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4 International Trade Strategies, Employment, and Income Distribution in Colombia

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4.1 Introduction

Colombia is an interesting country to study for this project because it has experienced both import substitution and export promotion trade strategies and because it faces severe employment problems. From World War II until 1967, Colombia followed well-defined import substitution policies. During this period the Colombian manufacturing sector evolved from producing mostly consumer goods to producing intermediate and capital goods as many import substitution industries developed. In this environment, natural resource based (NRB) commodities accounted for the bulk of exports. In 1960 coffee accounted for 72 percent of total exports, while manufactures made up only 2 percent of the total.

In 1967, after a balance of payments crisis, Colombia changed the focus of its trade policies. The change was not abrupt. Its purpose was to make the development of export industries more attractive than the further development of import substitution industries. However, at the same time, Colombia hoped that industries that had developed efficiently under the import substitution strategy would find it profitable to begin exporting. Thus the new policy was intended to improve the profitability of export sales relative to domestic sales for new and existing producers. The resulting opening of the economy was dramatic, and the composi-

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tion of exports changed drastically. By 1976, manufacturing exports accounted for 21 percent of total exports, and coffee's share had fallen to less than 50 percent.

Colombia's employment problems are similar to those afflicting many other LDCs. Population growth has been rapid, with the urban population rising at an even more rapid rate. During its import substitution phase, growth of manufacturing employment was dismal. In the last ten years of import substitution, manufacturing employment growth averaged 1 percent per year. In its last five years, manufacturing output rose at an annual rate of 5.5 percent, but manufacturing employment did not increase at all. One of the purposes of the export promotion policy was to increase employment opportunities in the manufacturing sector. To a certain degree this increase has occurred, although it has not been as strong as that experienced in some other countries. Since 1967, manufacturing employment has been growing at annual rates of 3 to 4 percent. This growth is not as large as, say, that of Brazil, which experienced increases in manufacturing employment on the order of 6 to 7 percent annually after adopting export promotion policies.

Although there have been extensive studies of the progress of the Colombian economy, its dependence upon coffee exports, and its import substitution policies (e.g., Berry and Thoumi 1977; Díaz-Alejandro 1976*b*; Thoumi 1978), there has been no study of the employment effects of the export promotion strategy. Thus, Colombia should make an interesting comparison to other export-oriented countries largely because its policies have been relatively less successful (though certainly not unsuccessful) in generating employment opportunities.

My analysis focuses upon the years 1970 and 1973.[1] Data availability was the primary reason for this choice. However, comparing labor requirements between the two years will permit inferences about the progress of the export promotion policies started in 1967. The 1970 estimates then will refer to the early phase of export promotion; the 1973 estimate will refer to the later phase.

4.2 An Overview of the Colombian Economy

4.2.1 Patterns of Growth

Colombia has many characteristics in common with other LDCs.[2] Its per capita income was approximately $630 in 1976, somewhat below the average for the "middle-income developing countries" (MDC) estimated by the World Bank. Growth in real GNP during the past thirty years has averaged approximately 5 percent per year, although growth has not been smooth by any means. From 1950 to 1956, growth in GNP averaged 5.23 percent; from 1956 to 1967, the annual average

growth rate fell to 4.57 percent; from 1967 to 1972, it averaged 6.08 percent. This rate has increased in more recent years to about 6.5 percent (see *Coyuntura Económica*, various issues), with the exception of 1975, when GNP grew only 1.8 percent as a result of the world recession and restrictive internal macroeconomic policies. The composition of GNP has changed substantially since, as formal manufacturing and services have grown at a faster rate than GNP, while agriculture has grown at a lower rate. The national accounts (*Cuentas nacionales* 1973, 1977) indicate that agriculture's share of GNP declined from 35.9 percent in 1950 to 26.7 percent in 1972. Total manufacturing's share, including the informal sector, grew from 17.8 percent to 20.2 percent. Underlying this, the rate of growth of the formal manufacturing sector has consistently outpaced GNP by approximately 1 percent per year during the past fifteen years. The shares of mining, personal services, government services, and transport have remained stable, while the shares of commerce, communications, electricity, gas and water, construction, and banking, insurance, financial, and real estate services have all increased significantly. Particularly large percentage changes took place in communications and electricity and other utilities, reflecting both the large infrastructure expenditures by the government in the fifties and sixties and also the increased degree of urbanization and internal economic integration of the country.

4.2.2 International Trade

Pattern and Composition of Trade

Colombia's exports consist principally of NRB products (of which coffee is the most important), destined mainly for the developed capitalist world. Its imports are mostly manufactured goods, again mainly originating from developed nations. However, it is perhaps not quite as dependent upon trade as some LDCs for its economic well-being and, to a degree, has succeeded in diversifying both the composition and the destination of its exports.

Colombia's international trade has grown at an accelerating rate since 1960. Table 4.1 shows that commodity exports (in current prices) rose by 16 percent between 1960 and 1965, by 35 percent between 1965 and 1970, and by 102 percent during the following five years. Commodity imports behaved somewhat erratically; they declined 16 percent between 1960 and 1965 and then increased sharply as dollars became available because of increased exports. During the 1960s the share of exports in GNP fluctuated between 12.8 and 14.3 percent, and that of imports ranged from 12.4 to 16.2 percent. More recently (1976), official figures show a decline in the share of exports in GNP to 11.8 percent and a decline in the share of imports to 12.0 percent. These figures, which

Table 4.1 **Growth of Colombia's Foreign Trade, 1960 to 1975 (Values in Millions of U.S. Dollars)**

Year	Exports	Coffee	DCs	LDCs	Imports	DCs	LDCs
1960	463.9	72%	94%	6%	541.1	89%	11%
1965	539.5	64	87	13	452.7	88	12
1970	727.6	64	86	14	843.7	90	10
1973	1,191.4	50	84	16	1,061.5	87	13
1975	1,468.2	46	79	21	1,494.8	87	13
			Percentage Change				
1960–65	16%	3%	7%	150%	−16%	−18%	−10%
1965–70	35	36	40	12	86	91	66
1970–75	102	44	72	324	77	72	122

Source: International Monetary Fund, *Direction of Trade*, computer tapes, 21 July 1977.

would mean a decline in the trade share in spite of the export drive and simultaneous lowering of tariffs, may be biased downward because contraband has probably increased.

Colombia has become less dependent upon NRB and coffee exports. In 1960, NRB commodities formed 98 percent of exports, of which coffee was 72 percent. In 1970 the share of NRB commodities in total exports had fallen to about 85 percent; that for coffee was 64 percent. By 1973 NRB products formed 65 percent of exports; coffee's share had fallen yet further to 50 percent.

The relative importance of exports to developed nations has fallen at the same time that the relative shares of NRB and coffee exports have fallen. In 1960, 94 percent of Colombia's exports were destined for DCs, of which the United States and Germany were most important. By 1975 the DC share in total exports had decreased to 79 percent. Its major LDC destinations were other Latin American countries, especially Ecuador, Peru, Panama, and Venezuela.

Colombian imports are mostly manufactured products and originate mostly in the developed countries (see tables 4.1 and 4.2). The course of imports has not changed much in the past twenty years, about 87 percent of imports originating in DCs. However, the relative share of the United States fell from 50 percent in the early 1960s to 46 percent in 1970 and 41 percent in 1973, while that of other DCs rose from 35 percent to 40 and 44 percent in the same time periods. The content of imports has also remained relatively stable. Manufactured imports were 95 percent of all imports in the early 1960s, 94 percent in 1970, and 89 percent in 1973.

It has been argued (Díaz-Alejandro 1976*b*) that the export promotion policies followed by the Colombian government have benefited NRB

products, which probably would have been exported independently of the export promotion policies—for example, cotton, sugar, coffee, tobacco, and bananas. However, the substantial increase in the importance of HOS exports in the 1970s indicates that the export promotion policies have affected HOS exports more than NRB exports. In general, growth rates (of the value of exports) for NRB exports have been lower than those for HOS exports despite booming world markets for NRB commodities (e.g., the export price of Colombian coffee increased by close to 200 percent between 1970 and 1975). It seems clear then that HOS exports have been more responsive to domestic price incentives than NRB commodities, whose exports depend upon weather and international price fluctuations.

Although HOS exports grew across the board, their most substantial growth was in exports to developed countries other than the United States. Exports to these countries increased ninefold to exceed the exports to the United States by 26 percent when HOS is defined to include all the manufacturing sector, and by 90 percent when the HOS definition excludes petrochemicals, jewelry, and sugar. The share of HOS exports going to the United States declined by over 15 percentage points between 1970 and 1973 under the different HOS definitions used (see table 4.2). The share going to other developed countries increased by about 20 percentage points. The share of LDCs in HOS exports decreased by about 8 percentage points when sugar, petrochemicals, and jewelry are included in the HOS sector and by about 5.5 percentage points when these products are excluded.

Table 4.2 also shows the share of HOS goods in total exports in 1970 and 1973. The striking feature is the dramatic increase of HOS exports as a percentage of total exports to nearly all destinations, with the most significant increases being in the HOS share of exports to other developed countries, the Andean Group, and other Latin American countries. Their share of HOS exports in total exports increased from 14.9 percent to 35.5 percent when all manufacturing except sugar is defined as the HOS sector and from 12.7 percent to 29.9 percent when all food manufacturing is excluded from the HOS category. They increased their shares in other DC exports from 3.5 to 30.2 percent, in Andean Group exports from 36.3 to 78.5 percent, and in other Latin American exports from 36.4 to 54.6 percent.

The evidence thus suggests that the switch in trade policies that improved the relative attractiveness of exports after 1967 had a cumulative effect. In the early post-1967 years many NRB exports benefited from the export incentives system, while the effect of these policies on HOS exports was not being fully felt. However, as time passed without drastic changes in export oriented policies, entrepreneurs gained confidence in

Table 4.2 **Colombian Exports and Imports by Country Groupings and Share of HOS Goods in Exports, 1970 and 1973**

		United States	Other Developed Countries	Venezuela	Andean Group	Central America and Caribbean	Other Latin American Countries	Other Less Developed Countries	Socialist Countries	Total
					Country Distribution of Trade (%)					
Total exports	1970	39.0	39.0	.9	7.3	3.6	2.1	.2	.7	100
	1973	36.5	43.6	1.8	5.6	6.6	1.8	.4	3.7	100
HOS exports—	1970	43.3	14.5	4.5	15.7	17.0	4.6	.2	.1	100
all manufactures	1973	27.8	35.3	4.2	11.5	14.8	2.7	.7	3.0	100
HOS exports excluding sugar,	1970	32.1	12.5	6.0	19.6	22.1	6.1	1.1	.5	100
petrochemicals, and jewelry	1973	17.2	33.0	6.3	17.2	21.0	4.0	.9	.4	100
Total imports	1970	46.4	39.5	1.1	4.3	.9	4.4	.8	2.6	100
	1973	41.0	43.5	.7	4.0	.9	7.0	1.2	1.7	100
Manufactured imports	1970	47.1	41.1	1.1	3.3	1.0	3.4	.3	2.7	100
	1973	37.7	47.7	.8	4.0	.8	6.6	.5	1.9	100
					Share of HOS Exports in Total Exports (%)					
HOS exports	1970	15.4	3.5	81.5	36.3	80.9	36.4	51.8	9.6	14.9
excluding sugar	1973	25.6	30.2	88.5	78.5	85.0	54.6	50.2	2.8	35.5
HOS exports excluding	1970	13.3	3.2	69.2	30.2	66.0	34.7	51.5	7.1	12.7
all processed foods	1973	23.2	23.5	71.9	67.0	73.3	53.9	49.2	2.0	29.9

Source: Computations derived from DANE (1970–73, 1970; see Appendix A). These computations are hereafter referred to as "author's computations."

the stability of these policies and began to invest in manufacturing plants to supply world markets. The full effect of this process had not been felt by 1970; thus the large increase in manufactured exports between 1970 and 1973.

Balance of Payments

Balance of payments problems have frequently shaped Colombia's trade policies. During its import substitution phase, Colombia typically encountered balance of payments difficulties (see table 4.3). Policymakers responded to these problems by increasing import licensing, introducing multiple exchange rates, and generally tightening the stringency of exchange controls. The change in policy directions of 1967 was itself partially due to a balance of payments crisis. In mid-1965, foreign exchange reserves were down to $56 million, their lowest level since 1957 and half that of a year earlier. From 1965 to 1966, merchandise imports rose (in current terms) by nearly 50 percent while exports fell by 6 percent. Reserves fell still further. A crisis ensued, and after consultation with domestic and international officials the exchange system was changed to a crawling peg (as characterized by Díaz-Alejandro 1976*b*, p. 206), and the nature of the trade regime was altered substantially.

The Exchange Rate

Colombia has used a multiple exchange rate system[3] since World War II with periodic changes in rates and classifications of different exports and imports. In some periods, various rates have been allowed to float. In general, it can be said that the peso was consistently overvalued and that exports were discriminated against during the import substitution phase, although the degree of overvaluation varied as exchange rates

Table 4.3 **Colombian Balance of Payments, 1957–74 (Annual Averages in Millions of Current U.S. Dollars)**

	1957–62	1963–66	1967–70	1971–74
1. Coffee exports	337	366	380	513
2. Merchandise exports	519	562	657	1,123
3. Merchandise imports	467	537	632	1,061
4. Trade balance	52	25	25	62
5. Net services and transfers	−86	−171	−227	−201
6. Current account balance	−34	−146	−202	−263
7. Net long-term capital	32	151	211	244
8. Net short-term capital	−31	31	38	13
9. Errors	1	− 42	0	61
10. Sum (6) + (7) + (8) + (9)	−32	− 6	47	55

Source: International Monetary Fund, *International Financial Statistics* (various years).

adjusted infrequently in the face of chronic inflation. Since 1967 the degree of overvaluation has fallen. Hutcheson and Schydlowsky (1976) indicate that it was about 25 percent.

The average annual rate of inflation for 1961–72 was 11.25 percent (Gomez-Otalora and Pardo-Vargas 1973). Inflation accelerated to 24 percent in 1973, then 26 percent in 1974, and declined to 18 percent in 1975 (see *Coyuntura Económica* 1 [April 1976]: 36). Growth of the money supply resulting from continued large budget deficits is probably the main cause of inflation (see Barro 1973). For example, the money supply in 1972 was twenty-five times greater than it was in 1960, while the government ran annual budget deficits exceeding 800 million pesos over the period.

The Trade Regime

After World War II, Colombia's international reserves diminished as the demands for many commodities not available during the war were satisfied. Simultaneously, coffee prices declined and the government reacted to the ensuing balance of payments problems with a combination of devaluations and protectionist policies favoring industrial development and penalizing agriculture. A boom in coffee prices from 1953 to 1956 allowed consumer goods imports to increase. Thus, competition for some domestic industries increased, but the fundamentally protectionist policies continued to encourage many new industries under the umbrella of cheap foreign exchange obtained from coffee, which was used to import machinery, technology, and intermediate goods. A precipitous fall in coffee prices from one dollar a pound in September 1956 to approximately thirty-five cents per pound in 1961 caused still more restrictions to be placed on imports.

In 1960 tariff laws were thoroughly revised. In effect the tariff was "modernized"; that is, a tariff structure was developed following some rules that rationalized the tariff already in existence, which had resulted from changes induced by balance of payments problems, specific lobbyists' pressures, and government priorities. Specific tariffs were abolished almost completely and a system of ad valorem tariffs was established, which increased "rationally" as the "degree of elaboration of a commodity and its technological complexity" increased. The tariff structure was complemented by the creation of three lists in which all tariff items were classified: prohibited, license-required, and free (no license required) imports. The composition of these lists varied, depending on short-term balance of payment conditions. In times of difficulty, the prohibited import list grew as the free list declined,[4] and vice versa.

Protection was also provided by indirect protective measures, such as prior import deposits, which were introduced as an anti-inflationary policy aimed at controlling the money supply. Another important pro-

tectionist measure was the "law of basic industries," which gave an income tax exemption to firms using intermediate goods produced by Paz-del-Rio, the government-supported steel mill that had been in operation for a few years with a dismal record.

Trade policies had some interesting loopholes; for example, the tariff did not apply to imports by the government and by the Catholic church. Furthermore, any importer attempting to bring in a "complete production process" could apply for a "global license" that would establish a single tariff for all the machinery and equipment imported. Since the tariff would be determined by that of "the machine that characterized the process," importers had a good idea of which tariff they could obtain and thus would apply for global licenses only if they expected a lower rate.

The general incentive system also included price controls, mostly on agricultural commodities, and capital subsidies. The latter were applied through portfolio requirements and interest-rate ceilings imposed on the banking system.

By the early 1960s the "easy import substitution" period was nearly over. To continue the import substitution process, it was necessary to develop intermediate and capital goods industries, many of them capital-intensive (e.g., the chemicals and petrochemical industries absorbed 25 percent of total investment in manufacturing from 1962 to 1967; Thoumi 1971). The government participated heavily in the industrial development at this stage, mainly through the Instituto de Fomento Industrial (IFI), whose assets skyrocketed in constant 1958 pesos from 35 million in 1958 to 1,962 million in 1972 (Thoumi 1978). The IFI's investments were coordinated with private sector projects; it undertook projects complementary to private sector investments that were not developed by private firms because of their high risk or the large amount of capital needed.

In summary, by 1967 Colombia had an incentive structure that provided heavy protection to the manufacturing sector, penalized the agricultural sector, provided higher protection to finished products and consumer goods than to unfinished products and capital goods, but which did not exclude the possibility of heavily protecting specific intermediate and capital goods industries through protection of individual plants and which penalized employment creation in manufacturing.[5]

After the balance of payments crisis of 1966, trade policies were thoroughly altered. The main features of the new policies were a commitment to generating exports of manufactures and an abandonment of the fixed exchange rate policy. Decree 444 was the major policy tool. It allowed the president to change the exchange rate periodically, creating, in practice, a crawling-peg system. A set of export incentives was also created. These included a flat 15 percent subsidy granted on the value

of "nontraditional" exports,[6] the extension of credit for exporters, and the establishment of a legal framework that regulated the establishment of free zones. Simultaneously, the government made a commitment to simplify the bureaucratic requirements of the temporary import and tariff drawback systems that had been in existence for some time but were not operating efficiently.

As I mentioned earlier, the policy change was not a clear shift from import substitution industrialization to export oriented industrialization. Import substitution manufactures had large investments and had been supplying most of the manufactured consumer goods available in Colombia. The new policies were not aimed at forcing those industries to compete with imports in the domestic markets. Nominal protection and import restrictions remained at a high level. However, the profitability of export oriented activities became more attractive relative to that aimed at supplying the domestic market. New export industries were developed, and industries that had developed efficiently under import substitution policies were encouraged to expand output for exports.

4.2.3 Labor Market

Employment creation has been perceived as a major problem in Colombia.[7] Its population growth rate was high, with intercensal data showing a 3.12 percent annual population growth rate for 1951–64, followed by a 2.82 percent growth rate for 1964–73.

Population growth has been accompanied by substantial rural-urban migration and one of the highest rates of urbanization in the world.[8] The Colombian population was 69.1 percent rural in 1938 and became 60.9 percent urban in 1973. The urban population grew at a rate of 5.36 percent per year between 1951 and 1964 and at the lower rate of 3.74 percent between 1964 and 1973. Urbanization has encompassed at least thirty cities. Bogotá has increased its share of the total population from 5.8 percent in 1951 to 12.2 percent in 1973. However, this increase has not made Bogotá significantly bigger relative to other cities, for they have increased their population shares in similar proportions.

Contrasted with these high rates of urban population growth, manufacturing employment has grown rather slowly. From 1956 to 1966 it grew at an annual average rate of 1 percent. Thereafter it has averaged about 3 percent annually. However, that higher rate has been insufficient to absorb even the natural rate of population increase, much less immigrants to urban areas.

Urban open unemployment in Colombia thus was high by MDC standards, although not abnormally high by LDC levels. As in most LDCs, unemployment data are difficult to evaluate, since time-series data are hard to come by and, when found, are not rigorously comparable through time. A recently published series (Asociación Nacional de

Instituciónes Financieras 1976) that puts together data for Bogotá, Medellín, Cali, and Barranquilla from 1963 to 1976 shows rising open unemployment in Bogotá between 1963 (7.9 percent) and 1967 (12.2 percent), followed by a period of declining unemployment to 6.8 percent in 1972. Then there was a sharp rise to 11.9 percent in June 1974, followed by a milder drop to 8.5 percent in October 1975 and an increase to 10.1 percent in February 1976. During this same period, open unemployment in Medellín was more stable, ranging from a low of 10.8 percent in 1965 to a high of 14.2 percent in 1972. Open unemployment rates in Cali and Barranquilla are chronically substantially higher than the ones of Bogotá, averaging 40 percent to 60 percent more. Recent work by Berry (1975) shows that a substantial number of the openly unemployed in the cities are city-born, have higher than average education, and are under thirty years of age. Apparently, members of this group have some means of subsistence (family) and are unemployed because they are not able to find jobs that satisfy their expectations.

Disguised unemployment in the cities has also apparently been high. The International Labor Organization (ILO) report on Colombia (1970) points out that the participation rates in the labor force tend to be lower in Colombia than in other Latin American countries, findings that suggest a substantial level of disguised unemployment. The ILO rough estimates put the urban disguised unemployment level somewhere around 13 percent. Rural open and disguised unemployment are also believed to be high, but no data exist on the subject.

Poverty is a bigger issue in Colombia than unemployment, not only because of the low income per capita, but also because of the concentration of income. Berry and Urrutia (1975) estimated that in 1964 the wealthiest 10 percent of urban population (excluding absentee landlords who reside in urban centers) received approximately 43 percent of urban income, and the richest 1 percent received 12 percent.

Income distribution in rural areas is still more concentrated; the richest 10 percent received 51 percent of the income, and the top 1 percent got 23 percent. In the urban areas the poorest 40 percent got only 9.5 percent of the income, while in the rural areas the comparable group took approximately 12 percent of the income.

Real wages in the manufacturing sector rose during the import substitution and early export promotion periods. They were 3.55 pesos per hour (1970 prices) in 1958, 5.73 pesos per hour in 1967, and 6.66 pesos per hour in 1971. Thereafter, they have fallen to 5.49 pesos per hour in 1975, the latest year for which data are available.

Real wages are affected in the formal sector by an array of legislative measures, which include minimum wage regulation, paid holidays, layoff costs, transport subsidies, paid vacations, paid holidays, contribution to the social security institute, which provides mainly health services,

and a Christmas bonus equal to one month's salary if the employee has worked the full year (or a fraction of a month's salary equal to the proportion of the year worked). All these legal fringe benefits amount to approximately 40 percent of the salary base.

All large manufacturing firms pay the legal fringes, and in many instances they provide extra ones such as education and food subsidies. It is widely believed that small firms escape payment of some of the legal fringe benefits.

The effect of the minimum wage legislation is extremely difficult to determine, since changes in the legislated minima have frequently lagged inflation increases, and thus minimum levels set by the government have been below prevailing wages at times.

4.2.4 The Structure of Production

The Colombian manufacturing sector, the focus of this study, forms a sizable share of GDP (about 20 percent). Industries classified as exportables (see section 4.4 below) generated about 52 percent of domestic value added in manufacturing (in 1970) and employed about 53 percent of the manufacturing labor force. Industries classified as importables generated 38 percent of manufacturing value added and employed 36 percent of its labor force. Production not competing with imports generated 10 percent of manufacturing value added and employed 10 percent of the labor force.

4.3 Effective Protection in Colombia

The most rigorous studies of effective protection in Colombia are Hutcheson (1973) and the revised study by Hutcheson and Schydlowsky (1976).[9] Their estimates include effects of quotas, subsidies, currency overvaluation, and other government interferences in trade. The Corden method was used and price comparisons were made when appropriate. Their estimates, protection on domestic sales, are given in table 4.4. Note that in general the ERPs, contrary to what is normally expected, tend to be lower than the nominal protection figures. This is because the ERPs adjust for currency overvaluation. These estimates indicate that ERPs were negative for coffee and mining and low for processed foods, construction materials, and "simple" intermediate goods; they were somewhat higher for beverages and tobacco, "complex" intermediate goods, and machinery, and higher still for nondurable consumer goods, durable consumer goods, and transportation equipment. Thus, protection for domestic sales retained the cascaded effect found in the import substitution period. Separate calculations of simple average ERPs for our trade categories (discussed in section 4.4 below) correspond to these estimates. The average (unweighted) ERP for activities classified

Table 4.4 **Nominal and Effective Protection in the Manufacturing Sector, 1969**

Aggregated Groupings	Nominal Protection	Effective Protection[a]
Agriculture, forestry, and fishing	−12.3%	−13.3%
Noncoffee agriculture, forestry, and fishing	2.3	2.2
Mining	− 9.0	− 8.9
All primary products	−12.0	−13.0
Processed foods	2.6	8.4
Processed foods excluding sugar	4.4	12.1
Beverages and tobacco	23.0	20.3
Construction materials	4.5	3.4
Intermediate products I ("simple")	11.4	12.2
Intermediate products II ("complex")	26.4	18.3
Nondurable consumer goods	36.8	30.5
Durable consumer goods	49.1	36.5
Machinery	33.0	25.0
Transportation equipment	138.6	135.2
All manufactures	19.5	18.6
All manufactures excluding beverages and tobacco	19.3	18.5
All manufactures excluding sugar	20.7	20.0
All sectors	2.7	− 1.9
All sectors excluding coffee, mining, and sugar	12.5	10.0
All exports	−15.1	−16.5
All exports excluding coffee, mining, and sugar	13.0	26.0
All manufactured exports excluding sugar	13.0	34.1

Source: Hutcheson and Schydlowsky (1976) and Hutcheson's unpublished data. Appendix table 4.A.1 shows nominal and effective protection rates for the disaggregated manufacturing sector (four digits). See also the note to table 4.A.1 for the effect of currency overvaluation on the relative levels of nominal and effective protection rates. All weights are international value added.

[a]Corden method of computation employed.

as exportables for purposes of estimating labor requirements in 1970 was 10 percent; that for importables was 22 percent; and that for noncompeting importable production was 52 percent. All estimates refer to protection on domestic sales. Exportables tended to fall into the processed food, construction materials, and "simple" intermediate products groups, while noncompeting importable production was likely to fall in the machinery and transportation equipment groups. There were differences between the effective protection rates in the domestic and foreign markets (not shown in table 4.4) owing to the effect of price controls, especially in the food sector, and the subsidies of the export incentive system. Exports of processed foods were highly protected while exports of construction materials and simple intermediate products were mildly subsidized, as were the average manufactured products. A comparison of these rates with those for domestic sales shows that the domestic market

in 1969 was more attractive than the export markets for industries producing capital goods, intermediate products, nondurable and durable consumer goods, and transportation equipment. The opposite was true of construction materials and processed foods, except beverages and tobacco. Thus, activities classified as exportables below (section 4.4) tended to have higher ERPs on export sales relative to domestic sales. However, activities classified as importables had higher ERPs in domestic markets than those for exportables and importables in foreign markets. Thus, while importables received incentives to export, the restrictions on imports in the domestic market continued to make it a more attractive place to sell.

Since this study focuses upon 1970 and 1973, it is important to note how policy changes in 1970–73 might have altered these 1969 estimates. First, the crawling-peg exchange system was maintained, thus keeping the real exchange rate at a fairly constant level (see *Coyuntura Económica*, various issues). Therefore the degree of currency overvaluation probably was unchanged. Likewise, the export incentive system was maintained, but the export subsidy was raised to 20 percent in 1972. Export ERPs would have increased thereafter.

The general trend toward a more open economy continued; many commodities were transferred from the prohibited list to the license-required list, and many others moved from the license-required to the free list. The number of import license applications approved increased; by the end of 1973 more than 90 percent were approved. Complementary to the relaxation of licensing policies, the average level of tariffs was lowered. These trends suggest that protection on domestic sales would have fallen.

In 1969 Colombia joined the Andean Common Market. The Andean Group's policies have emphasized the coordinated development of new industries and have deemphasized trade in products already manufactured in the region before the Common Market's creation. Protection within the Common Market thus would have increased export ERPs for exports whose major destination is the Andean Group. Between 1970 and 1973 (see table 4.2), exports to the Andean Group did not increase as rapidly as exports in general. This was true for both NRB and HOS exports. However, the share of HOS exports in total Andean Group exports rose dramatically, so it is likely that export ERPs for HOS goods in Andean trade increased. Nonetheless, the overall extent of this increase probably was small since the Andean Group absorbed so little (15 percent) of Colombia's HOS exports.

Finally, the Pastrana government, which took office in the middle of 1970, changed the overall thrust of Colombia's development strategy. It assigned first priority to the expansion of the construction sector. Export incentive policies continued, however, while import substitution

industries lost their privileged position as resources were diverted from the import substitution sector to construction. These changes would imply a reduction in ERPs for import substitutes and for domestic sales in general.

To summarize, in 1969 the structure of protection (for domestic sales) retained its cascaded effect from the import substitution phase, although the degree of cascading was probably lower. Protection in export markets was provided all HOS manufactures. Those later classified as exportables for purposes of calculating labor requirements naturally had higher ERPs on foreign sales than domestic sales. While importables received some incentives to export, they were more protected in domestic than foreign markets.

Changes in the trade regime since 1969 probably had the net effect of increasing protection somewhat on exports and decreasing protection on import sales. Major causes of these changes were an increase in the export subsidy, a continued relaxation of import controls, and a general decrease in tariff rates.

4.4 Factor Proportions in Colombian Trade

4.4.1 Sectoral Classification

For Colombia it was possible to undertake the analysis of factor proportions in trade on the basis of a four-digit ISIC-II classification. For the industries where foreign trade was not negligible, trade is classified according to the T statistic, defined in the introductory chapter as follows: if $T < 0$, the industry was classified as a producer of exportable goods; if $0 < T < 0.4$, the industry was defined as a producer of import-competing goods; if $0.4 < T < 1.0$, the industry was defined as a producer of non-import-competing goods. The value of 0.4 was chosen to separate the import-competing from the non-competing import industries because there were few industries for which the T statistic was close to 0.4.[10] When foreign trade was negligible, the industry was defined as a producer of nontraded commodities.

The agriculture and mining sectors were unambiguously classified as NRB. Various alternative classifications were employed for the manufacturing sector to account for the fact that some HOS activities are NRB-related. The first classification categorized all manufacturing activities as HOS. The second eliminated sugar refining. The third eliminated all food manufacturing (classifying those activities as NRB). The fourth eliminated sugar, petrochemicals, and jewelry (all defined as NRB). Finally, a fifth eliminated all food manufacturing, petrochemicals, and jewelry. Use of these alternative classifications was motivated by particular difficulties surrounding the commodities indicated. For the food-

processing branches, there is a question whether they need to be located near the raw material source. Petrochemicals raise a similar question. The jewelry branch is unique because of losses (stealing) of government output and repeated exporting of the same gems to collect the export subsidy (see below). These phenomena cast considerable doubt on the reliability of the jewelry statistics.

The T statistic was computed for both 1970 and 1973 with the classifications of exportable, import-competing, and non-competing goods varying substantially between the two years. Of the seventy-eight tradable manufacturing industries, sixteen switched classification. These industries accounted for 19 percent of total manufacturing value added in 1970. Nine import-competing industries in 1970 became exporters, while four industries went the opposite way. Two non-competing industries turned into import-competing, and one import-competing turned into non-competing. These changes are shown in table 4.5 below. That the largest change in classification was from import-competing to exporting reflects policy changes between 1970 and 1973 which made exporting more attractive relative to import substitution.

For this study, I decided to use the classification resulting from the 1973 data, despite the fact that international markets were exceptional

Table 4.5 **Changes from 1970 to 1973 in Classification of Industries by Major Trade Categories**

1970 import-competing industries turned exporters by 1973
- 3111 Meat products
- 3122 Animal feeds
- 3140 Tobacco
- 3212 Made-up textiles
- 3215 Cordage and rope
- 3319 Other wood and cork products
- 3412 Containers and boxes of paper and paperboard
- 3691 Structural clay products
- 3812 Metal furniture and fixtures

1970 export industries turned import-competing by 1973
- 3113 Canning of fruits and vegetables
- 3116 Grain mill products
- 3119 Cocoa and chocolate products
- 3219 Other textiles

1970 noncompeting industries turned import-competing by 1973
- 3710 Iron and steel basic industries
- 3841 Shipbuilding and repairing

1970 import-competing industry turned noncompeting by 1973
- 3512 Fertilizers and pesticides

in that year. This year is likely to be a better reflection of the present economy, since the trend toward a more open economy has continued. The classification of two industries, however, was modified. According to the trade statistics, refined petroleum and petroleum and coal products were net exports in 1973, owing to a Colombian government policy that until very recently kept oil prices at the lowest level in the world. Colombia's oil production has dwindled, however, and today Colombia has become a net importer of oil products. Furthermore, in the early 1970s the petrochemical industries were net exporters, since they were exporting at marginal costs products from domestic plants that were larger than needed by the domestic market. These "excess capacity" exports have disappeared. For these reasons, the refining and petrochemical industries are here classified as import-competing rather than as exporting.

It should be noted that this study deals only indirectly with the agricultural, mining, and services sectors of the economy. The lack of meaningful data (see Appendix A) constrains any comprehensive empirical study of those sectors.[11] This omission means that conclusions reached herein are valid primarily for the manufacturing sector.[12] It should also be noted that changes over time in average labor or skill ratios reflect changes in the relative size, and weight, of the components of the trade flows distinguished and not changes in factor inputs into individual industries. This follows from the fact that (as reported in Appendix A) the basic input and output data used are all for the year 1970.

The following activities were classified as major HOS exportables (see appendix table 4.A.1 for their respective ISIC codes and table 4.6 for factor intensities: meat, dairy products, fish packing, bakery, sugar, and prepared animal feeds among the food processing industries; tobacco; all textile branches with the exception of the small "other textiles"; apparel, shoes, and fur and leather and their products; wood and cork products; cardboard containers; tires and tubes; pottery, glass, structural clay products, and cement; metal furniture; and jewelry. Most of these classifications are expected, but a few comments are in order. Cardboard containers are exported mostly as packing for other exports, but they are classified separately so that the cardboard box producer can collect the export subsidy. Tires have been exported to South and Central America since the early 1960s. These exports have not been continuous, since they tend to occur when the domestic producers have excess capacity owing to large indivisibilities in production. Structural clay products and cement are exported from the northwest coast of Colombia to the Caribbean countries, since their transportation costs are lower than those in the interior of Colombia.[13] The list of exportables coincides

Table 4.6 **Factor Intensities in Major HOS Exportable and Importable Production, 1970**

Industry	ISIC Code	Total Labor Remuneration/ Value Added	Direct Labor/ Domestic Value Added (Man-Years/ Million Pesos)	Ratio Male to Female Blue-Collar Employment	Percentage of Labor Force Blue-Collar
Exportables					
Bakery products	3117	.51	37.7	1.608	76%
Sugar	3118	.87	17.0	60.832	81
Food products n.e.c.	3121	.34	11.3	2.202	70
Tobacco	3140	.14	3.1	1.850	80
Spinning, weaving	3211	.36	14.1	1.378	82
Knitting mills	3213	.71	32.9	.599	82
Cotton fabrics	3216	.56	16.0	5.343	87
Wearing apparel	3220	.52	40.6	3.021	85
Nonmetallic mineral products n.e.c.	3699	.46	20.4	28.200	79
Importables					
Grain mill products	3116	.15	8.8	1.462	78%
Pulp and paper	3411	.48	9.4	8.058	71
Printing and publishing	3420	.62	23.7	2.786	73
Drugs	3522	.52	12.9	.559	51
Soap and cosmetics	3523	.43	14.4	1.635	52
Iron and steel	3710	.69	20.6	102.368	75
Fabricated metal products	3819	.47	21.8	5.056	80

Source: Calculated from data outlined in Appendix A.
Note: "Major" means more than 300 million pesos of domestic value added.

in general with what one can a priori define as labor-intensive branches, with the exception of sugar, glass, cement, and rubber tires.

The import-competing industries are: canning, oils and fats, grain mill products, and candy and other foods among the food processors; wine and hard alcohol; "other textiles"; pulp and paper and their products; printing; paints, medicines, and soaps and cosmetics; petroleum refining and its derivatives; rubber products except tires and tubes; plastic products; other nonmetallic minerals; iron and steel; cutlery, hand tools, and general hardware; structural metal products; fabricated metal products; other electrical apparatus; shipbuilding, bicycles, and other transportation equipment; and manufacturing industries not elsewhere classified. This list also is predictable, since it includes some of the old import substitution industries, such as pulp and paper, iron and steel, paints, medicines, soaps and cosmetics, petroleum and its derivatives, rubber products, and metal products, which have developed for more than fifteen years, capturing a very large share of the domestic market.

The noncompeting industries include: industrial chemicals; fertilizers; synthetic resins and manmade fibers; other chemical products; industrial nonferrous basic metals; engines; all types of machinery and equipment; radio, television, and electrical appliances; railroad equipment; motor vehicles; aircraft; professional and scientific equipment; photographic equipment; watches; and musical instruments and sporting goods. Some of these industries require, or include subgroups that require, very advanced technology, such as many industrial chemicals, fertilizers, and aircraft. Others need a very well-developed industry for their inputs, such as synthetic resins and fibers, which require a very substantial petrochemical industry, and engines and most machinery, which require good iron, steel, and other basic mineral industries. Still other groups depend upon very accurate equipment and skills not well developed in Colombia: for example, photographic equipment, watches, and musical instruments. The radio, television, and household appliances industries, in spite of having a fairly long history in Colombia, are also noncompeting owing to some peculiar obstacles to their development. The small appliance industries have not been able to grow rapidly despite high protection because of significant amounts of smuggling. The large appliance industry has had particular difficulties with the low-quality sheet metal produced domestically. Policies protecting the domestic steel industries require it to use this low-quality input. Many of the other noncompeting branches fall into the machinery category. Colombia produces some simple machines and parts, but it does not produce machines that require the use of alloys or any sophisticated metal process. Thus, in most of these branches, imports do not compete with domestic production, since there is little or none of the latter.

The only manufacturing branches here identified as nontraded or home goods are beer and soft drinks. Note also that construction, transportation, utilities, insurance and banking, and personal services are treated as home goods when calculating indirect requirements from the input-output table.

4.4.2 Employment and Skill Requirements by Trade Category

Direct Requirements

Direct requirements by skill category (see Appendix B for discussion of categories) per unit of DVA and IVA for trade categories are given in table 4.7. The weights used in aggregation are value added in domestic production.

Observe that the results are as expected from the HOS model, given that Colombia's comparative advantage lies in labor-intensive production. Industries classified as exportables had ratios of blue-collar and total employment to domestic value added twice as large as those of the

importable group, and 50 percent higher than in the noncompeting industries. The same result holds, although the magnitude differs as one moves from DVA to IVA measures. The small change in the labor requirements for exportables and the larger changes for importables and noncompeting production are due to the higher effective protection in these latter industries.

Several comments are in order concerning the interpretation of the results for noncompeting production. A priori, one would have expected these industries to have the lowest labor requirements. That they do not is due to several factors. First, the values are based upon domestic coefficients. Had these been adjusted as suggested in chapter 1, they undoubtedly would have been lower. Second, there is a problem of aggregation in these activities. Domestic production is not always comparable to imports, especially in machinery industries where Colombia imports machinery and electrical equipment not produced domestically and produces spare parts and simple machines whose production is labor-intensive. Finally, the importable group contains some of the large capital-intensive import substitution projects developed during the sixties that supply most of what the country consumes. Industries in which these projects are located then will have low labor coefficients and reduce the overall importable estimates accordingly.

In general, my results indicate that exportables have a much larger direct employment generation effect than the import substitution industries. Berry and Díaz-Alejandro (1977) and Díaz-Alejandro (1976*a*) have suggested that manufactured exports are more capital-intensive than

Table 4.7 **Labor Intensity of Manufacturing Production by Major Trade Categories, 1973 (Number of Workers per Million 1970 Pesos of Direct Value Added)**

Trade Category	Total Employment	Blue-Collar Workers	White-Collar Workers	Management
Per unit of domestic value added				
Export industries	29.1	23.9	3.6	1.6
Import-competing industries	15.5	11.0	3.2	1.3
Noncompeting industries[a]	21.7	16.3	3.8	1.6
Per unit of international value added				
Export industries	29.3	24.0	3.6	1.7
Import-competing industries	18.0	13.1	3.7	1.7
Noncompeting industries[a]	27.8	20.8	4.8	2.2

Source: Author's computation (see Appendix A).

Note: Weights are DVA of domestic production.

[a]Values refer to domestic coefficients and are not adjusted in the manner suggested in chapter 1.

the products sold in the domestic market. This hypothesis is based on two facts: the firms that export are larger than the average, and larger firms are more capital-intensive. However, I (Thoumi 1979) have suggested that the shift in international trade strategies toward a more open economy increased the labor intensity of Colombian manufacturing as investment moved toward the most labor-using industries. My evidence corroborates this latter suggestion: export industries were substantially more labor-using than the import substitution ones. Unfortunately, I could not investigate Berry's and Díaz-Alejandro's hypothesis more fully, since it was impossible to obtain data on labor coefficients by firm size within an industry.[14] It is important to note, however, that the high degree of disaggregation used here minimizes interindustry variations in ratios of employment to value added. Furthermore, the average labor coefficients for each industry are closer to the ratios of the larger than of the smaller plants, since the larger plants have more weight than the smaller ones. Thus, while more research should be encouraged in this field, it can be concluded with some confidence that export oriented products are more labor-intensive per unit of value added than the import substitution ones.

The data available also gave a breakdown of employment by sex. Out of curiosity, I calculated the ratio of male to female blue-collar workers (hereafter M/F ratio) for each trade category (again weighting by value added of production). This ratio was smaller for exports (18.7) than for importables (22.3) and noncompeting production (24.5). When all foods and petrochemicals were excluded from the export branches, the M/F ratio dropped to 12.9. A comparison of the actual exports of 1970 and 1973 indicates that Colombian exports were becoming even less male-intensive; exports that were growing most rapidly tended to be significantly more female-intensive than exports on the average.[15]

One characteristic of Colombia is its lack of centralization. It not only has many urban centers, but also has various geographic regions clearly separated from each other. Three mountain ranges, thick tropical jungles, swamps, and tropical diseases have made internal communications and trade difficult.[16] Most of the rivers are not easily navigated, and transportation routes were very primitive until recently. Even today there is no overland communication with Panama or between the populated areas of Colombia and the one-fifth of the Colombian surface covered by the Amazon jungle. The natural regionalization of the country has allowed the development of ethnic subgroups with specific characteristics, including varying attitudes toward economic policies and entrepreneurship.[17]

To test whether these regional differences were important, I divided exports by origin into five categories, then calculated blue-collar labor requirements for these exports. The categories are: the Caribbean coast;

the "Llanos," or eastern prairies; Nariño, or the southern border; the northeast border (north of Santander); and the center of the country. The first four regions' exports to other countries can be considered as "border" trade induced by low international transportation costs. It is expected that the center's exports would be more labor-intensive than border exports, since the center needs a greater comparative advantage to export in the presence of high transportation costs. The data in table 4.8 support this hypothesis: blue-collar employment per unit of domestic value added was higher for the center's exports than for the exports of any of the other regions. Exports from the Caribbean region were particularly capital-intensive for 1970. However, when petrochemicals were eliminated, the coefficient for that region's manufactured exports increased notably—to 20.0 in 1970 and 26.2 in 1973 for "all manufactures." It is also apparent that the difference between the center's coefficient and the other regional coefficients declined between 1970 and 1973; this decline was probably caused by the development of some very labor-intensive exports in the border areas, especially in the Caribbean, where offshore assembly industries were established and increased exports rapidly.

Labor Skills and Salaries

Skill requirements are likely to affect Colombian comparative advantage. Specifically, we expect export industries to be less skill-intensive than import-competing industries, and exports to low-income countries to be more skill intensive than exports to high-income countries. It is very difficult to define skills theoretically and to measure them empirically (see Appendix B). Nevertheless, I decided to use two proxies to measure skills; the average remuneration per unit of labor and the ratio of the number of white- to blue-collar workers (hereafter the W/B ratio).

Table 4.8 **Labor Intensity of Manufacturing Production by Export Industries According to Region of Origins within Colombia, 1970 and 1973 (Blue-Collar Employment per Million 1970 Pesos of Domestic Direct Value Added)**

	All Manufactures		All Manufactures Except Processed Foods	
Region	1970	1973	1970	1973
Caribbean	11.5	20.0	6.1	14.6
"Llanos"	19.6	24.5	19.3	24.5
Nariño	19.5	26.5	14.5	26.2
Northeast border	19.8	17.4	19.8	17.4
Center	22.1	26.8	24.8	28.3

Source: Author's computations (see Appendix A).

Table 4.9 shows average remuneration for various types of labor in the trade categories for manufactures. Several interesting observations arise for these data. First, the average blue-collar total remuneration, which includes fringe benefits, is remarkably close in all categories, indicating that the average skill of blue-collar workers tends to be similar in every category. This finding is consistent with the beliefs of various entrepreneurs and officials of SENA,[18] who consider that the cost and time of training good blue-collar workers for the various manufacturing industries is fairly constant. If this is so, the value of the human capital of the blue-collar workers in the various categories, and thus their skill levels, would tend to be constant.

The same statement is true when comparing average white-collar remuneration in the export, import-competing, and noncompeting categories. The variations in managerial remuneration are to be expected; these data are much less reliable than the other wage data, since in many plants it is impossible to separate the remuneration of the manager from that of the owners. However, high managerial salaries appear to be concentrated in the import-competing and noncompeting industries. These are the ones that benefit from the highest effective protection levels (see table 4.11). Since the rent created by protection is expected to rise as protection increases, managers are probably in a better position to capture a share of this rent than blue- and white-collar workers, who face more competitive labor markets.

The last column of table 4.9 indicates that the W/B ratio increases as one goes from export to import-competing to noncompeting industries. This ratio reflects the average "skill content" of the product as well as the degree of competition of the markets in which the products are sold (see Appendix B). These results are expected. Either Colombia exports

Table 4.9 Indicators of Skill Content by Trade Category, 1973

	Export Industries	Import-competing Industries	Non-competing Industries
Average annual remuneration[a]			
All employees	26,200	28,580	28,220
Blue-collar workers	22,590	21,750	21,250
White-collar workers	38,050	38,470	40,510
Management	40,320	53,340	52,530
Ratio of white-collar to blue-collar workers	.151	.291	.233

Source: Author's computations (see Appendix A).

[a]Average in 1970 pesos, weighted by domestic value added of production in each four-digit industry in 1973.

products with lower skill contents than those produced for the domestic market, or domestic marketing requires a larger number of salesmen than the international market, or both.

4.4.3 Indirect Effects

The only way to derive the indirect effects generated by export, import-competing, and noncompeting manufacturing industries was to use the Colombian 1970 input-output matrix. This matrix has only thirty-one producing sectors; thus the level of aggregation is much higher than that used in other parts of this chapter. The nonfood manufacturing sector was disaggregated into ten branches. Agricultural-based manufacturing was disaggregated into seven branches. Six industries were treated as home goods: utilities, construction, transportation, communications, insurance and banking, and personal services. The indirect effects on output, value added, and total wages and salaries in these sectors were estimated. It was not possible to determine the effects on employment directly, because there were no employment data compatible with the matrix.

Table 4.10 shows the indirect effects in pesos generated by a one-peso increase in direct value added. The import-competing HOS industries have a much larger indirect effect on the economy than the export-oriented HOS industries. Noncompeting industries fall in between, although they are closer to the export sector. These results can be understood when the nature of the component industries is considered. The import-competing branches of Colombian manufacturing include the heaviest (more capital-intensive) industries in the country. These industries are also the most energy- and water-intensive, and the ones in which transportation costs for their inputs are the highest. The high capital intensity also results in higher banking and insurance inputs.

Table 4.10 **Indirect Effects on Home Goods of HOS Manufacturing Production by Trade Categories, 1973 (Increase, in 1970 Pesos, Generated by One Peso of Direct Value Added)**

Trade Category	Output (1)	Value Added (2)	Wages and Salaries (3)
Exports	.202	.145	.076
Import-competing	.307	.221	.115
Noncompeting	.226	.163	.087

Source: See text.

4.4.4 Changes in Manufacturing Industry Classification

Changes in the T Statistic and in the Composition of Trade Categories

As I noted earlier, and as is set out in table 4.5, sixteen manufacturing industries changed classification between 1970 and 1973 according to the T statistic. Five of them were food processors. These changes were probably caused by changes in world prices and domestic subsidies. Meat and prepared animal feeds turned from importable to exportable as their world prices increased. Canning, grain mill products, and cocoa turned from exportable into importable production. The only nonfood or tobacco branch that shifted from exportable to importable was "other textiles," a relatively unimportant catchall branch.

Apart from the latter and from food and tobacco, the only industry that become noncompeting was fertilizers and pesticides, which changed because of the skyrocketing fertilizer prices in the world market in 1973.

Some of the classification changes seem to be the result not of general policies but rather of specific developments and particular policies. Tobacco is a very special case because fluctuating excise taxes in Colombia have generated great swings between legal and illegal imports. The switch in T statistic between 1970 and 1973 happened because in the latter year large amounts of cigarettes were smuggled into the country. The high world price of steel in 1973 lowered steel imports and even allowed the normally inefficient Paz del Rio steel mill to export some of its products so that the sector moved from the noncompeting to the importable category. Between 1970 and 1973, Conastil, an IFI-financed plant that produces small fishing boats, began to operate. Because the production of these small boats is very labor-intensive, Colombia developed a sizable amount of exports, and this industry became import-competing rather than noncompeting.

Effective Protection and Classification Changes

Effective protection levels could also have affected classification changes. Thus, importable activities with low levels of protection were more likely to become exporters than more protected ones. Likewise, highly protected export sectors were more likely to become import-competing than less protected ones. Similar expectations hold for the switches between the import-competing and noncompeting categories.

Unfortunately, the available data on effective rates of protection did not cover all eighty four-digit manufacturing branches, and thus no formal test of these hypotheses could be made. However, the data available could be used to "suggest" a relationship between effective protection and the nature of the classification changes. Table 4.11 shows unweighted effective protection averages derived from estimates for forty-eight industries assigned to various categories. For those forty-

eight industries, this table shows that (1) exports had the lowest ERPs; (2) noncompeting industries had the highest ERPs; (3) industries that were exporters in 1970 and became import-competing in 1973 had higher ERPs than the 1973 export industries; and (4) the 1970 import-competing industries that became exporters had significantly lower protection than those classified as import-competing in 1973.

The results strongly suggest that lower protection is associated with industries that became exporters, while changes in the opposite direction are associated with higher protection.

Employment and Classification Changes

We next made estimates of labor coefficients and average remuneration of industries that switched trade categories from 1970 to 1973. These are shown in table 4.12. Note that the labor coefficients of import-competing industries in 1970 that became exporters by 1973 were 46 percent of the average of 1973 export branches (see table 4.12). Also, the average remuneration paid in these industries was 32 percent higher than the average paid by export industries, as is shown by comparing tables 4.12 and 4.9. These results are due to changes among the food industry group.

When nonfood industries were considered separately (column 2 of table 4.12), their labor requirements were 13 percent greater and their average remuneration 34 percent lower than similar averages for exportables. Those export industries that became import-competing had lower labor coefficients and slightly lower than average remuneration, while the noncompeting industries that turned import-competing had both

Table 4.11 **Effective Protection and Branches That Switched *T* Classification between 1970 and 1973**

	Number of Industries for Which Effective Protection Estimates Are Available	Effective Protection, 1970[a]
All manufacturing	48	19.0%
Export industries (1973)	16	9.2
Export industries turned import-competing	4	16.0
Import-competing industries turned exporters	4	11.0
Import-competing industries (1973)	16	18.2
Noncompeting industries turned import-competing	1	15.1
Noncompeting industries (1973)	15	30.2

Source: Hutcheson and Schydlowsky (1976) and author's computations.
[a]Unweighted averages. Corden method of computation employed.

Table 4.12 **Labor Intensity and Average Remuneration in Industries That Changed *T*-Statistic Classification between 1970 and 1973**

	Import-Competing Turned Exporter		Export Industries Turned Import-Competing		Noncompeting Turned Import-Competing—Two Industries (5)	Import-Competing Turned Noncompeting—One Industry (6)
	Nine Industries (1)	Excluding Food and Tobacco—Six Industries (2)	Four Industries (3)	Excluding Food—One Industry (4)		
Number of workers per unit of DVA						
Total employment	13.5	32.9	11.3	40.1	21.1	11.9
Blue-collar workers	10.8	27.3	8.5	33.1	15.9	7.1
White-collar workers	1.8	3.5	2.1	4.9	4.5	3.4
Management	.9	2.1	.7	2.8	.7	1.4
Average remuneration[a]						
All employees	34,580	17,240	19,220	19,320	33,400	39,150
Blue-collar workers	27,950	14,940	14,810	13,410	39,720	27,330
White-collar workers	48,840	29,630	31,670	28,770	38,220	50,180
Management	47,250	23,210	38,070	28,790	56,660	72,230

Source: See text.

[a]In 1970 pesos.

higher employment coefficients and higher remuneration; the importables that turned noncompeting had very low employment coefficients and very high remunerations.

On the whole, then, if we exclude the food sector (whose exports and imports are subject to fluctuations caused by domestic crop fluctuations and international price changes), labor-intensive manufacturing industries were more likely to move in the "correct" direction (i.e., toward lower T values). Movement in the opposite direction, however, could not be statistically verified from the data analyzed here because, as I noted above, only two nonfood industries moved to a higher T classification.

4.4.5 Employment and Skill Requirements Associated with Exports

Direct Employment

Table 4.13 gives labor coefficients per million pesos of domestic and international value added in the production of HOS goods exported to various country groupings. The overall results indicate that exports to developed countries other than the United States generated significantly more employment per unit of DVA than exports to LDCs. Surprisingly, the DVA labor coefficients for exports to the United States were remarkably close to the corresponding coefficients for exports to LDCs. However, when petrochemicals, sugar, and jewelry were excluded, exports to the United States were more labor-using than those of LDCs. These re-

Table 4.13 **Labor Intensity of HOS Exports by Destination, 1970 and 1973 (Number of Workers per Million 1970 Pesos of Direct Value Added)**

	All Manufactures		All Manufactures Except Sugar, Petrochemicals, and Jewelry	
Destination	1970	1973	1970	1973
Per unit of domestic value added				
United States	22.1	24.4	29.1	37.0
Other developed countries	34.7	38.8	44.4	46.7
Less developed countries	21.6	24.0	21.6	25.1
Total exports	23.8	29.1	28.6	35.5
Per unit of international value added				
United States	25.0	25.8	43.2	52.2
Other developed countries	40.8	44.0	62.8	72.2
Less developed countries	25.4	31.6	30.4	40.1
Total exports	27.6	33.9	38.8	47.2

Source: Author's computations.

sults tend to corroborate the notion that, in general, manufactured exports to developed countries were produced by manufacturing branches that were more labor-intensive than those producing goods exported to LDCs.

A further breakdown of exports to LDCs indicated that exports to Central America and the Caribbean were more labor-intensive than those to other LDCs or to the United States, using both IVA and DVA estimates. The high labor coefficients of these exports can probably be explained by the fact that the Central American and Caribbean countries have a less diversified manufacturing sector than do the other Latin American and less developed countries with which Colombia trades. Also, the Central American and Caribbean countries have far fewer nontariff barriers than do the other Latin American countries. To export to one of the latter, it is necessary to find a commodity not produced in large quantities in that country. Since the manufacturing structures of those countries are similar to Colombia's, such a commodity necessarily must be either skill-intensive or capital-intensive. By contrast, there were at least some labor-intensive goods produced in Colombia, as well as in other Latin American countries, that could be exported to Central America.

A comparison of the 1970 and 1973 data in table 4.13 shows a substantial increase in the employment coefficients of exports over that brief period. Similar estimates by labor category (not shown in the table) indicate further that managerial labor requirements increased faster than those for any other job category, followed by blue-collar employment and white-collar employment. (Average total labor requirements per unit of DVA for all exports increased by 22.3 percent; the average for blue-collar employment increased by 24.2 percent; the average for white-collar employment increased by 8.5 percent; and the average for managerial employment increased by 33.7 percent.) These changes were principally due to the changing composition of exports.

We pointed out earlier that exports were less male-intensive than other trade categories in 1970. We calculated these ratios for 1970 and 1973 exports by destination. These are given in table 4.14. Observe that exports to DCs other than the United States have much lower male intensities than exports to other destinations. When processed foods and petrochemicals were excluded from the estimates, the ratio for exports to the United States fell by more than half and was only 60 percent of that for exports to LDCs. These results suggest first that the male intensity of exports to DCs was substantially less than that of exports to LDCs and that the difference widened from 1970 to 1973. That exports became less male-intensive overall from 1970 to 1973 is expected, since many labor-intensive exports were also female-intensive, as in garment production and assembly plants.

Table 4.14 **Ratio of Male to Female Blue-Collar Workers in Colombian HOS Export Sectors, 1970 and 1973**

Sector		Total Exports	United States	Other Developed Countries	Less Developed Countries
All manufactures	1970	26.3	30.9	27.8	21.0
	1973	18.7	25.2	9.3	19.8
All manufactures except processed foods	1970	22.5	27.3	8.2	22.1
	1973	16.5	22.2	7.1	21.9
All manufactures except processed foods and petrochemicals	1970	16.8	13.9	8.2	21.8
	1973	12.9	10.5	6.3	17.5

Source: Author's estimates.

Skills and Salaries

Table 4.15 presents results of calculations of white- to blue-collar worker ratios by destination of exports. Note that the ratio of white- to blue-collar workers used in the production of HOS exports was significantly lower for exports to the United States and other DCs than for exports to most other destinations. The highest ratio was registered for exports to Colombia's neighbors, Venezuela and the Andean Group, with which Colombia had active border trade and integration agreements. From these ratios one can conclude that exports to the developed countries tended to create a greater number of blue-collar jobs per white-collar job than exports to the rest of the world. Inasmuch as the W/B ratio is a measure of the skill content of a product, one can also conclude that exports to the developed world were significantly less skill-intensive than exports to LDCs.

The W/B ratio for total exports declined by approximately 15 percent between 1970 and 1973. The ratios for exports to all country groupings except "other Latin America" also declined. The sharpest drop (23 percent) took place in the Venezuelan ratio. The increase in the ratio of the rather limited exports to "other Latin America" was a moderate 9 percent. Between 1970 and 1973 there was a very strong trend for low-skill exports to increase more rapidly than skill-intensive exports. The effect of the export-oriented policies was therefore larger on low-skill than on high-skill industrial branches.

The data on remunerations in exports by trade category (table 4.16) tend to confirm the preceding conclusion, since the average (in 1970 pesos) for every export destination except other DCs declined substantially between 1970 and 1973. The table also shows that total manufactured exports to the United States produced the highest average remuneration. However, when sugar, petrochemicals, and jewelry were

Table 4.15 **Ratio of White-Collar to Blue-Collar Workers in Production of HOS Exports, 1970 and 1973**

Year	Total Exports	United States	Other Developed Countries	Vene-zuela	Andean Group	Central America and Caribbean	Other Latin American Countries	Other Less Developed Countries	Socialist Countries
1970	.172	.157	.138	.245	.242	.169	.183	.198	.136
1973	.150	.137	.129	.194	.211	.155	.201	.191	.131

Source: Author's estimates.
Note: Unweighted average of the ratios for the five alternative classifications of HOS exports as defined in text (section 4.4.1).

excluded, the average generated by exports to the United States dropped to the second lowest position, higher only than that for exports to other DCs. Excluding the three industries mentioned, we can conclude that exports to DCs were less skill-intensive than exports to LDCs. Also, as the ratio of white- to blue-collar workers could be an indication of the degree of competition in Colombia's markets, the data suggest that industries that exported to the DCs tended to have more competitive markets than those that exported to LDCs.

4.4.6 Factor Proportions in Colombian Imports

Table 4.17 shows the total, blue-collar and white-collar employment per million dollars of international value added of imports of manufactures. The labor coefficients used here are derived from the United States census. They are assumed to reflect international coefficients. One interesting result is the similarity of most of the employment coefficients for the various country groupings. This may be due to the level of aggregation used, since the higher the level of aggregation, the more similar will be labor requirements for imports from various sources. On the average, the labor intensity of total imports declined slightly between 1970 and 1973, although this decline was not statistically significant. However, the labor intensity of imports from some particular countries did change markedly. Imports from the Andean Group were 33 percent less labor-intensive than the overall average in 1970 but exceeded the average by 11 percent in 1973. This change can be readily explained as the result of the Andean Group import liberalization program begun in 1971, according to which Colombia eliminated nontariff restrictions on imports from Common Market members and also eliminated tariffs for a special subset of imports from Bolivia and Ecuador, the least developed Andean Group countries. This special subset included some very

Table 4.16 **Average Total Employment Remuneration in HOS Exports by Destination, 1970 and 1973 (in 1970 Pesos)**

Sector		Total	United States	Other Developed Countries	Less Developed Countries
All manufactures	1970	34,830	42,650	27,990	28,930
	1973	27,000	37,340	18,070	26,820
All manufactures except sugar	1970	32,410	40,760	25,960	28,930
	1973	25,130	35,520	17,180	26,820
All manufactures except sugar, petrochemicals, and jewelry	1970	21,180	20,850	15,580	28,930
	1973	19,520	18,680	15,710	26,820

Source: Author's computations.

Note: The computations in this table relate to total exports of HOS goods, including those originating in import-competing and noncompeting industries.

Table 4.17 **Labor Intensity of Imports of Manufactures, 1970 and 1973 (Number of Workers per Million Dollars of International Value Added of Imported Goods)**

		Total Imports	United States	Other Developed Countries	Vene-zuela	Andean Group	Central America and Caribbean	Other Latin American Countries	Other Less Developed Countries	Socialist Countries
Total	1970	43.9	42.8	46.2	46.3	32.0	43.2	43.4	45.3	45.4
employment[a]	1973	42.7	42.5	42.5	42.5	47.2	35.0	44.1	55.4	38.5
Blue-collar	1970	32.3	30.8	34.3	37.1	25.2	32.7	30.4	36.0	36.1
employment	1973	30.6	30.4	30.0	32.6	37.8	24.6	31.8	45.2	28.4
White-collar	1970	11.6	11.9	11.9	9.2	6.8	10.5	13.0	9.3	9.3
employment	1973	12.1	12.1	12.5	9.9	9.4	10.4	12.3	10.2	10.1

Source: Author's computations.

[a]Total employment is exclusive of management.

labor-intensive items such as cotton jackets. Other large changes in labor coefficients were found in imports from Central America and the Caribbean and from socialist countries, which became less labor-intensive, and in imports from other LDCs, which became more labor-intensive.

Colombia's manufacturing sector is well diversified. More than 90 percent of manufactured consumer goods sold in the country are either produced or assembled domestically behind tariff walls. The greater part of imports is made up of intermediate and capital goods. Thus, most manufactures typically produced by LDCs are not imported. This is probably why the average labor coefficients for most of the country groupings were close to the overall average. And when tariff rates on some consumer goods items are reduced for certain countries, imports of such goods from those countries increased. This explains why special tariff concessions to Ecuador and Bolivia had an effect on their exports to Colombia and thus on the labor coefficients.

4.4.7 Employment and Income Distribution Effects of International Trade Strategies

Given the data available, it was impossible to estimate the effects of various trade strategies on the size distribution of income of Colombia. However, the evidence collected provided indications on which social groups tended to benefit the most from the development of exportable, import-competing and noncompeting manufacturing activities. Table 4.18 provides a summary of data relevant to the income distribution effects of the manufacturing groups considered.

The results suggest that the average compensation in the import-competing sector was slightly higher than in the noncompeting sector and 9 percent higher than in the export sector. The higher remuneration in the import-competing sector was due to higher management compensation and not to higher wages and salaries for blue- and white-collar workers (see table 4.9).

Direct employment per unit of value added generated by the export sector was almost twice that created by the import-competing sector. The employment difference was almost totally accounted for by blue-collar workers.

Total remuneration as a percentage of value added was highest by far in the export sector, followed by the noncompeting and import-competing sectors. This ranking was unchanged if indirect salary effects were taken into account. On this basis, the wage and salary share in value added was approximately 60 percent higher in exports than in importables.

In sum, it seems clear that, in terms of direct effects, export-oriented manufacturing created substantially more blue-collar jobs than import-competing manufacturing; wages in both sectors were almost equal; and

Table 4.18 **Employment and Labor Remuneration in Four Trade Categories, 1973**

Trade Category	Total Workers per Million Pesos of DVA[a] (1)	Blue-Collar Workers per Million Pesos of DVA (2)	White-Collar Workers per Million Pesos of DVA (3)	Ratio of White-to Blue-Collar Employment (4)	Average Remuneration (1970 Pesos) (5)	Total Remuneration as Percentage of DVA	
						Direct Only (6)	Direct and Indirect[b] (7)
Exports	29.1	23.9	3.6	.151	26,200	76.2%	73.2%
Import-competing	15.5	11.0	3.2	.291	28,580	44.3	45.7
Noncompeting	21.7	16.3	3.8	.233	28,220	61.2	60.1

Source: Author's computations.

Note: Columns 1 through 6 relate to direct employment only, whereas column 7 includes also indirect employment.

[a]Including management; see tables 4.7 and 4.9.

[b]Direct plus indirect remuneration divided by direct plus indirect value added; i.e. (column 6 + column 3 of table 4.10) ÷ (1 + column 2 of table 4.10).

total labor remuneration was higher in exports. This last point was still valid after measurable indirect effects were taken into account. Thus, given the evidence available, it can be concluded that emphasis upon export promotion produced more egalitarian effects on income distribution than emphasis upon import substitution in the period before 1967.

4.5 Conclusions

My analysis has shown that export-oriented manufacturing branches were significantly more labor-intensive than the import-competing and noncompeting branches. This does not mean that some of Colombia's exports have not been and are not now capital-intensive, since examples of such exports can be found. On the average, however, the results clearly showed that exports were more labor-intensive. Furthermore, the results showed that, as the economy became more open, the labor intensity of exports increased. As one would expect, exports to LDCs were less labor-intensive and less female-intensive than exports to DCs. On the import side, a strong similarity was found in the labor intensity of imports from DCs to LDCs.

The opening of the economy that began in 1967 also had an effect on the shares of NRB and HOS goods in exports. With the economy opening, the comparative advantage of the country in labor-intensive production was observable in the substantially higher increase in HOS export production relative to NRB exports; the strength of this trend was found even in the presence of increasing commodity prices.

Estimated indirect effects on home goods production also gave expected results. Home goods indirect labor affected import-competing industry more than other sectors, since they are more intensive in the use of energy, transportation, and banking services, all of which are relatively labor-using. Even including indirect effects, however, production for export still provided appreciably greater employment opportunities than import-competing production insofar as can be judged by the relative share of labor remuneration in total value added.

Export production had more egalitarian effects on income distribution than import-competing production. This was true even when the indirect effects on home goods were taken into account.

In general, all these results are expected in an economy that responds well to price incentives. They suggest that any incentive-oriented economic policy (import substitution or export promotion) will be effective, since Colombian entrepreneurs appear to respond well to traditional policy instruments. However, given Colombia's employment problems and experience with import substitution, my results provide a strong argument for continuation of Colombia's export promotion regime.

Appendix A: Data Sources

Employment, Skills, and Value-Added Data

The 1970 census of manufactures was used to obtain employment, skills, and value-added data at the four-digit level of the ISIC-II classification. The census provides information on the number of various types of workers employed in manufacturing: white-collar, blue-collar, and managers. Unfortunately, no information is available on the number of hours worked; thus all labor measures used in this study are based on the number of workers and not on the flow of services of labor.

The census data were used to derive value-added figures for each four-digit sector. The value-added figures were obtained by subtracting from the output data all intermediate goods purchases plus payments for services and raw materials. No deduction for depreciation was made, since no data on fixed capital are available. The value-added data are used as a proxy for capital stock because it was impossible to find data on capital.

No direct information on labor skills was available. Data on salaries and wages and on ratios of white- to blue-collar workers are used as proxy variables for skills (see Appendix B), as is the female-intensity of different sectors (with the strong presumption that under prevailing conditions women are, on the average, significantly less skilled than men).

Trade Data

International trade data were obtained from the trade yearbooks for 1970 and 1973 (DANE 1970–73). All exports and imports of Colombia were reclassified at the four-digit ISIC-II level to make them comparable to the manufacturing census data.

Following our beliefs about the relevance of the various trade partners of Colombia, the trade data were also assembled according to the following country groupings: (1) the United States, the largest single trade partner of Colombia; (2) all the other developed capitalist countries; (3) Venezuela, a country with which there is a large amount of trade, both legal and illegal; (4) the Andean Group countries (notice that in 1973 Venezuela had not joined and Chile was still a Common Market member and thus was included in this category); (5) the Central American and Caribbean countries, which have generally followed less protective policies than other LDCs and with which Colombia has low natural barriers, since the Caribbean supplies a cheap transport route; (6) the rest of Latin America (all these countries are members of the Latin American Free Trade Association—LAFTA, an integration

scheme that has developed a few bilateral and multilateral trade agreements in which Colombia participates); (7) the other LDCs; (8) the socialist European and Asiatic countries with which all trade takes place through bilateral agreements and where natural resource endowments play a lesser role in determining the composition of trade.

Other Data

Two other main sources of data were used in this study: the Colombian input-output table for 1970, and an effective protection study done by Thomas Hutcheson and Daniel Schydlowsky (1976) with 1970 data. The 1970 input-output table is unfortunately very aggregated, with only thirty-one sectors. Therefore, indirect effects could be determined only in a very approximate way, and estimates are given here only for output, value added, and wages and salaries. No estimates are offered for employment, since, for example, the indirect employment effects of the manufacturing branches of the 3111 to 3119 ISIC codes are estimated only globally and cannot be broken down by manufacturing branch.

The effective protection study is of very high quality. It is based on a survey of product prices and thus reflects actual domestic prices, not estimated prices. The study not only takes into account tariffs, licenses, and other foreign trade barriers, but also includes capital and other subsidies that affect the level of protection provided by the government's intervention in the market mechanism. Unfortunately, the survey provides effective protection data for only fifty-six branches of the eighty four-digit ISIC-II branches (table 4.A.1).

Table 4.A.1 Nominal and Effective Protection of Manufactures in Colombia, 1969

ISIC No.	Manufacturing Branch	Nominal Protection	Effective Protection	Trade Category[a]
3111	Slaughtering, preparing, and preserving of meat	6.3%	7.3%	X
3112	Manufacture of dairy products	15.0	11.8	X
3113	Canning of fruits and vegetables	41.6	30.2	M
3114	Canning, preserving, and processing of fish and crustaceans	30.8	11.1	X
3115	Manufacture of vegetable and animal oils	13.7	9.2	M
3116	Grain mill products	−4.8	17.8	M
3117	Manufacture of bakery products	0.0	−3.2	X
3118	Sugar factories and refineries	−9.8	−8.6	X
3119	Manufacture of cocoa, chocolate, etc.	20.8	16.3	M
3121	Manufacture of food products n.e.c.	9.6	2.3	X
3131	Distilling, rectifying, and blending spirits	51.0	42.5	M
3132	Wine industries	51.0	29.9	M
3140	Tobacco manufactures	0.0	0.0	X
3211	Spinning, weaving, and finishing of textiles	23.4	11.8	X
3212	Manufacture of made-up textile goods except wearing apparel	0.0	−0.3	X
3213	Knitting mills	46.1	30.4	X
3215	Cordage, rope, and twine industries	9.3	7.8	X
3219	Textiles n.e.c.	15.7	3.3	M
3220	Wearing apparel except footwear	22.0	13.6	X
3231	Tanneries and leather finishing	18.8	11.2	X
3233	Production of leather and leather substitutes, except footwear and wearing apparel	29.8	21.3	X
3240	Footwear, except vulcanized or plastic footwear	0.7	0.4	X
3311	Sawmills, planing, and other wood mills	9.4	7.2	X
3319	Wood and cork products n.e.c.	8.2	5.1	X
3320	Furniture and fixtures	8.0	4.9	M
3411	Pulp, paper, and paperboard	24.2	14.1	M
3412	Containers and boxes of paper and paperboard	22.4	14.6	X
3511	Basic industrial chemicals except fertilizers	41.9	32.7	NC
3513	Snythetic resins, plastic materials and manmade fibers, except glass	61.7	35.4	NC
3521	Paints, varnishes, and lacquers	49.5	49.8	M
3522	Drugs and medicines	85.7	64.3	M
3523	Soap and cleaning preparation, perfumes, cosmetics, etc.	16.3	6.8	M
3529	Chemical products n.e.c.	54.8	56.0	NC
3530	Petroleum refineries	−9.8	5.2	M
3540	Products of petroleum and coal	15.0	11.4	M
3551	Tire and tube industries	10.0	4.4	X
3559	Rubber products n.e.c.	29.5	24.3	M

Table 4.A.1—*continued*

ISIC No.	Manufacturing Branch	Nominal Protection	Effective Protection	Trade Category[a]
3620	Glass and glass products	36.0	5.1	X
3692	Cement, lime, and plaster	1.1	1.3	X
3699	Nonmetallic mineral products n.e.c.	85.6	61.2	X
3710	Iron and steel, basic industries	30.2	17.6	M
3720	Nonferrous metal, basic industries	43.4	25.6	NC
3811	Cutlery, hand tools, and general hardware	23.1	21.7	M
3812	Manufactures of furniture and fixtures, primarily of metal	33.2	4.6	X
3813	Structural metal products	33.2	4.6	M
3819	Fabricated metal products, except machinery and equipment n.e.c.	14.2	4.9	M
3822	Agricultural machinery and equipment	18.8	12.3	M
3824	Special industrial machinery and equipment, except metal and woodworking machinery	29.7	21.1	NC
3830	Electrical industrial machinery and apparatus	42.3	33.2	NC
3832	Radio, television, and communication equipment and apparatus	85.8	72.5	NC
3833	Electrical appliances and housewares	91.0	65.0	NC
3839	Electrical apparatus and supplies n.e.c.	192.9	123.5	M
3843	Motor vehicles	142.8	139.6	NC
3844	Motorcycles and bicycles	68.7	41.7	M
3901	Jewelry and related articles	0.1	−0.5	X
3909	Manufacturing industries n.e.c.	67.9	69.0	NC

Source: Hutcheson and Schydlowsky (1976), and Hutcheson's unpublished data.
[a]Code: X = exportable, M = importable, NC = noncompeting production.

Appendix B: A Note on Labor Skills and Their Measurement in Colombia

The decision to introduce skills in a study of this nature is based on the belief that there exist various types of labor that are important in determining total output, length of time of the production process, and so forth. A priori, these various skills or qualities of labor are not defined in the same dimension, and thus they are not directly comparable; for example, the skills of a wood-carver and those of a truck driver are not directly comparable. To compare these various skills it is necessary to use a function that weights all the skills being considered. The theory of human capital provides such a weighting function, since it offers a method of valuing each type of labor. If we rely basically on the assump-

tion that the supply of different types of skills is highly elastic, under competitive conditions, the wage paid each type of labor can be interpreted as representing the value of the raw labor used (unskilled time) plus the value of the skills embedded in marginal individuals providing the labor services. Total labor remuneration can thus be used as a proxy measure for the quantity of skills used in a production process.

Wages and salaries have to be used carefully in Colombia, because they are somewhat distorted by the following factors: minimum wage laws, extensive labor unionization in the manufacturing sector, and possible observation of disequilibrium conditions. Minimum wage laws establish a floor for wages in all areas of the country and assign differentiated wages by region and economic sector (agriculture vs. manufacture). The degree of compliance with these laws varies a great deal, and there is no way to measure the degree of evasion. However, minimum wage laws are generally enforced in the large cities and in manufacturing establishments with more than ten employees. Owing to the persistent inflation experienced in Colombia and to the lag in the adjustment in minimum wage floors, minimum wages have not always been binding. It is frequently stated that labor unions used the minimum wage levels as benchmarks in their salary demands. To conclude, while it is widely believed that minimum wage laws and unions have an effect on wage levels, there is no quantification of the magnitude of this effect.

Certain wages and salaries in Colombia are likely to be at levels different from what they would be in long-run equilibrium. In an economy where many new products and plants are developed every year, some types of labor will likely be in short supply. Individuals with the necessary skills are in a position to command salaries well above their social replacement costs, which in the long run are determined by the costs of training. While these conditions point out the difficulties in using wages and salaries as a proxy for skill levels in Colombia, they were nonetheless used in the absence of a better measure.

Census data were used to obtain labor remuneration for three types of workers: blue-collar, white-collar, and managerial. The blue-collar and white-collar data are believed to be of good quality. However, the managerial data are of lower quality, since in many small plants there is no separation between ownership and management. Thus the managerial remuneration is only an accounting cost and does not necessarily represent what the manager actually gets. Furthermore, in the corporate sector many managers get part of their salary in kind so that they can avoid paying income taxes. These payments in kind are not included in the data.

The ratio of white- to blue-collar workers is also taken as a proxy for skills used in production, because it is believed that white-collar workers are employed in jobs that are not directly related to the produc-

tion process but arise from market imperfections. Such jobs include those held by employees who are used to get import and export licenses, to influence price controls, and so forth. Also, many sales jobs have been created by oligopolistic market structures and product-differentiation advertising, and other sales efforts have to be made to maintain a plant's market share. To summarize, the white-collar workers employed by a plant include not only engineers and production workers but also non-production-related employees. Therefore the ratio of white- to blue-collar workers reflects the quality and skills of the production supervisory staff as well as market imperfections and government intervention. Unfortunately, there is no way to separate these three elements.

In this study, therefore, two skill measures have been used: the level of labor remuneration and the ratio of white- to blue-collar workers. As I pointed out above, both have to be employed with reservations. Both are used as they reflect different skill requirements of the various production processes. Salaries can be used to compare various skills within a labor classification, that is, skill differences among blue-collar workers of various industries. The W/B ratio can be used to reflect different supervisory, research, and engineering requirements of the various manufacturing branches.

Notes

1. In some respects 1973 was not a typical year: international inflation was running high, and it was a boom year for the world economy during which "shortages" of many commodities developed. These factors probably affected Colombian trade in 1973, since imports of NRB commodities were discouraged while exports of such commodities were encouraged by high prices. Furthermore, shortages of intermediate goods hampered domestic production of some manufactured goods and, thus, exports of manufactures.

2. A more detailed overview of Colombian development can be found in Díaz-Alejandro (1976*b*).

3. For a complete discussion of the exchange regime, see Díaz-Alejandro (1976*b*).

4. An excellent analysis of the Colombian trade system and history in recent years is found in Díaz-Alejandro (1976*b*).

5. These biases were still present in 1969, the date for which good effective protection estimates exist.

6. The subsidy was also income tax free.

7. Recently there have been some drastic changes in Colombia that have improved the employment picture. The description in this section pertains to the situation prevailing during the period to which the study applies—the 1960s and early 1970s. Several factors have altered the outlook: (1) Colombia has had one of the most dramatic declines in rate of population growth of any country, with the rate falling from about 3.3 percent in the 1950s and early 1960s to less than 2 per-

cent in the late 1970s; and (2) the boom produced by the high coffee prices, and the development of marijuana and cocaine industries, has produced a very large source of income, which in turn has had a large effect on employment.

8. See Conroy (1976) for a detailed analysis of this phenomenon; data mentioned here are taken from his study.

9. Protectionist policies have changed since these studies were made, as the 1970s have witnessed a continuation of the trade liberalization policies begun in 1967. However, the effective protection estimates for 1969 are suitable here because they are only one year away from the manufacturing census used in the latter part of this chapter.

10. This figure (0.4) is lower than the one used to divide import-competing and noncompeting industries in many other country studies presented in this volume. The T statistic for Colombia was clearly bimodal for values between zero and one, with modes at about 0.25 and 0.65. Furthermore, most of the noncompeting industries are either metal-manufacturing branches that contain a great number of products with different patterns of behavior or industries in which imports tend to be quite different from domestic products and thus are noncompeting.

11. The Colombian agricultural sector has not been studied extensively; however, the interested reader could look at Junguito (1974).

12. For example, the finding that manufactured exports are on the average more labor-intensive than import-competing manufactured products cannot be extended to the agricultural sector, where the opposite may take place (further discussed below).

13. For an explanation of the rationale for the geographic divisions used, see Appendix A.

14. The size breakdown is not available at the four-digit level of disaggregation used in this essay. Such detail would violate the confidentiality of the census data, since it would allow the identification of many firms.

15. This issue is discussed further below. See table 4.14.

16. These obstacles, in the view of many historians, played a major role in the dissolution of the Gran Colombia, which in the nineteenth century included what today are Colombia, Ecuador, Panama, and Venezuela.

17. See the works of Hagen (1962) and Lopez-Toro (1970), in which the regional development of entrepreneurial abilities in Antioquia are studied.

18. Servicio Nacional de Aprendizaje, a government organization in charge of a large vocational training program in Colombia.

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