* 4, no. 2.