IMPLICATIONS FOR U.S. EMPLOYMENT OF THE RECENT GROWTH IN MEXICAN MAQUILADORAS

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RESUMEN

La estructura industrial y tendencias en el patrón de empleo en Estados Unidos se examinan en las industrias más afectadas por el crecimiento reciente en el procesamiento y ensamblaje fuera de ese país, especialmente en maquiladoras mexicanas por parte de corporaciones estadunidenses. Estimaciones que se han hecho recientemente sobre los efectos de la exportación de trabajos para algunas operaciones intensivas en mano de obra indican que el efecto sobre el empleo total estadunidense probablemente es un porcentaje muy bajo del empleo total en tales industrias. El impacto se notará probablemente no en el nivel de empleo estadunidense, sino en su composición y distribución por sector industrial. Se consideran cuáles serán los efectos sobre el tipo y el carácter de empleos estadunidenses, incluyendo la distribución de de habilidades ocupacionales. También se estudia el total de requisitos estadunidenses de trabajo relacionados con la manufactura de componentes y con su ensamblaje. Al final del artículo el autor nos ofrece sus observaciones acerca de los efectos que tienen la maquila sobre el empleo en Estados Unidos

ABSTRACT

The industrial structure and trends of U.S. employment are examined in industries that are primarily affected by the recent growth in offshore processing and assembly, particularly by U.S.-based multinational corporations in Mexican maquiladoras. Recent estimates of the effects of this movement offshore of some labor-intensive U.S. operations indicate that the effect on total U.S. employment in the directly affected U.S. industries may be fairly small as a percentage of total employment in those industries. The impact will most likely be felt in the composition and industrial distribution of total U.S. employment rather than its level. The effects on the type and character of U.S. jobs, including the occupational skill mix, are explored. Total U.S. labor requirements related to production of components, and to assembly of those components, are also examined. Some closing observations are offered about the effects of outsourcing on U.S. employment.

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Introduction

U.S. industrial production has become more globally oriented since the early 1960s. Faced with increased foreign competition and the desire to maintain and expand both domestic and international markets, many U.S. firms have responded by restructuring their organizational practices and introducing new production technologies.[1] In some cases, labor-intensive phases of production have been outsourced to low-wage countries in Asia and Latin America.[2] This trend toward global sourcing by U.S. manufactu-rers is not unique; Japanese and Western European manufacturers have followed similar patterns of outsourcing, industrial restructuring, and adoption of additional measures to increase international competitiveness.[3]

The global restructuring of U.S. manufacturing production has been facilitated by the rapid rise of export processing zones (or free zones) and other incentives to attract foreign investment, especially in low-wage developing countries in Asia, Latin America, and the Caribbean.[4] The rapid development of the Mexican in-bond assembly industries (called "maquiladoras" or "maquilas") has contributed significantly to this rise.

Mexico's maquiladoras are a leading supplier to the U.S. market of products assembled from components made in the United States. During the 1980s, the maquiladora sector has been one of the most dynamic sectors of the Mexican economy and a source of considerable foreign exchange earnings (second only to petroleum) and job creation.[5] From 1983-87, U.S. imports of assembled products from Mexico grew at an average annual rate of 21 percent, compared to a rate of 4 percent for all U.S. imports from Mexico.

The surge in growth since 1982 of the Mexican maquiladora program-

1 See Susan Walsh Sanderson, "American Industry Can Go Home Again," Across *the Board*, 23: 2 (February 1986), pp. 38-43.

2 See. F. Frobel, J. Heinrichs, and 0. Kreye, *The New International Division of Labour,* Cambridge, Cambridge Univerity, 1980.

3 *For further* details, see Joseph Grunwald and Kenneth Flamm, *The Global Factory.* Washington, The Brookings Institution, 1985.

4 For a more formal definition of export-processing zones, see United Nations Conference on Trade and Development (UNCTAD), Expon Processing Free Zones in Developing Countries: Implications for Trade and Industrialization Policies. Geneva, UNCTAD, 1985; for a description of export-processing zones located in Mexico and the Caribbean, see Gregory K. Schoepfle and Jorge F. Pérez-López, "Export Assembly Operations in Mexico and the Caribbean"journal *of Interamerican Studies and World Affairs*, 32: 4 (Winter 1989), pp. 131-161.

5 *For further* discussion about the employment implications for Mexico, see Gregory K. Schoepfle and Jorge F. Pérez-López, *Employment Implications of Export Assembly Operations in Mexico and the Caribbean Basin*, Working Paper 16. Commission for the Study of International Migration and Cooperative Economic Development, Washington, D. C. (January 1990)

-with its high visibility and proximity to the United States- has rekindled the controversy about the effect of the program on U.S. employment. In the United States, attention has focused on the repeal of certain provisions in the U.S. tariff schedules that are generally considered to have made offshore assembly of certain labor-intensive products more attractive.

While no data are available on the actual number of U.S. jobs that have been lost or sustained as the result of outsourcing decisions by U.S.-based manufacturers, several recent econometric estimates of removing these special U.S. tariff provisions indicate that the effect on total U.S. employment in the directly affected U.S. industries may be fairly small and that the impact would most likely be felt in the composition and industrial distribution of total U.S. employment rather than its level.

The industrial structure and trends in employment are examined here in U.S. industries most affected by the recent growth in offshore processing and assembly by U.S.-based multinational corporations, particularly in Mexican maquiladoras. Prior to doing that, special U.S. tariff provisions are defined that apply to goods assembled abroad and data are presented on the leading commodity groups entered under these provisions and the leading country suppliers, with special emphasis on Mexico. Then, the structure of output and employment in the Mexican maquiladoras and recent estimates of the impact on the level of U.S. employment of removing the special U.S. tariff provisions are considered. Some closing observations arc offered about the impact of outsourcing on U.S. employment.

U.S. Imports of Assembled Products

The United States has special provisions in its tariff schedules that assess import duties only on the foreign value-added in products further processed or assembled abroad which are made of materials or components produced in the United States. Since the early 1980s, U.S. imports under these special tariff provisions have been growing at a much higher rate than overall U.S. imports. U.S. imports of assembled products under these special tariff provisions tend to be concentrated in a few product areas. Mexico is a major supplier of assembled products to the U.S. market; in addition, these assembled-product imports from Mexico have an extremely high level of U.S. content.

Special Provisions in the U.S. Tariff Schedule: The United States has several tariff provisions that contribute to the economic feasibility of U.S.-based manufacturers engaging in offshore assembly operations. For articles that are processed or assembled abroad from U.S. materials or components and then exported to the United States, there are provisions in the U.S. tariff schedule that assess import duties only on the foreign value-added in those articles. Formerly, the provisions were known as items 806.30 and 807.00 in the Tariff Schedules of the United States (TSUS), and now as items 9802.0060 and 9802.0080 in the new Harmonized Tariff

Schedule of the United States (HTSUS) introduced on January 1, 1989.[6] In what follows, these provisions will be referred to by their former designations.

Item 807.00, in effect since 1963, is by far the most important of the two special tariff provisions. It provides for duty-free treatment of U.S.-made components used in the assembly of products for the U.S. market. The other provision, item 806.30, applies only to the treatment of nonprecious metals that are sent abroad for processing and then imported for further processing in the United States.

In recent years, item 807.00 imports have accounted for over 99 percent of U.S. imports under these two provisions. In what follows, U.S. imports under item 807.00 will be used as a measure of offshore assembly activities by U.S.-based manufacturers.[7]

Leading Commodity Groups of Assembled Products: Table 1 presents the top-40 3-digit Standard Industrial Classification (SIC) commodity groups of products in which a significant share of all U.S. imports were entered under item 807.00 in 1987.[8] Assembled product (item 807.00) imports tend to be concentrated in a few product categories. For example, while motor vehicles and parts (SIC 371) accounted for 19 percent of all U.S. imports in 1987, they accounted for 70 percent of all imports under item 807.00 and 35 percent of the U.S.-content value of all item 807.00 imports. Electronic components and accessories (SIC 367) accounted for *4* percent of all U.S. imports in 1987, 8 percent of all item 807.00 imports, and 22 percent of the total U.S.-content value of all item 807.00 imports.

Table 1 also presents U.S. imports from Mexico for these top-40 item

6 Another related program (directed toward Mexico and certain Caribbean Basin countries) permits increased quotas to be negotiated for imported apparel items that are assembled from fabrics made and cut in the United States.

7 While U.S. imports under items 806.30 and 807.00 do provide a rough measure of offshore processing and assembly for the *VS.* market, they fail to capture all export processing or assembly operations (e.g., items not exported to the United States but entered under other tariff schedule provisions). However, the establishment of a customs user fee on imponed merchandise in December 1986 motivated many importers of goods normally covered by duty-free tariff provisions (e.g., most- favored- nation (MFN) duty free, the Generalized System of Preferences (GSP), and the Civil Aircraft Agreement) to claim eligibility under items 806.30 and 807.00 to avoid the fee; items entered under the 806.30 and 807.00 tariff provisions are exempt from the user fee (until September 30, 1991), the duty-free portion of U.S. imports under items 806.30 and 807.00 will more closely represent the U.S.origin components and metal in foreign manufacturing operations that export their finished products to the U.S. market.

8 The top-40 categories were determined according to the following rule: 4.5 percent or more of all imports but more than $100 million in U.S.- content value. Together, these top-40 commodity groups accounted for about half of all U.S. imports, 98 percent of all imports under item 807.00, and 96 percent of the total U.S.- content value of item 807.00 imports in 1987. In 1987, there were 50 three-digit SIC-based impon 807.00 products were primarily crude oil and refined petroleum products, meat products, silk fabrics, pulp and paper mill products, and industrial organic chemicals.

807.00 categories. These 40 categories of imports accounted for half of all U.S. imports from Mexico and over 95 percent of all item 807.00 imports from Mexico in 1987.

The top-40 item 807.00 categories in Table 1 are grouped by U.S.-content value class in Table 2, along with the top-3 supplier countries for each category. Nineteen of the 40-leading item 807.00 categories consisted of products with 40 percent or more U.S.-content value; however, these 19 groups accounted for only 14 percent of the total value of all item 807.00 imports (but over 42 percent of the total U.S.-content value of all item 807.00 imports) in 1987. These 19 categories can be grouped into 8 broader product categories as follows: apparel (SIC 225; 231-6); paper (SIC 264);
rubber footwear (SIC 302); leather (SIC 315, 9); nonferrous metals (SIC 335); electrical equipment (SIC 361, 2, 4, 7, 9); instruments (SIC 384); and miscellaneous manufactures (SIC 395). Imported products in these categories had fairly high U.S.-content value (or, alternatively, relatively little foreign value-added) and are more likely to represent the output ofoffehore assembly operations.

Mexico is a leading supplier of U.S. imports under item 807.00 in 33 out of the top-40 807.00 categories.[9] For all but one of the categories in which Mexico is not a major supplier, the major suppliers of these assembled product imports were developed countries and the U.S.-content value share was quite low.

Leading Country Suppliers of Assembled Products: Table 3 presents the leading country suppliers of item 807.00 imports in 1987 by U.S.-content value class; leading major commodity groups (2-digit SIC) for each country are also provided in the table. From this table, it is clear that Mexico is the leading developing country supplier of item 807.00 imports to the U.S. market. It should be noted that developed countries (e.g., Canada and Japan) were a major source (in terms of the value) of item 807.00 imports, but their U.S.-content value share was much lower than that for most developing countries.[10]

9 The exceptions are (each with less than 6 percent Mexican share of total item 807.00 entries): knit fabrics and hosiery (SIC 225), prefabricated building panels (SIC 245), fabricated structural metal products (SIC 344), farm and garden machinery (SIC 352), motor vehicles and pans (SIC 371), aircraft and parts (SIC 372), and railroad equipment (SIC 374).

10 The bulk of item 807.00 imports ($52.8 billion or 78 percent) in 1987 contained less than 20 percent U.S.-content value and came primarily from OECD and Eastern European nations. The majority of products with less than 20 percent U.S.- content value were transportation equipment products, mainly motor vehicles and equipment from Canada, Japan, West Germany, South Korea, United Kingdom, France and Sweden. In 1987, these seven countries accounted for 93 percent (or (46.5 billion) of all item 807.00 imports of transportation equipment. Together, they accounted for 88 percent of the value of item 807.00 imports that incorporate less than 20 percent U.S. -content value. U.S. imports of motor vehicles and parts from four of these countries (Canada, Japan, West Germany, and Sweden) accounted for over 30 percent of all U.S. imports

Over the period 1983-87, slightly over half (51 percent) of the value of U.S. imports from Mexico under item 807.00 consisted of U.S. materials. In 1983, U.S. imports from Mexico under item 807.00 accounted for 22 percent of all Mexican exports to the United States; by 1987, this had risen to *44* percent, reflecting the rapid expansion of the maquiladora sector and its increased exports to the United States.

The Mexican Maquiladora Program

Most of the item 807.00 U.S. imports of assembled products from Mexico come from maquiladoras. The number of Mexican maquiladoras has been growing rapidly, especially since 1982. The output of maquiladoras is concentrated in a few industrial sectors and uses very few Mexican inputs (i.e., consists primarily of U.S.-made components).

The Mexican in-bond assembly plants (maquiladoras) are located primarily along Mexico's border with the United States and represent the largest and most developed concentration of export-oriented assembly operations in Latin America and the Caribbean.[11] The number of maquiladora firms, as well as the number of workers that they employ, has grown rapidly. From its beginning in 1965 with 12 plants employing about 3, 000 workers, the maquiladora sector has expanded dramatically -especially since 1982. This trend has been encouraged by the brisk development of industrial parks along the northern frontier of the country, the sustained growth in the U.S. economy, the abundant supply of low-wage Mexican workers, and the steady devaluation of the peso vis-á-vis the U.S. dollar. In July 1989, there were 1, 674 maquiladora firms which employed 440, 000 workers; in addition, maquiladoras were estimated to have provided (2.9 billion in foreign exchange earnings in 1989.

Comparison of Mexican Data on Maquiladoras with U.S. Item 807.00 Import Data: Table 4 presents data on the value of maquiladora output and imported materials incorporated into that output for the period 1975-1988, based on Mexican sources. Also included in the table are U.S. data on the U.S.-content and foreign value-added in U.S. item 807.00 imports from Mexico for the same time period.

Mexican maquiladora data do not correspond directly to U.S. statistics on item 807.00 imports for several reasons, some of which have been mentioned above (e.g., differences in coverage, entry under other provisions, export to other countries, etc.). In addition, there are timing and

from each of these four countries.

11 For a more detailed discussion of the *maquiladora* program, see Leslie Sklair, *Assembling or Development; The Maquila Industry in Mexico and the United States*, Boston: Unwin Hyman, 1989, and Ellwyn R. Stoddard, *Maquila: Assembly Plants in Northern Mexico*, El Paso, Texas, Western Press, 1987.

valuation discrepancies.[12] In some cases, maquiladora output does not meet the requirements for entry under item 807.00.[13] 'While differences exist between U.S. and Mexican measures, the two series nevertheless exhibit similar trends.

Since 1983, about 77 percent of the value of maquiladora output has consisted of imported materials, maquiladora output has accounted for about 90 percent of the value of item 807.00 U.S. imports from Mexico, and the U.S.-content value of item 807.00 imports from Mexico has accounted for 65 to 80 percent of maquiladora imports.

There are some maquiladora sectors for 'which there are no comparable U.S. item 807.00 import data (e.g., food processing and other services such as coupon sorting, data entry, etc.). In other cases, Mexican maquiladora import data closely approximate the U.S.-content value of U.S. item 807.00 imports. For example, in 1987, the U.S.-content value of item 807.00 apparel imports accounted for 96 percent of maquiladora apparel imports, 90 percent of electrical and non-electrical machinery and electronics imports, 83 percent of chemicals imports, 77 percent of footwear and leather imports, and 61 percent of transportation equipment imports. On the other hand, the U.S.-content value of item 807.00 toys and sporting goods imports in 1987 accounted for only 16 percent of maquiladora toys and sporting goods imports (but 42 percent of toy and sporting goods U.S. imports from Mexico entered duty-free under GSP) and 30 percent for furniture imports (where 34 percent of Mexican furniture exports to the United States entered the United States duty-free under GSP).

Structure of Maquiladora Output and Value Added by Industry: Table 5 presents the structure of maquiladora output and value added by broad industrial category for the period 1985-87, based on official Mexican data. Together, the three leading industrial categories in 1987—transportation equipment (e.g., automobile parts), electrical machinery, and electronic components— accounted for nearly three-quarters of the value of total maquiladora output and imported inputs, and about two-thirds of the total value added.

Offshore Assembly and U.S. Employment

The impact of imports on the U.S. economy and domestic employment has always been a source of considerable controversy. However, the increasing

12 For a further discussion of the differences, see Grunwald and Flamm, *op. cit.,* p. *144.*

13 To qualify for entry under item 807.00, components must have been imported from the United States in a condition ready for assembly without further fabrication, must not have lost their physical identity in articles by change of form, shape, or otherwise, and must not be advanced in value or improved other than the assembly or operations incidental to assembly.

trend of many U.S. manufacturers to outsource certain labor-intensive portions of their manufacturing (often referred to as the "hollowing out" of the *U* .S. manufacturing base), in conjunction with the extremely strong growth since 1982 of the highly visible Mexican maquiladora program, has rekindled the controversy about the wisdom of the U.S. 807.00 tariff provision.

Viewpoints on the impact of offshore assembly operations on U.S. employment tend to be extremely polarized. On the one side, some argue that the 807.00 provision encourages the expansion of foreign subsidiary operations of U.S.-based corporations and the displacement of U.S. production and employment (i.e., the "export" of U.S. jobs). In their view, repeal of item 807.00 would lead to substantial increases in domestic employment and the "return" of jobs to the United States. On the other side, supporters of item 807.00 and "production sharing" argue that the provision benefits U.S. industry and labor in meeting stiff competition from foreign producers and helps to "save" some U.S. jobs. In their view, repeal of item 807.00 would lead to reductions in U.S. employment in industries that supply and support offshore assembly operations.

Several recent studies using different methodologies have estimated the probable economic consequences of removing item 807.00 from the U.S. tariff provisions under a set of assumed counterfactual circumstances. While each of the studies has limitations, they do provide comprehensive employment impact estimates. The results of some of these studies are summarized in Table 6; each study is based on data for 1986.[14] The methodology used and the results obtained in these studies have been reviewed in greater detail elsewhere.[15]

The moderate range of estimated U.S. employment impact of the repeal of item 807.00 (-16, 000 to+ 18, 000 jobs out of approximately 9.8 million directly affected workers) suggests that the effect on the level of U.S. employment may be fairly small. However, some U.S. industrial sectors (and regions) may be affected more than others. Also, the number of jobs

14 The studies summarized include: United States International Trade Commission (USITC), *The Use and Economic Impact of TSUS Items 806.30 and 807.00,* Publication 2053, Washington: USITC (January 1988); José A. Méndez, Tracy Murray, and Donald J. Rousslang (MMR), "U.S.- Mexico Employment Effects of Repealing the *VS.* Offshore Assembly Provision," mimeographed, 1988; and Gerald Godshaw, Corn Pinon-Farah, Marco Pinon-Farah, George Schink, and Virendra Shingh, *The Implications for the U.S. Economy of Tariff Schedule Item 807 and Mexico's Maquila Program,* Bala Cynwyd, PA: Wharton Econometric Forecasting Associates Group (WEFA Group) (May 1988).

15 See Gregory K. Schoepfle and Jorge P. Pérez- López, *U.S. Employment Impact of TSUS 806.30 and 807.00 Provisions and Mexican Maquiladoras: A Survey of Issues and Estimates,* Economic Discussion Paper 29, Bureau of International Labor Affairs, U.S. Department of Labor, Washington, D.C. (August 1988), and Gregory K. Schoepfle and Jorge Pérez-López, "The Impact of Maquiladoras on the U.S. National Employment and Employment in Selected Industrial Sectors," in *Maquiladora Industry: Economic Solution or Problem?,* Khosrow Fatemi, ed., New York: Praeger, 1990.

involved-whether large or small- does not capture the social costs borne and the painful toll on families and communities (especially those dependent on one or two local plants) that suffer plant closings resulting from a firm's decision to outsource certain phases of its production process.

Two industrial sectors, textiles and apparel (mostly assembled clothing) and electrical and electronic articles (such as capacitors, switches, resistors, conductors, etc.), were identified by these studies as the most likely to be affected by the removal of item 807.00.

U.S. Employment in Directly Affected Industries: Table 7 presents trends in U.S. employment in industries that produce products similar to those in the top-40 item 807.00 categories that were presented in Table 1. Employment levels are provided for 1973 and 1979, the last two business cycle peaks, and 1982 (the trough of the current expansion) and 1988 (the last available full year of the current expansion).

Since 1982, the overall U.S. employment situation has remained robust as the U.S. economy completed its sixth year of expansion in 1988—the second longest period of sustained growth since World War II and the longest peacetime expansion. As has been typically the case in recent years, U.S. employment has risen at a faster rate in the services-producing sector (which accounted for 80 percent of the gain in jobs during 1988). However, U.S. employment in manufacturing has showed some renewed strength, although it has not recovered to the previous 1979 peak level.

Of the U.S. manufacturing industries considered in Table 7 (i.e., industrial sectors directly affected by item 807.00), employment in 8 industries had exceeded previous 1979 peak levels by 1988: furniture and fixtures (SIC 25); paper and paperboard products (SIC 264); office accounting and computing equipment (SIC 357); communications equipment (SIC 366);
electronic components (SIC 367); aircraft and parts (SIC 372); mechanical, measuring, and controlling devices (SIC 382); and surgical, medical, and dental apparatus (SIC 384). While most of these 8 industries have shown strong annual increases in employment since 1982, two (office accounting and computing equipment and communications equipment) have remained flat or declined slightly since 1982.

Of particular concern are those U.S. industries which have not exceeded previous peak employment levels and where employment has declined since the 1982 trough in economic activity (i.e., those industries that have experienced a decline in employment during a period of sustained economic expansion). Of the industries considered in Table 7, the largest loss in employment since 1982 (107, 900 jobs) was posted by construction and mining machinery (SIC 353); other industries in nonelectrical machinery and apparel also have experienced sizable losses. On the other hand, motor vehicles (SIC 371) and furniture (SIC 25) have posted substantial recoveries since 1982 (an increase of 157, 200 and 97, 700 jobs, respectively).

The U.S. economy is projected by the U.S. Bureau of Labor Statistics (USBLS) to add another 18 million jobs by the year 2000, an average of 1.5

million jobs a year from 1988.[16] This growth rate is slower than in the past when the annual job gain averaged 2.3 million a year over a comparable 12-year period. The 18 million new jobs are expected to be added primarily in the services-producing sector. Manufacturing employment is projected to shrink slightly from 19.4 million in 1988 to 19.1 million by the year 2000. As noted above, employment in manufacturing has recovered slightly since the 1982 trough, but not to the 1979 peak level of 21 million, and is not projected by USBLS to be much higher than current levels.

In making their projections, the USBLS notes that, with the industrial restructuring and the introduction of new and more efficient plants and equipment, real output of U.S. manufacturing is expected to grow 2.3 percent a year during the 1988-2000 period, despite a modest 0.1 percent a year decline in employment. Over the period 1988-2000, none of the fastest growing industries (in terms of employment) is expected to be in manufacturing-all are in the services-producing sector. In contrast, nearly all of the most rapidly declining industries over the projection period are expected to be in manufacturing. USBLS finds that job growth in manufacturing will be lead by computer equipment manufacturers, but most of these jobs will be non-production worker jobs (i.e., engineers, technicians, etc.) and in industries related to computer manufacturing (e.g., semiconductors, electronic components, etc.).

Table 8 presents the USBLS employment and real output projections to the year 2000 for the U.S. industries that produce products similar to those in the top-40 item 807.00 categories. From this table, it is clear that over half of the projected total employment decline in manufacturing (316, 000 jobs) is expected to be in apparel (with a decline of 154, 000 jobs) and knit fabrics and hosiery (with a decline of 36, 000 jobs); both are item 807.00 product categories with significant U.S. content. While employment is expected to decline in these industries, real output is projected to remain virtually unchanged, growing at 0.5 percent a year. Several of the industries that produce products similar to the top-40 item 807.00 categories with significant U.S. content are expected to show an increase in employment. These industries are primarily health-related (X-ray and electromedical apparatus (SIC 3693) and surgical, medical, dental apparatus (SIC 384) and computer-related (semiconductors (SIC 3674) and electronic components (SIC 3675-9) industries and reflects the fact that these sectors are expected to grow more rapidly than others during the 1990s.

16 Recently, the USBLS issued a report in which it made projections of U.S. industry output and employment and occupational employment by industry to the year 2000. The study considered three growth scenarios (low, moderate, and high). The projections presented here are those under the moderate growth scenario. See United States Bureau of Labor Statistics (USBLS), “Outlook 2000: Five Articles on the Shape of the Economy and Occupations in the Year 2000,” in *Montbly Labor Review,* 112: 11 (November 1989), entire issue.

Occupational Structure of Workers in Directly Affected U.S. Industries: Table 9 presents the occupational distribution in 1988 for the 3-digit SIC industry groups that roughly correspond to the top-40 item 807.00 categories contained in Table 1. Subcategories of the nine major occupational groups presented in Table 9 are given in the Appendix Table.

With regard to production and assembly activities, there are four major occupational categories that are of particular interest: professional specialty (which includes engineers, scientists, and other professional workers); technicians and related support; precision production, craft, and repair; and operators, fabricators, and laborers (which includes set-up operators, hand workers and assemblers, and other laborers). These occupational categories cover a range of human capital and skill requirements.

From Table 9, it is clear that, collectively, all manufacturing employs a higher proportion of workers in precision production, craft, and repair (21 percent) and operators, fabricators, and laborers *(44* percent) occupational categories than is the case for the overall U.S. economy (respectively, 12 and 14 percent). Professional specialty occupations also account for a smaller proportion of manufacturing employment than in the total U.S. economy (6 percent compared to 12 percent). In two-thirds of the individual 3-digit SIC industry groups for which oushore assembly is important (i.e., those presented in Table 9), two occupational groups together (precision production, craft, and repair and operators, fabricators, and laborers) account for two-thirds or more of industry employment. At the low end (in terms of skill and human capital), the occupational category of operators, fabricators, and laborers accounts for over half of industry employment in slightly over two-fifths of the 3-digit SIC groups in the table; most of the high U.S.-content 807.00 classes (i.e., those marked with asterisks) are in this group. Among the industrial groups considered here, the lowest concentration of operators, fabricators, and laborers is found in SIC 357-office computing and accounting machines (which includes computers) (11 percent), SIC 366- communications equipment (16 percent), and SIC 372- aircraft (18 percent); correspondingly, these three industries employ the highest proportion of professional specialty workers (21, 21, and 19 percent, respectively).

Table 10 presents U.S. employment by major industry division for selected occupational groups in 1988. The four major occupational groups presented (professional specialty; technician and support; precision production, craft, and repair; and operators, fabricators, and laborers) are those which are more closely related to production and manufacturing activities. Clearly, workers in precision production, craft, and repair and operators, fabricators, and laborers occupations are concentrated in manufacturing, while those in professional specialty and technician and support occupations are concentrated in the services-producing sectors.

Within the broader occupational category of precision production, craft, and repair (see Appendix Table), the two more-detailed occupational

categories of blue-collar worker supervisors and production occupations (precision) account for 38 percent of total precision production occupational employment. About *44* percent of all blue-collar worker supervisors and about 72 percent of all production occupations (precision) are in the manufacturing sector.

Within the broader occupational category of operators, fabricators, and laborers, the two more-detailed occupational categories of machine setters, set-up operators, operators, and tenders and handworkers, including assemblers and fabricators, account for 45 percent of total operators, fabricators, and laborers occupational employment. About 88 percent of all machine setters, set-up operators, operators, and tenders are employed in the manufacturing sector; about 87 percent of all handworkers, including assemblers and fabricators, are employed in the manufacturing sector.

The occupational employment structure of the top-40 item 807.00 categories reveals that these industries (and especially those corresponding to item 807.00 categories with high U.S.-content value) employ a substantial number of precision production, craft, and repair workers and operators, fabricators, and laborers.

Table 11 presents U.S. employment and median weekly earnings of full-time wage and salary workers by detailed occupational group and sex, based on the USBLS household survey of employment and earnings for 1988.[17] The data in this table indicate that women comprise 42 percent of the work force and, in general, have lower median weekly earnings than men. Women have an above average representation in three occupational groups: administrative support, including clerical (78 percent); services occupations (50 percent); and professional specialty (which includes teachers) (48 percent). Women have a below average representation in three occupational groups: precision production, craft, and repair (8 percent); agriculture, forestry, and fishing (12 percent); and operators, fabricators, and laborers (25 percent). The table also indicates that there are small segments within the broad occupational categories of precision production, craft, and repair and operators, fabricators, and laborers (e.g., electronic assembly (precision), solderers (fabricator), textile machine operators, packaging, inspection, and sorting) where women constitute a majority of the occupational work force which is engaged in activities related to the production of products in significant item 807.00 product categories. With the exception of production inspectors and checkers, each

17 USBLS collects information on employment and earnings using two surveys; one based on establishment and the other based on households. Differences between these surveys are described in *Employment and Earnings.* The Office of Economic Growth in the USBLS also conducts a survey of occupational employment for its employment projections program; their sample frame is somewhat larger than the one used in the household survey. Comparisons between the three data sources (all used here) should take these factors into account.

of these detailed occupational categories had lower median weekly earnings than the broader occupational group to which it belongs.[18]

The modest decline projected over the period 1988-2000 by USBLS for employment in manufacturing (316, 000 jobs) masks pronounced shifts toward more highly skilled jobs that are occurring in the occupational distribution of manufacturing employment. Changes in the industrial composition of employment, introduction of new technologies, and other factors will have a major impact on the occupational structure of employment.

Three occupational groups (executive, administrative, and managerial; professional specialty; and technicians and related support) that require the highest level of educational attainment are each projected to grow more rapidly than the average for total employment over the period 1988-2000. This, in part, is a reflection of the industries where these occupations are concentrated in the services-producing sector, and not manufacturing.

Over the period 1988-2000, the number of precision production, craft, and repair jobs is expected to grow more slowly than the average for total employment (as it did over the period 1976-88). This occupational group is expected to have 102, 000 fewer jobs in manufacturing by the year 2000, while the construction sector is expected to account for most of the increase for this occupational group.

Operators, fabricators, and laborers, an occupational group that grew only 3 percent over the period 1976-88, is expected to grow only one percent over the period 1988-2000. This occupational group is expected to have the largest change in the share of total employment, declining from 14.4 percent in 1988 to 12.6 percent by the year 2000. All of the growth in this occupational group is expected to occur in the services-producing sector; an absolute decline of 714, 000 jobs is projected for manufacturing. With this decline in manufacturing, this occupational group's share of manufacturing employment is projected to fall from 44.3 percent in 1988 to 41.3 percent by the year 2000, but it still will remain the largest occupational group in the manufacturing sector.

In addition to the projections for the broad occupational categories, USBLS has made projections (over the period 1988-2000) for nearly 500 detailed occupations. Of these, the fastest growing are expected to be in health services and data processing and business and research services; this is a reflection of the projected strong growth of the health and computer industries over the period. The largest absolute increases are expected

18 Most of these detailed occupational groups appear to be paid near the minimum wage level. During 1988, the U.S. minimum wage was (3.25 per hour; based on a workday of 8 hours, this translates to $26 a day, $130 for five days, and $156 for six days (including any overtime).

primarily in retail trade, health services, and educational services; a large increase in janitors, secretaries, and receptionists is also expected.

Occupations that are projected to have declines over the period 1988-2000 present a potential worker displacement problem, especially if these occupations are concentrated in industries that are expected to decline in employment over the period. Table 12 presents projected employment change by occupation over the period 1988-2000, for selected detailed occupations among the top-36 detailed occupations with largest projected decline (over 10, 000 jobs) in all declining industries.

From Table 12, it can be seen that among those occupations that are highly concentrated in the declining industries, several are related to apparel and electronics assembly as well as activities related to the cutting and forming of metals and plastics, all activities that are closely related to products in the leading item 807.00 categories.

According to USBLS, more than half of all black and Hispanic employment is concentrated in three occupational groups: service occupations;

administrative support, including clerical; and operators, fabricators, and laborers. These three occupational groups generally require the least amount of education and training, have relatively low earnings, and are projected to grow more slowly over the next decade.

While employment opportunities will be found across a broad spectrum of occupations, workers having the most education and training are likely to be in a better position to obtain higher paying jobs. Blacks and Hispan-ics, who traditionally have had a lower educational attainment than whites, are likely to continue to be at a disadvantage in the job market unless their educational attainment improves.

Total U.S. Labor Requirements for Directly Affected Products: The discussion up to this point has focused on the industries directly affected by item 807.00, that is, industries in which item 807.00 imports are substantial (the top-40 item 807.00 categories) or where the repeal of item 807.00 would have a direct employment effect. In addition to the direct effects, there will be indirect effects on the firms that supply products and services to firms in the directly affected sectors.

Inter-industry relationships (input-output (1-0) accounts) have been estimated by the U.S. Department of Commerce which present the use of commodities by industrial sector (commodity by industry) as well as the industries that make various commodities (industry by commodity). These can be transformed into direct requirements per dollar of output and the total (direct and indirect) requirements from all industries (primary and secondary) for a change in final demand of a commodity. The annual input-output accounts (benchmarked to 1977 technical coefficients) are available both at the summary 85-industry/commodity level (2-digit) 1-0 level and the detailed 537-industry/commodity (6-digit) I.0 level. The analysis presented here uses the 2-digit 1-0 accounts for 1982.[19]

The 1-0 accounts can be used to determine the direct and indirect effects

of a change in final demand on employment. For example, employment multipliers can be calculated which show the number of employees required (both directly and indirectly) by all industries to produce the output generated by a dollar change in the final demand, for a specific commodity. The calculation requires three steps: (1) obtaining the ratios of employment to total output of each industry (i.e., labor-output ratios or the direct requirements coefficients for employment); (2) each industry labor-output ratio is multiplied by the particular industry's total requirements coefficient, which is obtained from the industry-by-commodity total requirements table and which shows the output of the industry generated by a dollar change in final demand for a specific commodity (i.e., the resulting product is the employment required by an industry to produce the output generated by the dollar change in final demand); and then (3) employment is summed over all industries to yield the employment multiplier for the change in total demand for the final assembled product.

Based on the U.S. Department of Commerce's use of commodities by industry in the annual input-output (1-0) accounts, total industry output can be decomposed into value-added (e.g., labor compensation, indirect business taxes, property income) and total intermediate inputs (from each of the 1-0 sectors). Each 1-0 sector's share of total intermediate inputs can be used to construct a weighted basket of components used in offshore assembly (i.e., total demand for components only). The total effect on final U.S. demand will be the sum of the changes in final demand for each of the component suppliers, weighted by the share used in the final product.

Thus two employment multipliers can be derived: the total labor requirements for a dollar change in the final demand for a final product and the total labor requirements for a dollar change in the final demand for the basket of components (perhaps exported) for final assembly.

Table 13 presents economy-wide (all), as well as the directly affected sector (own), total U.S. labor requirements for both the final products of the sector and for the components used by the sector in nine 1-0 sectors that are related to several 3-digit SIC-based groups that are among the top-40 item 807.00 categories. In 1987, U.S. imports in these nine 1-0 sectors accounted for 40 percent of all U.S. imports, 91 percent of all U.S. imports under item 807.00, and 82 percent of the U.S.-content value of all item 807.00 imports.

As an example, consider the apparel sector (1-0 sector 18) in Table 13. Based on apparel industry shipments and employment, it was estimated that on average 20.696 work-years were required per million dollars of output in 1982 (direct requirements). However, total requirements for apparel were 40.325 work-years per million dollars of output in 1982, with 25.152 work-years required from the apparel sector (total direct effects) and 15.173 work-years required from other sectors (total indirect effects).

To consider the requirements for apparel components only, total requirements for each input sector to apparel, weighted by its share of all

inputs, yielded a total requirement for components only of 31.640 work-years, with 7.545 work-years in the apparel sector (total direct components effect) and 24.095 work-years in other sectors (total indirect components effect).[19]

Based on the information in Table 13, economy-wide (all) total labor requirements for a million-dollar change in final demand for the final assembled product are less than the economy-wide total labor requirements for a million-dollar change in the final demand for the components only, except for two sectors: apparel (1-0 sector 18) and electronic components and accessories (1-0 sector 57). In the other 7 cases considered in Table 13, the employment multiplier for components only exceeds that for the final product.

Total requirements reflect the use of goods and services that include intermediate inputs (materials and component inputs) both from within the sector and from other sectors as well as supporting services (e.g., business services, hotels, wholesale/retail trade, eating and drinking places, transportation and warehousing, utilities, insurance, etc.). Total employment requirements for the final product are concentrated in the directly-affected sector in the case of apparel (62 percent of the total requirements are in the apparel sector) and electronic components and accessories (52 percent). The lowest concentration of total requirements in the directly-affected sector is in office, computing and accounting machines, where only 20 percent of the total employment requirements were in that sector.

Total requirements for components only show a similar pattern with the highest concentration of total employment requirements falling within the directly affected sector for apparel (24 percent), electronic components and accessories (18 percent), aircraft (14 percent), and motor vehicles and parts (12 percent), with the other five sectors being less than 5 percent. These results imply that over 75 percent of the total requirements for components only fall in sectors that are not directly affected by offshore assembly. That is, while employment multiplier for components is usually larger than that for the final product, the components employment effects will be less concentrated in the directly affected industry and will be spread over many more industrial sectors.

These results provide some insight into the U.S. employment effects of “production sharing.” Based on the nine 1-0 sectors considered above, total employment requirements for the products of the directly affected sectors are likely to be fairly concentrated (and more visible) in the directly affected sector, while the total requirements for components only, although considerable, are industrially more diffuse (and less noticeable). While a second-best solution (from a U.S. employment standpoint) to production

19 Detailed sectoral tabulations are available from the author upon request.

at home, the detrimental U.S. employment effects of production sharing will be ameliorated by the extent to which U.S. made components are used.

Concluding Observations

With the growing trend toward globalization of production of certain labor-intensive manufacturing operations, Mexico has become a favored location for many U.S.-based manufacturers. Assembly operations in Mexico (maquiladoras) are located primarily along the border with the United States and are not integrated into the domestic Mexican economy. Maquiladora operations tend to be concentrated in a few industrial sectors. The electrical machinery and transportation equipment sectors have accounted for about 75 percent of U.S. assembled product (item 807.00) imports from Mexico since 1983. In most cases, the domestic content of these products (i.e., value-added in Mexico) has been very small; however, the employment generated by assembly operations is quite significant for the Mexican border communities. Of the major suppliers of assembled products to the U.S. market, Mexico incorporates the highest proportion of U.S. components.

In the United States, discussions about offshore assembly have focused on certain provisions (i.e., items 806.30 and 807.00) in the U.S. tariff schedules that have contributed to outsourcing by U.S. manufacturers. However, several recent studies of the effects of repealing these special tariff provisions indicate that the effect on total U.S. employment in the directly affected industries may be fairly small as a percentage of total employment in those industries. Further, repealing these provisions is far more likely to affect the structure of employment than its level.

In the case of Mexico, the nearby availability of a low-wage and trainable work force with a supporting infrastructure may be a more important consideration than these special tariff benefits in deciding whether or not to establish assembly operations offshore. In particular, during the 1980s, the U.S. dollar appreciated significantly against other major currencies. This made U.S. exports less competitive and the outsourcing of more costly assembly phases of a production process more attractive, especially to Mexico, as the peso was devalued against the U.S. dollar several times. The peso devaluations have made Mexico very competitive with other major assembly locations in the Far East (with Mexican labor costs now below some Asian countries and about one-tenth of U.S. labor costs).[20]

20 The USBLS has constructed indexes of hourly compensation costs (which include hourly earnings plus additional compensation and benefits) for production workers in manufacturing for 30 countries or areas. Selected data for developing countries included in the USBLS repon are given in the following table:

The U.S. industrial sectors most affected by offshore assembly operations are apparel and electrical articles and electronic components. In some cases, production of components and their assembly occur within the same industry; in other cases, assembly takes place in a different industry. Consideration of the total U.S. labor requirements for the production of a finished product and the requirements for the components only revealed that total labor requirements for apparel and electronic components are more concentrated within each of those sectors than is the case for other significant categories of assembled products. In general, total labor requirements (per dollar of output) for components only tend to be larger, more diffuse, and not concentrated in the directly affected sector (i.e., the detrimental U.S. employment effects of offshore assembly will be moderated to some extent although not necessarily in the directly affected sector- by the use of U.S.-made components).

The type of work done in most offshore assembly operations usually involves fairly simple and repetitive assembly tasks that require few skills. Most of the jobs are at the entry level, are held for a limited time, and offer few career (or long-term) opportunities. Even in cases where assembly operations utilize the latest technology, it is usually in a form that does not require technicians or specialized skills (i.e., imbedded process technology that simplifies or de-skills the work task). Most research and development, as well as technical support (that reflect the higher quality and paying jobs) for the assembly operations, are done at the home office in the United States.

The nature of assembly work and its labor-intensity of production creates a rather low quality of worklife. Further, the assembly work force, whether in the United States or Mexico, consists primarily of production workers that are predominately women and are paid relatively low wages.[2]

(Index: U.S. = 100)

Country	1975	1980	1985	1986	1987	1988	1989
Brazil	14	14	9	11	10	11	12
México	31	30	16	11	12	14	16
Hong Kong	12	15	13	14	16	17	19
South Korea	6	10	10	11	13	18	25
Singapore	13	15	19	17	17	19	22
Sri Lanka	4	2	2	2	2	na	na
Taiwan	6	10	12	13	17	20	25

.See USBLS, *International Comparisons of Hourly Compensation Costs for Production Workers in Manufacturing, 1975-89,* Washington: U. S. Department of Labor (September 1990).

21 However, there is some evidence that these conditions may be changing somewhat in the Mexican *maquiladoras* as they become linked with more heavy and sophisticated manufacturing (e.g., transportation equipment) that requires more technicians and a skilled work force.

The dynamic U.S. economy has produced many new jobs since the early 1980s, but the rate of job growth is expected to slow down during the 1990s. There is likely to be less demand for assembly-related occupations in the United States, especially those concentrated in certain declining U.S. industries such as apparel. In many cases, as the result of increases in productivity and efficiency improvements, real output in U.S. manufacturing is expected to increase, while employment is expected to decline somewhat.

Job growth in the United States during the 1990s will be primarily in the services-producing sector, and the jobs generated will require higher educational and skill levels. However, the workers most affected by outsourcing (e.g., assemblers, inspectors, sorters, graders, etc.) may not have the prerequisites to move into new professions and occupations (not necessarily in manufacturing) that will require higher skill and educational attainment levels. USBLS projections indicate that there will be more jobs available in the United States, but there may be fewer qualified people to fill them. Also, there will be more opportunities to obtain better quality and higher paying U.S. jobs. The problem of future worker dislocations in the United States may be accentuated by an acute job/skill mismatch. Many of the new jobs created during the 1990s are more likely to be non-production worker jobs related to the design, development, and production of more sophisticated products and components. The challenge for many U.S. workers during the 1990s will be to maintain and develop further basic work skills that will permit them to adapt to an accelerated pace of change in the workplace.

TABLE 1

U.S. IMPORTS FROM THE WORLD AND MEXICO: TOTAL AND THOSE ENTERED UNDER ITEM 807.00 BY LEADING 3-DIGIT SIC-BASED IMPORT GROUP, 1983 AND 1987

(value in millions of dollars)

SIC Group	Customs Value				Total 807.00 Value				U.S. Content Value of 807.00			
	1983		1987		1983		1987		1983		1987	
	World	Mexico	World	Mexico	World	Mexico	World	Mexico	World	Mexico	World	Mexico
225--Knit fabrics & hosiery	41.3	0.6	151.3	1.5	3.7	0.0	15.7	0.0	2.3	0.0	13.5	0.0
231--Men's suits and coats	687.6	3.9	1,040.5	23.9	23.7	2.3	66.1	18.2	14.2	1.6	35.9	13.1
232--Men's shirts, trouser	2,534.1	34.8	5,176.3	136.1	138.5	32.8	496.2	116.4	80.0	25.8	321.4	85.6
233--Women's skrits, coats	2,191.5	29.4	4,573.5	77.4	135.7	25.3	282.8	63.1	85.5	17.6	159.8	37.9
234--Women's underwear	306.0	30.4	607.1	45.3	183.9	29.6	257.5	42.4	124.9	24.0	176.3	34.0
235--Headwear	126.3	15.6	209.6	14.6	16.3	13.8	16.4	12.0	12.1	10.3	11.7	8.9
236--Outerwear, textile	2,658.0	52.7	6,425.1	113.8	103.3	50.8	261.8	96.6	75.0	39.5	167.1	72.7
245--Prefabricated panels	5.6	0.0	34.7	0.1	0.1	0.0	11.0	0.1	0.0	0.0	0.7	0.1
251--Household furniture	9.5	0.9	89.3	29.0	0.1	0.1	27.1	27.1	0.0	0.0	6.8	6.7
259--Furniture and fixture	1,785.2	92.1	4,486.0	294.6	61.3	58.1	422.2	168.2	11.3	10.7	116.6	46.1
264--Paper and paperboard	573.7	100.0	1,301.8	204.8	97.2	96.1	142.5	142.0	80.0	79.4	115.4	115.1
277--Greeting cards	11.6	0.4	22.4	1.5	0.0	0.0	1.1	1.1	0.0	0.0	0.4	0.4
302--Footwear, rubber	331.1	13.3	347.5	32.9	15.1	13.1	49.5	32.8	10.7	10.6	31.2	28.2
315--Gloves, leather	59.5	8.5	89.7	8.5	11.7	8.2	14.0	8.4	8.2	7.1	8.0	7.1
319--Leather goods, nspf	73.8	4.1	167.7	28.2	0.1	0.0	20.2	18.4	0.0	0.0	17.7	16.2
335--Rolled, drawn and ext	1,450.1	132.5	2,441.6	323.8	153.6	107.1	241.2	203.2	96.8	73.2	147.6	132.4
343--Heating equipment	194.0	0.6	220.2	4.8	5.8	0.1	19.9	4.0	1.0	0.0	5.2	2.5
344--Fabricated structural	488.1	5.3	508.9	15.6	24.5	0.1	43.5	0.4	2.7	0.1	13.4	0.3
351--Engines and turbines	1,414.9	38.1	3,599.2	126.1	66.0	8.8	430.0	66.0	16.1	4.9	77.4	23.4
352--Farm and garden mach	1,390.8	22.6	2,000.0	20.8	19.2	4.3	372.9	9.1	4.0	3.3	40.0	7.6
353--Construction, mining	1,380.2	28.4	4,446.1	130.5	159.4	6.8	554.7	63.4	57.1	3.8	138.7	32.5
354--Metalworking mach	1,999.0	6.2	4,303.6	53.1	96.0	2.1	216.9	42.7	17.9	1.4	46.3	25.9
356--Gen industrial mach	3,486.8	73.7	7,302.9	121.9	133.0	59.7	396.7	89.8	55.0	34.3	129.0	70.4
357--Office, computing eq	6,110.9	174.3	17,283.7	485.2	1,218.7	150.1	2,215.9	287.1	241.8	75.3	492.6	124.1
358--Refrigeration equip	400.9	10.6	1,312.9	117.5	67.7	3.8	165.4	77.1	19.9	3.3	38.3	29.4
361--Electric distrib equip	251.7	35.5	518.4	104.1	53.1	28.3	127.3	88.4	24.4	18.1	73.5	60.3
362--Electrical apparatus	906.0	119.4	1,807.8	238.4	142.2	107.3	276.2	209.7	76.8	69.5	162.4	141.4
363--Household appliances	1,619.7	69.5	3,168.5	167.4	197.0	51.6	257.6	96.5	46.7	36.9	87.8	74.0
364--Electric lighting	920.5	104.7	2,401.3	211.4	127.0	95.2	292.1	184.0	80.6	71.3	157.7	125.0
365--Radio and tv equip	6,542.9	287.6	11,763.5	647.4	638.6	281.4	875.9	628.5	105.8	68.3	213.4	191.6
366--Communication equip	4,353.4	711.3	7,068.1	454.0	1,015.0	685.2	840.1	427.9	307.7	243.8	229.1	160.3
367--Electronic components	7,872.1	590.5	15,601.1	1,574.5	4,104.6	527.6	5,308.4	1,419.1	2,477.5	320.7	2,773.9	692.3
369--Electrical machinery	2,173.8	302.8	4,237.4	788.4	404.3	287.5	1,065.7	760.4	232.2	194.0	617.5	537.2
371--Motor vehicles & pts	37,283.1	682.9	75,802.5	2,777.5	10,675.5	595.0	47,161.2	2,495.6	357.5	206.1	4,340.2	1,029.8
372--Aircraft and parts	2,632.3	3.1	5,742.3	8.9	98.8	2.0	2,273.6	5.1	22.4	1.3	598.2	2.5
373--Yachts or boats	270.7	12.9	569.7	19.0	73.4	12.3	180.8	18.1	18.0	9.5	49.8	15.4
374--Railroad equipment	146.6	13.8	572.7	1.7	89.5	0.0	458.3	0.0	38.6	0.0	172.5	0.0
382--Mech measuring instru	1,172.4	80.5	2,813.0	165.2	156.9	78.5	351.7	158.0	70.2	56.7	134.5	102.1
384--Surgical, medical ins	315.4	30.3	785.1	120.9	45.5	29.5	126.8	111.1	26.9	23.1	89.7	82.6
395--Pens, pencils	154.3	12.6	349.7	23.0	13.3	11.6	21.8	20.1	10.7	10.3	14.2	13.8
Total, selected	96,325.5	3,936.4	201,342.8	9,713.3	20,569.4	3,466.1	66,358.5	8,212.1	4,912.6	1,755.8	12,025.4	4,148.9
Total all commodities	256,679.5	16,618.9	402,066.0	19,765.8	21,374.4	3,689.1	67,729.6	8,601.6	5,199.4	1,888.1	12,524.4	4,396.4

Source: Compiled from official statistics of the U.S. Department of Commerce.

TABLE 2

LEADING 3-DIGIT SIC COMMODITY GROUPS OF U.S. IMPORTS UNDER ITEM 807.00 BY 1987 U.S. CONTENT SHARE CLASS, 1983 AND 1987

(value in millions of dollars)

U.S. Content Share Class and 3-digit SIC Commodity Group	Value of Item 807.00 Imports		Share of Total Imports Entered Under Item 807.00		U.S. Content Share of Item 807.00		Leading Supplier Countries					
							1983			1987		
	1983	1987	1983	1987	First	Second	Third	First	Second	Third		
Over 40% U.S. Content	5,772.8	9,082.1										
367--Electronic components	4,104.6	5,308.4	52.1	34.0	60.4	52.3	Malaysa	Phil R	Mexico	Mexico	Malaysa	Singapr
369--Electrical machinery, equip	404.3	1,065.7	18.6	25.1	57.4	57.9	Mexico	Malaysa	S Korea	Mexico	Taiwan	Singapr
232--Men's or boys' shirts, trou	138.5	496.2	5.5	9.6	57.8	64.8	Dom Rep	Mexico	Haiti	Dom Rep	Mexico	Jamaica
364--Electric lighting and wirin	127.0	292.1	13.8	12.2	63.5	54.0	Mexico	Canada	Hg Kong	Mexico	Canada	Haiti
233--Women's, girls' skirts	135.7	282.8	6.2	6.2	63.0	56.5	Dom Rep	Mexico	Colomb	Dom Rep	Mexico	Colomb
362--Electrical industrial appar	142.2	276.2	15.7	15.3	54.0	58.8	Mexico	Hg Kong	Canada	Mexico	Canada	Hg Kong
236--Outerwear, nspf, of textile	103.3	261.8	3.9	4.1	72.6	63.8	Mexico	Dom Rep	Haiti	Mexico	Dom Rep	Haiti
234--Women's, girls' underwear	183.9	257.5	60.1	42.4	67.9	68.5	Dom Rep	Mexico	C Rica	Dom Rep	Mexico	Haiti
335--Rolled, drawn nonfer metals	153.6	241.2	10.6	9.9	63.0	61.2	Mexico	Japan	Canada	Mexico	Japan	Thailand
264--Paper and paperboard produc	97.2	142.5	16.9	10.9	82.3	81.0	Mexico	Canada	Taiwan	Mexico	Canada	Japan
361--Electric distribution equip	53.1	127.3	21.1	24.5	45.8	57.8	Mexico	Ireland	Canada	Mexico	Canada	Dom Rep
384--Surgical, medical instru	45.5	126.8	14.4	16.1	59.2	70.8	Mexico	Brazil	Denmark	Mexico	U King	Canada
231--Men's or boys' suits and co	23.7	66.1	3.4	6.4	60.1	54.2	Colomb	Dom Rep	Mexico	Mexico	Dom Rep	C Rica
302--Footwear, rubber or plastic	15.1	49.5	4.6	14.3	71.2	63.0	Mexico	S Korea	U King	Mexico	S Korea	Dom Rep
395--Pens, pencils, carbon paper	13.3	21.8	8.6	6.2	80.6	65.5	Mexico	Canada	Haiti	Mexico	Canada	Singapr
319--Leather goods, nspf	0.1	20.2	0.1	12.1	50.3	87.5	Canada	Phil R	Mexico	Mexico	Haiti	Canada
235--Headwear	16.3	16.4	12.9	7.8	74.1	71.5	Mexico	Haiti	Dom Rep	Mexico	Grenada	Dom Rep
225--Knit fabrics and hosiery	3.7	15.7	8.9	10.3	61.6	86.0	C Rica	Israel	Phil R	Jamaica	Colomb	C Rica
315--Gloves, leather	11.7	14.0	19.6	15.6	70.0	57.2	Mexico	Phil R	Haiti	Mexico	Phil R	China
Less than 40% U.S. Content	14,796.6	57,276.4										
371--Motor vehicles, and parts,	10,675.5	47,161.2	28.6	62.2	3.3	9.2	Japan	W Germ	Sweden	Canada	Japan	W Germ
372--Aircraft, and parts, nspf	98.8	2,273.6	3.8	39.6	22.7	26.3	France	Japan	Canada	France	U King	Canada
357--Office, computing, and acc	1,218.7	2,215.9	19.9	12.8	19.8	22.2	Singapr	Canada	Hg Kong	Singapr	Canada	Mexico
365--Radio and tv receiving equi	638.6	875.9	9.8	7.4	16.6	24.4	Mexico	Brazil	Taiwan	Mexico	Brazil	Japan
366--Communication equipment, ns	1,015.0	840.1	23.3	11.9	30.3	27.3	Mexico	Singapr	Canada	Mexico	Canada	Taiwan
353--Construction, mining and oi	159.4	554.7	11.5	12.5	35.8	25.0	Canada	U King	Japan	Canada	Japan	Mexico
374--Railroad equipment and part	89.5	458.3	61.1	80.0	43.1	37.6	Italy	Japan	Canada	Canada	Japan	France
351--Engines and turbines, and p	66.0	430.0	4.7	11.9	24.4	18.0	U King	Canada	Mexico	France	Brazil	Mexico
259--Furniture and fixtures, nsp	61.3	422.2	3.4	9.4	18.4	27.6	Mexico	Canada	Portugl	Canada	Mexico	Taiwan
356--General industrial machiner	133.0	396.7	3.8	5.4	41.4	32.5	Mexico	Canada	U King	Canada	Mexico	U King
352--Farm and garden machinery a	19.2	372.9	1.4	18.6	20.7	10.7	Japan	U King	Mexico	Canada	Japan	U King
382--Mechanical measuring and co	156.9	351.7	13.4	12.5	44.8	38.2	Mexico	Brazil	U King	Mexico	Canada	Japan
363--Household appliances, nspf,	197.0	257.6	12.2	8.1	23.7	34.1	Mexico	Denmark	Singapr	Mexico	Taiwan	Nethlds
354--Metalworking machinery and	96.0	216.9	4.8	5.0	18.6	21.4	Canada	W Germ	Austria	Japan	Canada	Mexico
373--Yachts or pleasure boats, a	73.4	180.8	27.1	31.7	24.5	27.5	Canada	Taiwan	Mexico	Taiwan	Canada	Mexico
358--Refrigeration and service i	67.7	165.4	16.9	12.6	29.4	23.2	Canada	Japan	Mexico	Mexico	Japan	Canada
344--Fabricated structural metal	24.5	43.5	5.0	8.6	10.9	30.7	Japan	Spain	Canada	Japan	Canada	Mexico
251--Household furniture, nspf	0.1	27.1	1.1	30.4	26.2	24.9	Mexico	Canada	Malaysa	Mexico	Japan	Canada
343--Heating equipment, except e	5.8	19.9	3.0	9.0	17.5	26.1	Canada	Taiwan	Mexico	Canada	Mexico	Taiwan
245--Prefabricated building pane	0.1	11.0	1.1	31.6	0.6	6.2	Canada	--	--	Canada	Mexico	--
277--Greeting cards, tally cards	0.0	1.1	0.0	4.8	--	38.7	--	--	--	Mexico	Mozambq	--

TABLE 3

LEADING COUNTRY SUPLLIERS OF U.S. IMPORTS UNDER ITEM 807.00 BY 1987 U.S. CONTENT SHARE CLASS

(value in millions of dollars; share in percent)

U.S. Content Share Class and Country	Value of Item 807.00 Imports		Share of Total Country Exports to the U.S.		U.S. Content Share of Item 807.00		Leading 807.00 SIC-Based Product Categories in 1987	
	1983	1987	1983	1987	1983	1987	First	Second
Over 40% U.S. Content								
Mexico	3,689.1	8,601.6	22	44	51	51	ElecMach	TransEq
Malaysia	1,189.2	1,025.3	57	36	58	58	ElecMach	Apparel
Philippines	725.2	644.3	36	28	63	50	ElecMach	Instru
Dominican Republic	161.0	428.3	20	37	69	69	Apparel	ElecMach
Haiti	197.4	232.3	58	59	71	71	Apparel	MiscMfg
Thailand	141.2	221.3	15	10	60	68	ElecMach	PrimMet
Costa Rica	78.8	145.6	20	22	77	67	Apparel	ElecMach
Jamaica	15.5	115.8	6	29	55	69	Apparel	Textiles
Colombia	29.8	48.0	3	2	67	64	Apparel	Textiles
Honduras	25.9	43.0	26	9	69	69	Apparel	MiscMfg
Guatemala	1.4	31.3	0	6	62	65	Apparel	Rubber
El Salvador	78.9	30.0	22	11	57	78	Apparel	ElecMach
Barbados	154.9	17.0	77	29	72	50	Apparel	Rubber
Belize	6.4	14.3	23	33	73	72	Apparel	Textiles
St Christopher-Nev-Ang	8.6	10.2	46	43	72	64	Apparel	ElecMach
St Lucia	3.6	10.0	77	56	70	69	Apparel	ElecMach
Antigua	5.8	5.2	66	60	79	70	Apparel	ElecMach
St Vincent & Grenadines	3.5	3.2	81	38	49	56	Apparel	ElecMach
Panama	1.9	2.5	1	1	70	69	Apparel	ElecMach
Guyana	3.6	2.4	5	4	57	58	Apparel	ElecMach
Mauritius	.	1.7	-	1	-	52	ElecMach	MiscMfg
Mozambique	.	1.3	-	5	-	46	TransEq	ElecMach
Montserrat	0.8	1.2	88	50	68	67	ElecMach	Instru
Grenada	0.0	1.1	2	31	44	70	Apparel	--
Malta	.	1.0	-	2	-	55	Apparel	ElecMach
Less than 40% U.S. Content								
Canada	1,184.0	21,019.9	2	30	30	18	TransEq	Mach
Japan	6,359.5	14,700.6	16	17	1	3	TransEq	Mach
West Germany	2,724.4	7,977.9	21	29	2	2	TransEq	Mach
South Korea	575.5	2,684.9	8	16	59	15	TransEq	ElecMach
United Kingdom	179.4	1,866.8	1	11	20	14	TransEq	Mach
France	344.9	1,731.7	6	16	11	15	TransEq	Mach
Singapore	975.6	1,727.5	34	28	28	23	Mach	ElecMach
Sweden	836.3	1,398.4	35	29	3	6	TransEq	Mach
Taiwan	568.3	940.7	5	4	18	25	ElecMach	Mach
Brazil	193.0	593.5	4	8	14	14	TransEq	ElecMach
Hong Kong	448.0	361.6	7	4	16	23	ElecMach	Mach
Belgium	57.4	339.3	2	8	8	3	TransEq	Mach
Italy	84.1	268.4	2	2	36	17	TransEq	Mach
Netherlands	62.9	111.3	2	3	20	27	Instru	ElecMach
Yugoslavia	1.9	71.7	1	9	17	11	TransEq	Leather
China	2.5	39.7	0	1	22	11	ElecMach	Apparel
Ireland	60.3	35.8	11	3	23	31	ElecMach	Mach
Hungary	3.4	23.4	2	8	24	18	TransEq	Leather
Denmark	38.7	21.1	4	1	7	7	ElecMach	Mach
Portugal	0.8	18.3	0	3	70	17	Mach	Leather
Finland	0.7	16.3	0	2	9	16	Mach	TransEq
India	17.4	12.8	1	1	58	31	Leather	ElecMach
Switzerland	7.5	10.4	0	0	19	22	Mach	ElecMach
Romania	2.3	10.3	0	1	3	3	Apparel	Leather
Spain	7.5	8.7	0	0	6	18	PrimMet	ElecMach
Indonesia	70.2	6.8	1	0	59	35	ElecMach	Apparel
Australia	2.5	6.1	0	0	8	34	ElecMach	TransEq
Poland	2.6	3.5	1	1	37	21	Mach	FabMet
Norway	0.6	3.3	0	0	57	29	Mach	FabMet
Austria	15.7	3.3	4	0	4	4	TransEq	ElecMach
New Zealand	0.4	2.4	0	0	22	15	TransEq	Mach
Czechoslovakia	0.3	2.0	0	3	3	8	Apparel	StoneGlass
Macao	0.4	1.6	0	0	82	1	Apparel	TransEq
Mali	0.0	1.6	0	35	15	8	Mach	--
Greece	2.3	1.5	1	0	75	33	ElecMach	Apparel

Note: Country suppliers with over $1 million in item 807.00 entries in 1987 are included.
Source: Compiled from special tabulations prepared for the U.S. International Trade Commission by the Census Bureau and official statistics of the U.S. Department of Commerce.

TABLE 4

VALUE OF MAQUILADORA OUTPUT AND IMPORTED MATERIALS AND THE VALUE OF U.S. IMPORTS FROM MEXICO UNDER ITEM 807.00, 1975-88

(value in millions of dollars and share in percent)

Year	Value of Maquiladora Output (a)	Value of Maquiladora Imp Mtrl (b)	Value of Item 807.00 Imports Total (c)	Value of Item 807.00 Imports US Cont (d)	Share Mag Output Imported (b/a)	US Cont Share Item 807 (d/c)	Mag Out Share Item 807 (a/c)	807 US Cont Share of Mag Imp (d/b)
1975	1,016.3	695.1	914.6	473.1	68.4	51.7	111.1	68.1
1976	1,120.7	768.5	1,058.1	544.9	68.6	51.5	105.9	70.9
1977	1,122.6	807.6	1,106.9	596.4	71.9	53.9	101.4	73.8
1978	1,555.1	1,116.5	1,489.9	791.1	71.8	53.1	104.4	70.9
1979	2,211.2	1,573.7	2,001.7	1,005.1	71.2	50.2	110.5	63.9
1980	2,493.5	1,729.0	2,276.3	1,141.4	69.3	50.1	109.5	66.0
1981	3,208.3	2,230.9	2,655.6	1,399.2	69.5	52.7	120.8	62.7
1982	2,707.4	1,896.4	2,816.5	1,436.4	70.0	51.0	96.1	75.7
1983	3,697.3	2,869.1	3,687.0	1,886.7	77.6	51.2	100.3	65.8
1984	4,910.1	3,749.6	4,775.4	2,530.1	76.4	53.0	102.8	67.5
1985	5,081.9	3,816.1	5,536.7	2,933.6	75.1	53.0	91.8	76.9
1986	5,635.4	4,339.9	6,366.7	3,331.8	77.0	52.3	88.5	76.8
1987	7,187.6	5,552.2	8,576.4	4,417.2	77.2	51.5	83.8	79.6
1988	10,218.6	7,864.2	10,653.5	5,299.8	77.0	49.7	95.9	67.4

Sources: (a) **and** (b): Instituto Nacional **de** Estadística, Geografía e Informálica (INEGI), ***Estadística de la Industria Maquiladora de Exportación,*** **México City: Secretaría** de **Programación y Presupuesto** (SPP), 1988 and **earlier years;** and Sistemas y Proyectos Pochteca, **"Structure** of **the Mexican Maquiladora** Industry-1988", **Tijuana, mimeographed,** (May 29, 1989), **based on data from** INEGI.

(c) **and** (d): **United** States **International** Trade Commission (USITC), ***Production Sharing:***

U.S. Imports under Harmonized Tariff Schedule Subheadings 9802.00.60 and 9802.00.80, 1985-1988 (formerly, Imports Under Items 806.30 and 807.00 of the Tariff Schedules of the United States), Publication 2243, Washington: USITC, (December 1989 and reports for earlier years).

TABLE 5

STRUCTURE OF MEXICAN MAQUILADORA OUTPUT AND VALUE -ADDED BY PRODUCT GROUP, 1985-87

Product Group	Output 1985	Output 1986	Output 1987	Imported Inputs 1985	Imported Inputs 1986	Imported Inputs 1987	Mexican Value-Added 1985	Mexican Value-Added 1986	Mexican Value-Added 1987
	millions of dollars								
Total	5,093.3	5,645.9	7,105.0	3,826.0	4,351.3	5,507.0	1,267.3	1,294.6	1,598.0
Food	50.4	43.4	44.0	40.1	32.5	28.3	10.3	10.9	15.7
Textiles and Apparel	376.6	360.4	409.5	289.4	276.9	308.1	87.2	83.5	101.4
Leather	78.1	66.6	77.6	57.2	49.8	58.1	20.9	16.8	19.5
Furniture	110.3	145.5	255.2	60.4	90.5	176.8	49.9	55.0	78.4
Chemicals	2.2	5.5	18.0	0.4	1.1	8.0	1.8	4.4	10.0
Transportation Equip	1,438.8	1,621.8	2,086.2	1,109.4	1,313.9	1,704.5	329.4	307.9	381.7
Nonelectr Machinery	61.0	73.0	115.6	40.7	48.1	87.4	20.3	24.9	28.2
Electrical Machinery	1,151.6	1,265.1	1,308.5	911.1	995.5	1,025.1	240.5	269.6	283.4
Electronic Components	1,248.8	1,397.2	1,846.7	922.1	1,082.1	1,453.6	326.7	315.1	393.1
Toys & Sporting Goods	164.8	134.9	152.0	125.2	94.2	107.7	39.6	40.7	44.3
Other Manufacturing	335.5	449.9	681.1	247.4	332.9	489.6	88.1	117.0	191.5
Services	75.1	82.6	110.7	22.7	33.8	59.7	52.4	48.8	51.0
	percent of total value								
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Food	1.0	0.8	0.6	1.0	0.7	0.5	0.8	0.8	1.0
Textiles and Apparel	7.4	6.4	5.8	7.6	6.4	5.6	6.9	6.4	6.3
Leather	1.5	1.2	1.1	1.5	1.1	1.1	1.6	1.3	1.2
Furniture	2.2	2.6	3.6	1.6	2.1	3.2	3.9	4.2	4.9
Chemicals	0.0	0.1	0.3	0.0	0.0	0.1	0.1	0.3	0.6
Transportation Equip	28.2	28.7	29.4	29.0	30.2	31.0	26.0	23.8	23.9
Nonelectr Machinery	1.2	1.3	1.6	1.1	1.1	1.6	1.6	1.9	1.8
Electrical Machinery	22.6	22.4	18.4	23.8	22.9	18.6	19.0	20.8	17.7
Electronic Components	24.5	24.7	26.0	24.1	24.9	26.4	25.8	24.3	24.6
Toys & Sporting Goods	3.2	2.4	2.1	3.3	2.2	2.0	3.1	3.1	2.8
Other Manufacturing	6.6	8.0	9.6	6.5	7.7	8.9	7.0	9.0	12.0
Services	1.5	1.5	1.6	0.6	0.8	1.1	4.1	3.8	3.2

Note; Output (which equals exports) is equal to the sum of imports used and Mexican value-added. U.S. dollar values may differ from those in Table *4* due to the use of different exchange rates.

Source: Economic Development Corporation of San Diego County, *Maquiladora Industry: The Economic Impact on San Diego's Economy, San Diego, CA:: San Diego Economic Development Corporation, (June 1989), based on data from INEGI.*

TABLE 6

SUMMARY OF ESTIMATES OF U.S. EMPLOYMENT CHANGE IN DIRECTLY-AFFECTED INDUSTRIES IF ITEM 807.00 WERE REPEALED UNDER DIFFERENT COUNTERFACTUAL CIRCUMSTANCES (WORK-YEARS IN THOUSANDS)

Counterfactual	Study	Assembly Jobs	Component Jobs	Net Change
All item 807.00 imports are replaced by domestically produced goods	USITC(1988)	+214	--	+214
Some item 807.00 imports are replaced entirely by domestically produced goods	USITC(1988)	+18	--	+18
Some item 807.00 imports are replaced by domestically produced goods and other imports that use foreign-made components	USITC(1988)	na	na	+10
	MMR(1988)	+26	-30	-5
	Godshaw(1988)			
	immediate	na	na	-5
	final	na	na	-13
Some item 807.00 imports are replaced entirely by other imports that use foreign-made components	USITC(1988)	--	-16	-16
All item 807.00 imports are replaced by other imports that use foreign-made components	USITC(1988)	--	-69	-69

Source: Schoepfle and Perez-Lopez (1988), *op. cit.*

TABLE 7

U.S. EMPLOYMENT IN INDUSTRIAL SECTORS DIRECTLY-AFFECTED BY ITEM 807.00 PROVISIONS(ANNUAL AVERAGE, ALL EMPLOYEES IN THOUSANDS)

SIC Industry	1973	1979	1982	1982-1988 Change		
				1988	Number	Average Annl %
Manufacturing, total	20,154.0	21,040.0	18,781.0	19,403.0	622.0	0.5
353--Construction and Mining Mach	323.6	382.8	335.2	227.3	(107.9)	(6.3)
*233--W-G-I Skirts and Coats	449.9	434.6	386.1	343.4	(42.7)	(1.9)
356--General Industrial Machinery	291.7	329.0	287.3	249.1	(38.2)	(2.3)
344--Fab Structural Metal Products	481.3	523.2	453.8	428.6	(25.2)	(0.9)
*362--Electrical Industrial Apparatus	239.1	251.5	206.6	183.8	(22.8)	(1.9)
*232--M-B Shirts and Trousers	407.6	362.9	322.3	301.1	(21.2)	(1.1)
351--Engines and Turbines and Parts	121.6	145.1	114.6	93.9	(20.7)	(3.3)
352--Farm and Garden Machinery	153.6	182.3	122.7	103.9	(18.8)	(2.7)
*231--M-B Suits and Coats	114.8	81.2	75.3	58.2	(17.1)	(4.2)
373--Yachts and Pleasure Boats	199.2	226.4	209.6	193.3	(16.3)	(1.3)
*234--W-G-I Undergarments	113.0	91.8	83.5	71.3	(12.2)	(2.6)
*335--R & D Nonferrous Metal Products	218.3	220.0	188.7	180.4	(8.3)	(0.7)
*302--Footwear, Rubber or Plastic	30.4	22.7	18.7	11.7	(7.0)	(7.5)
*361--Electric Distribution Equipment	136.6	125.6	113.3	106.5	(6.8)	(1.0)
365--Radio and TV Receiving Equip	152.4	114.7	91.3	85.4	(5.9)	(1.1)
374--Railroad Equipment and Parts	52.0	74.3	37.1	32.3	(4.8)	(2.3)
*236--Outerwear	78.2	65.7	61.4	58.5	(2.9)	(0.8)
366--Communications Equipment	468.1	522.6	569.4	566.9	(2.5)	(0.1)
*315--Gloves, Leather	na	na	4.0	3.1	(0.9)	(4.2)
*235--Headwear	14.8	16.7	15.4	14.8	(0.6)	(0.7)
277--Greeting Cards	24.7	24.3	24.5	24.1	(0.4)	(0.3)
354--Metalworking Machinery	320.4	368.8	314.0	313.9	(0.1)	0.0
343--Heating Equipment	74.5	75.7	59.9	60.2	0.3	0.1
363--Household Appliances	197.9	178.3	138.7	139.2	0.5	0.1
*319--Leather Goods, NES	14.2	14.5	8.7	9.3	0.6	1.1
357--Office, Computing Equipment	284.1	396.8	472.9	473.9	1.0	0.0
*395--Pens, Pencils, Carbon Paper	34.8	38.2	32.6	33.9	1.3	0.7
*225--Knit Fabrics and Hosiery	267.9	226.8	203.2	211.4	8.2	0.7
245--Prefabricated Building Panels	115.0	83.4	60.0	69.6	9.6	2.5
*364--Elect Lighting & Wiring Equip	222.6	225.3	186.6	198.1	11.5	1.0
*369--Electrical Mach & Equip, NES	142.0	174.3	143.8	155.6	11.8	1.3
382--Mech, Measuring, Control Device	174.2	235.9	244.8	260.4	15.6	1.0
*264--Paper and Paperboard Products	205.4	221.4	213.5	238.6	25.1	1.9
358--Refrigeration Equipment	183.2	188.4	158.6	184.7	26.1	2.6
*384--Surgical, Medical, Dental App	99.5	144.3	161.1	200.7	39.6	3.7
372--Aircraft and Parts	524.9	610.8	601.1	659.4	58.3	2.5
*367--Electronic Components	410.7	524.7	558.2	634.7	76.5	2.2
25---Furniture and Fixtures	506.8	497.8	432.0	529.7	97.7	3.5
371--Motor Vehicles and Parts	976.5	990.4	699.3	856.5	157.2	3.4
Total, selected industries	8,825.5	9,393.2	8,409.8	8,567.4	157.6	0.3

Note: * corresponds to an item 807.00 product category with 40 percent or more U.S.-content value. na = not available.

Source: U.S. Bureau of Labor Statisitcs (USBLS), establishment data.

TABLE 8

PROJECTED U.S. EMPLOYMENT IN INDUSTRIAL SECTORS DIRECTLY-AFFECTED BY ITEM 807.00 PROVISIONS, ACTUAL 1988 AND PROYECTED TO 2000 (ALL EMPLOYEES IN THOUSANDS)

SIC Industry	1988	2000	1988-2000 Employ Change: Number	Annual %	1988-2000 Ann Chg % Output
Manufacturing, total	19,406.0	19,090.0	(316.0)	(0.1)	2.3
*231-8--Apparel	893.0	739.0	(154.0)	(1.6)	0.5
371--Motor Vehicles and Parts	856.0	786.0	(70.0)	(0.7)	1.5
*225--Knit Fabrics and Hosiery	211.0	175.0	(36.0)	(1.5)	0.5
3661--Telephone & Telegraph Apparatu	111.0	84.0	(27.0)	(2.3)	2.4
*393,5,6,9--Manufactured Products, NE	228.0	203.0	(25.0)	(1.0)	0.2
344--Fab Structural Metal Products	429.0	406.0	(23.0)	(0.5)	0.8
363--Household Appliances	139.0	117.0	(22.0)	(1.4)	2.1
373--Yachts and Pleasure Boats	193.0	171.0	(22.0)	(1.0)	0.4
351--Engines and Turbines and Parts	94.0	77.0	(17.0)	(1.6)	1.1
354--Metalworking Machinery	314.0	298.0	(16.0)	(0.4)	1.4
365--Radio and TV Receiving Equip	85.0	70.0	(15.0)	(1.6)	4.2
*362--Electrical Industrial Apparatus	184.0	169.0	(15.0)	(0.7)	2.0
*302-4,6--Rubber Products, Plastic Ho	139.0	124.0	(15.0)	(0.9)	1.6
3572,4,6,9--Office & Accounting Equi	56.0	43.0	(13.0)	(2.2)	2.4
*364--Elect Lighting & Wiring Equip	198.0	187.0	(11.0)	(0.5)	1.2
*311,5-7,9--Luggage and Leather Produ	54.0	44.0	(10.0)	(1.8)	(0.3)
*3671-3--Electronic Tubes	39.0	32.0	(7.0)	(1.6)	1.4
*361--Electric Distribution Equipment	107.0	100.0	(7.0)	(0.5)	1.4
*3692,9--Electrical Equip & Supplies,	26.0	19.0	(7.0)	(2.4)	2.9
*3691,4--Storage Batteries, Engine El	98.0	92.0	(6.0)	(0.5)	1.6
*3357--Nonferrous Wire Drawing and In	77.0	71.0	(6.0)	(0.6)	1.5
*3353-5--Aluminum Rolling and Drawing	65.0	59.0	(6.0)	(0.8)	0.9
*3356--Nonferrous Rolling and Drawing	15.0	11.0	(4.0)	(2.8)	1.5
343--Heating Equipment	60.0	57.0	(3.0)	(0.4)	0.7
3531--Construction Machinery	82.0	79.0	(3.0)	(0.3)	1.6
3351--Copper Rolling and Drawing	23.0	21.0	(2.0)	(0.9)	0.7
3532,3--Mining and Oil Field Machine	58.0	58.0	0.0	0.0	1.2
3534-7--Materials Handling Machinery	87.0	87.0	0.0	0.0	2.1
277--Greeting Cards	24.0	25.0	1.0	0.5	3.3
374--Railroad Equipment and Parts	32.0	33.0	1.0	0.2	0.7
352--Farm and Garden Machinery	104.0	107.0	3.0	0.2	1.4
2452--Prefabricated Wood Buildings	24.0	27.0	3.0	1.0	2.3
358--Refrigeration Equipment	185.0	188.0	3.0	0.1	1.7
*3693--X-Ray and Other Electromedical	32.0	36.0	4.0	0.9	4.7
356--General Industrial Machinery	249.0	256.0	7.0	0.2	1.7
3662--Radio & TV Communications Equi	456.0	463.0	7.0	0.1	3.4
382--Mech, Measuring, Control Device	260.0	271.0	11.0	0.4	1.7
*264--Paper and Paperboard Products	239.0	254.0	15.0	0.5	2.1
3721--Aircraft	367.0	386.0	19.0	0.4	2.0
3724,8;3764,9--Aircraft Engines & Eq	385.0	404.0	19.0	0.4	2.1
*3674--Semiconductors and Related Dev	262.0	285.0	23.0	0.7	4.5
*3675-9--Misc. Electronic Components	334.0	359.0	25.0	0.6	2.4
3573--Electronic Computing Equipment	418.0	453.0	35.0	0.7	9.2
*384--Surgical, Medical, Dental App	201.0	253.0	52.0	1.9	4.2
25---Furniture and Fixtures	530.0	600.0	70.0	1.0	2.2
Total, selected industries	9,023.0	8,779.0	(244.0)	(0.5)	2.0

Note: * corresponds to an item 807.00 product category with 40 percent or more U.S.-content value.
Source: U.S. Bureau of Labor Statistics, Office of Economic Growth, unpublished data.

TABLE 9

EMPLOYMENT OF WAGE AND SALARY WORKERS BY OCCUPATION IN SELECTED INDUSTRIES, 1988

(percent of industry total)

Industrial Sector/SIC Industry	Occupational Group								
	Executive Managerial	Professional Specialty	Technicians	Marketing & Sales	Admin Support	Service Occup.	Agriculture & Fishing	Precision Production	Operators & Laborers
Total U.S. Economy	10	12	3	11	18	16	3	12	14
All Manufacturing	9	6	3	3	12	2	1	21	44
*231-8--Apparel	3	1	0	2	8	1	0	9	76
*225--Knit Fabrics	4	1	1	1	8	1	0	15	70
*315-7,9--Leather Products	6	1	0	3	10	1	0	17	61
363--Household Appliances	6	3	2	1	8	2	0	18	61
*302-4,6--Rubber Products	7	2	2	3	9	2	0	16	56
*264--Paper Products	8	6	2	3	12	1	0	12	56
371--Motor Vehicles & Eq	6	5	3	1	7	2	0	23	53
*335--Nonferrous Metals	7	4	2	2	10	2	0	20	53
343--Heating Equipment	8	2	2	3	12	1	0	19	52
*364--Elect Wiring&Lighting	8	3	2	3	12	1	0	19	52
25--Furniture	6	1	1	2	9	1	0	28	51
374,5,9--Other Trans Eq	8	4	2	2	11	1	0	21	51
358--Refrigeration Equip	8	3	3	3	11	1	0	20	51
393,5,6,9--Misc. Manuf	9	2	1	4	14	1	0	19	50
*369--Misc Electrical Equip	8	6	4	3	10	1	0	20	48
*362--Electrical Indust Ap	8	6	5	3	10	1	0	20	48
344--Fab Structural Metal	10	1	3	3	10	1	0	24	47
352--Farm & Gerden Mach	10	5	3	3	13	2	0	18	46
*361--Electric Distrib Eq	8	6	4	2	11	1	0	24	44
*384--Surgical, Medical Ins	10	5	4	5	15	2	0	20	40
245--Wood Buildings	7	0	2	3	6	1	0	41	39
365--Radio & TV Equipment	8	6	4	2	11	2	0	28	39
353--Construction Mach	10	6	5	4	14	1	0	23	37
351--Engines & Turbines	8	9	6	1	11	1	0	28	36
356--Industrial Machinery	11	5	4	4	14	1	0	25	35
373--Ships and Boats	8	5	4	1	8	2	0	42	31
*367--Electronic Components	11	13	9	2	11	1	0	21	31
277,9--Other Printing	9	8	2	6	26	1	0	18	30
354--Metalworking Mach	10	4	3	3	11	1	0	40	28
382--Measuring&Control Ins	13	12	10	4	15	1	0	21	24
372--Aircraft & Parts	12	19	6	1	13	1	0	29	18
366--Communications Equip	15	21	11	2	15	1	0	19	16
357--Office, Computing Eq	17	21	13	3	17	1	0	18	11

Note: * corresponds to an item 807.00 product category with 40 percent or more U.S.-content value.
Source: U.S. Bureau of Labor Statistics, Office of Economic Growth, unpublished data.

TABLE 10

U.S. EMPLOYMENT BY MAJOR INDUSTRY DIVISION FOR SELECTED OCCUPATION GROUPS, 1988

Industry	All Wage&Salary Occupations	Professional Specialty	Technician and Support	Precision Production	Blue-Collar Supervisor	Prod Occup, precision	Operators Fabricators	Machine Setters	Handworkers
Employment (in thousands)									
Total, all industries	107,777.0	13,264.1	3,773.7	12,459.8	1,677.3	2,965.1	16,369.0	4,850.7	2,443.0
Agriculture, forestry, and fishing	1,664.0	60.9	18.6	39.2	9.5	3.5	101.2	17.9	4.2
Mining	721.0	56.2	22.4	260.7	45.1	6.9	193.1	19.4	10.2
Construction	5,125.0	35.0	27.1	2,685.9	235.9	125.7	1,204.7	20.1	33.3
Manufacturing	19,405.0	1,212.8	618.5	4,017.4	744.2	2,122.8	8,593.9	4,282.3	2,116.9
Transportation, communications, and utilities	5,548.0	245.8	238.1	1,110.7	195.5	39.3	1,661.6	8.1	19.0
Wholesale and retail trade	25,138.0	325.7	159.1	1,767.8	169.5	380.9	2,300.8	96.0	109.5
Finance, insurance, and real estate	6,676.0	189.5	126.0	229.5	11.8	4.8	27.5	2.1	1.3
Services	34,526.0	9,713.1	2,133.1	1,410.0	137.8	227.6	1,701.4	377.6	129.0
Government	8,974.0	1,425.1	430.8	938.6	128.0	53.7	584.8	27.2	19.4
Percent of All Industries Total									
Total, all industries	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Agriculture, forestry, and fishing	1.5	0.5	0.5	0.3	0.6	0.1	0.6	0.4	0.2
Mining	0.7	0.4	0.6	2.1	2.7	0.2	1.2	0.4	0.4
Construction	4.8	0.3	0.7	21.6	14.1	4.2	7.4	0.4	1.4
Manufacturing	18.0	9.1	16.4	32.2	44.4	71.6	52.5	88.3	86.7
Transportation, communications, and utilities	5.1	1.9	6.3	8.9	11.7	1.3	10.2	0.2	0.8
Wholesale and retail trade	23.3	2.5	4.2	14.2	10.1	12.8	14.1	2.0	4.5
Finance, insurance, and real estate	6.2	1.4	3.3	1.8	0.7	0.2	0.2	0.0	0.1
Services	32.0	73.2	56.5	11.3	8.2	7.7	10.4	7.8	5.3
Government	8.3	10.7	11.4	7.5	7.6	1.8	3.6	0.6	0.8

Source: U.S. Bureau of Labor Statistics, Office of Economic Growth, unpublished data.

TABLE 11

U.S. EMPLOYMENT AND MEDIAN WEEKLY EARNINGS OF FULL-TIME WAGE AND SALARY WORKERS BY DETAILED OCCUPATIONAL GROUPS AND SEX, 1988

Occupation	All Workers		Men		Women	
	Number (thous)	Median Wkly Earn	Number (thous)	Median Wkly Ear	Number (thous)	Median Wkly Earn
Total, 16 year and over.....	82,692	$385	48,049	$449	34,643	$315
Executive, administrative, managerial	10,725	547	6,238	682	4,487	430
Professional specialty.....	11,045	555	5,730	651	5,315	485
Technicians and related support.....	2,960	448	1,647	510	1,313	384
Marketing and sales.....	7,741	385	4,519	488	3,222	264
Administrative support, inc clerical.	14,230	318	3,101	418	11,129	305
Service occupations.....	8,669	245	4,317	299	4,352	208
Agriculture, forestry, fishing.....	1,383	229	1,221	234	161	201
Precision production, craft, repair..	11,175	430	10,249	446	926	302
Operators, fabricators, laborers.....	14,763	313	11,026	352	3,737	238
Detailed occupational groups in precision production, craft, and repair and operators, fabricators and laborers occupations where women comprise a majority of the occupational group						
Precision workers, assorted materials:						
Electrical & electronic equip assemb	297	283	98	300	200	275
Textile, apparel, and furnishings machine operators:						
Winding and twisting mach operators.	73	249	15	na	57	244
Textile sewing machine operators....	669	193	73	216	595	191
Pressing machine operators.....	127	190	36	na	91	179
Laundering & dry cleaning mach op...	145	214	52	242	93	199
Machine operators, assorted materials:						
Packaging and filling mach operators	362	249	131	291	231	229
Photographic processing mach oper...	93	275	42	na	51	256
Fabricators, assemblers, and handworkers:						
Solderers and brazers.....	52	238	21	na	31	na
Production inspectors, testers, samplers, and weighers:						
Production inspectors, checkers.....	673	343	325	435	348	281
Graders and sorters, exc agric.....	89	240	41	na	49	na

Note: na = not available.

Source: U.S. Bureau of Labor Statistics (USBLS), *Employment and Earnings*, 37:1 (January 1990), Table 56.

TABLE 12

PROJECTED U.S. EMPLOYMENT CHANGE BY OCCUPATION FOR SELECTED DETAILED OCCUPATIONS IN DECLINING U.S. INDUSTRIES, 1988--2000

(number in thousands)

Occupation	Projected 1988-2000 Employment Change		
	All Industries	All Declining Industries	All Growing Industries
Total, all occupations.....	17,120.1	-1,435.3	18,555.4
All other assemblers and fabricators.....	-116.4	-113.1	-3.3
Sewing machine operators, garment.....	-90.7	-96.1	5.4
Inspectors, testers, and graders, precision...	-41.7	-71.6	29.9
Electrical and electronic assemblers.....	-103.3	-69.0	-34.3
Hand packers and packagers.....	-75.0	-48.8	-26.2
Electrical and electronic equip assemblers,pre	-70.2	-44.1	-26.1
All other machine operators, tenders, setters.	-28.5	-34.1	5.6
Textile winding machine operators and tenders.	-30.2	-30.8	0.6
Packaging and filling machine operators.....	-32.6	-30.1	-2.5
Machine feeders and offbearers.....	-31.0	-26.0	-5.0
Welders and cutters.....	-16.1	-24.8	8.7
Machine forming operators, metal and plastic..	-18.4	-23.4	5.0
All other hand workers.....	-18.5	-19.6	1.1
All other mechanics, installers, repairers....	-25.9	-17.7	-8.3
Sewing machine operators, nongarment.....	-8.0	-15.3	7.2
Machine tool cutting operators, metal and plas	-14.9	-14.1	-0.8
Welding machine setters, operators, tenders...	-13.6	-13.0	-0.6
All other metal and plastic machine setters...	-11.5	-11.9	0.3
All other machine tool cutting and forming....	-4.3	-10.9	6.5

Source: U.S. Bureau of Labor Statistics (USBLS) (1989), "Outlook 2000", *op. cit.*, Table 7, p. 61.

TABLE 13

TOTAL U.S. LABOR REQUIREMENTS FOR A MILLION DOLLAR CHANGE IN FINAL DEMAND FOR SELECTED FINAL ASSEMBLED PRODUCTS AND THEIR COMPONENTS ONLY

(work-years per million 1982 dollars)

I-O Sector (SIC Group)	Final Product		Components Only	
	All	Own	All	Own
18--Apparel.....(SIC 225;231-8)	40.325	25.152	31.640	7.545
57--Electronic Components and Accessories..(SIC 367)	34.891	18.009	28.907	5.290
56--Radio, TV, and Communications Equip. (SIC 365,6)	27.614	9.306	29.074	0.846
60--Aircraft.....(SIC 372)	24.200	11.594	27.112	3.682
44--Farm Machinery.....(SIC 352)	22.553	9.500	23.967	1.270
51--Office, Computing & Accounting Machines(SIC 357)	22.307	4.546	27.390	1.446
58--Misc Electrical Machinery & Supplies...(SIC 369)	22.263	8.598	25.741	0.540
59--Motor Vehicles and Equipment.....(SIC 371)	20.533	6.814	23.090	2.848
43--Engines and Turbines.....(SIC 351)	19.826	6.360	23.345	1.155

Source: Author's calculations, based on data from the U.S. Department of Commerce.

APPENDIX TABLE

MAJOR OCCUPATIONAL CATEGORIES

All occupations

Executive, administrative, and managerial
Managerial and administrative
Management support

Professional specialty
Engineers
Life scientists
Computer, mathematical, and operations research analysts
Physical scientists
Natural scientists
Lawyers and judicial workers
College and university faculty
Teachers, except college and university
Health diagnosing occupations
Health assessment and treating
Writers, artists, and entertainers
All other professional workers

Technicians and related support
Health
Engineering and science
Technicians and technologists, except health and engineering and science

Marketing and sales

Administrative support, including clerical
Adjusters, investigators, and collectors
Communications equipment operators
Computer operators and peripheral equipment operators
Financial records processing
Information clerks
Mail clerks and messengers
Material records, scheduling, dispensing, and distribution
Records processing, exc. financial
Secretaries, stenographers, and typists
Other clerical and administrative support workers

Service occupations

Agriculture, forestry, fishing, and related occupations

Precision production, craft, and repair

Blue-collar worker supervisors
Construction trades
Extractive and related workers, inc. blasters
Mechanics, installers, and repairers
Production occupations, precision
Assemblers, precision
Inspectors, testers, and graders, precision
Metal workers, precision
Textile, apparel, and furnishing workers, precision
Other precision workers
Plant and system occupations

Operators, fabricators, and laborers

Machine setters, set-up operators, operators, and tenders
Hand workers, including assemblers and fabricators
Transportation and material moving machine and vehicle operators
Helpers, laborers, and material movers, hand

Source: U.S. Bureau of Labor Statistics, Office of Economic Growth.