THE EFFECT OF MULTINATIONAL FIRMS' FOREIGN OPERATIONS
ON THEIR DOMESTIC EMPLOYMENT

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ABSTRACT

Given the level of its production in the U.S., a firm that produces more
abroad tends to have fewer employees in the U.S. and to pay slightly higher
salaries and wages to them. The most likely explanation seems to be that the
larger a firm's foreign production, the greater its ability to allocate the
more labor-intensive and less skill-intensive portions of its activity to
locations outside the United States. This relationship is stronger among manu-
facturing firms than among service industry firms, probably because services
are less tradable than manufactured goods or components, and service
industries may therefore be less able to break up the production process to
take advantage of differences in factor prices.

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The Effect of Multinational Firms' Foreign Operations

on Their Domestic Employment

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Introduction

The purpose of this paper is to examine the effects of foreign direct

investment (FDI) on the size and skill levels of the domestic employment of

U.S. parent companies. We are particularly concerned with the service indus-

tries, but we investigate manufacturing industries as well to determine

whether these effects differ between manufacturing and service industries.

There are a number of ways in which U.S. FDI might be expected to affect

the level and/or the skill composition of U.S. employment. Two of them in-

volve effects on trade. One channel that has been widely discussed is the

substitution of foreign affiliate production for U.S. exports. Another avenue

is the substitution of imports from affiliates for goods produced in the

U.S. Still another possibility is that even if there were no trade effects,

investment abroad substitutes for, or crowds out investment at home. This

might happen if the investible funds of a firm or of an industry were limited

and could be added to only at increasing cost.[1]

Even if there were no effect on the amount of production in the U.S., the

level of U.S. employment might be altered by the reallocation of various

stages or processes of production between U.S. parents and their foreign

affiliates. For example, if affiliate production were more labor intensive

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[1] However, some effects of this nature, although not very strong ones, are
suggested in Stevens and Lipsey (1988).

than parent production in the U.S. a reallocation of production could reduce the level of U.S. employment.[2] Similar effects could take place with respect to skill intensity; that is, the allocation of low skill intensity production to foreign operations could reduce the home demand for unskilled labor and raise the average skill and average compensation level at home.

We deal only briefly with the effects of U.S. direct investment on U.S. exports here because they have been studied extensively elsewhere. However, we do extend the earlier work to cover the service sector. We have not attempted to deal with effects of direct investment on U.S. imports because the imports from affiliates are so small relative to U.S. production. The crowding out effect on investment is studied in another paper (Stevens and Lipsey, 1988). What we do concentrate on in this paper is the effects of U.S. direct investment abroad on the labor intensity of U.S. production (employment for a given level of output) and the skill intensity of U.S. production by the investing firms.

The Data

In investigating these relationships we considered three indicators of the multinationals' activity abroad: affiliate total assets; affiliate property, plant, and equipment (PPE); and net sales (net of imports from parents).[3] The data relate to individual nonbank parents and their nonbank

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[2] For U.S. firms, see Courtney and Leipziger (1975) for both U.S. and Swedish firms, see Lipsey, Kravis, and Roldan (1982), and for foreign firms in Brazil, see Morley and Smith (1974).

[3] The amount of direct foreign investment was not used as an indicator because it has a number of disadvantages as a measure of foreign affiliate activity. Among other objections, the assets included may not be in the same location as the foreign affiliate, and assets financed by borrowed or equity capital provided by others than the parent are excluded. For further discussion of various indicators of the extent of direct investment abroad, see Kravis and Lipsey (1988).

affiliates. They are from the mandatory reports of parents and affiliates in the 1982 benchmark survey of U.S. direct investment abroad (U.S. Department of Commerce, 1985) This source includes the activity variables for parents as well as affiliates, and a wide variety of other balance sheet, income statement, and operating variables. Variables from this source used here in addition to the activity variables include parents' and affiliates' exports, parents' imports from their affiliates, and the number of employees and their compensation for both parents and affiliates. It was possible to analyze the data for individual firms (parents and affiliates) despite government prohibitions against disclosure of individual reports through an arrangement in which we specified regressions to be run or special tables to be prepared which were then executed by the Department of Commerce.[4]

The industrial classification used in the report on the benchmark survey (U.S. Department of Commerce, 1985) includes over 20 service (non-commodity producing) industries. The main categories into which they fall are wholesale trade; finance, insurance and real estate; and "services." "Services" includes "business services" such as advertising, and other services such as hotels and health services. Here we use the term "nonbusiness services" to cover the industries classified by Commerce under its "service" rubric but not as "business services;" hotels and health services are examples. We also include transportation and retail trade in the nonbusiness service category.

A criterion of confining the regressions to industries with at least 15 parents restricted the number of "basic" service industries (i.e., not further subdivided in the Commerce classification) to four — finance (excluding banking), advertising, computer services, and engineering. In the tables which

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[4] We are grateful to Mr. Arnold Gilbert of the Bureau of Economic Analysis of the U.S. Department of Commerce who played the key role in this arrangement and whose extensive knowledge of the data was invaluable.

follow, regressions are reported for these four industries, and for certain aggregations of basic industries, such as business service industries. There is also a set of regressions for all service industries which includes all the industries already mentioned plus petroleum trade and oil field services.

It is widely recognized that the service industries are a heterogeneous set of activities with wide variations in key industrial characteristics, such as capital labor/ratios, wage levels and use of human capital, and technological sophistication. The heterogeneity of the service sector, as compared with the goods sector, and especially with manufacturing, is illustrated by the following comparisons for two important industry characteristics (capital per employee and compensation per employee):

Plant, Property, & Equipment

per Employee	Services	Goods	Manufacturing
Standard deviation	141.9	83.1	21.3
Standard deviation/mean	1.70	1.57	.63
Compensation per Employee			
Standard deviation	9.70	5.93	5.97
Standard deviation/mean	.363	.205	.211

The Commerce classification contains a larger number of detailed ("basic") industries in the goods sectors — more than 30 in manufacturing alone — but since our main interest here is a comparison with the service industries, we confine our presentation of regressions to the total for all manufacturing and to each of the six major manufacturing sub-industries (food, chemicals, metals, nonelectrical machinery, electrical machinery, and transport equipment). Although manufacturing is included for comparative purposes, there is, of course, an inherent interest in the results for this sector which

is often regarded as the archetypal industry for foreign investment. Actually, manufacturing affiliates accounted for 38% of all affiliate sales; petroleum, including petroleum services such as oil field services and petroleum wholesale trade, 35%; and most of the rest are sales of service industries. [IIE17][5] A distinction has to be made between majority-owned affiliates (MAJs) and those in which parents owned a 50 percent or minority interest (MINs). For all industries, MAJs accounted for 78% of affiliate sales (IIE17, IIIE17) and the MAJs share was the same in all services (special tabulation).

Effect of foreign affiliate activity on U.S. employment

We turn our attention first to the reallocation hypothesis, examining the relationships of U.S. employment by parent firms in each industry to the three indicators of its foreign affiliate activity (total assets; property, plant, and equipment (PPE); and net sales[6]). We include parent sales as an independent variable in all the regressions as a proxy for parent production to hold constant the influence of the size of the parent firm.

There is a striking difference between service industries and manufacturing in the degree to which parent employment is related to the three independent variables describing affiliate activity. In manufacturing, there is only a small difference among the variables; they all, in combination with parent sales, explain parent employment well, although affiliate net sales has a slight edge. In services, however, outside of wholesale trade and finance, where PPE explains employment best, the net sales variable explains parent employment better than either of the other two variables. We therefore

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[5] References such as these are to tables in the benchmark survey (U.S. Department of Commerce, 1985).

[6] Sales less imports from parents.

concentrate on the net sales equations in the text, although all three sets are shown in the appendixes. (See Appendix Table 1.)

The relationship of parent employment to affiliate net sales in all service industries combined (589 parents) is as follows:

$$(1) \quad PEM = \begin{array}{c} -1.491 \\ (2.0) \end{array} + \begin{array}{c} .011 \ PS \\ (55.9) \end{array} - \begin{array}{c} .0096 \ MAJS \\ (10.9) \end{array} + \begin{array}{c} .020 \ MINS \\ (6.5) \end{array} \qquad \bar{R}^2 = .86*$$

where PEM is parent employment; PS, parent sales, and MAJS and MINS are the net sales (sales minus imports from the U.S.) of majority-owned and minority-owned affiliates, respectively. (*Significant at the 1% level.)

Given the level of parent sales, including exports, a million dollar increase in MAJ sales, reduces the number of parent jobs by 10. Higher MIN sales _add_ to parent employment — about 20 jobs per million dollars of sales.

When results for individual service industries are examined (Table 1, columns 2-5), the direction of the relationship between parent employment and sales of majority-owned affiliates is negative somewhat more often than not, although the relationship is significant in only half of the cases. Of those coefficients that are significant at the 5% level, four are negative and two are positive. For sales by minority-owned affiliates, there is no predominance of plus or minus signs, and the one significant coefficient was negative. (See Table 1 and Appendix Table 2.) The positive relation of parent employment to minority-owned affiliate sales found in the equation for all service industries does not appear in any of the groups or individual service industries we could examine separately. Thus, that positive association is apparently an industry phenomenon and the causation may well run in the opposite direction; industries with high employment/sales ratios at home were the ones with relatively extensive involvement in minority ownership abroad.

Table 1

Relationships of Parent Employment and Employee Compensation to Measures of Multinational Corporation Sales Activity

Industry (1)	Dependent Variable = Parent Employment				Dependent Variable = Parent Wage			
	$\bar{R}^2$ (2)	Parent Sales (3)	MAJ Sales (4)	MIN Sales (5)	$\bar{R}^2$ (6)	Parent Sales (7)	MAJ Sales (8)	MIN Sales (9)
All Services (589)	.864* (0.0)	.011 (55.9)	-.0096 (10.9)	.020 (6.5)	-.00009 (0.40)	-1.1E-4 (.63)	-6.5E-5 (.08)	-.0033 (1.2)
Wholesale Trade – Durable (99)	.178* (0.0001)	.0011 (3.5)	.0040 (3.9)	-.052 (3.2)	.091* (.007)	-.0017 (1.5)	-.0028 (.80)	.193 (3.4)
Wholesale Trade – Nondurable (66)	.528* (0.0)	.0036 (7.3)	-.0027 (4.1)	-.0046 (.4)	.0005 (.39)	-.0021 (1.2)	.0022 (.97)	-.025 (.56)
Finance (24)	.874* (0.0)	.0071 (11.0)	.0037 (.75)	.00022 (.11)	-.072 (.70)	.0062 (.85)	-.057 (1.0)	-.0084 (.36)
Insurance (71)	.912* (0.0)	.0034 (15.8)	.0084 (8.7)	.0051 (1.1)	-.036 (.90)	-1.3E-4 (.51)	7.4E-4 (.67)	-.0023 (.45)
Services (71)	.717* (0.0)	.026 (19.5)	-.022 (4.0)	.0069 (.22)	.045 (.02)	-.0086 (3.2)	.019 (1.7)	.033 (.51)
Business Services (83)	.361* (0.0)	.017 (6.9)	-.0037 (.42)	-.015 (.47)	.010 (.29)	-.014 (1.9)	.0046 (.17)	.048 (.50)
Advertising (20)	.844* (0.0)	.0087 (9.5)	.0046 (1.4)	.016 (.81)	-.022 (.48)	-.0074 (.73)	.030 (.84)	.235 (1.1)
Computer Services (16)	.827* (0.0)	.027 (8.1)	-.027 (1.4)	-.042 (1.5)	-.201 (.92)	-.012 (.46)	.101 (.65)	.045 (.21)
Nonbusiness Services (75)	.784* (0.0)	.028 (16.0)	-.028 (3.9)	.039 (.66)	.060 (.06)	-.0060 (2.5)	.022 (2.1)	.043 (.52)
Engineering (25)	.458* (0.0011)	.026 (3.5)	-.027 (2.3)	-.028 (.42)	-.046 (.59)	-.026 (1.2)	-.048 (1.3)	-.0048 (.02)
Transportation (49)	.860* (0.0)	.014 (17.2)	-.0050 (.80)	-.064 (1.2)	.169* (.01)	.0021 (3.0)	-.0011 (.21)	.077 (1.7)

Table 1 (continued)
Relationships of Parent Employment and Employee Compensation with Measures of Multinational Corporation Sales Activity

(1)	Dependent Variable = Parent Employment				Dependent Variable = Parent Wage			
	$\bar{R}^2$ (2)	Parent Sales (3)	MAJ Sales (4)	MIN Sales (5)	$\bar{R}^2$ (6)	Parent Sales (7)	MAJ Sales (8)	MIN Sales (9)
All Manufactures (1214)	.918 (0.0)	.010 (73.8)	-.0028 (10.5)	-.0037 (10.3)	.050* (0.0)	5.0E-4 (3.1)	2.1E-4 (.65)	.0010 (2.4)
Food (71)	.657 (0.0)	.011 (9.5)	-.0014 (.54)	-.018 (1.9)	-.012 (.54)	-5.4E-4 (.72)	.0025 (1.5)	-.0020 (.31)
Chemicals (166)	.892 (0.0)	.0072 (18.3)	-.0014 (1.8)	-.0011 (.40)	.034** (.04)	3.2E-4 (.54)	-1.1E-5 (.009)	.0042 (.99)
Metals (170)	.925 (0.0)	.010 (34.2)	-.0031 (2.8)	-.0015 (1.0)	.154* (0.0)	.0020 (2.8)	-.0014 (.52)	.010 (2.8)
Nonelectric Machinery (213)	.963 (0.0)	.014 (22.0)	-.0037 (5.4)	.0099 (4.8)	.006 (.25)	4.7E-4 (.35)	1.3E-4 (.09)	.0019 (.43)
Electric Machinery (149)	.976 (0.0)	.011 (29.9)	.0032 (2.0)	-.0061 (1.4)	.077* (.002)	7.5E-4 (1.5)	-.0011 (.47)	.0090 (1.5)
Transportation Equipment (58)	.988 (0.0)	.0099 (42.9)	-.0044 (9.2)	-.0026 (5.8)	.169* (.005)	4.8E-4 (1.8)	-2.0E-4 (.37)	6.2E-4 (1.2)

N.B.: Figures in parentheses represent the number of firms in column 1, the significance level of the regression in columns 2 and 6, and the t-ratios in columns 3, 4, 5, 7, 8, and 9. Employment in 1000's, sales in million dollars.

* Significant at the 1% level.
**Significant at the 5% level.

For manufacturing firms, the regression based on all 1214 parents is as follows:

(2) PEM = 1.219 + .010 PS - .0028 MAJS - .0037 MINS $\bar{R}^2$ = .918*
     (6.3)   (73.8)   (10.5)   (10.3)

(*Significant at the 1% level.)

As in the service industries, employment of parents in manufacturing industries, given their level of production, is negatively related to sales of their majority owned affiliates, but the impact is smaller than in services. A more substantial difference is that employment of manufacturing parents is negatively correlated with sales of minority owned affiliates. While we interpret the causation as running from the level of foreign production to labor intensity in the U.S., the alternative interpretation is that, in manufacturing, the less labor-intensive firms produce more abroad.

The significant MAJS coefficients are negative in 3 individual manufacturing industries and positive in only 1 (electrical machinery). (See Table 1 and Appendix Table 2.) The coefficients for MINS are also predominantly negative but the only 2 significant coefficients are split. Nonelectrical machinery is the industry with a positive (and significant) coefficient.

The generally negative associations between affiliate sales and parent employment fit with a finding in earlier work (Kravis and Lipsey, 1982) that manufacturing firms produce in a more labor-intensive manner abroad than in the U.S. and in a more labor-intensive manner the lower the cost of labor in a country. As was pointed out in that paper, this response to differences in the price of labor could occur in at least two ways. The multinational firm could produce the same goods in low-wage countries as in high-wage countries, but in a more labor-intensive manner. For example, Chevrolets produced in

Africa might be polished and finished in a much more labor-intensive way than those assembled in the U.S. That is the standard case of locating production at different points along a single isoquant in response to different prices of labor (Figure 1.) The other way the multinational firm might respond would be to allocate its production of capital-intensive goods for the world market to its high wage locations and its production of labor-intensive goods to its low-wage locations. For example, the semiconductor industry could locate its capital-intensive or technology-intensive wafer production to the U.S. and its labor-intensive assembly operations to Malaysia (Figure 2.)

In the former case, assuming that cars sold in Africa had to be assembled in Africa, the existence of the African assembly operation or its size should have no effect on the input of labor per unit of U.S. production. In the second case, however, a firm with extensive assembly operations overseas would be substituting labor-intensive production in Malaysia for labor-intensive production in the U.S. The finding here that larger foreign operations are associated with lower parent employment suggests the latter explanation.

Another possibility is that the less labor-intensive firms in an industry, or perhaps the firms that are more efficient overall, tend to invest more heavily in foreign production because they have the firm-specific assets that encourage direct investment.

The inclusion of the parent sales variable in these regressions is intended as a way of holding constant, or removing the influence on parent employment of, the size of the parent company's output. The assumption involved is that sales are roughly proportional to output, particularly within industries. Presumably, sales that do not come from the parents' output, such as those of products imported from affiliates, are not large enough to disturb this proportionality.
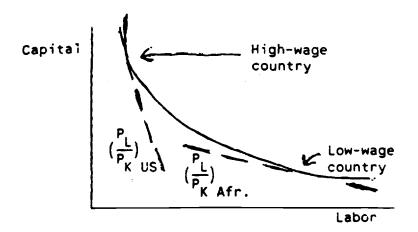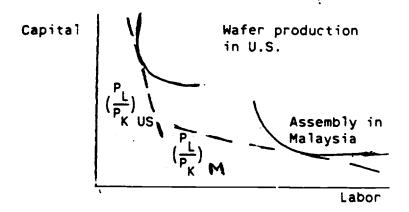
Figure 1

Figure 2

A closer approximation to parent output, particularly for industries such as motor vehicles in which imports from affiliates are important, would be parent sales net of imports from affiliates. We can test for the significance of such an adjustment by adding a variable for imports from affiliates to equations 1 and 2, with the results as given in equations 3 and 4.

All services:

(3) PEM = -.575 + 011PS - .010MAJS + .018MINS - .026M $\overline{R}^2$ = .893*
       (.7)   (56.5)   (11.1)   (6.0)   (2.0)

Manufacturing:

(4) PEM = .939 + .011PS - .0025MAJS - .0022MINS - .012M $\overline{R}^2$ = .923*
       (4.4) (68.6)   (8.9)   (5.2)   (7.5)

where M = parent imports from all affiliates and the other terms are as previously defined. (*Significant at the 1% level.)

The coefficients of PS, MAJS, and MINS do not change very much when M is added (compare equations 3 and 4 with 1 and 2), but the $\overline{R}^2$s increase slightly.

In manufacturing as a whole, the coefficient for imports is of about the same size as that for parent sales. That suggests that the import variable acts as a correction to parent sales, and that it would, therefore, be appropriate to use a single variable for parent sales net of imports from affiliates. In services, however, where imports are much less important than in manufacturing, the import coefficient is much larger than that for parent sales, an indication that the import variable represents some other phenomenon.

Equations for individual manufacturing industries (Appendix Table 3) show only three significant coefficients for imports, all negative. The import coefficient for the metals industry is similar to the parent sales coefficient but those for chemicals and transport equipment are much larger. A possible

interpretation is that parents in the metals industry are importing from the affiliates goods of capital intensity similar to their home production while those in chemicals and transport equipment are importing goods of lower capital intensity than their home production. If that were the case, it would be in accord with the idea that firms tend to assign the least capital-intensive production to their affiliates. It is puzzling, however, that in the electrical machinery and equipment industry, where this pattern has been documented, we find no significant import coefficient.

The equations for individual service industries show no significant coefficients for imports. That may be because imports are very small and because the location of production and the meaning of exports and imports are not easy to define in service industries. The fact that the import coefficient was negative and significant in the overall service equation, but not in individual industry equations suggests that there may be some tendency for imports to come from the more labor-intensive industries, even if not from labor-intensive segments within individual service industries.

In general, the sales variables explain a large part of the variation in employment among firms, but the formulation is a very simple one and a question may be raised about the robustness of the results were other explanatory variables such as factor intensities and relative wages added.

We did not explore these possibilities very extensively, but we did try adding to the independent variables the ratio of affiliate to parent compensation per employee. The theory behind this variable is that a low ratio of affiliate to parent wage represents an ability to locate affiliate production in low wage countries. A high ratio represents an inability to take advantage of low-wage locations. A high ratio should, therefore, be associated with low ratios of parent imports to parent sales and therefore with high parent employment

for any level of parent sales. The equations for all services and manufacturing are as follows:

	Intercept	Parent Sales	MAJ Sales	MIN Sales	Affiliate/Parent Wage	$\bar{R}^2$
(5) All Services	-.959	+ .011	- .010	+ .019	+ .354	.89*
	(.6)	(56.3)	(11.6)	(6.0)	(.2)	
(6) Manufactures	.710	+ .010	- .0028	- .0037	+ .915	.92*
	(1.5)	(70.8)	(10.2)	(9.9)	(1.5)	

(*Significant at the 1% level)

In the corresponding equations for basic industries (see Appendix Table 4) the coefficient of the new variable was positive whenever the t-ratio exceeded 1 (5 service and 2 manufacturing industries). However, both in the overall equations and in the equations for the basic industries, the coefficients of affiliate sales remained almost the same. In the overall equations:

	Coefficient of			
	MAJS		MINS	
	Without wage variable	With wage variable	Without variable	With wage variable
All services	-.0096	-.010	.020	.019
Manufacturing	-.0028	-.0028	-.0037	-.0037

Thus the contribution of the relative wage variable is limited to the hint given (by its tendency toward positive coefficients) that a greater ability of a firm or industry to shift production to low-wage countries, reduces parent employment per unit of output, or, in other words, the labor intensity of parent output.

Compensation Per Employee

Foreign activity of U.S. affiliates may affect U.S. labor not only through direct impacts on the number of jobs but also by affecting the demands for various types of labor. Given the lower wages for unskilled labor outside the United States, it might be expected that firms that can allocate different parts of their production to different host countries would place their most skill-intensive production in the U.S. and their unskilled-labor intensive production in their overseas affiliates. The effect of such an allocation of production would presumably be to raise the demand for skilled labor and reduce the demand for unskilled labor in the U.S. Even if no such skill-based allocation of production were feasible, a growth of foreign activity might tend to require increased supervisory input at home and therefore a shift in demand toward high-paid personnel.

We test for the effect of foreign activity in two ways. One is to relate the average compensation level of parents, which we take as representing the average skill level, to measures of parent size and affiliate size, distinguishing between majority-owned and minority-owned affiliates on the theory that they may represent different strategies in the allocation of production or perform different roles for the parents. The other is to relate average parent compensation to the relative size of affiliate operations.

When parent compensation per employee is related to the sales of parents and affiliates few statistically significant equations are obtained (See Table 1, columns 6-9). In the equations for all services none of the independent variables has a significant coefficient. In the basic industries, even a liberal definition (10 per cent) of significance for the equation as a whole puts within the pale only wholesale trade in durables, "services" as a group, nonbusiness services as a group, and transportation. In all of these cases,

all the affiliate coefficients with a t-statistic above one are positive, suggesting a faintly perceptible positive relation of affiliate production to parent average skill levels. Things look a little better in manufacturing; for all manufacturing the equation is:

$$(7) \quad PC = 25.95 + .0005PS + .0002MAJS + .0010MINS. \qquad \bar{R}^2 = .05*$$
$$ (112.3) \quad (3.1) \qquad (.6) \qquad\quad (2.4)$$

where PC = parent compensation per employee and the other variables have the same definitions as in the previous equations. (*Significant at the 1% level.)

In the manufacturing subindustries the equations meet the 10 percent level of significance in 4 out of the 6 cases and here, too, all the affiliate coefficients with a t-statistic above 1 are positive.

Similar results were obtained from equations in which compensation per employee was related to the ratio of affiliate to parent sales. (See Appendix Table 5, column 4.) There were few significant coefficients for the independent variable (3 out of 11 in services, and 1 out of 6 in manufacturing), but the signs were predominately positive (10 out of 11 and 5 out of 6).

While these results are weak, they do serve to confirm the earlier conclusion that manufacturing firms are more able to shift activities to locations with low-cost factors of production than are service firms. In this case, it is cheap unskilled labor that attracts U.S. firms and causes them to shift the operations intensive in low-skilled labor.

The effects of foreign operations on exports

We have, up to this point, examined the effects of foreign production on U.S. parent employment holding constant the level of parent sales. If foreign production substituted for domestic production, it would affect the level of

domestic employment, but that impact would be obscured by the use of total

parent sales as an independent variable. We ignored this problem on the

ground that previous work[8] has failed to uncover any substitution of foreign

production for exports but that work has been confined to manufacturing and it

is advisable to test those results and extend them to services.

Although exports are small relative to total sales in most industries (in

1982, 11% of sales of manufacturing parents and 6 percent for service industry

parents[9]) we would like to know whether foreign affiliate activity (net sales)

on balance is supportive of U.S. exports or substitutes for them.

The earlier results for manufacturing are confirmed and extended to

service industries by regressions using the benchmark FDI survey data to link

exports to foreign affiliate net sales:

All services:

$$(8) \quad \text{Par X} = -16.70 \quad -.003 \text{ PSU} + .4033 \text{ MAJS} - .1649 \text{ MINS} \qquad \bar{R}^2 = .620*$$
$$\qquad\qquad\quad (1.1) \qquad (.9) \qquad\quad (26.9) \qquad\qquad (3.1)$$

Manufacturing:

$$(9) \quad \text{Par X} = -12.11 + .129 \text{ PSU} + .0007 \text{ MAJS} + .050 \text{ MINS} \qquad \bar{R}^2 = .721*$$
$$\qquad\qquad\quad (2.0) \quad (27.5) \qquad (.1) \qquad\qquad (4.7)$$

where Par X = parent exports, PSU = parent sales in the U.S. (i.e., excluding

exports), and the other terms are as defined in previous equations. (Significant

at the 1% level.)

The coefficient of MINS in the service industry equation is negative but

it is more than offset by the larger positive coefficient for MAJS. Even if

the MINS coefficient were equal though opposite in sign from the MAJS coef-

ficients, the overall effect of foreign affiliate net sales on parent exports

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[8] For the U.S., see Bergsten, Horst, and Moran (1978), Lipsey and Weiss (1981)
and (1984), and Blomstrom, Lipsey, and Kulchycky (1988). For the UK, see
Reddaway (1967) and (1968), and for Sweden see Swedenborg (1979) and (1982),
and Blomstrom, Lipsey, and Kulchycky (1988).

[9] Kravis and Lipsey, 1988, Table 2.

would be positive, since sales of majority owned affiliates are 3 to 4 times as great as sales of minority owned affiliates.

In the basic service industries the MAJS coefficient is usually positive and significant at the 5% level, while the MINS coefficient is significant only in one industry — wholesale nondurables. (See Table 2.) It may be surmised that these affiliates are marketing U.S. goods while this is not so much the case for affiliates of parents in other industries. With the exception of advertising, for which affiliate sales are strongly negatively correlated with parent exports, the combined effect of sales of majority-owned and minority owned affiliates is positive in the individual industries. Much the same story emerges when factor intensities (parent wage as a skill proxy and PPE/employment as a capital/labor ratio) are added to the sales variables as independent variables. (See Appendix Table 6.) The MAJS coefficient is positive and significant in 10 out of 12 cases and dominates the negative MINS coefficient which appears in 5 cases (though only 1 is significant). Advertising again is the exception, having negative coefficients for both MAJS and MINS.

In the manufacturing equation, the coefficients of MAJS and MINS are both positive, although only the latter is significant. In 4 of the 6 subindustries at least one of these coefficients is positive and significant and the combined effect is positive (Table 2). The combined effect in one of the other two, transportation equipment, is negative, but the negative MAJS coefficient is only a little greater than its standard error and the positive MINS coefficient a little less than its standard error. This summary applies also to the equations in which factor intensities are added (Appendix Table 6).

The upshot of this exploration of the relationship of affiliate production to parent exports is that in service industries, as in manufacturing, affiliate production increases exports where it has any effect at all.

Table 2
Relationship Between Parent Exports and Parent and Affiliate Sales

Industry	Parent Sales in U.S.	MAJ Sales	MIN Sales	$\bar{R}^2$
All Manufacturing	.129	7.20E-4	.050	.721*
(1105)	(27.5)	(.09)	(4.7)	(0.0)
Service-Related	-2.995	.4033	-.1649	.620*
(456)	(.87)	(26.9)	(3.1)	(0.0)
Wholesale-Durable	.023	.041	.143	.434*
(82)	(3.5)	(3.2)	(.6)	(0.0)
Wholesale-Nondurable	1.22E-3	.316	8.87	.908*
(48)	(.03)	(6.7)	(6.2)	(0.0)
Finance	-7.97E-3	.115	-3.50E-3	.836*
(19)	(5.0)	(9.7)	(.7)	(0.0)
Insurance	-3.85E-4	.073	5.73E-3	.935*
(51)	(.4)	(18.1)	(.3)	(0.0)
Services	-1.55E-3	.092	-.023	.508*
(133)	(.8)	(11.3)	(.4)	(0.0)
Business Services	4.74E-3	.037	.054	.072**
(75)	(1.0)	(2.1)	(.7)	(.04)
Advertising	1.84E-3	-9.52E-4	-3.33E-3	.945*
(19)	(17.4)	(2.5)	(.5)	(0.0)
Computer Services	-.018	.450	.178	.758*
(15)	(1.5)	(6.8)	(1.9)	(.0003)
Nonbusiness Services	-3.12E-3	.107	-.052	.736*
(58)	(1.5)	(12.5)	(.5)	(0.0)
Engineering	-.029	.139	-.167	.856*
(18)	(1.2)	(5.3)	(.8)	(0.0)
Transportation	2.05E-3	9.54E-3	4.39E-3	.009
(36)	(1.3)	(.9)	(.04)	(.36)
Retail Trade	3.14E-3	5.40E-3	-.014	.079
(39)	(1.9)	(.6)	(1.5)	(.12)
Food	6.39E-3	6.67E-3	.053	.004
(64)	(.7)	(.3)	(.7)	(.37)
Chemicals	.074	-.016	.415	.894*
(153)	(10.7)	(1.2)	(9.2)	(0.0)
Metals	.027	.088	.096	.433*
(146)	(3.3)	(3.1)	(2.4)	(0.0)
Nonelectric Machinery	.061	.054	.541	.596*
(199)	(1.7)	(1.6)	(5.9)	(0.0)
Electrical Machinery	.106	.300	-.285	.889*
(142)	(8.4)	(6.5)	(2.2)	(0.0)
Transportation Equipment	.166	-.041	.028	.822*
(53)	(8.4)	(1.1)	(.8)	(0.0)
Other Manufacturing	.060	.080	.062	.531*
(348)	(7.0)	(4.4)	(3.1)	(0.0)

NB: Number of firms and T ratios in parentheses. All values in millions of dollars.

Dependent variable: Parent exports.

* Significant at the 1% level.
**Significant at the 5% level.

Conclusion

We find that, given the size of parent operations at home, a firm that produces more abroad more often than not has fewer employees in the U.S. and pays slightly higher average wages and salaries. Both of these relationships are stronger among manufacturing firms than among service industry firms. We think the most plausible explanation is that factor proportions in the parent firm change as affiliate activity increases: the ratio of labor to capital declines and the skilled or professional labor content of production rises. This would be the case if multinational firms tended to place their more labor intensive operations abroad, leaving the more capital intensive and skill intensive ones for home production.

An alternative explanation might be that affiliate sales abroad displace U.S. exports. However, as in earlier studies for manufacturing, we found that net sales or production by foreign affiliates tends, if anything, to increase parent exports, and that this is the case in both manufacturing and services.

An exception to the apparent negative effect of affiliate production on parent employment is the fact that production by minority-owned manufacturing affiliates seems to increase parent employment. We attribute this effect to the strong positive effect of production by these affiliates on parent exports. That relation is also noted in Blomstrom, Lipsey, and Kulchycky (1988), where it is described as suggesting that minority-owned affiliate production is even more of a method of buying market share for the parent than is majority-owned affiliate production.

Another possible explanation of the negative relationship between parent employment and affiliate sales might be that the parents' capital/labor ratios are not altered by affiliate activity but that inputs of both capital and labor decline as foreign activity increases. This could happen only if larger

foreign operations made greater economies of scale available for the parent firm's operations. A possible example would be the spreading of the output of R&D or some types of central management input over a larger volume of production.

The conclusions that the production of U.S. parents is less labor intensive than it would be if there were less affiliate production, and that the quality of the labor the parents employ is higher, do not apply to differences among firms in all service or all manufacturing industries. There is a great deal of variation among the industries, and in many cases there is no visible effect within detailed industries. We conclude that, especially in service industries, the impact of foreign operations on domestic employment and skill levels should not be a major consideration in assessing the desirability of encouraging overseas production by U.S. firms.

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Appendix Table 1
Relationship (Linear) Between Parent Employment and Indicators of Affiliate Activity

Industry (No. of Firms)	R̄² (1)	Assets			Property, Plant & Equipment			Sales		
		Parent Assets (2)	MAJS Assets (3)	MINS Assets (4)	Parent PPE (5)	MAJS PPE (6)	MINS PPE (7)	Parent Sales (8)	MAJS Sales (9)	MINS Sales (10)
All Manufactures (1214)	.844* (0.0)	.0076 (40.5)	-.0025 (5.0)	-.0018 (2.9)						
	.733* (0.0)				.020 (29.2)	.0068 (4.5)	-.0044 (2.3)			
	.918* (0.0)							.010 (73.8)	-.0028 (10.5)	-.0037 (10.3)
All Services (589)	.275* (0.0)	.0039 (12.5)	.0015 (.48)	.0045 (.71)						
	.575* (0.0)				.021 (26.3)	.039 (3.0)	-.039 (2.8)			
	.864* (0.0)							.011 (55.9)	-.0096 (10.9)	.020 (6.5)
Wholesale Trade – Durable (99)	.732* (0.0)	.0071 (10.2)	.0052 (3.4)	-.035 (2.1)						
	.771* (0.0)				.034 (12.7)	.029 (4.7)	-.143 (3.5)			
	.178* (0.0001)							.0011 (3.5)	.0040 (3.9)	-.052 (3.2)
Wholesale Trade – Nondurable (66)	.868* (0.0)	.019 (14.1)	-.016 (6.2)	.012 (.27)						
	.935* (0.0)				.053 (20.6)	-.069 (10.1)	.101 (1.6)			
	.528* (0.0)							.0036 (7.3)	-.0027 (4.1)	-.0046 (.4)
Finance (24)	.635* (0.0)	.00056 (2.4)	.011 (3.7)	-.0025 (.72)						
	.894* (0.0)				.084 (13.1)	.019 (.20)	-.022 (.87)			
	.874* (0.0)							.0071 (11.0)	.0037 (.75)	.00022 (.11)

Appendix Table 1 (continued)

Industry (No. of Firms)	$\bar{R}^2$ (1)	Assets			Property, Plant & Equipment			Sales		
		Parent Assets (2)	MAJS Assets (3)	MINS Assets (4)	Parent PPE (5)	MAJS PPE (6)	MINS PPE (7)	Parent Sales (8)	MAJS Sales (9)	MINS Sales (10)
Insurance (71)	.822* (0.0)	.00063 (7.7)	.0089 (11.6)	-.00023 (.15)						
	.681* (0.0)				.020 (4.4)	.044 (2.9)	.019 (.47)			
	.912* (0.0)							.0034 (15.8)	.0084 (8.7)	.0051 (1.1)
Services (158)	.462* (0.0)	.020 (10.9)	-.045 (4.7)	-.050 (1.7)						
	.496* (0.0)				.028 (12.0)	-.051 (2.8)	-.014 (.23)			
	.717* (0.0)							.026 (19.5)	-.022 (4.0)	.0069 (.22)
Business Services (83)	.010 (0.29)	.0056 (1.9)	-.010 (.82)	-.017 (.77)						
	-.032 (0.92)				.00091 (.19)	.044 (.53)	-.014 (.31)			
	.361* (0.0)							.017 (6.9)	-.0037 (.42)	-.015 (.47)
Advertising (20)	.836* (0.0)	.012 (9.7)	-.0043 (1.6)	.0021 (.15)						
	.844* (0.0)				.056 (9.9)	.019 (.64)	.082 (.49)			
	.844* (0.0)							.0087 (9.5)	.0046 (1.4)	.016 (.81)
Computer Services	.250 (0.09)	.019 (2.4)	.020 (.35)	.053 (.61)						
	-.128 (0.73)				.015 (.95)	-.103 (.35)	.124 (.33)			
	.827* (0.0)							.027 (8.1)	-.027 (1.4)	-.042 (1.5)

Appendix Table 1 (continued)

Industry (No. of Firms)	R̄² (1)	Assets			Property, Plant & Equipment			Sales		
		Parent Assets (2)	MAJS Assets (3)	MINS Assets (4)	Parent PPE (5)	MAJS PPE (6)	MINS PPE (7)	Parent Sales (8)	MAJS Sales (9)	MINS Sales (10)
Nonbusiness Services (75)	.561* (0.0)	.023 (9.2)	-.060 (4.2)	-.069 (.78)						
	.667* (0.0)				.035 (11.8)	-.148 (4.1)	.624 (2.6)			
	.784* (0.0)							.028 (16.0)	-.028 (3.9)	.039 (.66)
Engineering (25)	.330* (0.0095)	.012 (2.7)	-.0091 (.65)	-.310 (2.9)						
	.282** (0.0187)				.024 (2.7)	-.024 (.49)	-.167 (.62)			
	.458* (0.0011)							.026 (3.5)	-.027 (2.3)	-.028 (.42)
Transportation (49)	.504* (0.0)	.0094 (7.2)	-.012 (1.1)	-.045 (.62)						
	.433* (0.0)				.012 (6.3)	-.012 (.54)	-.044 (.48)			
	.860* (0.0)							.014 (17.2)	-.0050 (.80)	-.064 (1.2)
Food (71)	.554* (0.0)	.0091 (4.2)	.0122 (2.2)	-.042 (2.2)						
	.546* (0.0)				.025 (7.4)	.034 (2.2)	-.051 (1.2)			
	.657* (0.0)							.011 (9.5)	-.0014 (.54)	-.018 (1.9)
Chemicals (166)	.892* (0.0)	.0080 (19.0)	-.0027 (2.7)	-.0061 (3.0)						
	.808* (0.0)				.0094 (9.1)	.019 (4.0)	-.016 (4.1)			
	.892* (0.0)							.0072 (18.3)	-.0014 (1.8)	-.0011 (.40)

Appendix Table 1 (continued)

Industry (No. of Firms)	$\bar{R}^2$ (1)	Assets — Parent Assets (2)	Assets — MAJS Assets (3)	Assets — MINS Assets (4)	Property, Plant & Equipment — Parent PPE (5)	Property, Plant & Equipment — MAJS PPE (6)	Property, Plant & Equipment — MINS PPE (7)	Sales — Parent Sales (8)	Sales — MAJS Sales (9)	Sales — MINS Sales (10)
Metals (170)	.730* (0.0)	.0061 (14.0)	.00056 (.47)	-.0012 (.85)						
	.688* (0.0)				.018 (17.5)	-.0087 (3.1)	-.0039 (1.6)			
	.925* (0.0)							.010 (34.2)	-.0031 (2.8)	-.0015 (1.0)
Nonelectric Machinery (213)	.924* (0.0)	.0071 (9.2)	.0013 (.90)	.017 (7.8)						
	.882* (0.0)				.021 (9.0)	-.0019 (.60)	.104 (10.2)			
	.963* (0.0)							.014 (22.0)	-.0037 (5.4)	.0099 (4.8)
Electric Machinery (149)	.910* (0.0)	.0062 (11.2)	.012 (4.4)	.0048 (.45)						
	.932* (0.0)				.035 (17.3)	.036 (2.9)	-.012 (.39)			
	.976* (0.0)							.011 (29.9)	.0032 (2.0)	-.0061 (1.4)
Transportation Equipment (58)	.932* (0.0)	.0080 (13.1)	-.0064 (3.7)	-.0011 (.74)						
	.951* (0.0)				.042 (13.6)	-.023 (4.0)	-.0059 (1.6)			
	.988* (0.0)							.0099 (42.9)	-.0044 (9.2)	-.0026 (5.8)

NB: Number of firms and T ratios in parentheses. All values in millions of dollars.
Dependent variable: Parent employment

* Significant at the 1% level.
**Significant at the 5% level.

Appendix Table 2
Characteristics of Coefficients of Affiliate Activity Variables
with Parent Employment as the Dependent Variable

Number of Equations with Signs as Indicated

Industry	Assets				PPE				Sales			
	All		Significant		All		Significant		All		Significant	
	(+)	(−)	(+)	(−)	(+)	(−)	(+)	(−)	(+)	(−)	(+)	(−)
I. MAJS												
All Services	1	0	0	0	1	0	1	0	0	1	0	1
Business Services	0	1	0	0	1	0	0	0	0	1	0	0
Nonbusiness Services	0	1	0	1	0	1	0	1	0	1	0	1
11 Service Equations	4	7	3	3	5	6	2	3	4	7	2	4
All Manufacturing	0	1	0	1	1	0	1	0	0	1	0	1
6 Mfg. Equations	4	2	2	2	3	3	3	2	1	5	1	3
II. MINs												
All Services	1	0	0	0	0	1	0	1	1	0	1	0
Business Services	0	1	0	0	0	1	0	0	0	1	0	0
Nonbusiness Services	0	1	0	0	1	0	1	0	1	0	0	0
11 Service Equations	3	8	0	2	5	6	1	1	5	6	0	1
All Manufacturing	0	1	0	1	0	1	0	1	0	1	0	1
6 Mfg. Equations	2	4	1	2	1	5	1	2	1	5	1	1

Appendix Table 3
Relationship of Parent Employment to Sales and Parent Imports

Industry (No. of firms)	$\overline{R}^2$	Parent Sales	MAJ Net Sales	MIN Net Sales	Par. Imports from All Aff.
All Manufacturing (1105)	.923* (0.0)	.011 (68.6)	-.0025 (8.9)	-.0022 (5.2)	-.012 (7.5)
All Services (454)	.893* (0.0)	.011 (56.5)	-.010 (11.1)	-.018 (6.0)	-.026 (2.0)
Wholesale-Durable (82)	.519* (0.0)	.0037 (5.2)	.0011 (.8)	-.031 (1.3)	.077 (3.4)
Wholesale-Nondurable (48)	.561* (0.0)	.0034 (5.8)	-.0018 (.9)	.0017 (.08)	-.107 (.5)
Finance	—	—	—	—	—
Insurance	—	—	—	—	—
Services (132)	.718* (0.0)	.026 (17.8)	-.024 (3.5)	.059 (1.3)	-.090 (.1)
Business Services (74)	.353* (0.0)	.017 (6.5)	-.0080 (.8)	-.0029 (.06)	1.860 (.5)
Advertising (19)	.849* (0.0)	.014 (3.4)	.0015 (.4)	2.75 E-4 (.01)	-54.74 (1.4)
Computer Services (15)	.805* (.0003)	.027 (7.2)	-.027 (1.3)	-.042 (1.4)	-1.16 (.1)
Nonbusiness Services (58)	.781* (0.0)	.028 (13.8)	-.032 (3.2)	.151 (1.7)	.148 (.2)
Engineering (18)	.392** (.03)	.029 (3.0)	-.038 (2.1)	-.0087 (.1)	.734 (.9)
Transportation (36)	.834* (0.0)	.015 (13.1)	-.0065 (.9)	-.117 (1.5)	.479 (.3)
Retail (39)	.888* (0.0)	.011 (10.0)	-.0037 (.6)	.016 (2.4)	-.012 (.2)
Food (64)	.663* (0.0)	.011 (9.4)	-.0021 (.8)	-.019 (1.9)	-.057 (1.0)
Chemicals (153)	.899* (0.0)	.0082 (16.6)	-.0014 (1.8)	.0011 (.4)	-.085 (3.4)
Metals (146)	.922* (0.0)	10 (30.4)	-.0022 (1.8)	2.11 E-4 (.1)	-.012 (2.2)
Nonelectric Machinery (199)	.963* (0.0)	.014 (20.0)	-.0040 (5.1)	.010 (4.7)	.013 (1.0)
Electric Machinery (142)	.975* (0.0)	.011 (28.9)	.0035 (2.0)	-.0067 (1.4)	-.0027 (.5)
Transportation Equipment (53)	.993* (0.0)	.012 (35.1)	-.0030 (6.8)	4.41 E-4 (.7)	-.023 (5.9)
Other Manufacturing (348)	.905* (0.0)	.0099 (33.5)	.0022 (2.8)	-.0070 (9.3)	-.0085 (.8)

NB: Number of firms and T ratios in parentheses. All values in millions of dollars.

* Significant at the 1% level.
**Significant at the 5% level.

Appendix Table 4

Relationship Between Parent Employment and Parent and Affiliate Sales and Relative Wage

Industry (No. of Firms)	Parent Sales	MAJ Net Sales	MIN Net Sales	Affiliate Wage /Par Wage	$\bar{R}^2$
All Manufactures (1105)	.010 (70.8)	-2.85E-3 (10.2)	-3.72E-3 (9.9)	.915 (1.5)	.920*
All Services (456)	.011 (56.3)	-.010 (11.6)	.019 (6.0)	.354 (.2)	.892*
Wholesale-Durable (82)	4.85E-3 (7.2)	1.93E-3 (1.4)	-.048 (1.8)	-.896 (.8)	.450*
Wholesale-Nondurable (48)	3.53E-3 (6.0)	-2.67E-3 (3.8)	-2.63E-3 (.1)	-.774 (.5)	.561*
Finance (19)	7.62E-3 (12.1)	1.45E-3 (.3)	6.47E-4 (.3)	.065 (.04)	.910*
Insurance (51)	3.43E-3 (13.4)	8.27E-3 (7.7)	4.36E-3 (.9)	-.807 (.4)	.913*
Services (133)	.026 (18.2)	-.024 (4.0)	.061 (1.3)	2.04 (1.8)	.726*
Business Services (75)	.016 (6.4)	-4.82E-3 (.5)	-1.24E-3 (.03)	2.22 (1.4)	.371*
Advertising (19)	8.60E-3 (9.2)	4.50E-3 (1.3)	.011 (.5)	1.79 (1.1)	.841*
Computer Services (15)	.025 (7.6)	-.023 (1.3)	-.029 (1.2)	2.23 (2.3)	.871*
Nonbusiness Services (58)	.028 (14.3)	-.030 (3.8)	.154 (1.8)	2.40 (1.5)	.790*
Engineering (18)	.027 (2.7)	-.030 (1.9)	-.030 (.4)	-.482 (.3)	.355** (.04)
Transportation (36)	.015 (12.5)	-6.20E-3 (.9)	-.101 (1.3)	1.68 (.3)	.833*

Appendix Table 4 (continued)

Industry (No. of Firms)	Parent Sales	MAJ Net Sales	MIN Net Sales	Affiliate Wage /Par Wage	$\bar{R}^2$
Food (64)	.011 (9.3)	-2.29E-3 (.8)	-.017 (1.8)	1.64 (.5)	.658*
Chemicals (153)	7.23E-3 (17.6)	-1.53E-3 (1.9)	-5.40E-4 (.2)	.882 (.5)	.891*
Metals (146)	.010 (30.1)	-3.04E-3 (2.5)	-1.66E-3 (1.0)	-.503 (.5)	.920*
Nonelectrical Machinery (199)	.014 (21.9)	-3.78E-3 (5.6)	9.89E-3 (4.8)	3.36 (3.9)	.965*
Electrical Machinery (142)	.011 (28.9)	3.25E-3 (1.9)	-6.43E-3 (1.4)	-.643 (.6)	.975*
Transportation Equipment (53)	9.93E-3 (41.4)	-4.33E-3 (8.8)	-2.56E-3 (5.6)	2.97 (.6)	.989*
Other Manufacturing (348)	9.91E-3 (33.9)	1.97E-3 (2.8)	-6.90E-3 (9.2)	.911 (1.6)	.905*

NB: Number of firms and T ratios in parentheses. All values in millions of dollars.
Dependent variable: Parent employment.

* Significant at 1% level.
**Significant at 5% level.

Appendix Table 5
Relationship Betwen Parent Compensation per Employee
and Indicators of Relative MOFA Activity

Industry	No. of Firms (1)	$\overline{R}^2$ (2)	MAJ/Parent Assets (3)	MAJ/Parent Sales (4)	MAJ/Parent PPE (5)
All Services	589	-.0006	.199 (.8)		
		-.002		.016 (.2)	
		.0007			3.61 E-7 (1.2)
		.0003		-.126 (.9)	6.08 E-3 (1.5)
Wholesale-Durables	99	-.010	-7.58 E-3 (.03)		
		.009		-.098 (.4)	
		-.010			7.24 E-3 (.2)
		-.015		-.272 (.7)	.032 (.6)
Wholesale-Nondurables	66	.092*	4.12 (2.8)		
		.047**		2.26 (2.0)	
		.075*			.060 (.01)
		.085**		1.50 (1.3)	.049 (1.9)
Finance	24	-.018	-7.41 (.8)		
		.020		-.232 (.7)	
		-.033			-3.14 E-3 (.5)
		-.002		-2.19 (1.3)	.039 (1.2)
Insurance	71	.007	1.64 (1.2)		
		-.009		1.97 (.6)	
		-.003			.425 (.9)
		-.018		-.219 (.05)	.449 (.6)

Appendix Table 5 (continued)

Industry	No. of Firms (1)	$\overline{R}^2$ (2)	MAJ/Parent Assets (3)	MAJ/Parent Sales (4)	MAJ/Parent PPE (5)
Services	158	.031*	4.63 (2.5)		
		.045*		3.23 (2.9)	
		.109*			1.36 (4.5)
		.107*		.994 (.8)	1.22 (3.4)
Business Services	83	.024	5.04 (1.7)		
		.081*		5.35 (2.9)	
		.158*			1.35 (4.0)
		.148*		.283 (.1)	1.31 (2.7)
Advertising	20	.102	11.04 (1.8)		
		.025		3.47 (1.2)	
		.007			2.93 (1.1)
		-.026		2.58 (.7)	1.26 (.3)
Computer Services	16	-.070	1.96 (.1)		
		-.057		1.96 (.4)	
		-.045			6.82 (.6)
		-.125		.290 (.05)	6.30 (.4)
Nonbusiness Services	75	.015	3.21 (1.5)		
		.005		1.41 (1.2)	
		.010			-2.45 (1.3)
		.045		2.53 (1.9)	-4.11 (2.0)

Appendix Table 5 (continued)

Industry	No. of Firms (1)	$\overline{R}^2$ (2)	MAJ/Parent Assets (3)	MAJ/Parent Sales (4)	MAJ/Parent PPE (5)
Engineering	25	-.020	2.05 (.7)		
		-.040		.426 (.3)	
		.015			-3.68 (1.2)
		.004		1.38 (.9)	-4.97 (1.4)
Transportation	49	.048	-5.26 (1.8)		
		-.011		-1.23 (.7)	
		-.021			.050 (.2)
		-.032		-.378 (.3)	.043 (.7)
All Manufacturing	1,214	.014*	2.50 (4.3)		
		.007*		1.20 (3.0)	
		.009*			.840 (3.5)
		.011*		.825 (1.9)	.673 (2.6)
Food	71	.213*	4.84 (4.5)		
		.128*		7.62 (3.4)	
		.221*			1.66 (4.6)
		.231*		3.47 (1.4)	1.36 (3.2)
Chemicals	166	-.005	.463 (.4)		
		-.004		.314 (.6)	
		.003			-1.14 (1.2)
		.003		.586 (1.0)	-1.48 (1.5)

Appendix Table 5 (continued)

Industry	No. of Firms (1)	$\overline{R}^2$ (2)	MAJ/Parent Assets (3)	MAJ/Parent Sales (4)	MAJ/Parent PPE (5)
Metals	170	-.005	.798 (.3)		
		-.001		1.07 (.9)	
		-.006			.327 (.2)
		-.007		1.18 (.9)	-.337 (.2)
Nonelectrical Machinery	213	-.004	.739 (.4)		
		-.002		1.28 (.8)	
		-.004			.860 (.5)
		-.007		1.20 (.6)	.166 (.08)
Electrical Machinery	149	-.0007	-1.82 (.9)		
		-.006		-.496 (.2)	
		.005			-2.10 (1.3)
		.005		2.95 (1.0)	-3.78 (1.6)
Transportation Equipment	58	-.001	-5.10 (1.0)		
		-.017		-.734 (.2)	
		-.004			-3.42 (.9)
		-.009		5.75 (.8)	-7.63 (1.2)

NB: Dependent variable: parent compensation per employee.

* Significant at the 1% level.
**Significant at the 5% level.

Appendix Table 6

Relationship of Parent Exports to Parent and Affiliate Sales and Factor Intensities

Industry (No. of Firms)	Parent Sales to U.S.	MAJ Net Sales	MIN Net Sales	Parent Wage	Parent PPE/Emp.	$\bar{R}^2$
All Manufacturing (1105)	.128 (27.5)	-1.13E-3 (.1)	.047 (4.4)	3.69 (4.6)	-.278 (1.5)	.726*
All Services (456)	-3.09E-3 (.9)	.403 (26.8)	-.167 (3.1)	-.570 (.6)	-.041 (.3)	.619*
Wholesale-Durable (82)	.024 (3.5)	.041 (3.2)	.119 (.5)	.167 (.4)	3.56E-3 (.02)	.420*
Wholesale-Nondurable (48)	-1.09E-3 (.02)	.313 (6.6)	8.93 (6.2)	-1.18 (.3)	1.41 (1.2)	.907*
Finance (19)	-8.08E-3 (4.9)	.119 (9.9)	-2.16E-3 (.4)	.104 (1.5)	-7.74E-3 (.05)	.840*
Insurance (51)	-1.88E-4 (.2)	.072 (17.5)	6.63E-3 (.4)	-.050 (.08)	.436 (1.4)	.935*
Services (133)	-2.02E-3 (1.0)	.093 (11.3)	-.024 (.4)	-.052 (.8)	-2.89E-3 (.5)	.505*
Business Services (75)	3.51E-3 (.7)	.037 (2.1)	.054 (.7)	-.076 (1.0)	-1.18E-3 (.2)	.061
Advertising (19)	1.90E-3 (12.4)	-9.19E-4 (2.2)	-3.40E-4 (1.4)	5.83E-4 (.2)	-4.73E-3 (.5)	.938*
Computer Services (15)	-.022 (2.5)	.475 (9.4)	.197 (2.8)	-.366 (2.7)	4.62E-3 (.7)	.862*
Nonbusiness Services (58)	-2.30E-3 (1.0)	.115 (12.4)	-.080 (.8)	-7.50E-3 (.07)	-.087 (2.3)	.751*
Engineering (18)	-.015 (1.5)	.157 (14.1)	-.181 (2.1)	.076 (.7)	-.304 (8.3)	.977*

Appendix Table 6 (continued)

Industry (No. of Firms)	Parent Sales to U.S.	MAJ Net Sales	MIN Net Sales	Parent Wage	Parent PPE/Emp.	$\bar{R}^2$
Transportation (36)	1.79E-3 (1.0)	.011 (1.0)	4.14E-4 (.004)	.059 (.2)	-7.32E-3 (.5)	-.050
Retail (39)	3.13E-3 (1.8)	5.12E-3 (.6)	-.014 (1.4)	.317 (.5)	6.37E-3 (.01)	.031
Food (64)	2.87E-3 (.4)	.023 (1.2)	-.025 (.4)	-1.67 (1.2)	2.00 (5.1)	.290*
Chemicals (153)	.072 (10.7)	-.014 (1.1)	.401 (9.1)	1.34 (1.6)	.227 (2.0)	.899*
Metals (146)	.022 (2.7)	.094 (3.4)	.032 (.8)	.787 (.9)	.804 (3.3)	.483*
Nonelectrical Machinery (199)	.066 (1.9)	.046 (1.4)	.527 (5.8)	3.12 (1.8)	.755 (1.3)	.606*
Electrical Machinery (142)	.102 (8.1)	.306 (6.7)	-.307 (2.4)	2.16 (1.2)	2.07 (1.5)	.891*
Transportation Equipment (53)	.156 (8.0)	-.036 (1.0)	.021 (.6)	24.09 (2.5)	-8.03 (.9)	.835*

NB: Dependent variable: Parent exports.

*Significant at the 1% level.