

## **Outsourcing, Offshoring, and Trade: Identifying Foreign Activity Across Census Data Products**

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### **Abstract**

The 2007 Economic Census asked establishments to identify if they engaged in domestic outsourcing or foreign offshoring for manufacturing and wholesaling. These novel data can be linked to existing longitudinal business microdata that include information on such variables as employment, firm structure and revenue. In this paper, we describe the collected responses, their distribution across sectors, and some business activity patterns with reference to the U.S. economy as a whole. We find that the majority of establishments do not offshore but those that do are likely to belong to larger firms; furthermore, most offshorers can be linked to at least one import transaction. Interestingly, less than a third of manufacturing activity occurs among “Traditional Manufacturers” – firms that design and produce their own good and whose primary activity is the production of their own goods. We observe additional differences in employment shares and growth between offshorers and own-producers. Finally, we find the special inquiry data are a valuable complement to other Census Bureau microdata on trade transactions and firm dynamics. While there is still more work needed to develop a fully integrated data infrastructure, this paper demonstrates that analytic utility of that infrastructure will likely be very high.

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\* Center for Economic Studies, U.S. Census Bureau, 4600 Silver Hill Road, Washington, DC 20233. Any opinions and conclusions expressed herein are those of the authors and do not necessarily represent the views of the U.S. Census Bureau. All results have been reviewed to ensure that no confidential information is disclosed. We would like to thank Susan Houseman, Ken Ryder, Dennis Shoemaker, John Murphy, and participants in the National Academy of Public Administration pre-conference workshop on measurement and globalization.

## I. Introduction

The practice by which firms transfer all or part their production to another company is called “outsourcing” if the partner business is domestic and “offshoring” if foreign. While offshoring and outsourcing have been controversial topics in the public discourse, some have noted that these practices can impact many of the key measures we use to track the health of our economy. Houseman (2007, 2008) notes, in particular, that increased sourcing of imports, whose prices are poorly measured and biased upwards, is leading to mismeasurement of industry productivity statistics. In addition, the growing ease with which production activities can be moved around the globe to take advantage of factor price differentials has made the classification and measurement of activity at domestic business establishments and firms more difficult.

Our ability to quantify and examine how outsourcing and offshoring affect our statistics and economy has been severely limited by a lack of appropriate data.<sup>1</sup> This paper is an exploratory study that utilizes a unique new dataset linking survey based offshoring data from the 2007 Economic Census with administrative import and export transactions files. With these data, we are able to conduct a number of exercises aimed at assessing our ability to identify firms engaging in these practices and to appropriately classify their activities in official statistics. Moreover, the data we use are part of a broader effort underway at the Center for Economic Studies (CES) to link import, export, outsourcing, and longitudinal firm data. CES maintains and updates an innovative dataset of the universe of transaction-level foreign trade data linked to firm-level data from the Longitudinal Business Database (LBD), the Economic Censuses and other data sources. The new file is called the Longitudinal Firm Trade Transactions Database or (LFTTD).<sup>2</sup>

In this paper, we describe and evaluate the new Census 2007 questions on outsourcing. For example, we break down the responses by industry sector and firm size and identify some intuitively appealing stylized facts. We observe, for example, that although most offshoring firms are small, offshoring firms are overrepresented among the largest firms, i.e., those that employ more than five hundred workers. To gauge the reliability of the offshoring responses, we match them to international trade data and find that, as expected, a disproportionate share of the firms that report outsourcing activities also can be linked to an import transaction. Finally, we more closely scrutinize differences in employment shares and growth among the three different types of manufacturing sourcing firms.

The paper proceeds as follows: Section II describes the new data we use. Section III provides some basic statistics and various exercises that include data quality checks; disaggregation by major sector, size, and activity; linkage to trade data; comparisons at the establishment- and firm-levels; and preliminary analyses of employment differences. Section IV summarizes our findings and concludes.

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<sup>1</sup> Helpman (2006) notes that while theoretical work on why firms outsource production or invest abroad for vertical integration is inconclusive, very few studies empirically test some model implications due to a lack of appropriate data.

<sup>2</sup> The LFTTD was developed primarily through the efforts of J. Bradford Jensen, an RDC researcher. See the data appendix in Bernard, Jensen and Schott (2009) for details.

## II. Data

Among other business microdata, CES maintains and updates a novel dataset of the universe of transaction-level foreign trade data linked to firm-level data from the LBD, the Business Register (BR), Economic Censuses and other data sources. The transaction-level international trade files, also known as the Foreign Merchandise Trade (FMT) data, underlie the Census Bureau's published foreign trade statistics, which are the official source of data on U.S. international trade.<sup>3</sup> The export data come from exporters' electronic filings on the Census Bureau's Automated Export System and also through a data-sharing arrangement with the Canadian government. Each filing represents a shipment of one or more kinds of merchandise from one exporter to one importer on a single carrier. Similarly, the import data come from the U.S. Customs' Automated Commercial System which collects information on imports from import entry forms, warehouse withdrawal forms, and Foreign Trade Zone documents.

These data contain information for each transaction, including the ten-digit Harmonized Schedule (HS) code, value, quantity, entry or exit port, date of transaction, mode of transportation and related-party status. Data are collected for every import transaction with a value greater than \$2,000 and every export transaction with a value greater than \$2,500. In addition, the Employer Identification Number (EIN) of the importer or exporter is collected. This is the primary variable used to link the records to other Census data products like the BR.<sup>4</sup>

The BR is the primary file used to assign Firm IDs to transaction-level trade data. In particular, the BR contains establishment-level data including EIN, firm name, Firm ID, address and industry affiliation. Matching transaction-level import data to Firm IDs is relatively straightforward. Because most export and all import transaction data contain a field for the EIN, observations can be linked directly to the BR. The match rates of import transactions to the BR are typically in the 80 percent range and the share of matched import value is typically above 80 percent. The linked trade transaction data with firm identifiers are the key components of the LFFTD.<sup>5</sup>

For this exercise, we link the LFFTD files to the special inquiries data on offshoring and outsourcing in the 2007 Economic Census. The questions were originally designed to help Census more accurately describe firms' supply chains and to aide in the classification of the increasingly complex web of manufacturing activities. In particular they ask manufacturing and wholesaling plants whether (1) they designed the goods they sell, (2) their primary activity was manufacturing (for themselves or others) or re-sales and (3) if they purchased contract-manufacturing services from either foreign or domestic companies.<sup>6</sup> For all establishments that received a form, about 72 percent of wholesale establishments and 66 percent of manufacturing plants responded to the questions,

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<sup>3</sup> Tang (2009) describes the FMT in detail and provides useful information including variable definitions, codebooks and variable coverage over time. The data cleaning performed to construct the FMT include, for example, assigning time-consistent variable names.

<sup>4</sup> The EIN variable is not present on records of exports to Canada due to a bilateral data exchange program; instead, name and address are used. Because of differences in matching methodologies as well as the sheer number of records (20 million per year), it has taken several years for researchers to develop matching algorithms that can be rapidly and reliably applied to new years of data.

<sup>5</sup> The description of the matching procedure for imports and exports draws heavily on the data appendix in Bernard, Jensen and Schott (2009).

<sup>6</sup> 2007 Economic Census, Forms MC-313XX through 315XX, Question 26. Although the question was asked in the Census of Manufacturers, respondents included both manufacturers and wholesalers. See appendix at the end of this paper for the specific questions (under "Special Inquiries"). Note that the language used in these questions was not pretested.

which is roughly comparable to the 72 percent and 73 percent response rates for employment.<sup>7</sup> Although the questions were not officially pre-tested, our results indicate that the responses make intuitive sense.

### **III. Exploratory exercises**

#### Special Inquiry Cross-Tabulations, by Activity, Count, and Size

We begin our analysis with a few basic tabulations. Table 1 presents establishment-level breakdowns for each part of the special inquiry, while Table 2 contains analogous figures for employment.<sup>8</sup> From these basic summary statistics, a number of interesting patterns quickly emerge. Almost 60 percent of establishments responding to this part of the manufacturing form indicate that they design their own goods (row 2, column 1), while only 15 percent of responding wholesale establishments state the same. For part 2 of the special inquiry, the majority of responses to both forms are consistent with the expected industry definition of the establishments. For example, roughly 81 percent of the manufacturing establishments (and about 86 percent of their employment) is accounted for by establishments that reported their major activity as either “production” or “contracting.” Similarly, about 68 percent of establishments (and 66 percent by employment) that answered the wholesale forms reported their major activity as “resales.”<sup>9</sup> Note that although the first row indicates the total number of establishments or their associated employment, not all establishments necessarily answered each part of the inquiry, which is why the subtotals for each part may sum to less than the total responses.

[Tables 1 and 2]

Interestingly, 5 percent of tabbed manufacturing establishments report that their primary activity is resales and 7 percent of tabbed wholesale establishments report their major activity is production. While the special inquiry data were not used for classification purposes the Economic Census is the most reliable source of industry codes available to the Census Bureau and quinquennial collection results in a substantial number of corrections to establishment industry codes. In fact, about 5 percent of the manufacturing establishments (non-blank) were classified in different (non-manufacturing) sectors after the 2007 Economic Census form was received and the share of wholesalers that switched sectors was roughly twice that. These numbers are typical during Economic Census operations. Thus, the findings from the special inquiries are in line with typical re-classification rates.

In light of recent research on the effects of Professional Employer Organizations (PEOs) on industry statistics, it is worthwhile to note that in separate calculations, we found these shares to have been relatively stable

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<sup>7</sup> These include all long-form manufacturing cases and all wholesale establishments except for Miscellaneous Wholesale and Agents and Brokers. Furthermore, note that establishments receiving forms represent less than half of the universe of establishments. We thank Dennis Shoemaker in the Census Bureau's Economic Planning and Coordination Division for providing the background information.

<sup>8</sup> Since this categorization is based on which forms the establishments responded to and not on a comprehensive measurement of the overall firms' activities, one should interpret the table accordingly. That is, it may be that the establishment is classified as “wholesale” but report doing their own production because they are part of a larger firm that has manufacturing activities.

<sup>9</sup> We should note that this sample conditions on the establishments answering all three questions and also excludes wholesale establishments that are known to act primarily as manufacturers' sales offices.

since at least 1997.<sup>10</sup> That is, it seems unlikely that the share of manufacturers reporting that they engage in other activities is due to them reclassifying themselves because they use PEOs. Instead, it seems like a normal part of the classification process. Furthermore, most establishments indicated that they neither outsource or offshore any activity. For manufacturing, the offshorer, outsourcer, and own-producer shares were roughly 2, 26, and 69 percent, respectively. For wholesale establishments, the analogous shares were 4, 11, and 82 percent.

The employment breakdowns in Table 2 are qualitatively similar to the figures in Table 1, with employees concentrated in each sector's primary functions (manufacturing and reselling). However, note that establishments that offshore production - particularly manufacturers - represent twice their share of manufacturing employment (4 percent) than they do of establishments (2 percent). Thus, establishments reporting offshoring activity are larger, on average, than non-offshorers.<sup>11</sup>

The decision to outsource or offshore production activities is better thought of as a firm-level rather than establishment-level choice. For the exercises that follow, we will shift our unit of analysis to the firm-level. In order to do this we need a protocol for aggregating the establishment-based questions from the Economic Census. Our approach is to classify a firm as an offshorer if it operates at least one establishment that reports offshoring activity, an outsourcer if has no offshoring establishments and at least one outsourcing establishment. Firm with no contracts make up the balance.

One important firm characteristic that is likely related to the propensity to engage in outsourcing and offshoring activity is size. Table 3 shows the number of firms grouped by size and primary sourcing activity. While small firms (i.e., those with fifty or fewer employees) dominate each category of firm, a greater proportion of offshoring firms (8 percent) employ more than 500 employees compared to firms with no contracts (1 percent) or those using domestic suppliers (5 percent). That is, while most offshoring firms are small, the greatest share of offshoring activity can be found among large firms.

[Table 3]

#### Matching to the Trade Transactions Files

A natural quality control check on the validity of the offshoring responses was to look at differences in observed importing activities among the three firm production types. As shown in Table 4, the overwhelming majority (78 percent) of firms that reported offshoring activity on the 2007 Economic Census form can be matched to at least one import transaction in 2007. We cannot conclude that most of the remaining firms that responded that they are offshorers but were not matched to an import transaction answered the form incorrectly since (1) our matching methodology between firms and import transactions is still under development and (2) not all firms that outsource their production will necessarily re-import the good. Clearly many of these firms are MNCs that sell

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<sup>10</sup> Dey et al (2009).

<sup>11</sup> The relative share of domestically outsourced employment in manufacturing (35.0 percent) reported here is comparable to that found using the 2005 Contingent Worker Supplement (CWS) collected by the Bureau of Labor Statistics (38.7 percent). *Ibid*, Table 3.

goods and services in many different countries and it may be that the majority of their offshore production is aimed at foreign markets. Finally, (3) many firms use third-party wholesale firms to handle their foreign trade activity.

[Table 4]

Interestingly, Table 4 also shows that while the shares of total import value are fairly similar across the production categories, if one considers the much smaller number of offshoring firms it is clear that offshorers import far more than other types of producers. We also corroborated this hierarchy of import activity by firm production type by focusing on two specific industries: vehicle manufacturing and electronics where we found even stronger results.<sup>12</sup> Additional breakdowns by each census form type are presented in Tables 5 and 6, which also present the number of firms and their employment associated with the responding establishments. We in turn identify the number of manufacturing and wholesaling establishments owned by these firms, which may or may not have responded to the census forms, as well as how many of these firms can be identified in the import transaction data and what share of total U.S. imports those transactions represent. It is interesting to note the employment discrepancy among respondents to the wholesaling forms (Table 6), with both own producers and outsourcers having a larger share of their workers in wholesaling establishments (column 4) than in manufacturing, as one would expect; yet among offshorers this is not the case. These statistics hint at the complex structure of larger multinational companies. We're hopeful that the integrated data infrastructure discussed here and still under development will help researchers to get a better handle on how firms and value chain evolve and the role outsourcing and offshoring play in this evolution.

[Tables 5 and 6]

### Comparing Manufacturing Types

In a recent Federal Register Notice the Organization of Management and Budget's (OMB's) Economic Classification Policy Committee (ECPC) pointed-out some of the difficulties involved in defining what a manufacturing establishment is in the presence of outsourcing and offshoring.<sup>13</sup> They define three general types of manufacturing units: (1) Traditional or Integrated Manufacturing (2) Manufacturing Service Providers and (3) Factoryless Goods Providers. They define the major characteristics of each as follows:

- (1) *Traditional Manufacturers:*
- Perform transformation activities
  - Own the rights to the product they manufacture
  - Control and facilitate the production process
  - Sell the final good

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<sup>12</sup> Results are withheld due to potential disclosure of confidential information.

<sup>13</sup> OMB (2009).

- (2) *Manufacturing Service Providers:*
- Performs transformation activities
  - Receives contracts to perform transformation activities
  - Does not own intellectual property or design of the final product
  - Does not own the final product
  - Controls the production facility but not the production process
  - Does not sell the final product
- (3) *Factoryless Goods Providers:*
- Does not perform transformation activities
  - Contracts with Manufacturing Service Providers
  - Owns the intellectual rights to the final product
  - Owns the final product
  - Sells the final product

We make use of the new questions on the 2007 Economic Census to approximate these categories using the following definitions:

- (1) *Traditional Manufacturers*
- Establishment does not contract out for manufacturing services from other companies or other establishments of its company
  - Establishment's primary activity is manufacturing
  - Establishment designs, engineers, or formulates the manufactured products it sold, produced or shipped.
- (2) *Manufacturing Service Providers*
- Establishment does not contract out for manufacturing services from other companies or other establishments of its company
  - Establishment's primary activity is providing contract services for others
  - Establishment does not design, engineer, or formulate the manufactured products it produced or shipped.
- (3) *Factoryless Goods Provider:*
- Establishment does not contract out for manufacturing services from other companies or other establishments of its company (both in and outside of U.S.)
  - Establishment's primary activity is resales
  - Establishment designs, engineers, or formulates the manufactured products it sold, produced or shipped.

Table 7 displays the shares of activity accounted for by each establishment type. The denominator is the sample of total activity accounted for by the establishments that answered all three questions. While Traditional Manufacturers dominate the three categories of producer types, they represent less than a third of total manufacturing activity by establishment count and employment.

[Table 7]

Of course, it may be that traditional manufacturers are more (or less) common in certain industries. We investigate this possibility by calculating the employment shares accounted for by these producers for a subset of NAICS industries. Due to disclosure concerns, we limit the analysis to only those industries with a relatively large number of firms; results are displayed in Figure 1.<sup>14</sup>

[Figure 1]

Clearly, there is wide variability in the shares of activity accounted for by traditional manufacturers across industry sub-groups. The range of activity starts at about 8 percent for printing and ranges to almost half for textile mills. Interestingly, computer manufacturing, an industry one would normally associate with outsourcing, is only slightly above the average share of employment at traditional manufacturers. This unexpected finding for computer manufacturing suggests that as outsourcing and offshoring become more common, firms may become less manufacturing-intensive over time. That is, firms that previously had a large share of manufacturing employment may begin to specialize more heavily in other activities and it may affect their manufacturing employment, overall employment or both.

To explore this issue further, we identified firms that existed in both 1990 and 2007 and categorized them according to whether or not they outsourced, offshored, or did not contract-out for manufacturing services. Next we calculated the firms' shares of manufacturing employment in both years as well as the changes in total employment for each group; these are shown in Figures 2 and 3, respectively.

[Figures 2 and 3]

Both figures show an ordering to the changes in employment. The firms without contracts decline less or grow more than either outsourcers or offshorers. In Figure 2 non-contracting firms' manufacturing shares (weighted means) declined about 13 percent, similar to outsourcers (14 percent) but visibly less than offshorers (18 percent). Similarly, in Figure 3 we see that own producers had much stronger growth than did either outsourcing or offshoring firms. In fact, employment actually declined at offshoring firms.

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<sup>14</sup> We found similar results for establishment shares but omit them here for brevity.

### Multivariate Analysis of Employment Trends

The above findings do not control of any of the many other factors that are known to affect firm growth rates such as age, size and geography. While a rigorous treatment of these factors is beyond the scope of this exploratory paper, we begin by running linear regressions of changes in manufacturing shares and total employment on a set of basic firm controls – as well as firm type. The results are reported in Table 8.

[Table 8]

In both specifications, the omitted firm type is non-contractors so the results should be interpreted accordingly. Interestingly, the regression results do not completely support our preliminary observations from the earlier figures. Controlling for other major factors, both outsourcers and offshorers are associated with a more negative change in their shares of manufacturing employment (column 1, rows 5 and 6) relative to own producers. On the other hand, with growth in total manufacturing employment as the dependent variable (column 2), it appears that outsourcers may have had more employment growth than own-producers, and substantially more than offshorers. These discrepant findings suggest that substantial care must be taken in any interpretation and that much more work is necessary before we are fully confident in the results.

### **IV. Conclusion**

This paper takes advantage of a unique new dataset linking offshoring data from the 2007 Economic Census with import and export transactions files to examine the prevalence of outsourcing and offshoring and how these activities are correlated with firm productivity. We performed a number of preliminary quality control and exploratory exercises and obtained the following results:

1. The majority of establishments do not report either outsourcing or offshoring activity.
2. Most establishments' activity is consistent with their industry definitions. That is, most wholesalers report resales as their primary activity and most manufacturers report either manufacturing or contracting as their primary activity. Differences from these norms is in-line with historical industry changes that normally occur during economic censuses.
3. The majority of offshoring firms are small but large firms are more likely to engage in offshoring.
4. We are able to match 78 percent of the firms that reported engaging in offshoring activity to at least one import transaction. This is encouraging given that there is some noise in our linking variable and that a firm that offshores does not necessarily need to re-import the good.
5. Less than a third of manufacturing activity occurs at “Traditional” manufacturing plants that design and produce their own goods and whose primary activity is manufacturing for themselves.
  - a. A further 11 percent occurs at “Manufacturing Service Providers”
  - b. Less than 1 percent is accounted for by “Factoryless Goods Providers”
  - c. There are substantial differences in these shares across industries.

6. As a group, non-contractors grew more and stayed more manufacturing-intensive than both outsourcers and offshorers, but when we controlled for key firm characteristics we found that outsourcing firms grew more than non-contractors.

Additional areas for study that can usefully exploit these data include examining the role of outsourcing and offshoring in firm and productivity dynamics. Combining the data infrastructure described in this paper with BEA data on trade in services and foreign direct investment would greatly enhance the analytic capability of both – permitting the analysis of, for example changes in the distribution of manufacturing and wholesaling activities across establishments within domestic-only and multinational firms; and investment patterns by sector and firm type.<sup>15</sup> Discussions about bringing these rich data sources together are ongoing.

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<sup>15</sup> Data on foreign direct investment (FDI) are collected by the U.S. Bureau of Economic Analysis; see Mataloni (1995), Quijano (1990), and U.S. BEA (2004, 2006).

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<b>Table 1: Special Inquiry Response Breakdown, by Form Type: Establishment</b>		
	Manufacturing	Wholesaling
Total establishment count*	106,550	153,147
Own design		
Yes	63,017	22,554
No	41,266	127,942
Primary function		
Production	57,371	10,061
Contracting	28,725	4,169
Reselling	5,326	104,900
Other	10,725	20,627
Primary sourcing		
No contracts	74,030	126,100
Domestic outsourcing	28,173	16,762
Foreign offshoring	2,269	5,397

\*Includes all establishments that answered any part to special inquiry.

<b>Table 2: Special Inquiry Response Breakdown, by Form Type: Employment</b>		
	Manufacturing	Wholesaling
Total employee count	9,215,356	2,805,397
Own design		
Yes	6,129,012	547,211
No	2,937,883	2,209,371
Primary function		
Production	6,211,181	291,188
Contracting	1,790,786	63,166
Reselling	198,641	1,847,761
Other	603,521	422,633
Primary sourcing		
No contracts	5,486,210	2,195,630
Domestic outsourcing	3,161,254	380,445
Foreign offshoring	361,009	143,767

<b>Table 3: Number of Firms by Employment Size</b>			
	≤50	51-500	>500
No contracts	122,139	21,401	2,007
Domestic outsourcing	23,899	7,699	1,551
Foreign offshoring	4,402	1,122	506

<b>Table 4: Importing, Offshoring, and Outsourcing</b>			
	2007 EC respondent firms	2007 import data matches	% Total value of imports (2007)
No contracts	154,961	40,827	19%
Domestic outsourcing	33,313	10,250	16%
Foreign offshoring	6,055	4,750	14%

<b>Table 5: Special Inquiry Part 3 Breakdown: Primary Sourcing in Manufacturing Responses</b>						
	Estab.	Firms				Import value* (\$ bil)
			<i>Affiliated mfg. estab.</i>	<i>Affiliated wholesale estab.</i>	Matched to import data	
<b>Total</b>						
count	104,472	75,677	113,084	39,442	20,738	\$855.7
employees	9,008,473	19,575,864	10,472,662	1,371,578	16,070,271	
<b>No contracts</b>						
count	74,030	52,629	65,520	13,306	11,932	\$205.9
employees	5,486,210	7,602,322	3,872,270	479,717	5,135,543	
<b>Outsourcing</b>						
count	28,173	20,991	37,021	14,806	7,088	\$356.3
employees	3,161,254	7,579,528	4,276,430	499,135	6,588,885	
<b>Offshoring</b>						
count	2,269	2,057	10,543	11,330	1,718	\$293.5
employees	361,009	4,394,014	2,323,962	392,726	4,345,843	
*Note: total U.S. import value in 2007 = \$2,344.6 billion						

<b>Table 6: Special Inquiry Part 3 Breakdown: Primary Sourcing in Wholesaling Responses</b>						
	Estab.	Firms				Import value* (\$ bil)
			<i>Affiliated mfg. estab.</i>	<i>Affiliated wholesale estab.</i>	Matched to import data	
<b>Total</b>						
count	148,259	122,227	24,966	194,312	37,586	\$987.3
employees	2,719,842	16,431,116	4,746,349	3,839,155	14,316,785	
<b>No contracts</b>						
count	126,100	104,087	6,631	148,036	29,910	\$387.9
employees	2,195,630	7,527,531	779,450	1,604,389	5,775,482	
<b>Outsourcing</b>						
count	16,762	13,700	10,634	29,948	4,223	\$298.5
employees	380,445	4,728,984	2,015,647	749,150	4,413,939	
<b>Offshoring</b>						
count	5,397	4,440	7,701	16,328	3,453	\$300.9
employees	143,767	4,174,601	1,951,252	485,616	4,127,364	
*Note: total U.S. import value in 2007 = \$2,344.6 billion						

	Establishment share (%)	Employment share (%)
Traditional manufacturers	28.1	30.3
Manufacturing service providers	11.0	6.0
Factoryless manufacturers	0.9	0.5
All other manufacturing types	60.0	63.2

DV:	(1) Δ share of mfg. employment	(2) % Δ in total mfg. employment
Firm age	-0.013*** (0.000)	-0.044*** (0.001)
# States	-0.009*** (0.001)	0.018*** (0.001)
1990 Firm employees (1,000)	-0.000 (0.001)	-0.011*** (0.001)
1990 Estab. count (1,000)	0.065*** (0.022)	0.072* (0.042)
Outsourcer	-0.023*** (0.004)	0.048*** (0.008)
Offshorer	-0.049*** (0.011)	-0.075*** (0.022)
Intercept	0.287*** (0.004)	0.684*** (0.008)
Observations	34,667	34,667
Adjusted R-squared	0.055	0.110

Significance levels: \*10 percent \*\*5 percent \*\*\*1 percent  
Standard errors in parentheses.

Figure 1

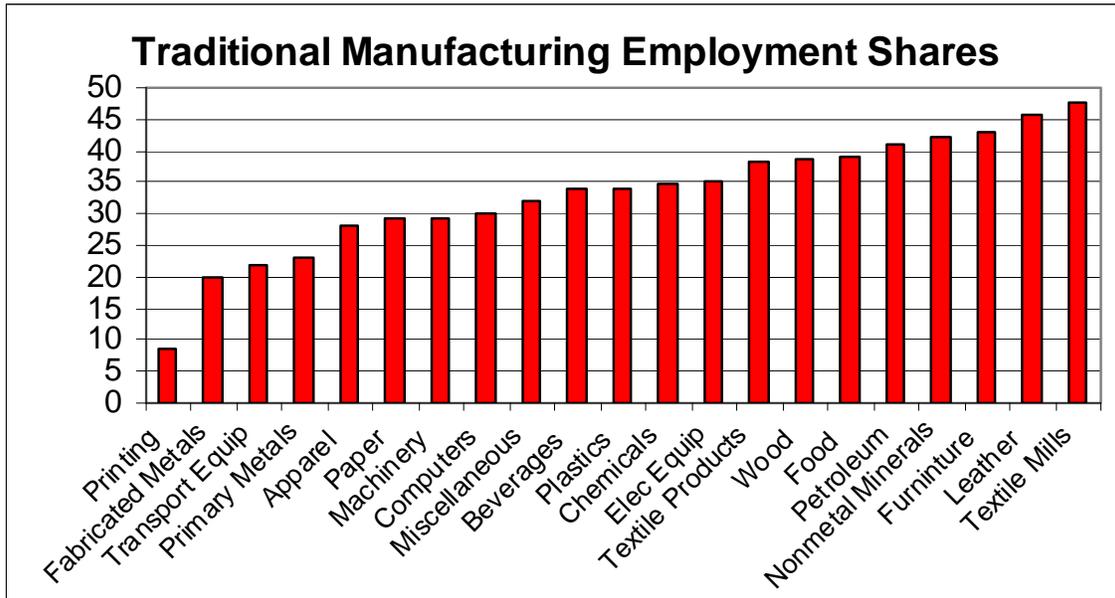


Figure 2

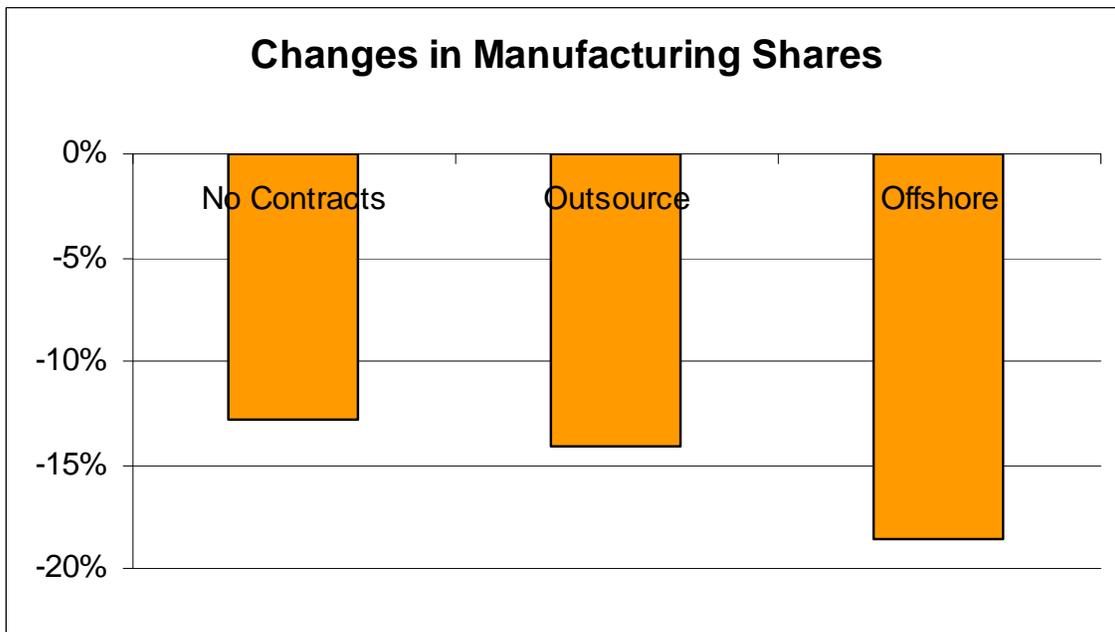
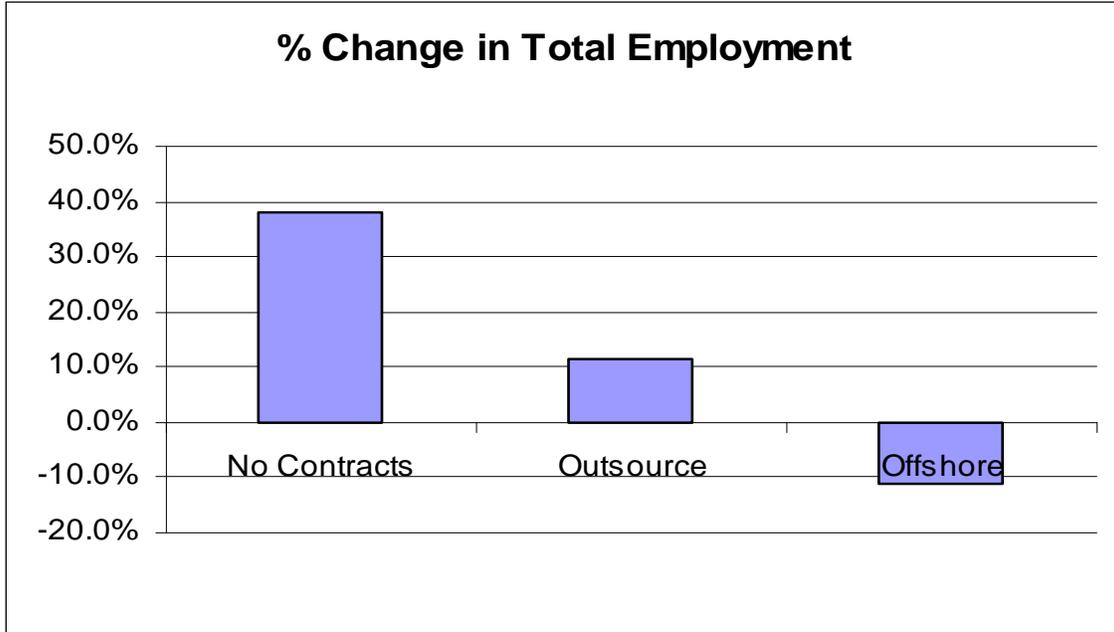


Figure 3



Appendix

● DETAIL OF SALES, SHIPMENTS, RECEIPTS, OR REVENUE - Continued					
Line No.	Products and services	Census product code	Products shipped and other receipts		
			Value, f.o.b. plant		
			\$ Bil.	Mil.	Thou.
0734		0730	0731		
41		42			
42		59			
43		67			
44	Contract work - Receipts for work done for others on their materials (Specify products worked on and kind of work.) ↴	930000 0000			
45	Resales - Sales of products bought and sold without further manufacture, processing, or assembly (The cost of such items should be reported in ●, line A2.) . . . . .	999890 0000			
46	Other miscellaneous receipts (including receipts for repair work, etc.) . . . . .	999809 8000			
47	<b>TOTAL</b> (Should equal total reported in ●) . . . . .	770000 0000			
●-● Not Applicable.					
● SPECIAL INQUIRIES					
OTHER ESTABLISHMENT ACTIVITIES					
1. Did this establishment design, engineer, or formulate the manufactured products that it sold, produced, or shipped?					
0318 <input type="checkbox"/> Yes					
0319 <input type="checkbox"/> No					
2. Which of the following best describes this establishment's primary activity? (Mark "X" only ONE box.)					
0362 <input type="checkbox"/> Providing contract manufacturing services for others					
0363 <input type="checkbox"/> Transforming raw materials or components into new products that this establishment owns or controls					
0364 <input type="checkbox"/> Reselling goods manufactured by others (with or without minor final assembly)					
0365 <input type="checkbox"/> Other - Specify ↴					
0366 <input type="text"/>					
3. Did this establishment purchase contract manufacturing services from other companies or other establishments of your company to process materials or components that this establishment owns or controls?					
0496 <input type="checkbox"/> Yes, primarily with establishments WITHIN the 50 States and the District of Columbia					
0497 <input type="checkbox"/> Yes, primarily with establishments OUTSIDE of the 50 States and the District of Columbia					
0498 <input type="checkbox"/> No					
●-● Not Applicable.					

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