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TRADE AND EMPLOYMENT: INDUSTRIAL  
EXPORTS COMPARED TO IMPORT SUBSTITUTION  
IN MEXICO

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by

John Sheahan

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The welcome signs that many developing countries are shifting attention away from import substitution toward promotion of exports may mean that they can begin to raise employment more rapidly. Exports should allow countries with relatively abundant labor to expand the production of labor intensive industries beyond the limits of domestic markets, and the imports thereby made possible could meet domestic demand for the products of industries that offer little employment in relation to the scarce factors of production they require. But such a positive result depends on what the factor intensities of traded goods actually are. Many years of growing doubts about the venerable conclusions of the Heckscher-Ohlin theory of comparative advantage suggest the need for caution in using them to link changes in trade to changes in employment. The study of Mexican trade patterns reported in this paper is an attempt to compare the actual consequences for employment of industrial exports and of substitution for industrial imports.

Mexico is a semi-industrialized rather than an under-developed country, with a high rate of capital formation and slightly over half of its labor force in urban employment. But capital per worker in the industrial sector is only about a third as high as in the United States, which is Mexico's main export market and source of im-

ports.<sup>1</sup> A high proportion of its labor force is still caught in occupations of extremely low productivity and income. The number of unskilled workers in agriculture is rising at a rate of about 1.8 percent a year.<sup>2</sup> If exports of labor intensive manufactures could be developed on a larger scale they could open up the country's development process to provide productive employment for many people who have so far been left out.

#### A. FACTOR INTENSITIES OF EXPORTS AND OF IMPORT SUBSTITUTION

In its simplest form, the factor proportions theory provides a direct link between trade and employment. Developing countries with high ratios of labor to capital, trading with labor-scarce industrialized countries, should achieve their lowest relative costs in labor intensive

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1. Einer Hardin and W. Paul Strassman, "La productividad industrial y la intensidad de capital de México y los Estados Unidos," El Trimestre Económico, enero-marzo de 1968, pp. 54-55.
  2. The figure for unskilled agricultural labor is from Alan S. Manne, "A Dynamic Multi-Sector, Multi-Skill Model for Mexico, 1968-80," IBRD Basic Research Center, Memorandum 70-8, July 1970, table 7. Manne does not stress under-employment as a major problem; he argues that Mexico is running out of excess labor. The question is discussed in part C below.

goods.<sup>3</sup> A given flow of investment directed to export industries should provide more employment than could be expected from the same rate of investment used to replace imports. But once the necessary qualifications are taken into account the argument becomes doubtful. The question is whether the long list of problems that afflict the theory means that the latter ought to be rejected outright, or constitutes an interesting set of complications that does not greatly change the main result.

Among the more serious problem with factor proportions analysis, as applied to questions of employment, are: (1) the possibilities of factor reversals which could undermine any inference from a country's own factor proportions to the composition of its trade; (2) marked differences in supplies of particular labor skills which imply a need for more complex analysis in terms of multiple factors of production; (3) technological leads and lags or demand patterns which may override advantages based on factor proportions; and (4) distorted factor prices which mask real advantages in terms of social costs. That does not exhaust the possible list but it may be enough. Enough to suggest both that conclusions about the effects of trade on employment must be

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3. Gene Tidrick makes good use of the general proposition, with evidence from Jamaican trade, in "Wages, Output and the Employment Lag in Jamaica," Williams College Research Memorandum no. 40, December 1970.

based on empirical tests, and that the profession badly needs a higher-order synthesis to replace theories of trade based on factor proportions.

### 1. Factor reversals

Leontief's demonstration that the exports of the United States are more labor intensive than its imports had a highly stimulating effect on the whole field of trade theory, and in particular gave new life to theoretical discussion of the possibility of factor reversals.<sup>4</sup> Some of the products which are among the most labor intensive in an economy with abundant labor and scarce capital could become relatively capital intensive as the basic factor balance of the whole economy changes over time: relative factor intensities need not remain constant while the whole collection evolves in the direction of using more of the factors becoming more abundant. Such changes in relative inputs could mean that a developing country with abundant labor and scarce capital would not be able to export its most labor intensive goods because of lower external prices for the same product achieved by capital intensive methods in more industrialized countries. If common, such reversals would mean that it would be impossible to predict anything about the factor composition of trade from a country's own factor proportions.

Fortunately for the Heckscher-Ohlin argument, Hal Lary has demonstrated that factor reversals are probably not common. He applied a useful new measure of labor

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4. W. Leontief, "Domestic Production and Foreign Trade: The American Capital Position Reexamined," Proceedings of the American Philosophical Society, September, 1953.

intensity to compare production structures among countries at widely different income levels, and showed that the rank orders of industries by degree of labor intensity are closely similar. "The comparisons tend rather to support the strong-factor-intensity hypothesis underlying the factor-proportions theorem and, more specifically, the relevance of the U.S. pattern of factor intensities to other countries at very different levels of economic development and with very different factor-price ratios."<sup>5</sup> It should be noted that these comparisons exclude primary production. They are limited to manufacturing and based on direct labor and capital requirements only, a method defended on the ground that materials inputs may themselves be traded so that inclusion of their capital and labor inputs could destroy the meaning of factor requirements calculated for the economy producing the final good.

On the basis of his evidence about comparability of factor proportions, Lary identified a list of industrial products considered to be unambiguously labor intensive. They turned out to be, as of 1965, less than half of all the imports of manufactured goods by developed from under-

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5. Hal B. Lary, Imports of Manufactures from Less Developed Countries (New York: NBER, 1968), p. 15. Cf. also Gary Hufbauer, Synthetic Materials and the Theory of International Trade (Cambridge, Mass., Harvard, 1966), and David Ball, "Factor-Intensity Reversals in International Comparison of Factor Costs and Factor Use," Journal of Political Economy, Feb. 1966, pp. 77-80.

developed countries. On the other hand, their growth rate from 1953 to 1965 was 13 percent per year, nearly three times as fast as aggregate exports from developing to developed countries.<sup>6</sup>

## 2. Skill intensities

Even if there is a fair degree of stability in the factor intensity characteristics of given industries, the employment connotations of trade in their products may be ambiguous because of complexities in the characteristics of the factors themselves. A commodity could be relatively labor intensive but still inappropriate and expensive for a developing country because the labor required is highly skilled and in short supply. Baer and Hervé have argued that the problem may go further: that the effective use of unskilled labor may require relatively fixed inputs of skilled labor to direct it, so that a shortage in the necessary skills could mean that the labor supply which can be used productively is scarce relative to capital even in a poor country.<sup>7</sup>

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6. Lary, op. cit., pp. 1 and 16.

7. Werner Baer and Michel E.A. Hervé, "Employment and Industrialization in Developing Countries," Quarterly Journal of Economics, 1966, pp. 100-101.

Every industry requires some input of skilled or directive labor to use its unskilled workers effectively, but the proportions surely vary among industries. Donald Keesing has established convincing explanations of trade patterns based on the proposition that a country's comparative advantage will lie in industries appropriate to its own mixture of labor skills.<sup>8</sup> This turns around the point made by Baer and Hervé to fit the principle of factor proportions analysis: if a country has little skilled labor, its comparative advantage should lie precisely in those lines of production in which the required ratio of skilled to unskilled is particularly low.

Lary's definition of labor intensive industry is designed to meet this question. He classified an industry as labor intensive only if it met a double criterion: it had to have below average capital per worker (as measured by non-wage value added), and below average wage costs per worker. His argument, supported by comparisons with skill indicators, is that inter-industry differences in wage rates can be attributed principally to differences in inputs of human capital. The comparative advantages of developing countries should then lie particularly in the industries that have below average requirements for both physical and human capital inputs.

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8. Donald Keesing, "Labor Skills and Comparative Advantage," American Economic Review, May 1966, pp. 249-58.

A subsequent study of the exports of manufactures from developing countries to developed market economies demonstrated clearly, with a multiple regression analysis holding capital/output ratios constant, that these exports are inversely related to industry skill requirements.<sup>9</sup> This study thus adds to the evidence developed by Lary in favor of the expectation that exports should be particularly strategic for the employment of less-skilled workers.

### 3. Technological leads and demand patterns

Regardless of factor availabilities, it is clear that trade in manufactures is strongly affected by technological leads and lags.<sup>10</sup> One possibility is that the first producer sells and other countries buy for some time before the latter organize their own production, even though factor endowments could make some of the buyers the more appropriate ultimate producers. Another is that the earliest producers may be able to keep underselling by successive improvements in technique, operating with persistently superior production functions that outweigh disadvantages of factor endowment. A third is that differentiated products with strong buyer attachment can move for a long time in what would be the wrong direction if factor proportions were the governing influence. Tastes are not exercised

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9. United Nations Conference on Trade and Development, "Trade in manufactures of developing countries, 1969 Review," New York, U.N., 1970, pp. 52-57.

10. Hufbauer, *op. cit.*, Raymond Vernon, "International Investment and International Trade in the Product Cycle," *Quarterly Journal of Economics*, May 1966, pp. 190-207; Lawrence Weise and Keith Jay, "Alternative Theories of International Commodity Trade," *American Economic Review*, forthcoming.

in a vacuum, without regard to costs, but it is hard to conclude that relative factor inputs dominate the result when high proportions of the trade in manufactures among developed countries consist of two-way exchanges of goods produced by the same industries.<sup>11</sup>

Developing countries probably buy and sell higher proportions of traditional goods which are less subject to special consumer preferences, but they constantly face shifts in demand toward new goods by both consumers and producers. Their imports may well include a fair proportion of labor intensive goods coming from richer countries either because of technological leads or because of potent salesmanship. Import substitution which replaces such imports may be completely appropriate to domestic factor proportions. And their labor intensive exports may be limited by their own lack of sales effort abroad or by competition from ever-new alternatives sold by the more industrialized countries.

#### 4. Factor prices

Finally, even if all other interferences turn out to be of minor importance, domestic factor price distortions may act to weaken or reverse the employment effects of

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11. S. Burenstam Linder, An Essay on Trade and Transformation (New York, Wiley, 1961), ch. III.

trade. If costs of capital equipment are subsidized, or interest rates held below the opportunity cost of capital, those industries which use more capital intensive techniques will show up better in comparisons of costs and will raise the capital intensity of exports. Arbitrary wage rates for that part of the labor force employed in the industrial sector work in the same direction. The average earnings of the labor force as a whole may be excruciatingly low, but this will do nothing to favor labor intensive industries if the minority of workers in manufacturing are paid wages that are a multiple of the earnings of those left outside.

B. EMPLOYMENT EFFECTS OF MEXICO'S EXPORTS  
AND IMPORT SUBSTITUTION OF MANUFACTURES.

All exports generate employment in their own production, but they also use up scarce factors of production that are then unavailable to go with labor in alternative possible occupations. The purpose of the following measurements is to compare this cost of employment, in terms of the scarce factors required, to the cost of employment in the production of substitutes for imports. Further, both sides of trade have been compared to the factor requirements of domestic industrial production as a whole. The results should help answer two different questions. (1) If a balance of payments constraint on growth is to be taken

as given, would it be better for employment to replace imports of manufactured goods or to raise exports of manufactures by an equal amount? (2) If there is no special problem with respect to the balance of payments, is it better for employment to raise exports and imports by equal amounts or to expand domestic production of non-traded goods instead? That is, is it preferable from the point of view of employment to move toward a greater ratio of trade to national income or toward a lower ratio?

The scarce factors to be considered are capital, imported inputs and skilled labor. Since the purpose is to focus on inputs of human and physical capital relative to employment, trade that is primarily determined by natural resource availabilities has been excluded from consideration. The exports and imports included are based on a restricted definition of manufacturing, leaving out processed foods, oil products, and non-ferrous basic metals. The categories which are included are listed in table 1 following. It will be noted that imports of such manufactures greatly exceed exports, although exports are growing more rapidly. The growth rate from 1960 to 1968 for exports of the industrial products listed was 14 percent per year.

If true comparative advantage were allowed to operate, Mexico might not have any industrial exports at all. A recent programming exercise based on Mexican input-output data indicates that manufacturing would have no place in

TABLE 1. MEXICO'S EXPORTS AND IMPORTS OF MANUFACTURES, 1960, 1964, and 1968  
(Million Pesos)

SITC code	I-O <sup>a</sup>	Exports			Imports		
		1960	1964	1968	1960	1964	1968
541	25 Pharmaceuticals	136	185	285	433	447	424
55	26 Perfumes	---	18	76	79	144	135
5 exc. above	21 Other chemicals	90	298	495	1717	2270	2934
611	19 Leather products	11	13	30	---	---	---
62	20 Rubber products	---	---	---	48	71	82
63	16 Wood mfrs	28	40	58	---	---	---
641	17 Paper	---	---	---	263	353	440
65	13 Textile yarns	328	361	277	157	164	184
66	28 Non-metallic mineral prod.	79	141	182	56 <sup>b</sup>	146	278
67	29 Steel	28	200	289	522	506	726
69	30 Metal mfrs n.e.s.	37	106	162	297	768	714
71	31 Machinery, non-elec	53	84	247	3481	4031	6302
72	32 Electrical machinery	12	29	107	863	1294	2810
731	33 Railway equipment	---	32	24	482	536	346
732	34 Motor vehicles, parts	6	7	40	1766	3222	2867
841	15 Clothing	12	24	58	9	92	206
851	15 Footwear	21	9	19	---	---	---
86	35 Scientific instr.	---	---	---	404	583	812
892	18 Printed matter	54	92	163	69	137	229
Totals		895	1639	2512	10646	14764	19489

Note (a): I-O refers to the category in the Mexican input-output table for 1960 which comes closest to the specified trade classification and is used in this paper to calculate the factor intensities of trade.

Note (b): for 1960 imports, data given are only for SITC code 662.3. All other figures are for SITC code 66.

Source: United Nations, Yearbook of International Trade Statistics, 1962, 1967, and 1968 volumes.

TABLE 1A. DIRECT PLUS INDIRECT INPUT COEFFICIENTS FOR PRIMARY FACTORS  
USED IN THE INDUSTRIES LISTED IN TABLE 1, MEXICO, 1960

<u>Input-Output Category</u>	<u>Capital</u>	<u>imported inputs</u>	<u>Labor</u>
25 Pharmaceuticals	.378	.287	.314
26 Perfumes	.659	.080	.241
21 Other chemicals	.476	.231	.285
19 Leather products	.584	.138	.258
20 Rubber products	.493	.273	.208
16 Wood manufactures	.732	.043	.215
17 Paper	.547	.120	.317
13 Textile yarns	.489	.116	.386
28 Non-metallic min products	.530	.356	.103
29 Steel	.543	.124	.319
30 Metal manufactures, n.e.s.	.500	.122	.364
31 Machinery, Non-electric	.644	.114	.236
32 Electrical machinery	.450	.196	.344
33 Railway equipment	.414	.212	.364
34 Road motor vehicles	.275	.502	.172
15 Clothing and footwear	.565	.084	.336
35 Scientific instruments	.495	.146	.351
18 Printed matter	.446	.195	.347

Note: total inputs add up to slightly less than 1.000 for each industry because of tax adjustments in the input-output table.

Source: Inversion of input-output matrix from Banco de Mexico, Cuadro de Insumo Producto de Mexico, 1960 (Mexico: 1966)

the structure of production best suited to maximize the rate of growth.<sup>12</sup> This suggests, as is the case, that exports of manufactures depend to some degree on subsidies and other special arrangements that weaken any expectation of systematic connection with factor availabilities. The tests below do not prove or disprove anything about what the factor proportions of Mexican trade would be under conditions of an open economy without distortions, and therefore do not prove or disprove anything about the basic logic of factor proportions theory. All they purport to do is to measure the actual employment consequences of trade in manufactures with the observed structures of exports and imports.

1. Factor input combinations of exports and imports

The factor inputs required per thousand pesos worth of manufactured exports and of domestic replacement of imports are summarized in table 2 following. These inputs were calculated as the combined direct-plus-indirect requirements indicated by Mexico's input-output table for 1960. They are all flows of payments to the factors of production, not physical measures. The inputs shown for 1960 refer to the

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12. Saúl Trejo Reyes, "Un modelo multisectorial para México -- promoción de exportaciones y crecimiento óptimo de la economía," mimeo, Banco de México, October 1970.

TABLE 2  
 DIRECT PLUS INDIRECT INPUT REQUIREMENTS PER THOUSAND PESOS  
 OF INDUSTRIAL EXPORTS AND IMPORTS, MEXICO 1960-1968

	(Pesos)		
	<u>1960</u>	<u>1964</u>	<u>1968</u>
<u>Exports</u>			
Capital	493	498	505
Imported inputs	180	163	170
Labor	315	328	313
 <u>Imports</u>			
Capital	497	479	502
Imported inputs	220	236	213
Labor	270	266	270

Note: input coefficients are from the 1960 input-output table; changes in total inputs shown for subsequent years are due to changes in the composition of exports and imports, with the same 1960 coefficients used for all years. The input totals add up to slightly less than 1000 in each case because output values include taxes.

Source: tables 1 and 1c above.

actual trade structure and input coefficients for that year. Those for 1964 and 1968 refer to the trade structures in those years, but with the input coefficients of 1960. The changes in factor use during the years covered thus refer entirely to changes in the structure of trade, with constant input coefficients.

Exports and import substitutes do not differ greatly in their implications for capital requirements. The capital needed per thousand pesos worth of exports was almost identical to that needed for the same amount of imports, both in 1960 and in 1968. On both sides, the capital requirement increased insignificantly over this period.

Exports and replacement of imports do differ markedly in their use of labor and of imported inputs. As of 1960, a given value of manufactured exports provided 17 percent more payments to labor than the same value of replaced imports. The counterpart of this relationship was that import replacement would have required 22 percent more imported inputs than needed for the same value of exports. These relationships remained much the same in 1968. Payments to labor were then 16 percent higher on the export side, for a given value of output.

The advantage of exports over import substitution applies to income produced as well as to employment. If capital and foreign exchange are true constraints and labor

is not, the value of exports that could be produced with a given use of scarce factors is greater than the value of imports that could be replaced. The capital and imported inputs needed to replace 1000 pesos worth of imports in 1960 could have produced 1065 pesos worth of exports. The employment generated on the export side would then have been 24 percent greater than that on the import side. In 1968, the scarce factors needed for 1000 pesos worth of import replacement could have yielded 1059 pesos worth of exports, and could have generated 23 percent more employment. Both the balance of payments and the employment situation would be improved by favoring export production over import substitution.

It should be stressed that these numerical conclusions are based on the actual structures of exports and imports in the years considered. More rapid expansion of highly labor intensive exports, or more rapid replacement of particularly labor intensive imports, would of course give better results for employment than generally increased exports with their actual structure, or import substitution in the same proportions as actual imports.

## 2. Skill intensities

The preceding measures treat labor as a single factor of production, without reference to differing skill requirements. It is possible to take such differences into account with two independent tests, each of which has its own considerable imperfections.

One test is the method suggested by Lary: to take differences in wages per worker as measures of differences in requirements for human capital. The main trouble with this is that so many arbitrary factors enter in the determination of particular wage rates. Another difficulty is that Mexico's census data on employment and labor costs by industry are subject to some doubt. If this measure had to be used alone, one might well prefer not to use it at all. But if used in conjunction with a direct measurement of skill distributions, it provides an interesting check. The relevant data from the 1960 census are given in table 3.

Data on the distribution of skill inputs in Mexico have been prepared by Donald Keasing and Alan Manne, using five broad skill classifications. One of the classifications applies to agricultural labor only, but the other four are useful for the present comparison among industries. The main trouble with this measure is that the distribution has been worked out in terms of very broad industrial groups. The export and import fields used above must be combined

TABLE 3. AVERAGE PAYMENTS OF WAGES, SALARIES AND BENEFITS PER EMPLOYEE IN INDUSTRIES PRODUCING EXPORTS OR COMPETING WITH IMPORTS, 1960

<u>Industry</u>	<u>Industry codes, 1960 Census</u>	<u>Average wage and benefit payments<sup>a</sup> (pesos)</u>
Pharmaceuticals	3141	18 170
Perfumes	3142	15 549
Other chemicals	3111, 3116, 3149	11 858
Leather products	29	9 837
Rubber products	30	16 345
Wood manufactures	25, 2611	8 129
Paper	27	14 269
Textile yarns	231	10 106
Non-metallic min. mfrs.	33	10 891
Steel	3411, 3412, 3413	14 000
Metal mfrs. n.e.s.	2612, 2616, 35 (exc 3526)	9 431
Machinery, non-electric	36	10 818
Electrical machinery	37	12 985
Railway equipment	3821	3 584
Road motor vehicles (parts)	3834	10 960
Clothing	24, 232	7 582
Footwear	3013	13 677
Scientific instruments	3911-3932	10 006
Printed matter	28	12 239

Note (a): these data all refer to privately owned firms; industrial production by government owned firms was reported separately and on a different basis in the census of 1960.

Source: Estados Unidos Mexicanos, Secretaria de Industria y Comercio, VII Censo Industrial, 1961 (Datos de 1960), México, D.F., 1965, cuadro 1, pp. 1-28.

into only six groups, and each of these groups includes non-trade activities which help further to confuse the matter. But then again, the results can be checked to some degree by comparison with those indicated by relative wages. The data for the skill classes are given in table 4.

The two methods of comparison give inconsistent results for 1960 but come out surprisingly close together for 1968. In 1968, they indicate that exports were about 5 percent more skill intensive than import replacement. In 1960, average wages were 4 percent higher on the export side, almost exactly matching the result for 1968, but the skill coefficient shows higher skill intensity on the import side. Since it is impossible to say which measure is the less imperfect, the only defensible conclusion for 1960 is that the differences in skill intensities on the two sides were not enormous. For 1968, it remains true that the differences are not great, but the answer seems to be unambiguous as to direction: exports were slightly the more skill intensive.

The higher wage level on the export side, in both years, means that the previously calculated advantage for employment must be deflated. Factor payments to labor were 24 percent better on the export side in 1960, considering only capital and imported inputs as the scarce factors, but if wages were 4 percent higher then the advantage in terms of numbers employed falls to 19 percent. For 1968, the advantage on the export side in terms of numbers employed

TABLE 4. LABOR FORCE DISTRIBUTION BY SKILL CLASS WITHIN MANUFACTURING  
1960

Thousands of man-years by skill category

	1	2	3	4	Skill coefficient
	<u>Engineers, scientists</u>	<u>Other professional, technical</u>	<u>Clerical and admin- istrative</u>	<u>Manual and sales</u>	
Textiles, clothing, leather	1.46	4.86	20.41	459.41	1.21
Wood, paper printing	0.82	6.09	14.28	188.88	1.40
Chemicals, rubber	3.76	4.54	23.34	45.15	2.80
Non-metallic minerals	0.46	0.91	4.56	70.03	1.32
Basic metals	0.87	1.06	3.91	42.51	1.58
Machinery, metal products	<u>3.72</u>	<u>10.37</u>	<u>41.33</u>	<u>307.14</u>	1.67
Totals	11.09	27.83	107.83	1113.12	(1.49)
Approximate relative wages in 1960:	10.00	4.17	3.00	1.00	

Source: all data except skill coefficients from Donald B. Keesing and Alan S. Manne "Manpower Projections for Mexico," IBRD Basic Research memorandum 71-72, August 1971, table 2, p. 11, and table 5, p. 23. The skill coefficients were calculated by weighting employment in each category with its approximate relative wage in 1960.

TABLE 5. AVERAGE WAGES AND SKILL COEFFICIENTS FOR MEXICAN EXPORTS AND IMPORTS OF MANUFACTURES, 1960 and 1968

	<u>1960</u>	<u>1968</u>	<u>percent change</u>
<u>Average wage value added</u>			
(pesos)			
Exports	11871	12191	+ 2.7
Imports	11385	11984	+ 0.9
All domestic industry	9670	--	
<u>Skill coefficients</u>			
Exports	1.71	1.93	+12.9
Imports	1.89	1.85	- 2.1
All domestic industry	1.49	--	

Note: wages and skill coefficients used are those for 1960; the changes in 1968 refer to differences in the structures of imports and exports, with unchanged coefficients in each industry.

Sources: data given in tables 1, 3, and 4.

works out to be 16 percent.

With this conflict among the implications of three scarce factors, a solution taking the structures of exports and imports as given would involve a linear programming problem, and the solution of that problem would include a combination of both import substitution and exports. Any statement of general preference for exports as opposed to substitution is weakened by the apparently higher skill intensity on the export side. A real solution for policy concerned with employment would of course reject the given structures of exports and imports and concentrate instead on the more labor intensive fields within both collections.

### 3. Traded goods compared to overall industrial production

While exports of manufactures clearly generate more employment than equal values of import substitution, they may not be as good for employment as general domestic industrial production. The problem arises from the higher skill requirements and wage rates of traded goods. The skill coefficient for exports is 15 percent higher than that for all industry combined. And the average wage for exports is 23 percent higher than that for all industry.

In terms of the flow of payments to labor, as compared to the costs of capital and imported inputs, exports

were superior to import replacement in 1960 but were not as favorable as general domestic industry. Labor received 32 percent of factor payments for manufactured exports, and 35 percent of factor payments for total industrial production.

If Mexican policy attached no special weight to improving the balance of payments, and did attach a high value to employment, then it would seem preferable to use scarce resources for expansion of general domestic production, rather than to use them either for exports or specifically for import substitution. But again it is crucial to note that this conclusion depends on the observed structures of exports, imports, and domestic industrial production. Concentration of scarce resources on particularly labor intensive exports or import replacements could give far better results than those actually observed.

### C. IMPLICATIONS FOR POLICY

Mexico's recent emphasis on the development of industrial exports is clearly much superior to import substitution in so far as its effects on the demand for labor are concerned. It would be possible to do still better for employment by concentrating more on the particular lines of industry which are especially labor intensive, both on the export side and in import substitution. But there is a real

question about the advisability of doing so if in fact the country is running out of excess labor. Mexico is certainly not an extreme case of openly worsening employment conditions. Industrial employment has been increasing as a percentage of the labor force. Agricultural employment fell from 58 percent of the total in 1950 to 54 in 1960 and 48 in 1967.<sup>13</sup> Alan Manne projects an absolute decrease in the number of agricultural workers between 1968 and 1980. He concludes that "Mexico is approaching the end of the labor-surplus phase of her development, and that capital-labor substitution could become increasingly significant."<sup>14</sup>

The problem is that capital-labor substitution has been getting more significant too soon. There was certainly no shortage of unskilled labor in the 1960's. Underemployment in the sense of people with extremely low earnings, often related to lack of regular year-around employment, seems to have increased through the 1950's

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13. Francisco Javier Alejo, "Aspectos demográficos del crecimiento económico," in Dinámica de la Población de México (México: El Colegio de México, 1970), cuadro VIII-9, p. 240.
  14. Manne, op. cit., p. 3. See also Keesing and Manne, "Manpower Projections for Mexico," IBRD Memorandum 71-12, August 1971. On the other hand, Saúl Trejo's projections for the period up to 1980 indicate the opposite conclusion. See his "Industrialization and Employment Growth: Mexico 1950-1965," unpublished Ph.D. dissertation, Yale, 1971, especially ch. VII.

and to be highly important in both urban activities and agriculture.<sup>15</sup> In 1965, average weekly wages and benefits in industry were equal to 310 pesos. But 56 percent of the workers in services and agriculture received average monthly incomes below 300 pesos.<sup>16</sup> Services and agriculture combined included 62 percent of the total labor force. Since their median incomes are less than one-fourth the average for industry, the situation so far can hardly be described as one of labor scarcity.

Despite the existing disequilibrium between earnings in agriculture and services as compared to industrial wage rates, the latter have been rising rapidly relative to prices for capital equipment. For workers in construction, transformation industries, and electric power, average hourly earnings increased 7.5 percent a year from 1960 to 1965. This was twice the rate of increase of prices for

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15. Cf. David Ibarra, "Mercados, desarrollo y política económica: perspectivas de la economía de México," El Perfil de México en 1980 (México: Siglo XXI, 1970), Vol. I, pp. 126-31; Alejo, op. cit., especially cuadro VIII-15 reporting a study of underemployment in five non-agricultural sectors by John Isbister; Clark W. Reynolds, The Mexican Economy (New Haven and London: Yale, 1970), pp. 78-84 and 100; John Sheahan, "Innovaciones y empleo," Demografía y Economía, no. 13, 1971, pp. 13-26.

16. Jesús Prieto Vázquez, "La distribución del ingreso en México," Comercio Exterior, September 1969, pp. 687 and 693, Tables 2 and 12.

capital equipment.<sup>17</sup> Similarly, with the exchange rate constant, the cost of imported supplies decreased relative to industrial wages. These price trends surely work to discourage expansion of those industries which are especially labor intensive, both on the export side and in substitution for imports.

Export composition has probably also been bent away from labor intensive products by the structure of import barriers in Mexico's dominant market, the United States. The American tariff structure is in general biased against labor intensive manufactures, and tariff obstacles to imports have been accompanied in the last decade by increasing use of both quotas and agreements forced on other countries to limit specific exports to the United States as the price of avoiding more drastic direct restriction. In its efforts to protect its least efficient industries, the United States helps worsen employment in developing countries.

Mexican economic policy may work in the same direction. Fairly generous social legislation chiefly beneficial to regularly employed urban labor, plus frequent increases in minimum wages enforced more rigorously in activities where labor is well organized, surely con-

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17. Wage data from *ibid.*, p. 687; producers' goods prices from Banco de México, Cuentas Nacionales.

tribute to cost trends unfavorable for employment of those outside the system. So does the use of investment incentives which permit substantial reductions in corporate taxes to the extent that firms invest in new equipment. And so do a number of the administrative arrangements for individual industries which have been developed recently to encourage exports.

The automobile industry provides an interesting example of the use of special administrative arrangements to promote exports. Exports of automobile parts increased from 7 million pesos in 1964 to 40 million in 1968. The motor vehicle industry has the highest ratio of capital-plus-imports to labor of all the industrial activities separately reported in Mexican input-output accounts. Some of its exports may be directly profitable but a good part of them seem to be attributable to a complex promotional scheme. Each firm is assigned a production quota, at levels of production which are at present much too low to hope for costs comparable to external prices. Given protection from import competition, plus rapidly rising domestic demand, the companies place a considerable premium on getting their quotas raised. The government has cashed in on this pressure by requiring exports as a precondition for higher production quotas. The system forces the automobile producers to convert some of the private gain from protection into foreign exchange. But it uses up more capital and

imported supplies per peso's worth of labor than any other category of exports.

Mexico's fiscal system, like those of many other countries, gives pervasive subsidies for investment in capital equipment. Opportunities for employment could be improved if such subsidies to capital intensive techniques and industries could be reduced or eliminated. Mexican economists have recognized the issue and begun to argue in favor of revising the present approach, but this immediately leads to the question of what to do about export industries. If they are just becoming competitive, changes that act to slow up their adoption of new techniques or add to the costs of their equipment seem to conflict with an outward-looking solution of foreign exchange constraints. One conclusion, suggested both by David Ibarra for Mexico and the I.L.O. Mission led by Dudley Seers for Colombia, would be to make an exception for export industries: to exempt them from policies designed to limit incentives to invest in labor-saving equipment.<sup>18</sup> But such special treatment does not seem to be necessary and would have undesirable side effects. Generalized export incentives to all producers, whether through exchange rates or across-the-board subsidies for

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18. Ibarra, op. cit., p. 158; International Labour Office, Towards Full Employment (Geneva: I.L.O., 1970), p. 179.

value added on export sales, could provide the stimulus to exports without the harm to employment.

If anything ought to be subsidized, it is labor and not capital. If the exchange rate cannot be moved, there is a good case for the use of subsidies to lower costs of firms to the point at which some industries can export profitably, but it can just as well be a subsidy encouraging the demand for labor. This could be applied equally to import-substituting and all other industries, and offers a far more promising line of policy than either direct subsidies to capital or the use of administrative pressures that do not take full account of the implications for factor inputs.<sup>19</sup>

When exports are compared to overall domestic industry, they do not have any advantage for employment in terms of capital and foreign exchange inputs, and they are inferior in terms of their requirement for higher proportions of skilled labor. If the composition of demand is taken as given, and that part of demand directed toward imports must be satisfied either by import replacement or by exports to get the necessary foreign exchange, exporting

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19. James E. Meade, "Mauritius: A Case Study in Malthusian Economics," Economic Journal, September 1961, pp. 521-34; Ian Little, Tibor Scitovsky, and Maurice Scott, Industry and Trade in Some Developing Countries (London and New York: Oxford, 1970), chapter 4.

is the better alternative. But if producers' demand for imports of capital goods is overstimulated by tax incentives or an over-valued exchange rate, then part of the import demand would disappear in an optimal system, there would be less need to shift production toward exports, and the implications for employment would be improved. Similarly, if consumer demand for imports is overstimulated by advertising pressures or by a strongly unequal distribution of income which acts to bias demand toward the newest consumer goods, it is questionable that the use of scarce resources for export production to pay for such imports constitutes a net gain. Production of industrial exports is better for employment than import replacement but not necessarily better than shutting off the demand for some of the goods now imported.

#### D. CONCLUSIONS

As of 1968, the simple presumptions of factor proportions theory fit the pattern of Mexico's trade in manufactured goods reasonably well. Import substitution in the sense of replacement of industrial imports in their actual proportions would have been about the worst possible way to use scarce resources, if the objective were to help employment. Import composition was such as to require more capital and foreign exchange relative to labor than necessary

either for industrial exports or for domestic industrial production in general. Import composition was also such as to require much more skilled labor than general domestic industry, though it was slightly better than industrial exports on this score.

Neither industrial exports nor imports changed significantly between 1960 and 1968 in their demands for labor relative to scarce inputs. This stability suggests that neither import substitution nor the development of exports has been guided by any special attention to the desirability of improving employment opportunities, or that of maximizing the output that could be obtained from a given use of capital and imported inputs. The country, and in particular the labor force, might well get more benefit out of the effort to stimulate exports if administrative favors and other differential advantages were given a relatively secondary role, in favor of increased use of generalized price incentives that could be expected to be selectively helpful to the more labor intensive industries.

The interactions of export promotion and employment policy may prove to be treacherous terrain. Industries operating with high costs behind protective barriers, but with their profits limited by the scale of the domestic market, may be able to persuade both themselves and their governments that they deserve new subsidies or administrative favors to enable them to compete in export markets

despite high costs. As with import substitution, it is easy to see the employment they provide and also easy to lose track of the possibility that the scarce resources they use would permit higher employment and national income if used in alternative lines of production. Export incentives that take the form of subsidies to capital and special privileges to import materials, or administrative favors to exporters that raise profits without reference to efficiency, could lead to a totally inappropriate set of export industries. Subsidies may well be needed to promote exports, but if the exports are to help employment the subsidies should either be equal for all industries or focused on reducing the cost of labor.