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# The Employment Effects of Trade in Manufactured Products Between Developed and Developing Countries

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This paper examines prospective changes in employment associated with the expected expansion of trade in manufactured goods between the developed and developing countries over the next decade. It appears that, on balance, the developed countries would experience net employment creation as a result of this trade, and there would be only relatively small decline of employment in their import-substituting industries. In turn, the developing countries would gain employment through increased export that would further contribute to their economic growth, with favorable indirect effects on employment.

## INTRODUCTION

The employment effects of trade are an important political issue in the developed countries, in which labor unions have expressed fear of competition from manufactured products originating in the developing countries. It is also an important economic issue in the developing countries, the leaders of which hope that manufactured exports can

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371

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provide an important source of employment. What is the validity of these fears and hopes? How does trade in manufactured goods affect employment in the developed and in the developing countries and what are the prospects for the future? These are the questions addressed in this article.

In Section 1 I describe the system of country and trade classification used in the article and provides information on trade in manufactured products between developed and developing countries in 1973 and 1983 and, in more detail, for 1983. In Section 2 I describe the procedure utilized to estimate the employment effects of trade in manufactured products for developed as well as for developing countries. In Section 3 I present alternative estimates of the prospective employment effects of this trade. In the conclusion, the policy implications of the findings are drawn.

## 1. MANUFACTURED TRADE BETWEEN DEVELOPED AND DEVELOPING COUNTRIES

Trade in manufactured products between developed and developing countries grew rapidly between 1973 and 1983. In terms of constant prices, the manufactured exports of the developed countries to the developing countries rose at an average annual rate of 7.3%, and their imports from these countries increased 10.5% a year.<sup>1</sup>

As a result of these changes, the overall export surplus of the developed countries in trade in manufactured products with the developing countries increased from \$38 billion in 1973 to \$134 billion in 1983. Within the developing-country category, however, considerable differences are observed between OPEC<sup>2</sup> and the non-oil developing countries. Whereas the export surplus of the developed countries in manufactured trade with OPEC rose from \$13 billion in 1973 to \$77 billion in 1983, the increase in the surplus was from \$25 to \$57 billion in trade with the non-oil developing countries.

The differences reflect the rapid growth of developed-country

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<sup>1</sup>The data on the current value of trade flows originate in GATT, *International Trade, 1983/84*, Geneva, 1984; the unit value index for the manufactured exports of developed countries is reported in United Nations, *Monthly Bulletin of Statistics*, March 1985 and in earlier issues of the same publication; and the corresponding index for the exports of the developing countries has been derived by this author as the weighted average of unit value indices for the manufactured exports of Brazil, Hong Kong, Korea, Singapore, and Taiwan, the five largest exporters of these products to the developed countries.

<sup>2</sup>The OPEC countries include Algeria, Ecuador, Gabon, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates, and Venezuela.

imports of manufactured products from the non-oil developing countries, with an average annual rate of increase of 10.7% in volume terms. As a result, the export-import ratio of the non-oil developing countries in this trade rose from 0.38 in 1973 to 0.55 in 1983. With the OPEC countries failing to expand their manufactured exports, the average export-import ratio for all developing countries increased from 0.30 in 1973 to 0.35 in 1983.

The data pertain to manufactured products as customarily defined in trade statistics; i.e., categories 5 to 8 less 68 (nonferrous metals) in the Standard International Trade Classification (SITC). For estimating the employment effects of trade, use has to be made of an industrial classification scheme, however. This, in turn, required establishing a correspondence between the two classification schemes.<sup>3</sup>

In the following description, the trade data are reported according to the three-digit breakdown of the International Standard Industrial Classification (ISIC). But, to conform to the trade classification scheme, food (311 and 312), beverages (313), tobacco (314), petroleum refining (353), petroleum and coal products (354), and nonferrous metals (372) have been omitted from ISIC class 3. This leaves 21 categories of "genuine" manufactured products, or industries.

For purposes of the analysis, the developed countries have been divided into four groups. They include the United States, the European Common Market,<sup>4</sup> Japan, and the other OECD countries.<sup>5</sup> Data for France are also shown separately in the tables.

The developing countries have been divided into five groups. Applying a definition earlier introduced by the author (Balassa 1984), the newly industrializing countries (NICs) have been defined to include countries that had a per capita income of \$1100 in 1978 and a share of manufacturing in the gross domestic product of 20% or higher in 1977. Data for the Far Eastern NICs (Hong Kong, Korea, Singapore, and Taiwan) and the Latin American NICs (Argentina, Brazil, Chile, Mexico, and Uruguay) are shown separately in the tables.

The third group includes the Newly Exporting Countries, defined to include developing countries whose manufactured exports amounted to at least 0.05% of the world exports of these commodities in 1983.

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<sup>3</sup>The author is indebted to Jerzy Rozanski for establishing this correspondence.

<sup>4</sup>In 1983, the Common Market member countries were Belgium, Luxembourg, Denmark, France, West Germany, Greece, Ireland, Italy, the Netherlands, and the United Kingdom.

<sup>5</sup>Australia, Austria, Canada, Finland, Iceland, New Zealand, Norway, Portugal, Spain, Sweden, and Switzerland.

They are Bangladesh, the People's Republic of China, Colombia, the Dominican Republic, Egypt, Guatemala, India, the Ivory Coast, Kenya, Malaysia, Morocco, Pakistan, Peru, the Philippines, Sri Lanka, Thailand, Tunisia, and Turkey.<sup>6</sup>

Data for the rest of the non-oil developing countries, as well as for Israel, South Africa, and Yugoslavia that are difficult to classify, is reported in the Other Developing Country category. Finally, as before, data for the OPEC countries is separately shown.

Table 1 provides information on exports and imports in trade in manufactured products between developed and developing country groups. According to the data reported in the table, the developed countries, taken together, had an export surplus of \$117 billion in 1983 in trade with all developing countries and an export-import ratio of 2.1. At the same time, considerable differences in this trade exist among developed as well as among developing countries and country groups.

In 1983, U.S. exports and imports in trade in manufactured goods with the developing countries were nearly at equality, with an export surplus of \$2 billion. The surplus was \$54 billion in the European Common Market, and it was \$13 billion in France alone; the ratio of exports to imports in manufactured trade with the developing countries was 2.5 in the first case and 3.3 in the second. Japan had an export surplus of \$48 billion and an export-import ratio of 5.2. Finally, the rest of the developed countries had a surplus of \$13 billion and an export-import ratio of 2.2.

The OPEC countries accounted for slightly more than one-half (\$62 billion) of the \$117 billion import surplus of the developing countries in trade in manufactured products with the developed countries, although their exports covered only one-tenth of their imports. For the non-oil developing countries, the export-import ratio was 0.6 and the import surplus \$55 billion.

Among the non-oil developing countries, too, are considerable differences among country groups. The newly industrializing countries (NICs) taken together had an export surplus of \$8 billion in trade in

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<sup>6</sup>In the GATT statistics cited earlier, the developing-country group excludes China. This fact, as well as differences in commodity coverage, account for the observed discrepancies between the two set of data. In particular, several natural resource products are classified as primary products in the SITC but are grouped with manufactured products in the ISIC. With the products in question being exported in large part by developing countries and, in particular, by OPEC, the import surplus of these countries is considerably less in the present classification than in the trade statistics reported by GATT.

**Table 1: Trade in Manufactured Products Between Developed and Developing Countries 1983: Country Groups (\$ Millions)**

	NIC(Far East)			NIC(Latin America)			Newly Exporting		
	Exports	Imports	Balance	Exports	Imports	Balance	Exports	Imports	Balance
Developed Countries									
United States	9913.76	27,085.74	-17,171.98	8119.39	8577.14	-457.75	10,973.93	8349.48	2624.45
EEC	6199.56	9514.64	-3315.08	3981.32	2530.33	1451.00	21,639.26	8920.72	12,718.55
France	876.21	1080.13	-203.93	1180.76	371.83	808.93	4405.62	1692.29	2713.33
Japan	17,625.30	4187.60	13,437.70	1582.98	1085.40	497.58	16,391.51	3360.76	13,030.75
Other OECD	2633.82	5275.17	-2641.35	1469.01	990.33	478.69	5658.46	2097.18	3561.28
OECD Total	36,372.45	46,063.17	-9690.71	15,152.71	13,183.20	1969.51	54,4663.16	22,728.14	31,935.02
	Other Non-Oil			OPEC			All LDC		
	Exports	Imports	Balance	Exports	Imports	Balance	Exports	Imports	Balance
Developed Countries									
United States	11,962.81	3591.18	8371.63	10,539.91	1892.98	8646.93	51,509.87	49,496.62	2013.25
EEC	23,693.28	11,686.47	12,006.82	34,064.24	2761.54	31,302.70	89,578.55	35,414.35	54,164.21
France	5490.50	1991.28	3499.22	6864.23	585.02	6279.21	18,817.42	5720.62	13,096.80
Japan	6625.40	874.95	5750.45	17,363.29	2015.77	15,347.52	59,588.60	11,524.59	48,064.02
Other OECD	6427.66	1749.99	4677.67	7668.71	543.44	7125.27	23,858.56	10,656.60	13,201.97
OECD Total	48,709.15	17,902.58	30,806.57	69,636.15	7213.73	62,422.43	224,535.59	107,092.15	117,443.4

Source: World Bank data base.

manufactured products with the developed countries in 1983. They had a large export surplus with the United States, a smaller surplus with the European Common Market (an approximate balance with France) and the other industrial country group, but a large deficit with Japan.

The average export-import ratio for the newly industrializing countries was 1.1; it was 1.3 for the Far Eastern and 0.9 for the Latin American NICs. The former group of countries had much higher export-import ratios than the latter in trade with all the developed country groups other than Japan, for which the ratios were 0.2 and 0.7, respectively.

The ratio of exports to imports in trade in manufactured products with the developed countries was 0.4 in the newly exporting countries as well as in the group of other developing countries. Recall, however, that in addition to low-income countries, the latter group includes Israel, South Africa, and Yugoslavia.

The data in Table 1 further indicate the relative importance of various groups of developing countries as trading partners for the developed countries. In 1983, the Far Eastern NICs supplied 43% of the manufactured goods imported by the developed countries from the developing countries and provided markets for 16% of their exports. The corresponding percentages were 12% and 7% for the Latin American NICs, 21% and 24% for the newly exporting countries, 17% and 22% for the other non-oil developing countries, and 7% and 31% for OPEC.

Table 2 provides information on trade between developed and developing countries in the 21-industry breakdown. The table shows few surprises. The export-import ratios for the developed countries in 1983 were below 1 for labor-intensive products,<sup>7</sup> in which the developing countries have a comparative advantage, and the ratios were lower the greater the extent of this comparative advantage. The ratios were 0.3 for clothing, 0.5 for footwear and for leather and leather products, 0.8 for the miscellaneous group of other industries, and 0.9 for textiles.

The next group contains natural resource products, including wood products (an export-import ratio of 1.3), industrial chemicals (1.6), and other chemicals (1.4), for which the availability of natural resources provides advantages to developing countries. An exception is paper

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<sup>7</sup>Data on the labor intensity of manufactured products are provided in a 184-industry breakdown in Balassa (1979b).

**Table 2:** Trade in Manufactured Products Between Developed and Developing Countries, 1983: Industry Categories

Industry Category	Developed Country Total			Export-Import Ratio
	Exports	Imports	Balance	
321 Textiles	9611.55	10,764.98	-1153.42	0.89
322 Wearing Apparel	831.24	3075.19	-2243.94	0.27
323 Leather and Products	1201.08	2174.62	-973.54	0.55
324 Footwear	475.75	884.65	-408.89	0.54
331 Wood Products	5249.63	4048.50	1201.13	1.30
332 Furniture, Fixtures	4542.13	2610.71	1931.41	1.74
341 Paper and Products	2279.60	441.53	1838.08	5.16
351 Industrial Chemicals	11,447.52	7221.32	4226.20	1.58
352 Other Chemical Products	8720.40	6043.92	2676.48	1.44
355 Rubber Products	11,910.27	5972.81	5937.46	1.99
356 Plastic Products, N.E.C.	13,948.33	7588.01	6360.33	1.84
361 Pottery, China, Etc.	1727.22	824.38	902.84	2.08
362 Glass and Products	5383.77	1151.25	4232.52	4.68
369 Nonmetallic Products, N.E.C.	3992.87	701.54	3291.33	5.69
371 Iron and Steel	20,802.62	8789.33	12,013.29	2.37
381 Metal Products	26,365.04	10,821.47	15,543.56	2.44
382 Machinery N.E.C.	28,949.26	8218.96	20,730.29	3.52
383 Electrical Machinery	24,148.89	7846.95	16,301.94	3.08
384 Transport Equipment	21,487.19	2982.32	18,504.86	7.20
385 Professional Goods	14,754.48	6440.94	8313.53	2.29
390 Other Industries	6706.75	8488.76	-1782.02	0.79
Total Values	224,535.59	107,092.15	117,443.44	2.10

Source: World Bank data base.

and paper products (5.2), for which the capital intensity of the production process favors the developed countries.

Several other industries had export-import ratios for the developed countries in their trade with the developing countries lower than the overall average in 1983. They include furniture (1.7), plastic products (1.8), rubber products (2.0), and pottery and china (2.1), all of which are natural-resource intensive, as well as labor-intensive, products.

At the other extreme, the export-import ratio was 7.2 for transport equipment, 5.7 for nonmetallic products, 4.7 for glass and glass products, followed by nonelectrical machinery (3.5), electrical machinery (3.1), metal products (2.4), iron and steel (2.4), and professional

goods (2.3). These industries tend to be physical and/or human-capital intensive, on the average. However, they also encompass a wide range of products with different characteristics. Correspondingly, considerable product specialization exists in these industries between developed and developing countries. Trade between the two groups of countries is also promoted by the international division of the production process, entailing the exchange of parts, components, and accessories across national borders.

## 2. ESTIMATING THE EMPLOYMENT EFFECTS OF TRADE

The employment effects of trade may be estimated retroactively or prospectively. In the first case, traditional analysis has involved using an accounting procedure to decompose the contribution of domestic demand, imports, exports, and productivity change to employment growth (Frank 1977; Krueger 1978; and Wolter 1979).

The accounting procedure has been criticized on several grounds. Martin and Evans (1981) argued that productivity improvements are often undertaken in response to import competition, thus giving rise to the underestimation of the effects of imports on employment under this procedure. In turn, Orr and Orr (1983) suggested that import competition may be met by decreases in wages, in which case the employment effects will be less than the accounting procedure would indicate.

Several efforts have been made to estimate econometrically the economic effects of import competition. For the United States, Orr and Orr claimed to have established that decreases in wages was a more important form of adjustment than reductions in employment in a sample of 25 import-sensitive industries. In contrast, Grossman (1982) did not find that changes in import prices would have had an appreciable impact either on employment or on wages in nine import-competing U.S. industries, the exception being radio and television.

Neither of these empirical studies tested the hypothesis that import competition would have a bearing on technological change. At the same time, the former study did not introduce import competition directly in the estimating equation, whereas the latter limited the analysis to changes in import prices, thus neglecting changes in import quantities. Finally, the implications of changes in exports for employment, wages, and technological change were not considered.

Rather than attempting to gauge the effects of past changes in trade flows on employment, this article will build on an earlier study by the author (1979a) in analyzing possible future changes under *ceteris paribus* assumptions as regards wages and technological change. This

assumption is made because of the lack of firm empirical evidence on the relationships between trade flows, on the one hand and wages and technological change on the other. Even less can be said about prospective relationships among these variables.

In contradistinction with the earlier study, employment effects in both developed and developing countries have been analyzed in this article. This required estimating labor coefficients (the ratio of employment to output) for particular industries in the individual countries.

To do so, data on employment and output have been collected for the industries and the countries covered in the study. Although a complete coverage of the 22 developed and the 28 developing countries under consideration could not be achieved, data have been obtained for 37 to 41 countries in particular industries.

In the case of every country, average employment-output ratios for several years have been calculated, and the results have been converted into U.S. dollars and expressed in terms of 1983 prices. The average labor coefficients thus obtained for particular industries of the individual countries have been regressed on average per capita incomes for the years 1979–1981, for which most of the employment-output ratios have been established. Per capita incomes have been taken as indicators of the relative price of labor in intercountry relationships. This has been done for lack of comparable information on wages in the individual countries.

The regression coefficients have the expected negative sign, ranging between  $-0.45$  and  $-0.79$ , with a median of  $-0.60$ ,<sup>8</sup> in the double-logarithmic form utilized in the estimation, the coefficients represent the elasticities of the employment-output ratios with respect to per capita incomes. All the regression coefficients are statistically significant at the 1% level, whereas the coefficient of determination varies between 0.46 and 0.85 (see Table 3).<sup>9</sup>

Next, the estimated equation have been utilized to derive predicted values of the labor coefficients for particular industries for each of the countries included in the investigation. Table 4 summarizes the

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<sup>8</sup>The regression coefficients are generally higher than those estimated by Lydall, who used the same equational form (1975, Table 13). But Lydall's estimates are limited to nine "genuine" manufacturing industries, only a few of which could be exactly identified with the industrial categories used in this paper. At the same time, Lydall does not report  $t$  values and  $R^2$ s.

<sup>9</sup>The coefficient of determination is by far the lowest for the miscellaneous category of "Other Industries."

**Table 3: Regression Results for Employment-Output Ratios**

ISIC	Industry	Regression Coefficient <sup>b</sup>	t Value	R <sup>2</sup>	N
321	Textiles	-0.709	-9.87	0.714	41
322	Wearing Apparel	-0.574	-9.22	0.691	40
323	Leather and Products	-0.475	-6.88	0.561	39
324	Footwear	-0.535	-11.42	0.784	38
331	Wood Products	-0.788	-9.43	0.701	40
332	Furniture, Fixtures	-0.763	-12.54	0.818	37
341	Paper and Products	-0.633	-10.11	0.724	41
351	Industrial Chemicals	-0.600	-7.96	0.625	40
352	Other Chemical Products	-0.564	-10.93	0.773	37
355	Rubber Products	-0.519	-6.92	0.564	39
356	Plastic Products, N.E.C.	-0.630	-11.01	0.766	39
361	Pottery, China, Etc.	-0.591	-10.59	0.767	36
362	Glass and Products	-0.645	-14.49	0.854	38
369	Nonmetal Products, N.E.C.	-0.631	-9.22	0.686	41
371	Iron and Steel	-0.449	-8.55	0.664	39
381	Metal Products	-0.586	-9.41	0.694	41
382	Machinery, N.E.C.	-0.626	-6.40	0.532	38
383	Electrical Machinery	-0.521	-7.98	0.626	40
384	Transport Equipment	-0.536	-7.00	0.557	41
385	Professional Goods	-0.722	-12.85	0.821	38
390	Other Industries	-0.508	-5.57	0.463	38

<sup>a</sup>The explanatory variable is per capita incomes; the equation has been estimated in a double-logarithmic form.

<sup>b</sup>All coefficients are significant at the 1% level.

Source: World Bank data base.

average labor coefficients in trade between developed and developing countries in 1983 in the 21-industry breakdown. The table shows that, in trade in manufactured products with the developing countries, the average labor coefficient was 14.9 for the exports and 15.3 for the imports of the developed countries. (More exactly, the estimates refer to exports and import-competing goods, with the average labor coefficients being derived by weighting with the composition of exports and imports.)

The differences in the results obtained for the exports and imports of the developed countries find their origin in the relatively high labor content of industries, such as wearing apparel, footwear and leather, and leather products, in which the developed countries have the lowest export-import ratios. Conversely, paper, with the lowest labor coefficient, has the second highest export-import ratio.

A number of exceptions exist, however. They include industrial chemicals that have one of the lowest labor coefficients but a lower-

**Table 4:** Average Labor Coefficients for Manufactured Trade Between the Developed and the Developing Countries

Industry Category	Developed Country Total		Developing Country Total	
	Exports	Imports	Exports	Imports
321 Textiles	17.99	17.49	108.04	86.71
322 Wearing Apparel	32.93	30.73	110.68	118.17
323 Leather and Products	20.30	20.27	61.70	55.76
324 Footwear	28.95	26.20	78.16	83.65
331 Wood Products	16.65	15.87	99.43	101.79
332 Furniture, Fixtures	22.68	21.05	79.90	125.07
341 Paper and Products	10.11	10.16	35.09	43.37
351 Industrial Chemicals	6.12	6.21	26.61	25.36
352 Other Chemical Products	9.86	9.86	35.27	35.93
355 Rubber Products	15.55	14.78	44.54	50.39
356 Plastic Products, N.E.C.	15.42	14.46	51.74	61.40
361 Pottery, China, etc.	32.28	28.86	106.63	106.64
362 Glass and Products	16.89	16.00	56.41	68.32
369 Non-Metalic Products, N.E.C.	12.82	11.68	47.64	47.38
371 Iron and Steel	10.42	10.07	26.30	30.66
381 Metal Products	17.90	17.05	59.48	65.71
382 Machinery N.E.C.	13.79	13.26	41.20	55.56
383 Electrical Machinery	16.15	15.50	39.75	49.12
384 Transport Equipment	12.83	13.08	40.92	45.25
385 Professional Goods	17.59	16.48	81.22	86.07
390 Other Industries	20.53	19.57	60.58	62.40
Total Trade	14.95	15.33	58.53	57.30

Source: World Bank data base.

than-average export-import ratio for the developed countries. By contrast, transport equipment has a below-average labor coefficient and an above-average export-import ratio. All in all, the Spearman rank correlation coefficient between average labor coefficients and the export-import ratios of the developed countries is  $-0.53$ , statistically significant at the 1% level.<sup>10</sup>

Various considerations may be introduced to explain the exceptions. To begin with, as noted earlier, developing countries may export relatively capital-intensive natural-resource products, such as indus-

<sup>10</sup>The correlation has been estimated in regard to average labor coefficients for the exports of the developed countries; the corresponding rank correlation is  $-0.52$  in regard to the average coefficient for imports. The two series of labor coefficients differ little among themselves, with a rank correlation coefficient of  $0.99$ ; the only difference lies in the country composition of the exports and imports of the individual countries.

trial chemicals. At the same time, until recently, they did not possess the technological sophistication necessary for the exportation of transport equipment, which is a labor-intensive industry. Finally, the heterogeneity of product categories may reduce the correlation between average labor coefficients and export-import ratios.

Further interest attaches to intercountry differences in the results. Among developed countries, Japan provides the principal exception to the described pattern. In 1983, the average labor coefficient was 15.8 for Japan's exports and 14.5 for its imports of manufactured products in trade with the developing countries. This result cannot be explained by reference to Japan's poor natural resource endowment alone, because several European countries are in a similar situation. Rather, the explanation appears to lie in high Japanese protection of labor-intensive products imported from the developing countries (Balassa 1986).

In trade in manufactured products with all developing countries, taken together, the average labor coefficient for imports exceeds that for exports also in France, Italy, and New Zealand, albeit to a much smaller margin than in Japan. In France, the protection of labor-intensive products originating in the developing countries reduced the average labor coefficients for imports to 13.8, as against an average of 14.0 for exports. In Italy, its success in exporting high-quality, labor-intensive products raised the average labor coefficient for exports to 20.0, compared with 19.3 for imports. In New Zealand, the exports of labor-intensive wool products resulted in an average labor coefficient of 20.0, vis-à-vis 19.0 for imports.<sup>11</sup>

The corresponding results were 15.2 and 15.6 for the European Common Market and 15.0 and 16.7 for the group of other OECD countries. In the latter case, dominated by the small European countries, the free-trade orientation of these countries has contributed to specialization in capital-intensive products in conformity to their comparative advantage.

Thus far, the discussion has concerned the average labor coefficients derived from developed-country data. The coefficients estimated for the developing countries average 58.5 for their exports and 57.3 for their imports of manufactured products in trade with the developed countries in 1983.

For reasons discussed earlier, these coefficients are much higher than those for the developed countries. At the same time, the overall

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<sup>11</sup>"Labor intensity" refers to the ratio of labor to capital rather than to that of labor to output.

pattern is rather similar, although some differences are observed among industries, owing to differences in the elasticity of labor with respect to output. Thus, the Spearman rank correlation is 0.88 between labor coefficients for developed countries in their manufactured exports to developing countries and the coefficients for the latter group of countries in their imports from the developed countries. The same result has been obtained in correlating labor coefficients for developed country imports and developing country exports. The correlation coefficients are significant at 0.01%.

Among groups of developing countries, manufactured exports from OPEC to the developed countries tend to be capital intensive, reducing the average labor coefficient for these exports (34.5) to below that for imports (46.5). The same result obtains in OPECs trade with every developed country other than Austria and Switzerland.

Given the importance of relatively capital-intensive natural-resource products in their exports, the average labor coefficient for the exports of the other developing countries to the developed countries (70.9) also fell short of that for their imports (76.1), albeit to a much lesser extent than for OPEC. This was the case in their trade with all the major developed countries, whereas some of the smaller developed countries provided exceptions to the overall result.

The traditional pattern of the developed countries exchanging capital-intensive products for labor-intensive products originating in the developing countries applies, however, to the newly industrializing and the newly exporting countries. This was the case, in particular for the latter group of countries whose average labor coefficients for the exports and the imports of manufactured products in trade with developed countries were 76.2 and 104.3, respectively. This result is not surprising, given that the comparative advantage of these countries lies in labor-intensive manufactured products.

The newly industrializing countries have progressed further on the ladder toward industrial development and, correspondingly, their average labor coefficients for exports and for imports in trade in manufactured products tend to be more similar to those of the developed countries. But considerable differences are shown between the Far Eastern NICs, with average labor coefficients of 40.8 and 33.2, and the Latin American NICs, with average coefficients of 37.9 and 36.9.

These results conform to the findings obtained in a research project under the direction of Anne Krueger (1983), which showed a certain bias toward capital-intensive exports in the Latin American NICs. The observed bias finds its origin in the protectionist policies applied by

these countries that tend to distort their trade pattern. By contrast, the Far Eastern NICs have followed policies aimed at exploiting their comparative advantage in labor-intensive products.

In interpreting the estimates, consideration needs to be given to the possibility that, within the same industry, labor-intensive products have a higher share in the developing than in the developed countries, thereby raising the ratio of employment to output in the former relative to the latter. We may assume, however, that the relatively labor-intensive products manufactured in the developing countries replace (or are replaced by) the more capital-intensive products of the developed countries through international trade. If this was the case, the estimates may correctly represent the employment effects of trade even if the product composition of individual industries varied with per capita incomes.

### **3. THE PROSPECTIVE EFFECTS OF MANUFACTURED TRADE ON EMPLOYMENT IN DEVELOPED AND IN DEVELOPING COUNTRIES**

The next question concerns the possible impact that the future expansion of trade in manufactured products between developed and developing countries may have on employment in the two groups of countries. In an earlier paper on the subject, I suggested estimating employment effects of hypothetical cases of 1) a balanced and 2) a proportional expansion of trade in manufactured products, with the country and the product composition of exports and imports assumed to remain unchanged (Balassa 1979a).<sup>12</sup>

In the first case, one evaluates the employment effects of equal increases in absolute values in the exports and in the imports of the developed countries in their trade in manufactured products with the developing countries. Under the stated assumptions, comparisons of average labor coefficients for exports and imports (import-competing goods) will indicate the employment effects of balanced trade expansion.

In the manufactured trade of the developed countries with the developing countries, then, the gain in employment through export expansion will fall short by 2.5% of the loss in employment in their import-competing industries. However, Japan and, to a lesser extent,

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<sup>12</sup>The estimates are limited to the direct employment effects of exports and imports. Indirect effects operating through input-output relationships have not been estimated because of the uncertainty involved as to the domestic or imported origin of the inputs.

France, Italy, and New Zealand would obtain a gain in employment as against relatively large employment losses for the United States and the group of other developed countries. The Far Eastern NICs and the newly exporting countries would make considerable employment gains and the Latin American NICs would obtain small gains, whereas other-developing-countries group would incur small losses, and OPEC substantial losses, in employment.

An alternative hypothesis postulates equiproportionate increases in exports and imports in trade in manufactured products between developed and developing countries (i.e., identical rates of change in exports and imports); in short, a proportional expansion of trade. The employment effects under this alternative can be seen in Table 5, which provides information on the labor content of manufactured exports, and of products competing with imports, in the trade of the developed countries with the developing countries. The estimates have been derived by multiplying export and import values in the year 1983 by the labor coefficients estimated for each country in the 21-industry breakdown.

The results show substantial positive employment effects for the developed countries, taken together, with the ratio of job gains through exports to jobs lost through imports estimated at 2.0. The ratio is the highest, 5.6, for Japan, which would derive benefits from its export surplus in manufactured trade with the developing countries as well as from the relative labor intensity of its exports. It is followed by France, with a ratio of 3.3, and the corresponding results are 2.5 for the European Common Market and 2.0 for the group of other developed countries. The United States, however, would experience an employment loss, with a ratio of 0.9, because its small export surplus in manufactured trade with the developing countries would not compensate for the relative labor intensity of its imports.

Finally, the proportional expansion of trade in manufactured goods with the developed countries would lead to considerable job losses for the developing countries, taken together, with the ratio of jobs gained through exports to the jobs lost through imports being 0.5. At the same time, these results need to be reinterpreted by reference to the situation existing in developing countries. This will be done in the subsequent discussion of the employment effects of trade.

The described alternatives represent extreme cases, with a zero trade balance in manufactured goods assumed on the margin in the first case and an equiproportionate expansion of all manufactured trade flows in the second. Neither of these alternatives can be considered realistic, however.

**Table 5:** Employment Content of Trade in Manufacturing Products Between Developed and Developing Countries, 1983 (Thousand Employees)

	Exports	Imports	Exports Less Imports	Exports/Imports
Developed Countries				
United States	696.8	745.4	-48.7	0.93
EEC	1362.2	551.2	810.9	2.47
France	263.1	79.0	184.1	3.33
Japan	940.8	167.0	773.8	5.63
Other OECD	357.0	178.1	178.9	2.00
OECD Total	3356.6	1641.8	1714.9	2.04
Developing Countries				
Far Eastern NICs	1880.0	1206.1	674.0	1.56
Latin American NICs	499.8	559.4	-59.6	0.89
Newly Exporting Countries	2370.7	4164.0	-1793.3	0.57
Other Non-Oil LDCs	1268.8	3705.7	-2436.9	0.34
OPEC	249.1	3231.6	-2982.6	0.08
All LDCs	6268.4	12,866.8	-6598.4	0.49

Source: World Bank data base and text.

For one thing, given the large export surplus of the developed countries in trade in manufactured products with the developing countries, substantial differences in export growth rates in favor of the latter (in the first year, the ratio of the two growth rates would have to exceed 2) would be necessary for incremental changes in exports and imports to be equal. For another thing, given observed differences in export growth rates, one cannot expect equiproportionate changes in exports and imports to occur.

As an alternative to the two hypothetical cases discussed so far, the assumption has been made that past trends in trade in manufactured products would continue in the future. More exactly, the assumption is that increases in exports and imports in manufactured trade between developed and developing countries during the 1983–1993 period will equal the increases observed between 1973 and 1983.

Expressed in terms of constant prices, the manufactured exports of the developed countries to the developing countries rose by 103% between 1973 and 1983, whereas their manufactured imports from these countries grew by 172%. These expansion rates have been used in the projections in cases in which, for lack of comparable information, I have assumed that the country and the industry composition of exports and imports would remain unchanged.

The results are intermediate between those obtained under the assumption of a balanced expansion and an equiproportionate expansion of trade. The export-import ratio for the increment of manufactured trade for the developing countries is 1.0 under balanced expansion, and 2.0 in the event of equiproportionate expansion of trade, it is 1.7 if past trends are projected to continue during the 1983-1993 decade.

Tables 6 and 7 show the changes in employment that would result under the projected expansion of trade between developed and developing countries. The results show a net gain of 634,000 jobs in the developed countries during the 1983-1993 period. Among individual industries, gains would be obtained in the technologically more advanced industries that employ to a large extent skilled and technical labor, whereas losses would occur in the highly labor-intensive industries that employ mostly unskilled and semiskilled labor. But losses in employment would amount to less than 5% of the labor force in the latter group of industries in the base year, 1983.<sup>13</sup> In addition, the changes would occur over a ten-year period, thereby limiting the cost of adjustment.

As far as the developing countries are concerned, OPEC should receive separate consideration, because in the OPEC countries we cannot speak of employment losses in non-existing industries. In fact, OPEC imports a number of manufactured products, in particular in the electrical and nonelectrical industries, which are not produced domestically.

These considerations apply to a considerable extent to the non-oil developing countries as well, which import a variety of commodities that are not produced domestically. More generally, economic growth will require more imports without necessarily replacing domestic production. At the same time, economic growth is promoted through the expansion of exports. Thus, attention should focus on the creation of 10 million jobs through the exports of the non-oil developing countries to the developed countries.

If current trends continue, one-third of these jobs would be created in the Far Eastern NICs. They would be surpassed, however, by the newly exporting countries, with a ratio of two-fifths, largely because of the higher labor coefficients observed in these countries that are at lower levels of industrial development. Finally, the other non-oil developing countries would account for one-fifth and the Latin

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<sup>13</sup>The employment data originally were published in United Nations (1986) *Industrial Statistics Yearbook, 1983*. New York: United Nations.

**Table 6:** Employment Effects of Prospective Changes in Trade Flow Between Developed and Developing Countries, 1983–1993: Countries and Country Groups (Thousand Employees)

	Exports	Imports	Exports Less Imports	Exports/Imports
<b>Developed Countries</b>				
United States	717.7	1282.1	-564.5	0.56
EEC	1403.0	948.1	454.9	1.48
France	271.0	135.9	135.1	1.99
Japan	969.0	287.2	681.8	3.37
Other OECD	367.7	306.3	61.3	1.20
OECD Total	3457.3	2823.8	633.5	1.22
<b>Developing Countries</b>				
Far Eastern NICs	3233.7	1242.3	1991.4	2.60
Latin American NICs	859.6	576.2	283.4	1.49
Newly Exporting Countries	4077.5	4288.9	-211.3	0.95
Other Non-Oil LDCs	2182.4	3816.9	-1634.5	0.57
OPEC	428.4	3328.6	-2900.2	0.13
All LDCs	10,781.6	13,252.8	-2471.2	0.81

Source: World Bank data base and text.

American countries for less than one-tenth of newly created jobs through export.

### CONCLUDING REMARKS

The purpose of this article has been to examine prospective changes in employment associated with the future expansion of trade in manufactured products between developed and developing countries. We can read the conclusions with a certain optimism in regard to both country groups.

The developed countries would experience net employment creation as a result of the expected expansion of trade flows over the 1983–1993 period. At the same time, the reallocation of employment would involve a shift from unskilled and semiskilled labor to skilled and technical labor. But adjustment would occur over a long period and would affect a relatively small proportion of workers in labor-intensive industries.

In turn, developing countries would gain employment through increased exports that would further contribute to their economic growth, with favorable indirect effects on employment. Higher growth, in turn, would lead to increased imports without necessarily cutting

**Table 7: Employment Effects of Prospective Changes in Trade Flows Between Developed and Developing Countries 1983–1993: Industries (Thousand Employees)**

	Exports	Imports	Exports Less Imports	Exports/Imports
<b>Developed Countries</b>				
<b>(ISIC Numbers)</b>				
321	178.1	323.9	-145.8	0.55
322	28.2	162.5	-134.4	0.17
323	25.1	75.8	-50.7	0.33
324	14.2	39.9	-25.7	0.36
331	90.0	110.5	-20.5	0.81
332	106.1	94.5	11.6	1.12
341	23.7	7.7	16.0	3.08
351	72.2	77.2	-5.0	0.94
352	88.6	102.5	-14.0	0.86
355	190.8	151.9	38.9	1.26
356	221.5	188.7	32.8	1.17
361	57.4	40.9	16.5	1.40
362	93.7	31.7	62.0	2.96
369	52.7	14.1	38.6	3.74
371	223.2	152.3	70.9	1.47
381	486.0	317.4	168.7	1.53
382	411.1	187.5	223.6	2.19
383	401.6	209.2	192.3	1.92
384	283.9	67.1	216.8	4.23
385	267.3	182.6	84.7	1.46
390	141.9	285.8	-143.9	0.50
<b>Total</b>	<b>3457.3</b>	<b>2823.8</b>	<b>633.5</b>	<b>1.22</b>
<b>Developing Countries</b>				
<b>(ISIC Numbers)</b>				
321	2000.5	858.4	1142.0	2.33
322	585.4	101.1	484.2	5.79
323	230.8	69.0	161.8	3.34
324	118.9	41.0	77.9	2.90
331	692.4	550.4	142.0	1.26
332	358.8	585.1	-226.3	0.61
341	26.7	101.8	-75.2	0.26
351	330.6	299.0	31.6	1.11
352	366.7	322.7	43.9	1.14
355	457.6	618.2	-160.6	0.74
356	675.3	882.1	-206.8	0.77
361	151.2	189.7	-38.5	0.80
362	111.7	378.9	-267.2	0.29
369	57.5	194.9	-137.4	0.30
371	397.6	656.9	-259.4	0.61
381	1107.1	1784.5	-677.3	0.62
382	582.4	1656.8	-1074.4	0.35
383	536.5	1221.8	-685.3	0.44
384	209.9	1001.4	-791.5	0.21
385	899.7	1308.0	-408.3	0.69
390	884.5	431.0	453.4	2.05
<b>Total</b>	<b>10,781.6</b>	<b>13,252.8</b>	<b>-2471.2</b>	<b>0.81</b>

Source: World Bank data base and text.

into employment in import-competing industries. In fact, the imports of machinery and equipment may benefit employment through increased investment.

These results have been obtained with the assumption that past trends in trade in manufactured products would continue. This, in turn, requires the application of a liberal trade policy on the part of the developed countries. Such a policy is also in the well-conceived interest of these countries, because it promotes the development of technologically advanced industries, for which the developing countries provide increasingly important markets.

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