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U.S. MULTINATIONALS AND LATIN AMERICAN
MANUFACTURING EMPLOYMENT ABSORPTION

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1. INTRODUCTION

The main purpose of this study is to examine the impact of U.S. affiliates of multinational corporations (MNC) on the generation of employment in the Latin American manufacturing sector. The emphasis of the analysis is mainly empirical, and an important byproduct is the collection and processing of information about the quantitative evidence on the role of U.S. MNCs in the Latin American manufacturing sector.

The problem of the generation of new sources of employment is beginning to receive a high priority in Latin America; for various reasons, it has always been believed that, in this regard, the industrial sector has an important role to play.[1/] The MNC are attaining a growing importance in the manufacturing sector; thus it is particularly relevant to examine the employment that is generated by that part of the Latin American manufacturing sector whose production is attributable to the affiliates of the MNC.

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There are two opposing hypotheses concerning the impact of MNC affiliates on the generation of employment in their host countries, particularly in the less developed countries (LDC).[2] One of the hypotheses asserts that the MNC are an important mechanism in the generation of employment in the LDC.[3] This proposition is based on two factors: (1) The MNC bring to the LDC relatively scarce factors of production, such as capital, technology, and managerial skills, which permits the utilization of an existing labor factor that is relatively abundant and is either underemployed and/or unemployed. (2) The MNC affiliates facilitate access to developed countries (DC) markets, and through exports, generate a significant number of sources of employment. The opposing hypothesis purports that the MNC generate little local employment in the LDC since: (1) The MNC use technologies which are not labor intensive, (2) the MNC produce goods that are relatively capital intensive, and (3) they displace labor intensive production of domestic enterprises, with the capital intensive production of MNC affiliates.

The existing empirical evidence on the impact of the affiliates on the generation of employment in the LDC is fairly fragmented and diffuse. It lacks sufficient perspective to determine the global magnitudes of the absolute and relative importance of MNC affiliates operating in the manufacturing sector of the LDC. Moreover, there is also no comparison, from a quantitative point of view, of the importance of the various factors which influence the level of employment generation. The type of questions which this study attempts to answer (from an empirical point of view) are the following. Do MNC affiliates constitute a quantitatively significant mechanism in the generation of employment?, is the technology employed by MNC affiliates labor saving?, does the

presence of the MNC result in an expanded market with important increases in the sources of employment? The implicit alternative used in this study to examine this type of questions is the domestic enterprise of similar size to the existing U.S. affiliate located in the corresponding manufacturing branch.

This study uses data for U.S. MNC affiliates provided by the U.S. Department of Commerce for the period 1966-70. Thus, non-U.S. MNC affiliates are excluded because of the lack of information. The outcome is that the study accounts for approximately 75 percent of total MNC affiliates operating in the Latin American manufacturing sector during this period. The empirical analysis focuses on 7 countries: Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela. The level of industrial disaggregation corresponds to 13 manufacturing branches at two-digits of the ISIC (International Standard Industrial Classification). Finally, the study uses information relating to major manufacturing establishments, both U.S. affiliates and all Latin American establishments, which employ 100 or more persons.

II. EMPIRICAL EVIDENCE

1. Descriptive elements

Total employment for U.S. manufacturing affiliates in the 7 Latin American countries is slightly above 325,000 persons.[4/] All large manufacturing establishments (100 or more persons employed) in these 7 Latin American countries employed slightly more than 2,900,000 persons. Consequently, employment by U.S. affiliates represented about 11 percent of total employment; however, in some of these 7 countries the percentage is higher: 28.1 percent (Venezuela), 18.1 percent (Peru), and 16.6 percent (Colombia).

Table 1 shows the relative share of the U.S. affiliates in the employment of the largest industrial establishments (100 or more persons) for the 7 Latin American countries at the manufacturing branch level. Based on Table 1, the following can be inferred: (1) In 9 of 64 observations, U.S. affiliates accounted for more than 50 percent of the manufacturing employment of the largest industrial establishments (100 or more persons); in 27 of 64 observations, U.S. affiliates employed more than 25 percent of the manufacturing employment of the largest industrial establishments. (2) The manufacturing branches in which U.S. affiliates have, almost systematically, a major share of the employment are: rubber, chemicals, electrical machinery and appliances, transportation equipment, and non-electrical machinery.

Table 2 shows at each country that the manufacturing branches that account for the greatest percentage of employment generated by MNC affiliates are: chemicals, food manufacturing, and transport equipment. In general almost 60 percent of employment generated by affiliates is concentrated in these 3 manufacturing branches.

2. Analytical elements

In this section three effects are quantified: Selection of industries, choice of techniques, and the expansion of U.S. affiliates (growth rates and export incidence).[5]

a) Selection of industries

Given that capital is a mobile factor, while labor is virtually immobile (or having a very low intercontinental mobility), the MNC establish affiliates in the LDC, where they can take advantage of the relatively lower labor costs. The ways by which MNC affiliates can take advantage of the relatively lower

labor LDC costs, from a product mix perspective, would be[6/]: (1) To channel their investments toward those industries that are relatively more labor intensive, and (2) to produce goods that are relatively labor intensive. In this study, only the first mechanism will be examined, since the second one requires special case studies.

Table 3 is used to examine the pattern of labor intensity of U.S. affiliates industry composition in Latin America. Table 3 provides the capital/labor ratio (book value of fixed assets divided by the number of persons employed) of the affiliates by manufacturing branches, and, also, the sectoral employment distribution for the 7 Latin American countries (these figures are equivalent to those shown on Table 2). The rank correlation coefficient (Spearman) between the capital/labor ratio and the sectoral employment shares is 0.243 which is statistically not significant; i.e., U.S. affiliates do not tend to be more concentrated either in the relatively more labor intensive or in the relatively more capital intensive industries. Chemicals and transportation equipment which are industries with high employment shares, show lower capital-labor intensities than industries like paper and basic metals; this may be due to the fact that there are important differences in the value added-gross value of production relationship across industries between affiliates and MNC parents. The previous finding contradicts Sabolo & Trajtenberg (1976) who state that U.S. affiliates tend to be more concentrated in the relatively more capital intensive industries of the LDC. However, our findings corroborate a study by Lipsey et.al. (1978), where the sectoral manufacturing structure of the MNC in their country of origin (the United States and Sweden) is compared with the sectoral manufacturing structure of the affiliates of these same MNC located in the LDC; this study concludes

that the MNC apparently do not locate labor intensive industries in the LDC.

To measure the impact upon employment of the composition of the industries in which MNC affiliates operate, the affiliates selection of industries will be compared with the pattern of industrial production of the host country. From the difference in the composition of both industry structures it will be possible to infer if there is a difference in the volume of employment generated as a consequence of the distinct industrial patterns.

Given L_i and Y_i as the number of persons employed and the value added of the U.S. affiliates in the manufacturing section i of a Latin American country; then $(L/Y)_i$ becomes the labor requirement per unit of value added of U.S. affiliates in sector i.[7]

To obtain coefficients L/Y at the level of the total manufacturing sector two different weighting criteria have been used: (1) On one hand, each coefficient $(L/Y)_i$ is weighted according to the relative share of value added Y_i in the manufacturing value added of all major U.S. affiliates (100 or more persons employed) in the manufacturing sector of the host country. (2) A second weighting corresponds to the use of relative value added of branch i in the manufactured product of all major industrial establishments (100 or more persons employed) of the host country. The first type of weighting reflects the relative importance of the industries by U.S. affiliates; the second type of weighting corresponds to the relative importance of the industries by the manufacturing structure of the major industrial establishments (100 or more employed) of each individual Latin American country. Table 4 shows the resultant values for these two types of weighting.[8]

The question to be answered through this methodological procedure is, what would the employment generation by U.S. affiliates have been if these affiliates

had a sectoral composition similar to that of the host Latin American country?

Based on Table 4 the following conclusions may be drawn: (1) The weight criterion produces discrepancies of less than 15 percent in the 7 countries. (2) For 4 of the 7 Latin American countries, the industry composition of U.S. affiliates generates less employment than the total manufacturing production composition of the host country; however, in 3 of 7 countries a reverse situation is observed. (3) Utilizing the weighted average of the values of Table 3, in which the weights consist of the relative employment share generated by the affiliates in the 7 countries, it can be concluded that the selection of industries effect of U.S. affiliates implies a smaller relative generation of employment of 5 percent in relation to that which would have been obtained with a composition of manufacturing production similar to the production of the host country.

In summary, the composition of the manufacturing production of affiliates apparently generates less employment per unit of industrial value added than that generated by the overall manufacturing sector of the local host country; however, the orders of magnitude in question are not spectacular. Moreover, the presence of MNC affiliates may have displaced domestic enterprises from capital intensive sectors to labor intensive ones. It is necessary to point out that, given the level of aggregation being used, there may be an important difference in the type of goods produced by the affiliates and the local firms in a given industry, and this can change, or even accentuate the foregoing conclusions.

b) Choice of techniques

On this subject the prevailing premise is that the MNC utilize a technology that is relatively capital intensive and consequently, the presence of MNC

affiliates generates little employment in the LDC. Moreover, the slow growth
of employment in the manufacturing sector of the LDC is due in part to the
growing importance of MNC affiliates, and to the demonstration effect that
these have on local firms in the use of modern technologies.[9]

To test these propositions, we will compare the capital/labor ratio, K/L,
at the industrial level (two-digits ISIC) between the U.S. affiliates and all
major manufacturing enterprises.[10] The $(K/L)_i^f$ expression represents the capital/
labor ratio of U.S. affiliates in the manufacturing sector i and $(K/L)_i^t$ is the
capital/labor ratio for all establishments in the same branch i. Capital K is
measured as the book value of fixed assets and L corresponds to the number of
persons employed. The coefficient λ_i indicates the quotient between the ratios
$(K/L)_i^f$ and $(K/L)_i^t$; therefore, $\lambda_i = (K/L)_i^f / (K/L)_i^t$.

Values of λ_i greater (less) than 1.0 would indicate the percentage by which
production techniques of the U.S. affiliates are relatively more (less) capital
intensive than those techniques used by the average of total enterprises of the
same manufacturing sector i. Table A-1 in the Appendix gives the values of the
coefficients λ_i for the Latin American countries dealt with in this study.

To obtain the capital/labor ratio differentials at the total manufacturing
sector level, it is necessary to determine the weighted average of the λ_i coef-
ficients for each individual country. The pertinent question in this case is:
What would the capital/labor ratio of U.S. affiliates have been if they had
utilized the same production techniques as the average of all enterprises? The
weights to be utilized relate to the relative share of each manufacturing branch
i in the value added produced by all U.S. affiliates located in a Latin American
country. Table 5 summarizes these results.[11]

Based in Table 5 the following conclusions may be drawn: (1) In general, production techniques are relatively more capital intensive in U.S. affiliates than in local enterprises of a similar size in the corresponding manufacturing branches.[12/] (2) The range of variations of the values of Table 5 is fairly large, given that differntials fluctuate between 4 and 107 percent. (3) The weighted average (according to relative employment of U.S. affiliates in each country) of the values of Table 5 provides the figure of 1.40.

In summary, from Table 5, it can be concluded that U.S. affiliates utilize production techniques that, in general are much more capital intensive than those techniques employed by local manufacturing establishments of a similar size located in the same industries. This differential in the intensities of capital/labor ratio between U.S. affiliates and local firms could exceed 60 percent if it is assumed that the non-U.S. MNC affiliates have technique intensities similar to those of U.S. affiliates.

Similar results, which point out in the same direction as the previous ones have been found by Fajnzylber & Martinez (1976) for the Mexican industry ("the capital/labor ratio of affiliates is about 2.5 times larger than the capital/labor ratio of local firms of the same manufacturing branch"), by Agarwal (1976) for the large Indian manufacturing sector ("foreign firms employed 16.1% more productive capital per employee than domestic firms"), and by Brewster for the Guatemalan industry ("domestic owned enterprise tends to be much more labor intensive than foreign-owned enterprises"[13/]); these studies use aggregated data. There are many case studies using disaggregated data comparing affiliates and local enterprises production techniques, which support the above finding; these are Mason (1973) for Philippines and Mexico, Cohen (1975) for Taiwan, and

Leipziger (1976) for India. A case study which finds "no significant differences between foreign-controlled firms and their domestic counterparts" is that one by Wilmore (1976) for Costa Rica; a similar result is obtained by Cohen (1975) for South Korea and Singapore.[14/]

c) Expansion of affiliates

Although there is little empirical evidence to support this assertion, no one questions the fact that MNC affiliates located in the LDC have higher output growth rates than local firms. An unresolved issue, however, is whether this greater growth of output produces a relatively greater growth in employment.

This section provides, for descriptive purposes, the growth rates of employment and value added for U.S. affiliates and for the total number of the largest establishments operating during 1966-70 in the host economy. Owing to data problems, this section utilizes a sub-sample of total U.S. affiliates operating at the Latin American level; moreover, data is provided for largest establishments of only 3 Latin American countries. This information is shown on Table 6.

In Table 6 the following may be observed: (1) Employment and value added growth rates of U.S. affiliates, 3.1% and 11.1% respectively, are in between those values observed for total major industrial establishments of the 3 Latin American countries. (2) The gross employment-value added elasticity of U.S. affiliates is 0.28; this value is much lower than those elasticities observed for either of the 3 Latin American countries (Brazil: 0.61, Mexico: 0.38, Venezuela: 0.57). This could be interpreted that output expansion by U.S. affiliates is relatively less labor intensive; different factors could be at work here like the higher capital intensiveness of the affiliates technology, a relatively higher sustitution of skill for unskilled labor, the introduction of newer technology,

a higher rate of capital investment, etc.

A final aspect related to the output expansion of affiliates is the examination of the quantitative importance of manufactured exports of U.S. affiliates. As shown on Table 7, 1966 manufactured exports of U.S. affiliates located in Latin America were valued at nearly USS 268 million [15]; the amount of employment associated with this volume of exports was slightly above 19,000 persons.[16] Thus, employment generated by exports of U.S. affiliates represented approximately 5 percent of the total employment generated by U.S. affiliates in the Latin American manufacturing sector. In other words, most of the output produced by the U.S. manufacturing affiliates in 1966, was for the domestic local market; the external sector did not play an important role as a mechanism for output expansion and employment generation.

IV. SUMMARY AND CONCLUSIONS

The following results relate to the period 1966-70 and basically refer to the manufacturing establishments that employ 100 or more persons in 7 Latin American countries.

1. Regarding the relative importance of U.S. affiliates at the manufacturing branch level the following is observed: (i) The relative importance of U.S. affiliates, measured in terms of employment, is greater than 50 percent of the volume of employment of a manufacturing branch at two-digits (ISIC) in 9 of 64 cases, and surpasses 25 percent in 27 of 64 cases. (ii) The manufacturing branches that have a systematically higher share of employment are: rubber, chemicals, electrical machinery and appliances, and transportation equipment.

2. U.S. affiliates generate a relatively greater amount of employment in

the following sectors: chemicals, manufacturing foods and transportation equip-
ment. Thus, these 3 industries account for almost 60 percent of total employ-
ment generated by U.S. affiliates.

3. The composition of manufacturing production of U.S. affiliates generates
less employment per unit of industrial value added than that generated by the
pattern of manufacturing production of the host countries. There are two
qualifications for this observation: (i) This result is not conclusive since
it is observed for only 4 of the 7 Latin American countries examined; in 3 of 7
countries the reverse result is observed. (ii) A weighted average for the 7
Latin American countries indicates that the selection of industries effect of
U.S. affiliates implies a smaller relative generation of employment of 5 percent
compared to that which could have been obtained with a composition of production
similar to that of the host country. This 5 percent represents some 20,000 new
jobs, which corresponds to less than 1 percent of the manufacturing employment
of major enterprises of the 7 Latin American countries dealt with in this study.
In summary, the absolute magnitude of this effect is small.

4. In general, U.S. affiliates utilize techniques relatively more capital
intensive than local Latin American establishments. The differentials observed
in the capital/labor ratio are variable, and a weighted average for 6 Latin
American countries suggests a figure close to 60 percent. This is undoubtedly
a fairly important magnitude and reveals that the technology of U.S. affiliates
is relatively very labor saving.

5. The employment growth rate of U.S. affiliates during 1966-70 is of a
comparable magnitude (3.1 percent annually) to that rate traditionally observed
for the Latin American manufacturing sector.

6. Employment generated by manufacturing exports of U.S. affiliates in 1966 amounted to approximately 5 percent of total employment generated by U.S. affiliates in the Latin American manufacturing sector.

These results are subject to a series of qualifications related to the type of data utilized, the methodology used in the calculation of figures, etc. These qualifications can be grouped in the following manner: (1) The problems of the level of aggregation questions the assumption of product homogeneity. At the two-digit ISIC level the industrial establishments can be producing goods that are not close substitutes for each other. In addition, each industrial establishment produces a wide variety of goods in distinct proportions, and even more, great differences may exist in the value added/gross value of production ratio; thus, the sample may be comparing very different types of establishments. (2) Similar observations can be made with respect to the labor and capital factors of production, for which aggregation implies a sum of quite heterogeneous elements; furthermore, no account is taken with respect to differences in quality in the labor force, as well as with respect to differences in depreciation schemes, in capital revalorization due to inflation, in effective exchange rates, and their combined effect upon book values of fixed assets. (3) The combinations of data from various sources and the assumptions made for this combination introduce biases of an unknown magnitude and direction in the final results. (4) In the calculation of the growth rates it is not possible to separate the generation of employment of the affiliates through the creation of new jobs from the phenomenon of growth of the affiliates through the acquisition of existing firms in the host country. This phenomenon produces an over-estimation of the rate of growth of employment (and of production) of U.S. affiliates; the

degree of this over-estimation is unknown. (5) Indirect employment effects due to forward and backward linkages, and sub-contracting issues, have not been considered. (6) Finally, the results obtained reflect the situation of a specific period, 1966-70.

However, notwithstanding these qualifications, this study fulfills the basic objective of providing orders of magnitudes concerning the role of U.S. affiliates in the generation of sources of employment in the Latin American manufacturing sector. To summarize: (a) U.S. affiliates located in the Latin American manufacturing sector show a growth rate of employment that is neither especially high nor especially low compared to domestic enterprises of similar size located in the corresponding manufacturing branch. (b) At least from a point of view of the creation of (direct) employment it seems that it is not worthwhile to distinguish within the industrial sector those manufacturing branches for which it is advantageous to encourage (or discourage) the entry of MNC affiliates. (c) Manufactured exports of U.S. affiliates did not constitute, at least in 1966, an important mechanism in the generation of employment; in fact nearly 95 percent of the production of U.S. affiliates was aimed at supplying the local market of the respective Latin American host countries. (d) The technology utilized by the affiliates is relatively labor saving; undoubtedly the determinants of this characteristic should constitute the focus for research into the problem of increasing the employment generation by MNC affiliates.

FOOTNOTES

1/ On this subject, see the survey by Morawetz (1974).

2/ For a review of the issues on employment generation by MNC, see the surveys by Helleiner (1975), Lall (1978), and White (1978).

3/ In fact, generation of employment is an important objective of the host countries in attracting the MNC. For this reason, the host countries provide a great deal of incentive to the MNC which utilize underemployed and unemployed labor; moreover, simultaneously, they severely restrict dismissal of workers and/or reductions in the production levels of the affiliates. See Bergsten, et.al. (1978).

4/ Based on the Census of U.S. MNC, in 1966 total manufacturing employment of U.S. affiliates operating in Latin America (continental Latin America), numbered 408,000 persons. The U.S. affiliates that employ 100 or more persons represented 93.3 percent of manufacturing employment generated by U.S. MNC affiliates located in Latin America.

5/ See Methodological Appendix, the assumptions, procedures, and data sources utilized in obtaining pertinent information.

6/ Lipsey, et.al. (1978).

7/ In those cases in which no information relating to U.S. affiliates was available, the coefficient $(L/Y)_i$ of the respective manufacturing sector for all Latin America has been used.

8/ Results similar to those of Table 4 were obtained by using weights keyed to the value added of all industrial establishments of the manufacturing sector (that is, for establishments employing 5 or more persons).

9/ The literature on the type of technology utilized by the MNC in the LDC emphasizes two aspects: (1) The problem of technology adaptation by the MNC to the relative factor endowment existing in the LDC, and (2) the existence of production techniques appropriate for the LDC. On these issues see Stewart (1974), Lall (1978), and White (1978).

10/ Information for local enterprises is not available.

11/ The chemical industry of each country has been excluded since its inclusion significantly distorts values obtained in Table 5. This distortion is probably produced by petro-chemical enterprises (generally state-owned) that exist in the various Latin American countries.

12/ The implicit assumption that is being made is that the non-U.S. MNC affiliates possess capital/labor intensities similar to those of U.S. affiliates.

13/ Cited in Wilmore (1976).

14/ For further references see Lall (1978) and White (1978).

15/ This figure corresponds to exports by the largest U.S. affiliates, which represented 94.6% of total exports.

16/ Calculation of this figure was based on disaggregated establishment data, at the manufacturing sector level, utilizing the weighted average productivity of labor of U.S. affiliates which show exports on the respective manufacturing sector; the weights used correspond to each affiliate share of the respective manufacturing sector exports.

Table 1

RELATIVE EMPLOYMENT SHARE BY U.S. AFFILIATES IN LARGEST INDUSTRIAL ESTABLISHMENTS (100 PERSONS AND MORE)

FOR 7 LATIN AMERICAN COUNTRIES. YEAR 1966

(Percentages)

Type of Industry (ISIC Code)	Argentina	Brazil	Chile	Colombia	Mexico	Perú	Venezuela
Food manufacturing (20)	19.26	9.77	a/	14.84	7.94	11.85	32.13
Beverages (21)	23.43	3.10	1.68	a/	5.55	a/	a/
Textiles, clothing and footwear (23 and 24)	a/	a/	-----	2.58	2.98	a/	11.47
Wood, wood products, furniture and fixtures (25 and 26)	a/	a/	a/	-----	1.08	a/	a/
Paper and paper products (27)	a/	3.94	a/	60.92	12.06	-----	22.54
Printing and publishing (28)	4.05	1.36	12.45	a/	7.27	-----	a/
Rubber products (30)	48.03	38.35	-----	78.66	39.00	a/	100.00
Chemicals (31)	33.73	20.08	94.31	64.14	34.42	100.00	70.76
Non-metallic mineral products (33)	18.28	6.01	-----	20.25	1.94	-----	16.40
Basic metal and metal products (34 and 35)	2.13	7.96	0.87	11.56	7.46	4.32	10.52
Machinery except electrical (36)	10.99	25.31	2.31	19.91	40.89	a/	a/
Electrical machinery and appliances (37)	16.54	16.70	25.50	26.33	15.26	a/	79.82
Transportation equipment (38)	13.83	12.97	2.24	7.82	27.22	49.07	73.39
Number of workers employed by affiliates	68,700	104,800	6,100	25,100	82,000	14,800	24,800
U.S. affiliates share in total employment	12.6	9.0	3.7	16.6	11.6	18.1	28.1

Source: U.S. Department of Commerce (Census of 1966); Manufacturing Census (See Data Sources and Methodological Appendix).

a/ Suppressed information due to the presence of less than three affiliates.

17.

Table 2

SECTORAL EMPLOYMENT DISTRIBUTION OF LARGEST U.S. AFFILIATES (100 PERSONS AND MORE) FOR 7 LATIN AMERICAN COUNTRIES.

YEAR 1966

(Percentages)

Type of Industry (ISIC Code)	Argentina	Brazil	Chile	Colombia	Mexico	Perú	Venezuela
Food manufacturing (20)	27.93	12.97	a/	9.51	11.08	16.25	22.46
Beverages (21)	4.16	0.88	1.37	a/	2.73	a/	a/
Textiles, clothing and footwear (23 and 24)	a/	a/	-----	5.27	5.04	a/	10.41
Wood, wood products, furniture and fixtures (25 and 26)	a/	a/	a/	-----	0.44	a/	a/
Paper and paper products (27)	a/	1.32	a/	8.72	3.34	-----	4.10
Printing and publishing (28)	1.01	0.49	11.23	a/	1.86	-----	a/
Rubber products (30)	5.74	6.93	-----	16.53	4.88	a/	9.70
Chemicals (31)	21.93	22.37	47.67	34.90	28.27	71.07	20.20
Non-metallic mineral products (33)	6.52	4.46	-----	10.85	1.02	-----	3.85
Basic metal and metal products (34 and 35)	2.20	8.89	3.74	5.34	9.64	2.72	4.56
Machinery except electrical (36)	5.23	14.49	3.87	1.64	8.87	a/	a/
Electrical machinery and appliances (37)	5.65	12.29	25.31	5.16	10.09	a/	8.26
Transportation equipment (38)	19.62	14.91	6.81	2.09	12.74	9.96	16.47
	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: U.S. Department of Commerce (Census of 1966)

a/ Suppressed information due to the presence of less than three affiliates.

Table 3

CAPITAL-LABOR RATIOS AND SECTORAL EMPLOYMENT DISTRIBUTION OF LARGEST U. S. AFFILIATES (100 PERSONS OR MORE) FOR 7 LATIN AMERICAN COUNTRIES. YEAR 1966

Type of Industry (ISIC Code)	Capital-Labor Ratio (US $ / person)	Employment Distribution (Percentages)
Food manufacturing (20)	5,009	16.0
Beverages (21)	8,491	1.9
Textiles, clothing and footwear (23 and 24)	8,325	2.5
Wood, wood products, furniture and fixtures (25 and 26)	4,218	0.1
Paper and paper products (27)	14,243	2.2
Printing and publishing (28)	7,611	1.0
Rubber products (30)	8,422	6.7
Chemicals (31)	7,392	27.2
Non-metallic mineral products (33)	9,023	4.2
Basic metal and metal products (34 and 35)	9,162	6.7
Machinery except electrical (36)	7,228	8.2
Electrical machinery and appliances (37)	3,941	9.2
Transportation equipment (38)	8,441	14.1

Source: U.S. Department of Commerce (Census of 1966).

Table 4

IMPACT OF INDUSTRIAL COMPOSITION OF U.S. AFFILIATES ON EMPLOYMENT GENERATION

Number of persons/million dollars (1966) of manufacturing product

Countries	U.S. Affiliates Industrial Composition	Latin American Country Industrial Composition
Argentina	138	158
Brazil	211	204
Chile	149	161
Colombia	216	202
Mexico	169	192
Peru	180	154
Venezuela	117	128

Sources: U.S. Department of Commerce (Census of 1966); Manufacturing Census (See Data Sources and Methodological Appendix).

Table 5

RELATIONSHIP BETWEEN U.S. AFFILIATES AND LARGEST INDUSTRIAL ESTABLISHMENTS CAPITAL-LABOR RATIOS FOR THE MANUFACTURING SECTOR OF 6 LATIN AMERICAN COUNTRIES. a/

YEAR 1966

Establishments with 100 or more persons

Countries	Affiliate Capital-Labor Ratio / Total Capital-Labor Ratio
Argentina	1.53
Brazil	1.38
Chile	1.46
Colombia	2.07
Mexico	1.22
Venezuela	1.04

Source: Table A-1 (Statistical Appendix).

a/ Chemicals industry has been excluded in each country.

Note: Peru has been excluded in this case because it has too few industries for which the comparison can be made.

Table 6

ANNUAL AVERAGE GROWTH RATES OF EMPLOYMENT AND VALUE ADDED
FOR TOTAL MANUFACTURING SECTOR   -   1966   -   1970
(Percentages)

	U.S. Affiliates	Total largest establishments (100 persons and more)		
		Brazil	Mexico	Venezuela
Employment growth	3.1	1.9	4.2	6.8
Value added growth	11.1	3.1	11.1	12.0

Sources: U.S. Department of Commerce ("matching sample" 1966-1970); Manufacturing Census (See Data Sources and Methodological Appendix).

Table 7

MANUFACTURED EXPORTS AND EMPLOYMENT ABSORPTION

BY U.S. AFFILIATES IN LATIN AMERICA. YEAR 1966

Type of Industry (ISIC Code)	Export share of total sales (percentages)	Value of exports (thousands of dollars)	Employment (number of people)
Food manufacturing (20)	19.4	158,876	10,766
Beverages (21)	0.1	112	6
Textiles, clothing and footwear (23 and 24)	0.5	748	77
Wood, wood products, furniture and fixtures (25 and 26)	56.7	11,012	1,062
Paper and paper products (27)	5.2	7,217	408
Printing and publishing (28)	5.8	3,465	219
Rubber products (30)	0.7	2,728	162
Chemicals (31)	4.2	48,611	3,830
Non-metallic mineral products (33)	0.7	858	99
Basic metal and metal products (34 and 35)	1.7	5,061	382
Machinery except electrical (36)	2.5	6,372	668
Electrical machinery and appliances (37)	2.0	6,324	622
Transportation equipment (38)	1.5	16,302	717
Total manufacturing	5.4	267,686	19,018

Sources: U.S. Department of Commerce (Census of 1966).

Table A-1

RELATIONSHIP BETWEEN U.S. AFFILIATES AND LARGEST INDUSTRIAL ESTABLISHMENTS CAPITAL-LABOR RATIOS FOR

7 LATIN AMERICAN COUNTRIES. YEAR 1966
Establishments with 100 or more persons

(Affiliate Capital-Labor Ratio/Total Capital-Labor Ratio)

Type of Industry (ISIC Code)	Argentina	Brazil	Chile	Colombia	Mexico	Perú	Venezuela
Food manufacturing (20)	0.43	0.80	a/	1.36	0.99	0.92	0.81
Beverages (21)	1.05	1.60	2.42	a/	0.82	a/	a/
Textiles, clothing and footwear (23 and 24)	a/	a/	----	2.30	1.09	a/	2.50
Wood, wood products, furniture and fixtures (25 and 26)	a/	a/	a/	----	2.03	a/	a/
Paper and paper products (27)	a/	1.64	a/	1.17	1.21	----	0.80
Printing and publishing (28)	2.82	1.15	2.30	a/	1.81	----	a/
Rubber products (30)	1.06	1.48	----	1.54	1.17	a/	1.00
Chemicals (31)	0.95	0.59	0.31	1.60	0.63	1.00	0.68
Non-metallic mineral products (33)	0.86	1.27	----	1.17	1.02	----	0.72
Basic metal and metal products (34 and 35)	2.49	0.83	2.67	1.88	0.75	1.39	1.38
Machinery except electrical (36)	1.53	2.13	1.32	6.55	1.88	a/	a/
Electrical machinery and appliances (37)	2.17	1.10	0.63	1.79	1.43	a/	0.74
Transportation equipment (38)	2.04	1.38	1.40	6.34	1.03	0.76	0.87

Source: U.S. Department of Commerce (Census of 1966); Manufacturing Census (See Data Sources and Methodological Appendix).

a/ Suppressed information due to the presence of less than three affiliates.

METHODOLOGICAL APPENDIX

The Census of Manufactures of the respective Latin American countries provides information for total industrial establishments without distinguishing between local and foreign firms. The U.S. MNC Census provides data for only one part, nonetheless the most important part, of foreign firms operating in 1966 in the Latin American manufacturing sector. In general there is no information available, at the manufacturing sector level, for non-U.S. foreign firms. 1/

1. Capital data for the 7 Latin American countries

a. To measure capital the book value of fixed assets is used. The first problem that arises is that not every Census of Latin American countries contains information on the capital variable.

b. Furthermore, information on capital, including the published one, is generally considered to be very unreliable. Published values use accounting depreciations; in addition, there are uncertainties as to monetary correction of capital values in countries having persistent rates of inflation.

c. Given the type of coefficients that are obtained, given the year of the Census, and given that the country in question had very stable prices for the period in question, it is assumed that the Census of Manufactures of Mexico for 1970 provides the most reliable information in regard to the capital variable. Thus, the 1970 capital/product ratio for Mexico is used at the industrial level as the representative technological coefficient for the various Latin American countries. In this way capital data at the industrial sector level are obtained for the other 6 Latin American countries. An advantage of this method is that it assures that a consistent definition of capital is used throughout the various countries.

d. This methodology has been applied exclusively to those industrial establishments that employ 100 or more persons.

2. Calculation of data for 1966

This study is centered on year 1966, which to date is the only year for which data on U.S. affiliates is obtainable.

The Census of Manufactures for the various Latin American countries generally does not correspond to 1966; thus, in order to calculate the necessary information each country must be treated separately.

1/ It is possible to make two opposite assumptions in order to obtain data for local firms. (i) Assume that non-U.S. foreign firms show a pattern similar to that of local firms. (ii) Assume that non-U.S. foreign firms show a pattern similar to that of U.S. MNC affiliates. In this study the latter assumption is made.

Data for 1966 are available only for Brazil and Venezuela. For 4 Latin American countries, two Census of Manufactures have been used to obtain information for 1966 through exponential interpolation (assuming constant rates of average annual growth). These countries are: Argentina (1963-73), Colombia (1962-68), Mexico (1965-70), and Perú (1963-68). Finally, for Chile, 1966 data are obtained from the Census of Manufactures of 1967 and by utilizing 1966-67 growth rates of the respective variables at the manufacturing level.

3. Data for 1970

These data are required to calculate 1966-70 rates of growth.

a. For U.S. MNC affiliates information from a U.S. Department of Commerce "matching sample" has been used. This information corresponds to a sample of 546 affiliates operating during 1966-70 in the Latin American manufacturing sector. Growth rates have been calculated using this sample.

b. In the calculation of 1966-70 growth rates for the Latin American countries the study uses only those countries which have available information either for the year 1966 or 1970; these countries are: Brazil (1966-70), Mexico (1965-70), and Venezuela (1966-71). The average rate of growth for this period has been used.

4. For monetary conversions (exchange rates) and to obtain dollars of equal purchasing power (constant dollars) data provided by the International Monetary Fund have been utilized.

DATA SOURCES

1. Information on U.S. affiliates

Information provided especially by the U.S. Department of Commerce. U.S. affiliates, whose information is used in this study, represent those in which U.S. shareholders own at least 50 percent of the shares (majority-owned). These U.S. MNC represented approximately 87 percent of the total stock of U.S. investment in the Latin American manufacturing sector. Three distinct types of information are available: (a) Information for 1966 at a disaggregated level (U.S. affiliates separated into groups of four, from larger to smaller) by type of industry (two-digits ISIC, 13 industries). This information corresponds to all of Latin America. The source of this information is the 1966 U.S. MNC Census conducted by the U.S. Department of Commerce; for reasons of confidentiality of this type of information, the results for publication correspond to two-digit ISIC. (b) Information at the national level (for 7 Latin American countries: Argentina, Brazil, Chile, Colombia, Mexico, Perú and Venezuela) by type of industry (two-digit ISIC, 13 industries) for the year 1966. (c) Growth rates by variable (employment, prod-

uct, and capital) and by type of industry (two-digits ISIC, 13 industries) for all Latin America for the period 1966-70. The source of this information is the "matching sample" of the U.S. Department of Commerce--546 U.S. affiliates operating in Latin America during 1966-70.

2. Data sources for the manufacturing sector of Latin American countries.

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Brazil: -Producao Industrial. Vol. 1, 1966. Fundacao I.B.G.E. Instituto Brasileiro de Estadística.

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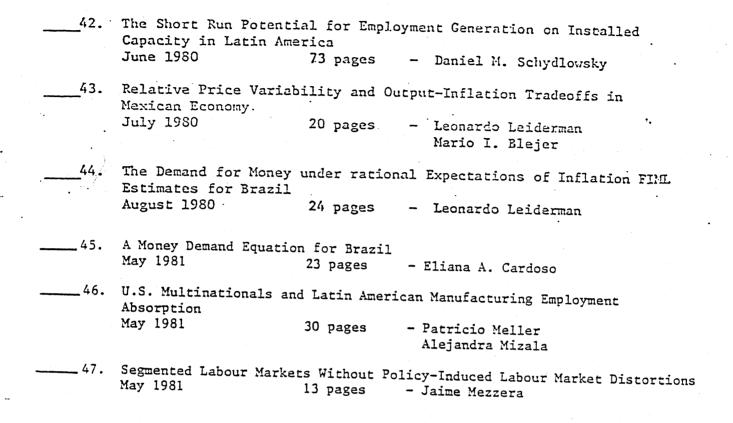CENTER FOR LATIN AMERICAN DEVELOPMENT STUDIES

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