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Census of Manufactures

MC82-A-3
GEOGRAPHIC AREA SERIES

Arizona



The publications
from the 1982 Economic and
Agriculture Censuses are dedicated
to the memory of Shirley Kallek,
Associate Director for Economic Fields.
During her career at the Bureau of the
Census (1955 to 1983), she continually
directed efforts to improve
the timeliness and accuracy of
economic statistics.

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INTRODUCTION

ECONOMIC CENSUSES OVER TIME

The early beginnings of America's industrial output were first measured in the United States in the 1810 Decennial Census and again in 1820, when questions on manufacturing were included with those for population. Beginning with the 1840 Decennial Census, there were enumerations of manufactures and mineral industries at 10-year intervals up to and including the year 1900 for manufactures and 1940 for mineral industries. The latter census was again taken for 1954, 1958, 1963, and 1967.

Because of the increasing dominance of manufacturing in the early 20th century, Congress directed that quinquennial censuses of manufactures be taken beginning in 1905. However, from 1919 through 1939, these censuses were conducted every 2 years. The need for war-related current surveys in the early 1940's postponed the next census of manufactures until 1948 (for 1947). That census was again taken for 1954, 1958, 1963, and 1967.

Retail and wholesale trade data were first collected in 1930, and in 1933 information on selected service industries was added to the data-collection operation. These business censuses, as they were called, were again taken for 1935, 1939 (as part of the 1940 decennial program), 1948, 1954, 1958, 1963, and 1967.

Information on construction industries was obtained first in 1930 and again for 1935 and 1939. Data for the full spectrum of construction industries were not gathered again until 1968 (for 1967).

The need for transportation data to supplement information available from existing governmental or private sources was recognized by Congress in the late 1950's and early 1960's. The census of transportation (consisting of several surveys) was taken first for 1963 and again for 1967.

Since 1967, all of the above censuses have been taken quinquennially as part of the Census Bureau's economic census program. (For the 1977 censuses, the coverage of the service industries was broadened from "selected services" to "all services, except religious organizations and private households." A total of 41 additional four-digit standard industrial classifications¹ (SIC's) in 7 SIC major groups was added to the scope of the census. While most of the industries included for the first time for 1977 were covered again for 1982, some were not, i.e., hospitals; elementary and secondary schools; colleges, universities, and professional schools; junior colleges and technical institutes; labor unions and similar labor organizations; and political organizations.)

The first manufacturing census for an outlying area was conducted in Puerto Rico for the year 1909. Thereafter, with the exception of 1929, a census was taken at 10-year intervals through 1949. The first censuses of retail trade, wholesale trade,

and selected service industries in Puerto Rico were conducted for 1939. These censuses also were taken for the years 1949, 1954, 1958, 1963, and 1967. A census of construction industries was introduced first in Puerto Rico for 1967. These censuses of Puerto Rico have been taken since then for the years 1972, 1977, and 1982.

Censuses of manufactures, retail trade, wholesale trade, and selected service industries were conducted in Guam and the Virgin Islands of the United States for 1958, 1963, 1967, 1972, 1977, and 1982. Censuses of mineral industries were taken in the Virgin Islands of the United States for the years 1958, 1963, and 1967 but not since that time. A census of construction industries was also undertaken in these areas for 1972, 1977, and 1982.

Retail trade, wholesale trade, selected service industries, manufacturing, and construction industries were canvassed for the first time in the Northern Mariana Islands in 1983 (for 1982).

For 1982, the economic censuses and agriculture censuses were conducted concurrently.

USES OF THE ECONOMIC CENSUSES

The economic censuses are the major source for facts about the structure and functioning of the Nation's economy and provide essential information for government, business, industry, and the general public. They provide an important part of the framework for such composite measures as the gross national product, input-output measures, indexes of industrial production, and indexes measuring productivity and price levels. Information from the censuses is used to establish sampling frames and as benchmarks for current surveys of business activity, which are essential for measuring short-term economic conditions.

State and local governments use census data to assess business activities within their jurisdictions. The private sector uses the data to forecast general economic conditions; analyze sales performance; lay out sales territories; allocate funds for advertising; decide on locations for new plants, warehouses, or stores; and measure potential markets in terms of size, geographic areas, kinds of business, and kinds of products made or sold.

Following every census, thousands of businesses and other users purchase reports. Likewise, census facts are disseminated widely by trade associations, business journals, and newspapers. Volumes containing census statistics are available in most major public and college libraries. All 1982 data are available on microfiche from the U.S. Government Printing Office and most data on computer tape from the Census Bureau. Finally, the more than 50 State Data Centers also are suppliers of economic census statistics.

AUTHORITY AND SCOPE OF THE ECONOMIC CENSUSES

The economic censuses are required by law under title 13 of the United States Code, sections 131, 191, and 224, which

¹Standard Industrial Classification Manual: 1972. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 041-001-00066-6. 1977 Supplement. Stock No. 003-005-00176-0.

directs that they be taken at 5-year intervals for the years ending in 2 and 7. The 1982 Economic Censuses covered manufacturing, mining, construction industries, retail trade, wholesale trade, service industries, and selected transportation activities. Special programs also cover minority-owned and women-owned businesses. The next economic censuses are scheduled to be taken in 1988 for the year 1987.

CENSUS OF MANUFACTURES

General

The 1982 Census of Manufactures is the 31st census of manufactures of the United States. For 1982, it was conducted jointly with the censuses of mineral industries, construction industries, retail and wholesale trades, service industries, selected transportation activities, and minority-owned and women-owned businesses.

This report from the 1982 Census of Manufactures, is one of a series of 51 reports for each State and the District of Columbia. Each report contains establishment-based data (number of establishments, employment, payroll, value added by manufacture, and capital expenditures) for each State and its important standard metropolitan statistical areas, counties, and places, by industry groups and individual industries. Totals for "all manufacturing" will be shown for counties and selected places with more than 450 manufacturing employees.

Additional separate reports will be issued for each of 82 groups of related industries and on special subjects, such as size of establishments, legal form of organization, and fuels and electric energy consumed.

These separate reports will subsequently be issued as portions of the final census volumes. Volume I, Subject Statistics, will show comparative statistics for industries, States, and standard metropolitan statistical areas. It also will show selected subjects, such as concentration ratios in manufacturing, selected materials consumed, manufacturing activity in government establishments, and water use in manufacturing. Volume II, Industry Statistics, will be a consolidation of reports for the 82 groups of industries. Volume III, Geographic Area Statistics, will be a consolidation of the 51 geographic reports showing the same information that is shown in this report. The introduction to the final volumes will discuss, at greater length, many of the subjects described in this introduction. For example, the volume text will discuss the relationship of value added by manufacture to National income by industry of origin, the changes in statistical concepts over the history of the censuses, and the valuation problems arising from intracompany transfers between manufacturing plants of a company and between manufacturing plants and sales offices and sales branches of a company.

Scope of Census and Definition of Manufacturing Industries

The 1982 Census of Manufactures covers all establishments employing one person or more primarily engaged in manufacturing as defined in the 1972 Standard Industrial Classification (SIC) Manual and its 1977 Supplement.¹ This is the system of

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industrial classification developed over a period of years by experts on classification in government and private industry under the guidance of the Office of Management and Budget. This system of classification is in general use among government agencies as well as organizations outside the government.

The SIC manual defines manufacturing as the mechanical or chemical transformation of inorganic or organic substances into new products. The assembly of component parts of products is also considered to be manufacturing if the resulting product is neither a structure nor other fixed improvement. These activities are usually carried on in plants, factories, or mills that characteristically use power-driven machines and materials-handling equipment.

Manufacturing production is usually carried on for the wholesale market, for transfers to other plants of the same company, or to the order of industrial users rather than for direct sale to the household consumer. Some manufacturers in a few industries sell chiefly at retail to household consumers through the mail, through house-to-house routes, or through salespersons. Some activities of a service nature (enameling, engraving, etc.) are included in manufacturing when they are performed primarily for the trade. They are considered nonmanufacturing when they are performed primarily to the order of the household consumer.

Relationship Between Annual Survey of Manufactures and Census of Manufactures

The Bureau of the Census conducts the annual survey of manufactures (ASM) in each of the 4 years between the censuses of manufactures. The ASM is based on a scientifically selected sample of approximately 55,000 establishments and collects the same industry statistics (employment, payroll, value of shipments, etc.) as the census of manufactures. In addition to collecting the information normally requested on the census form, the establishments in the ASM sample are requested to supply detailed information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, and costs of purchased services.

Establishment Basis of Reporting

The census of manufactures and the annual survey of manufactures are conducted on an establishment basis. A company operating at more than one location is required to file a separate report for each location. Companies engaged in distinctly different lines of activity at one location are requested to submit separate reports if the plant records permit such a separation and if the activities are substantial in size.

In 1982, as in earlier years, a minimum size limit was set for including establishments in the census. All establishments employing one person or more at any time during the census year are included. The same size limitation has applied since 1947 in censuses and annual surveys of manufactures. In the 1939 and earlier censuses, establishments with less than \$5,000 value of products were excluded. The change in the minimum size limit in 1947 does not appreciably affect the historical comparability of the census figures except for data on number of establishments for a few industries.

This report includes information for separately operated administrative offices, warehouses, garages, and other auxiliary units that serve manufacturing establishments of the same company (see Auxiliaries).

Manufacturing Universe and Census Report Forms

The 1982 Census of Manufactures universe includes approximately 345,000 establishments. The amounts of information requested from manufacturing establishments were dependent upon a number of factors. The more important considerations were the size of the company and whether it was included in the annual survey of manufactures. The methods of obtaining information for the various subsets of the universe to arrive at the aggregate figures shown in this publication are described below.

1. Small Single-Unit Companies Not Sent a Report Form

In the 1982 Census of Manufactures, approximately 140,000 small single-establishment companies were excused from filing reports. Selection of these small establishments was done on an industry-by-industry basis and was based on annual payroll and total shipments data as well as on the industry classification codes contained in the administrative records of other Federal agencies. The cutoffs were selected so that these administrative records cases would account for no more than 3 percent of the value of shipments for the industry. Generally, all single-establishment companies with less than 5 employees were excused, while all establishments with more than 20 employees were mailed report forms.

Information on the physical location of the establishment, as well as information on payrolls, receipts (shipments), and industry classification, was obtained from the administrative records of other Federal agencies under special arrangements, which safeguarded their confidentiality. Estimates of data for these small establishments were developed using industry averages in conjunction with the administrative information.

The industry classification codes included in the administrative records files were assigned on the basis of brief descriptions of the general activity of the establishment. As a result, an indeterminate number of establishments were erroneously coded to the four-digit SIC level. This was especially true whenever there was a relatively fine line of demarcation between industries or between manufacturing and nonmanufacturing activity.

Sometimes these administrative record cases were given only a two- or three-digit SIC group. For the 1982 Census of Manufactures, these establishments were sent a separate classification form, which requested information on the products and services of the establishment. This form was used to code many of these establishments to the four-digit SIC level. Establishments that did not return the classification form were coded later to those four-digit SIC industries identified as "not elsewhere classified" (n.e.c.) within the given two- or three-digit industry groups.

As a result of these situations, a number of small establishments may have been misclassified by industry. However, such possible misclassifications have no significant effect on the statistics other than on the number of establishments.

The total establishment count for individual industries should be viewed as an approximation rather than a precise measurement. The counts for establishments with 20 employees or more are far more reliable than the count of total number of establishments.

2. Establishments Sent a Report Form

The 205,000 establishments covered in the mail canvass were divided into three groups:

a. ASM sample establishments— This group consisted of approximately 55,000 establishments covering all the units of large manufacturing establishments as well as a sample of the medium and smaller establishments. The probability of selection was proportionate to size (see appendix, Annual Survey of Manufactures).

In a census of manufactures year, the ASM report form (MA-1000) replaces the first page of the regular census form for those establishments included in the ASM. In addition to information on employment, payroll, and other items normally requested on the regular census form, establishments in the ASM sample were requested to supply information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, and costs of purchased services. Results of the ASM inquiries are included in table 3b of this report.

The census part of the report form is one of approximately 200 versions containing product, material, and special inquiries. The diversity of manufacturing activities necessitated the use of this many forms to canvass the approximately 450 manufacturing industries. Each form was developed for a group of related industries:

Appearing on each form was a list of products primary to the group of related industries, as well as secondary products and miscellaneous services that establishments classified in these industries were likely to be performing. Respondents were requested to identify the products, the value of each product, and, in a large number of cases, the quantity of the product shipped during the survey year. Space was also provided for the respondent to describe products not specifically identified on the form.

The report form also contained a materials-consumed inquiry, which varied from form to form depending on the industries being canvassed. The respondents were asked to review a list of materials generally used in their production processes. From this list, each establishment was requested to identify those materials consumed during the survey year, the cost of each, and, in certain cases, the quantity consumed. Once again, space was provided for the respondent to describe significant materials not identified on the form.

Finally, a wide variety of special inquiries was included to measure activities peculiar to a given industry, such as operations performed and equipment used.

b. Large and medium establishments (non-ASM)—

Approximately 100,000 establishments were included in this group. A variable cutoff, based on administrative records payroll data and determined on an industry-by-industry basis, was used to select those establishments that were to receive one of the approximately 200 census of manufactures regular forms. The first page, requesting establishment data for items such as employment and payroll, was standard but did not contain the detailed statistics included on the ASM form.

The product, material, and special inquiry sections supplied were based on the historical industry classification of the establishment.

- c. **Small single-unit establishments (non-ASM)**—This group consisted of approximately 50,000 establishments. For those industries where application of the variable cutoff for administrative records cases resulted in a large number of small establishments being included in the mail canvass, an abbreviated or "short" form was used. These establishments received one of the approximately 80 versions of the short form, which requested summary product and material data and totals but no details on employment, payrolls, cost of materials, inventories, and capital expenditures.

Auxiliaries

Auxiliaries are establishments whose employees are primarily engaged in performing supporting services for other establishments of the same company, rather than for the general public or for other business firms. They can be at different locations from the establishments served or at the same location as one of those establishments but not operating as an integral part thereof and serving two or more establishments. Where auxiliary operations are conducted at the same location as the manufacturing operation and operate as an integral part thereof, they usually are included in the report for the operating manufacturing establishment.

Included in the broad category of auxiliaries are administrative offices. Employees in administrative offices are concerned with the general management of multiestablishment companies, i.e., with the general supervision and control of two units or more, such as manufacturing plants, mines, sales branches, or stores. The functions of these employees may include (1) program planning, including sales research and coordination of purchasing, production, and distribution; (2) company purchasing, including general contracts and purchasing methods; (3) company financial policy and accounting, tax accounting, company sales and profit reports, and personnel accounting; (4) general engineering, including design of product machinery and equipment, and direction of engineering effort conducted at the individual operation locations; (5) direction of company personnel matters; and (6) legal and patent matters.

Other types of auxiliaries serving the plants or central management of the company include sales promotion offices, research and development organizations, etc.

In the 1982 census, as in previous censuses, respondents were asked to file separate report forms (ES-9200) for auxiliary units which were at different locations from the establishments served or at the same location as one of those establishments but not operating as an integral part thereof and serving two or more establishments.

This report includes information for separately operated auxiliaries tabulated from the form ES-9200. Data for these establishments are included at the total manufacturing level in each table of this report and are shown separately in tables 5 through 9. Also included in this report are data for those auxiliary operations that are conducted at the same location as the manufacturing operation and are collected as an integral part of the census of manufactures report form for the operating manufacturing establishment. These data are not separately shown on the tables.

A separate report on all separately operated auxiliaries, including those serving nonmanufacturing establishments, will be issued as part of the Enterprise Statistics program of the 1982 Economic Censuses. This report will provide data by industry of the establishment served, by primary activity of the parent company, by size of auxiliary, and by size of parent company. Data will be presented on employment by type of activity performed by the employees and primary activity of the auxiliary. Information will also be shown on capital expenditures, inventories, and cost of research and development.

Industry Classification of Establishments

Each of the establishments covered in the census was classified in one of approximately 450 manufacturing industries in accordance with the industry definitions in the SIC system. Under this system of classification, an industry is generally defined as a group of establishments producing a single product or a closely related group of products. The product groupings from which industry classifications are derived are based on considerations such as similarity of manufacturing processes, types of materials used, types of customers, and the like. The resulting group of plants must be significant in terms of its number, value added by manufacture, value of shipments, and number of employees. The system operates in such a way that the definitions progressively became narrower with successive additions of numerical digits. There are 20 major groups (two-digit SIC), 143 industry groups (three-digit SIC), and approximately 450 industries (four-digit SIC). The product classes and products of the manufacturing industries have been assigned codes based on the industry from which they originate. There are about 1,500 classes of products, identified by a five-digit code, and about 11,000 products, identified by a seven-digit code. The seven-digit products are considered the primary products of the industry with the same four digits.

Accordingly, an establishment is usually classified in a particular industry on the basis of its major activity during a particular year, i.e., production of the products primary to that industry exceeds, in value, production of the products primary to any other single industry. In a few instances, however, the industry classification of an establishment is not only determined by the products it makes but also by the process employed in making those products. For example, establishments engaged in blast furnace operations, refining of nonferrous metals from ore, or rolling and drawing of nonferrous metals (processes which involve heavy capitalization in specialized equipment) would be classified according to the process used during a census year. These establishments then would be "frozen" in that industry during the following ASM years.

In either a census or ASM year, establishments included in the ASM sample with certainty weight, other than those involved with heavily capitalized activities described above, are reclassified by industry only if the change in the primary activity from the prior year is significant or the change has occurred for two successive years. This procedure prevents reclassification when there are minor shifts in product mix.

In ASM years, establishments included in the ASM sample with noncertainty weight are not shifted from one industry classification to another. They are retained in the industry where they were classified in the base census year (see appendix, Annual Survey of Manufactures). However, in the following census year, these ASM plants are allowed to shift from one industry to another.

The result of these rules covering the switching of plants from one industry classification to another is that, at the aggregate level, some industries comprise different mixes of establishments between survey years, and establishment data for such industry statistics as employment and payroll may be tabulated in different industries between survey years. Hence, comparisons between prior-year and current-year published totals, particularly at the four-digit SIC level, should be viewed with caution. This is true particularly for the comparison between the data shown for a census year versus the data shown for the previous ASM year.

As previously noted, the small establishments that may have been misclassified by industry are usually administrative-record cases whose industry codes were assigned on the basis of incomplete descriptions of the general activity of the establishment. Such possible misclassifications have no significant effect on the statistics other than on the number of establishments.

While some establishments produce only the primary products of the industry in which they are classified, all establishments of an industry rarely specialize to this extent. The industry statistics (employment, inventories, value added by manufacture, total value of shipments including resales and miscellaneous receipts, etc.), therefore, reflect not only the primary activities of the establishments in that industry but also their secondary activities.

Geographic Area Coding

Accurate and complete information on the physical location of each establishment is required to tabulate the census data for States, standard metropolitan statistical areas (SMSA's), counties, and incorporated municipalities including cities, towns, villages, boroughs, and townships.

A computerized system was developed which assigned an area code number and a prefix symbol to the mailing address before the questionnaires were mailed. The assignment of tentative code numbers by the computer was based on extensive reference files which have been continually updated and expanded. The prefix symbol indicated whether the information contained in the mailing address was sufficient to provide a clearly acceptable area code or whether there was some question about the physical location of the establishment. An example of this situation is when the mailing address is a P.O. box or a central office. Respondents were required to report their physical location (street address, municipality, county, and State) if it differed from their mailing address.

Whenever the respondent reported a physical location different from the mailing address, the corrected address was used to assign a geographic code to the establishment. In addition, if the prefix symbol indicated any question about the acceptability of the mailing address, the information received from the respondent on the actual location was later carefully reviewed. As in previous censuses, the mailing address of the establishment was not always accepted as defining the physical location. For nonmail establishments (and those single-unit establishments that did not provide acceptable information on physical location), location information from the Internal Revenue Service tax forms was used as a basis for coding.

Geographic Areas Covered

The State—Total data for each State and the District of Columbia are published in tables 1 through 4. Table 5 presents data

by State for two-, three-, and four-digit SIC industries with 150 manufacturing employees or more, except those whose inclusion would disclose data for individual companies.

Standard metropolitan statistical areas (SMSA's)—These are integrated economic and social units with a large volume of daily travel and communication between the central city and outlying parts of the area.² Each area (except in New England) consists of one whole county or more. An area may include highly industrialized counties and adjoining counties, primarily residential in character, that contribute significantly to the SMSA industrial labor force and are socially and economically integrated with the central city. SMSA's are defined by the Office of Management and Budget for use throughout the Federal Government in presenting economic and social data.

In the New England States, similar criteria are applied in defining SMSA's on a place and town basis because towns rather than counties are the significant political unit in these States.

The requirement that each SMSA consist of county units (except in New England) sometimes results in the inclusion of considerable territory that ordinarily would not be considered "metropolitan," much less "industrial." Metropolitan areas could be defined more accurately by smaller area segments, such as minor civil divisions. However, the usefulness of information based on such areas would be limited by the fact that many types of economic and social data are available only on a county basis.

Each SMSA is identified primarily by the name of the principal place of the area. The area title may include one or two additional place names.

Table 4 shows all manufacturing totals for the SMSA's. Table 6 includes industry detail at the two-, three-, and four-digit SIC level for SMSA's with 250 manufacturing employees or more, except those whose inclusion would disclose the data for individual companies. This continues the practice begun in 1967. Before then, no detail had been shown for SMSA's under 40,000 total employment and no four-digit industries for SMSA's under 190,000 total employment.

Standard consolidated statistical areas (SCSA's)—Each SCSA includes two contiguous SMSA's or more which meet specific criteria of size, urban character, integration and contiguity of urbanized areas. As with the SMSA's, the SCSA's are defined by the Office of Management and Budget. Their number has increased from 13 in the 1977 Census to 16 for 1982. All manufacturing totals are shown in table 4. Table 6 has data for two-, three-, and four-digit industries with 250 manufacturing employees or more, except those whose inclusion would disclose data for individual companies.

²Each SMSA must include either (1) a place with 50,000 or more inhabitants, or (2) a place having a population of at least 25,000 which (a) with the addition of the population of contiguous places has a population density of at least 1,000 persons per square mile; (b) constitutes, for general economic and social purposes, a single community with a combined population of at least 50,000; and (c) includes a total population of at least 75,000 in the county or counties in which the place and contiguous places are located.

On June 30, 1983, the Office of Management and Budget announced newly defined metropolitan statistical areas (MSA's), consolidated metropolitan statistical areas (CMSA's), and primary metropolitan statistical areas (PMSA's) into which previously defined SMSA's and SCSA's were restructured. The 1982 Economic Censuses publications do not present data for the newly defined areas. These areas were defined after 1982 publication plans were almost complete. Inclusion of the newly defined areas would have materially delayed the publication of the 1982 Economic Censuses reports. However, limited 1977 data for the new areas will be published in the 1984 edition of the *State and Metropolitan Area Data Book*, and limited 1982 data will be published in the 1985 edition.

Industrial counties or county equivalents—Counties are the primary divisions of States, except in Louisiana where they are called parishes and in Alaska where they are called census divisions. Georgia, Maryland, Missouri, Nevada, and Virginia have one place or more that are independent of any county organization and constitute primary divisions of their States. These places are treated as counties. Table 4 presents total data for counties. Table 7 presents data by county for two-, three-, and four-digit industries with 450 manufacturing employees or more, except data whose inclusion would disclose data for individual companies.

Places with 450 manufacturing employees or more—The term "places" includes boroughs, towns, and villages, except boroughs in Alaska and New York. For census purposes, places are defined as incorporated municipalities with populations of at least 2,500, or unincorporated municipalities with populations of at least 25,000, based on the 1980 population census. In addition, a few "industrial park" areas of substantial manufacturing activity but with population below the specified limits have been included in the 1982 Census of Manufactures. Table 4 presents total data for places with 450 manufacturing employees or more. Table 8 presents data by places for two-, three-, and four-digit industries with 450 manufacturing employees or more, except those whose inclusion would disclose data for individual companies.

CENSUS DISCLOSURE RULES

In accordance with Federal law governing census reports, no data are published that would disclose the data for an individual establishment or company. However, the number of establishments classified in a specific industry is not considered a disclosure, so this item may be given even though other information is withheld.

The disclosure analysis for the statistics in tables 4 through 8 of this report is based on the total value of shipments. When the total value of shipments cannot be shown without disclosing data for individual companies, the complete line has been suppressed. However, the suppressed data are included in higher level totals. Additional disclosure analysis is performed for new capital expenditures that can be suppressed even though value of shipments data are publishable.

MICROFICHE AND COMPUTER TAPES

All the data in this report are available on microfiche. Selected data are also available on computer tape.

In addition to selected published data being on computer tape, one major data series, the location of manufacturing plants, will

be available only on computer tape. This series presents the number of establishments by employment size class by four-digit SIC industry codes for States, counties, and places of 2,500 inhabitants or more. These data are available for both State and county by industry, and State and place by industry.

Microfiche reports are sold by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Computer tapes are sold by the Data User Services Division, Customer Services (Tapes), Bureau of the Census, Washington, D.C. 20233.

SPECIAL TABULATIONS

Special tabulations of data collected in the 1982 Census of Manufactures may be obtained on computer tape or in tabular form. The data will be in summary form and subject to the same rules prohibiting disclosure of confidential information (including name, address, kind of business, or other data for individual business establishments or companies) as are the regular publications.

Special tabulations are prepared on a cost basis. A request for a cost estimate, as well as exact specifications on the type and format of the data to be provided, should be directed to the Chief, Industry Division, Bureau of the Census, Washington, D.C. 20233.

ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used in this publication:

-	Represents zero.
(D)	Withheld to avoid disclosing data for individual companies; data are included in higher level totals.
(IC)	Independent city.
(NA)	Not available.
(NC)	Not comparable.
(S)	Withheld because estimate did not meet publication standards on the basis of either the response rate or a consistency review.
(X)	Not applicable.
(Z)	Less than half the unit shown.
n. e. c.	Not elsewhere classified.
n. s. k.	Not specified by kind.
pt.	Part.
r	Revised.
SIC	Standard Industrial Classification.
SCSA	Standard Consolidated Statistical Area.
SMSA	Standard Metropolitan Statistical Area

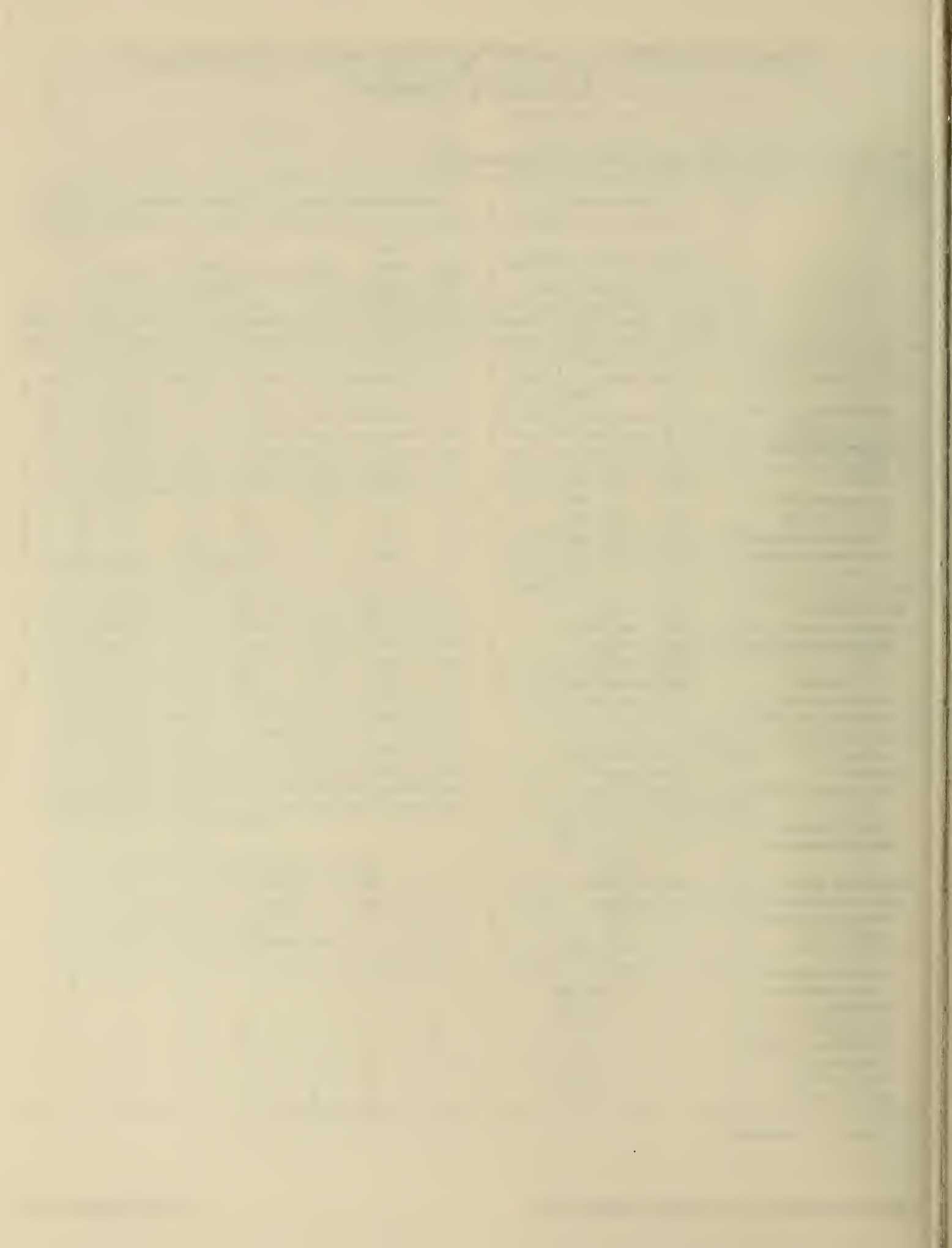
Other abbreviations, such as lb, gal, yd, doz, bbl, and s tons, are used in the customary sense.

Users' Guide for Locating Statistics in This Report by Table Number

[For definitions of SCSA's and SMSA's and explanation of terms, see appendixes]

Item	State statistics				SCSA and SMSA statistics				County statistics		Statistics for selected places	
	Historical	Operating ratios	All manufacturing totals	By selected industry	Historical (selected SCSA's/SMSA's)	Operating ratios (selected SCSA's/SMSA's)	All manufacturing totals	By selected industry	All manufacturing totals	By selected industry	All manufacturing totals	By selected industry
Number of establishments:												
Total	2a		*3a,4	5	2a		4	6	4	7	4	8
By employment size class				9						9		
Number of companies			3a									
Employment and payroll:												
Number of employees . . .	1,2a	2b	3a,4	5	2a	2b	4	6	4	7	4	8
Payroll	1,2a	2b	3a,4	5	2a	2b	4	6	4	7	4	8
Supplemental labor costs.			*3b									
Production workers	2a	2b	*3a,4	5	2a	2b	4	6	4	7	4	8
Production-worker hours.	2a	2b	*3a,4	5	2a	2b	4	6	4	7	4	8
Production-worker wages	2a	2b	3a,4	5	2a	2b	4	6	4	7	4	8
Shipments, cost of materials, and value added:												
Value of shipments	2a	2b	3a,4	5	2a	2b	4	6	4	7	4	8
Value added by manufac- ture	2a	2b	3a,4	5	2a	2b	4	6	4	7	4	8
Cost of materials	2a	2b	*3a,4	5	2a	2b	4	6	4	7	4	8
Cost of fuels and elec- tric energy			3a									
Quantity of electric energy			*3b									
Inventories:												
Beginning and end of year			*3a									
Stage of fabrication			*3a									
Method of evaluation			*3a									
Expenditures, assets, rents, and purchased services:												
New capital expendi- tures	2a		*3a, *3b,4	5	2a		4	6	4	7	4	8
Used plant and equip- ment expenditures			3a,*3b									
Gross assets			*3b									
Depreciation			*3b									
Retirements of buildings and machinery			*3b									
Rental payments			*3b									
Purchased services			*3b									

*Detailed information shown.



Arizona

CONTENTS

[Page numbers listed here omit the prefix that appears as part of the number of each page]

	Page
Introduction	III
Users' Guide for Locating Statistics in This Report by Table Number	IX
Summary of Findings	2

TABLES

HISTORICAL STATISTICS

1. Historical Employment Statistics for Operating Manufacturing Establishments and Auxiliaries for the State and Standard Metropolitan Statistical Areas: 1982 and Earlier Census Years	3
2a. Historical Statistics for the State and Selected Standard Metropolitan Statistical Areas: 1982 and Earlier Census Years	3
2b. Selected Operating Ratios for the State and Selected Standard Metropolitan Statistical Areas: 1982 and Earlier Census Years	4

SUMMARY STATISTICS

3a. Summary Statistics for the State: 1982	4
3b. Supplemental State Statistics Based on Sample Estimates: 1982	5
4. Statistics for the State, Standard Metropolitan Statistical Areas, Counties, and Selected Places: 1982	5

INDUSTRY STATISTICS

5. Statistics by Selected Industry Group and Industry for the State: 1982 and 1977	6
6. Statistics by Selected Industry Group and Industry for Standard Metropolitan Statistical Areas: 1982	10
7. Statistics by Selected Industry Group and Industry for Selected Counties: 1982	13
8. Statistics by Selected Industry Group and Industry for Selected Places: 1982	14

EMPLOYMENT SIZE CLASS STATISTICS

9. Distribution of Establishments by Employment Size and Major Group for the State and Counties: 1982	17
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APPENDIXES

A. Explanation of Terms	A-1
B. Annual Survey of Manufactures (ASM) Sampling and Estimating Methodologies	B-1
C. Standard Metropolitan Statistical Areas	C-1
D. Geographic Notes	D-1

Publication Program	Inside back cover
-------------------------------	-------------------

SUMMARY OF FINDINGS

In 1982, 149.8 thousand persons were employed in Arizona's manufacturing establishments. This figure represented an increase of 35 percent from the 1977 figure of 110.9 thousand workers.

The total value added by manufacture for the State amounted to \$6.2 billion in 1982. This figure, along with all dollar figures in this report, are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

In the State, the most important industry groups ranked by employment were electric and electronic equipment; machinery, except electrical; transportation equipment; and printing and publishing. They accounted for approximately 59 percent of the State's 1982 employment. This represents a shift from 1977 when electric and electronic equipment; machinery, except electrical; transportation equipment; and primary metal industries

accounted for approximately 52 percent of the State's employment.

The most important counties in the State ranked by employment were Maricopa, Pima, Pinal, and Coconino. They accounted for approximately 93 percent of the State's 1982 manufacturing employment. This represents a shift from 1977 when Maricopa, Pima, Pinal, and Gila accounted for approximately 90 percent of the State's employment.

The methods of data collection and use of administrative-record data are discussed in detail in the Introduction. Small single-unit companies with up to 20 employees (cutoff varied by industry) were excluded from the mail portion of the census. For these establishments (and a small number of larger establishments whose reports were not received in time to be tabulated), statistics on payrolls and receipts were obtained from administrative records of other government agencies. Other statistics were developed from industry averages. For this State, these establishments accounted for 13 percent of the total value of shipments.

Table 1. Historical Employment Statistics for Operating Manufacturing Establishments and Auxiliaries for the State and Standard Metropolitan Statistical Areas: 1982 and Earlier Census Years

[For information on geographic areas followed by Δ and for general geographic information, see appendixes. For meaning of abbreviations and symbols, see introductory text]

Geographic area and year	All establishments		Operating manufacturing establishments		Auxiliaries ¹	
	Employees (1,000)	Payroll (million dollars)	Employees (1,000)	Payroll (million dollars)	Employees (1,000)	Payroll (million dollars)
ARIZONA						
1982 -----	149.8	3 036.9	145.8	2 937.4	4.0	99.5
1977 -----	110.9	1 462.9	105.9	1 374.5	5.0	88.4
1972 -----	93.9	855.1	92.2	830.5	1.7	24.6
1967 -----	76.8	543.2	75.7	533.1	1.1	10.1
Standard Metropolitan Statistical Areas						
Phoenix						
1982 -----	108.0	2 210.0	105.2	2 132.4	2.8	77.6
1977 -----	84.6	1 135.2	80.1	1 054.9	4.5	80.3
1972 -----	71.9	673.6	70.6	653.0	1.3	19.6
1967 -----	59.3	433.4	58.6	426.1	.7	7.3
Tucson						
1982 -----	26.4	551.2	25.6	541.5	.8	9.7
1977 -----	11.1	143.6	10.9	141.1	.2	2.5
1972 -----	9.1	80.6	(D)	(D)	(D)	(D)
1967 -----	8.5	59.8	(D)	(D)	(D)	(D)

¹Defined in introductory text. Data for these establishments are included at the total manufacturing level in each table in this report. Data for these establishments are shown separately in tables 5 through 9.

Table 2a. Historical Statistics for the State and Selected Standard Metropolitan Statistical Areas: 1982 and Earlier Census Years

[Includes operating manufacturing establishments and auxiliaries. Includes SMSA's with 40,000 manufacturing employees or more. For information on geographic areas followed by Δ, definition of SMSA's, and explanation of terms, see appendixes. For meaning of abbreviations and symbols, see introductory text]

Year ¹	All establishments ²		All employees		Production workers			Value added by manufacture ³ (million dollars)	Cost of materials ⁴ (million dollars)	Value of shipments ⁴ (million dollars)	New capital expenditures (million dollars)	Comparative indexes and U.S. employment			
	Total (no.)	With 20 employees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					Percent of U.S. manufacturing employment	Index of State/SMSA employment change (1977 = 100)	Index of U.S. manufacturing employment change (1977 = 100)	U.S. manufacturing employment (1,000)
ARIZONA															
1982 -----	3 407	854	149.8	3 036.9	86.7	165.2	1 423.4	6 162.4	6 726.3	12 907.2	765.2	.78	135	98	19 137.2
1977 -----	2 892	677	110.9	1 462.9	69.8	135.0	780.7	3 332.9	3 773.4	7 022.4	213.7	.57	100	100	19 596.9
1972 -----	2 037	597	93.9	855.1	62.3	121.1	481.5	1 879.6	2 233.7	4 041.2	198.4	.49	85	98	19 028.7
1967 -----	1 630	424	76.8	543.2	50.8	101.8	308.6	995.3	1 003.9	2 003.7	109.9	.40	69	99	19 323.2
Phoenix SMSA															
1982 -----	2 352	606	108.0	2 210.0	63.7	121.1	1 058.4	4 513.0	3 560.8	8 155.2	462.1	.56	128	98	19 137.2
1977 -----	1 976	488	84.6	1 135.2	51.1	99.4	577.2	2 558.6	2 092.8	4 586.6	156.5	.43	100	100	19 596.9
1972 -----	1 367	411	71.9	673.6	46.4	90.4	365.5	1 379.0	1 199.9	2 543.5	81.5	.38	85	98	19 028.7
1967 -----	1 063	296	59.3	433.4	37.0	75.1	228.1	773.3	615.8	1 396.4	89.4	.31	70	99	19 323.2

¹For intercensal data for the years between 1963 and 1978, see the 1978-1979 Annual Survey of Manufactures (ASM) clothbound volume. For data prior to 1963, see the 1963 Census of Manufactures, vol. III, table 2 of the State chapter.

²Includes establishments with payroll at any time during year.

³Value added by manufacture for 1982 is computed using inventory data reported at cost or market prior to any adjustment to LIFO cost. This uniform instruction is a change from prior years in which respondents were permitted to value their inventories using any generally accepted accounting method. Consequently, 1982 data for value added by manufacture are not comparable to prior year data. For further explanation, see inventories in appendixes.

⁴Aggregate of cost of materials and value of shipments includes extensive duplication since products of some industries are used as materials by others.

Table 2b. Selected Operating Ratios for the State and Selected Standard Metropolitan Statistical Areas: 1982 and Earlier Census Years

[Includes operating manufacturing establishments and auxiliaries. Includes SMSA's with 40,000 manufacturing employees or more. For information on geographic areas followed by Δ, definition of SMSA's, and explanation of terms, see appendixes. For meaning of abbreviations and symbols, see introductory text]

Geographic area and year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production-worker hour (dollars)
ARIZONA									
1982 -----	20 273	58	1 905	8.62	52	76	41 138	49	37.30
1977 -----	13 191	63	1 934	5.78	54	75	30 053	44	24.69
1972 -----	9 106	66	1 944	3.98	55	76	20 017	45	15.52
1967 -----	7 073	66	2 004	3.03	50	77	12 960	55	9.78
Standard Metropolitan Statistical Areas									
Phoenix									
1982 -----	20 463	59	1 901	8.74	44	71	41 787	49	37.27
1977 -----	13 418	60	1 945	5.81	46	70	30 243	44	25.74
1972 -----	9 369	65	1 948	4.04	47	74	19 179	49	15.25
1967 -----	7 309	62	2 030	3.04	44	75	13 040	56	10.30

Note: For qualifications to the data, see table 2a footnotes.

Table 3a. Summary Statistics for the State: 1982

[Includes operating manufacturing establishments and auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	1982	Item	1982
Companies ¹ ----- number ..	3 341	Manufacturers' inventories ⁵ :	
All establishments ² ----- do ..	3 407	End of 1981, total ----- mil dol..	2 487.2
With 1 to 19 employees ----- do ..	2 553	Detail by method of valuation:	
With 20 to 99 employees ----- do ..	650	Subject to LIFO costing ⁶ ----- do ..	413.0
With 100 employees or more ----- do ..	204	LIFO reserve ----- do ..	113.1
All employees:		LIFO value ----- do ..	299.9
Average for year ----- 1,000 ..	149.8	Not subject to LIFO costing ----- do ..	1 838.8
Annual payroll ----- mil dol..	3 036.9	Valuation method not reported ⁷ ----- do ..	232.0
Production workers:		Amount subject to LIFO reported without associated reserve and value ⁸ ----- do ..	3.4
Average for year ----- 1,000 ..	86.7	Detail by stage of fabrication:	
March ----- do ..	90.0	Finished goods ----- do ..	668.1
May ----- do ..	88.0	Work-in-process ----- do ..	1 211.1
August ----- do ..	85.4	Materials and supplies ----- do ..	608.0
November ----- do ..	83.5	End of 1982, total ----- do ..	2 441.5
Hours ----- millions ..	165.2	Detail by method of valuation:	
January to March ----- do ..	42.3	Subject to LIFO costing ⁶ ----- do ..	353.2
April to June ----- do ..	42.2	LIFO reserve ----- do ..	111.4
July to September ----- do ..	40.8	LIFO value ----- do ..	241.7
October to December ----- do ..	39.5	Not subject to LIFO costing ----- do ..	1 864.2
Wages ----- mil dol..	1 423.4	Valuation method not reported ⁷ ----- do ..	220.3
Cost of materials, etc. ³ ----- do ..	6 726.3	Amount subject to LIFO reported without associated reserve and value ⁸ ----- do ..	3.8
Materials, parts, containers, etc., consumed ----- do ..	5 650.5	Detail by stage of fabrication:	
Resales ----- do ..	249.7	Finished goods ----- do ..	671.1
Fuels consumed ⁴ ----- do ..	147.3	Work-in-process ----- do ..	1 189.5
Purchased electric energy ----- do ..	169.1	Materials and supplies ----- do ..	580.9
Contract work ----- do ..	509.4	Capital expenditures for plant and equipment ----- do ..	799.2
Value added by manufacture ⁵ ----- do ..	6 162.4	New capital expenditures ----- do ..	765.2
Value of shipments, including resales ³ ----- do ..	12 907.2	New buildings and other structures ----- do ..	222.2
Value of resales ----- do ..	301.5	New machinery and equipment ----- do ..	543.0
		Used capital expenditures ----- do ..	34.0

¹For the census, a company is defined as a business organization consisting of one establishment or more under common ownership or control. Figure shown excludes auxiliaries.

²Includes establishments with payroll at any time during year.

³Aggregate of cost of materials and value of shipments includes extensive duplication, since products of some industries are used as materials by others (see appendixes).

⁴Data on purchased fuels by type were not collected for 1982. See MC82-S-4, Fuels and Electric Energy Consumed, for 1981 data on purchased fuels by type.

⁵Beginning in the 1982 Economic Censuses, all respondents were requested to report their inventories at cost or market prior to any adjustment to LIFO cost. This uniform instruction is a change from prior Censuses and annual surveys of manufactures in which respondents were permitted to value their inventories using any generally accepted accounting method. Consequently, 1982 data for inventories and value added by manufacture, which is computed using the inventory data, are not comparable to prior year data. For further explanation, see Inventories in appendixes.

⁶Includes only data reported by respondents who: a. indicated amount of inventories subject to LIFO cost, and b. provided sufficient information to determine associated LIFO reserve and value figures.

⁷Includes data estimated for nonresponse and nonmail administrative records and data reported by respondents who provided total inventory figures without other information.

⁸Includes data reported by respondents who indicated their inventories subject to LIFO cost but did not provide associated LIFO reserve and value figures.

Table 3b. Supplemental State Statistics Based on Sample Estimates: 1982

[Includes only operating manufacturing establishments. For meaning of abbreviations and symbols, see introductory text. For description of annual survey of manufactures (ASM) and explanation of terms, see appendixes]

Item	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Item	Amount (million dollars)	Relative standard error of estimate ¹ (percent)
Supplemental labor costs:			Gross book value of depreciable assets — Con.		
Total	607.7	1	Buildings and other structures:		
Legal costs	227.5	1	Beginning of year	1 129.2	2
Voluntary costs	380.2	2	New capital expenditures	190.9	2
Purchased services:			Used capital expenditures	12.1	81
Cost of purchased services for the repair of—			Retirements	40.1	6
Buildings and other structures	16.0	6	End of year	1 292.2	2
Response coverage ratio (percent) ²	76	(X)	Machinery and equipment:		
Machinery	69.1	7	Beginning of year	3 431.9	2
Response coverage ratio (percent) ²	83	(X)	New capital expenditures	429.1	2
Cost of purchased communication services	47.4	3	Automobiles, trucks, etc., for highway use	5.6	18
Response coverage ratio (percent) ²	81	(X)	Computers and peripheral data processing equipment	64.7	6
Electric energy used for heat and power:			All other	326.3	2
Purchased:			New machinery and equipment, n.s.k. ³	32.4	13
Quantity (million kWh)	3 524.9	4	Used capital expenditures	26.4	25
Cost	169.1	(X)	Retirements	192.7	5
Generated less sold (million kWh)	(S)	(X)	End of year	3 694.7	2
Gross book value of depreciable assets:			Rental payments:		
Total:			Total	80.6	5
Beginning of year	4 561.2	2	Buildings and other structures	42.6	6
New capital expenditures	620.0	2	Machinery and equipment	37.9	5
Used capital expenditures	38.5	42	Depreciation charges during 1982:		
Retirements	232.8	5	Total	366.8	2
End of year	4 986.9	2	Buildings and other structures	49.1	2
			Machinery and equipment	317.8	2

Note: Data for total new capital expenditures, new building expenditures, new machinery expenditures, and total used expenditures are also shown in table 3a. Data in table 3a are census universe totals and may differ from annual survey of manufactures (ASM) sample estimates shown in this table. Data in this table represent best estimates of year-to-year change as measured by the continuing ASM sample. However, they are subject to sampling error and, hence, as estimates of level, are not as reliable as universe figures shown in table 3a.

¹For description of relative standard error of estimate, see Qualifications of the Data in appendixes.

²Measure of extent to which respondents reported each item. Derived for each item by calculating the ratio of weighted employment for those sample establishments that reported the specific inquiry to weighted total employment for all sample establishments classified in industry. (See appendixes for explanation of sample weight.)

³Represents total machinery and equipment expenditures for establishments that did not break down their expenditures by specific type.

Table 4. Statistics for the State, Standard Metropolitan Statistical Areas, Counties, and Selected Places: 1982

[Includes operating manufacturing establishments and auxiliaries. Includes places with 450 manufacturing employees or more. For information on geographic areas followed by Δ, definition of SMSA's, and explanation of terms, see appendixes. For meaning of abbreviations and symbols, see introductory text]

Geographic area	E ¹	All establishments ²		All employees		Production workers			Value added by manufacture ³ (million dollars)	Cost of materials ⁴ (million dollars)	Value of shipments ⁴ (million dollars)	New capital expenditures (million dollars)
		Total (no.)	With 20 employees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
Arizona	E1	3 407	854	149.8	3 036.9	86.7	165.2	1 423.4	6 162.4	6 726.3	12 907.2	765.2
STANDARD METROPOLITAN STATISTICAL AREAS												
Phoenix	-	2 352	606	108.0	2 210.0	63.7	121.1	1 058.4	4 513.0	3 560.8	8 155.2	462.1
Tucson	E2	534	121	26.4	551.2	12.1	22.8	178.3	1 062.4	1 658.3	2 613.1	144.8
COUNTIES												
Apache	E5	21	4	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Cochise	-	43	14	1.4	22.4	.9	1.9	13.4	43.4	63.3	107.1	2.0
Coconino	E2	76	19	2.3	36.2	1.5	2.8	20.6	116.8	147.8	260.9	11.9
Gila	-	26	10	1.7	44.9	1.2	2.5	33.6	83.6	388.4	492.3	68.9
Graham	E4	9	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Greenlee	-	3	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Maricopa	-	2 352	606	108.0	2 210.0	63.7	121.1	1 058.4	4 513.0	3 560.8	8 155.2	462.1
Mohave	-	67	14	2.1	41.0	1.5	3.0	26.1	50.3	77.5	147.9	11.4
Navajo	E1	50	9	1.4	27.6	1.1	2.1	21.8	65.8	97.6	168.4	27.9
Pima	E2	534	121	26.4	551.2	12.1	22.8	178.3	1 062.4	1 658.3	2 613.1	144.8
Pinal	-	55	22	2.4	45.1	1.8	3.5	32.2	26.5	535.1	566.0	5.3
Santa Cruz	E2	26	5	.6	6.3	.3	.5	2.6	12.4	18.5	30.8	.9
Yavapai	E1	85	12	1.6	25.2	1.2	2.1	17.9	61.0	51.8	111.4	5.3
Yuma	E3	60	15	1.4	16.2	1.0	1.9	10.5	35.5	61.6	98.5	1.9

See footnotes at end of table.

Table 4. Statistics for the State, Standard Metropolitan Statistical Areas, Counties, and Selected Places: 1982—Con.

[Includes operating manufacturing establishments and auxiliaries. Includes places with 450 manufacturing employees or more. For information on geographic areas followed by Δ, definition of SMSA's, and explanation of terms, see appendixes. For meaning of abbreviations and symbols, see introductory text]

Geographic area	E ¹	All establishments ²		All employees		Production workers			Value added by manufacture ³ (million dollars)	Cost of materials ⁴ (million dollars)	Value of shipments ⁴ (million dollars)	New capital expenditures (million dollars)
		Total (no.)	With 20 employees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
PLACES												
Buckeye	E2	7	3	.6	6.0	.4	.7	4.3	10.4	8.6	19.3	.4
Casa Grande	-	26	12	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Chandler	-	46	20	2.8	54.0	1.9	3.7	30.8	144.6	119.7	265.1	34.5
Douglas	-	15	6	.7	13.1	.5	1.1	8.2	22.6	36.7	59.5	.8
Flagstaff	E1	53	15	1.7	26.1	1.1	2.0	14.8	98.8	97.1	191.7	6.9
Glendale	-	94	22	3.6	59.6	2.7	4.9	33.7	156.1	107.7	254.8	10.6
Goodyear	-	2	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Lake Havasu City Δ	E2	31	4	.5	5.1	.4	.8	3.6	18.1	11.7	28.0	2.5
Mesa	E1	150	27	7.9	166.3	4.4	7.1	60.1	317.9	146.3	462.4	47.3
Phoenix	-	1 417	380	66.8	1 381.3	39.4	76.8	687.1	2 786.9	2 421.2	5 326.4	229.6
Prescott	-	40	6	1.0	14.3	.7	1.2	9.0	23.8	23.5	47.6	1.8
Scottsdale	E1	159	24	8.1	177.0	3.6	6.8	55.0	301.3	128.4	440.4	38.0
Tempe	-	318	89	13.0	262.5	8.0	15.3	133.7	626.1	445.8	1 042.6	78.4
Tucson	E2	402	94	24.2	521.6	10.3	19.8	157.0	987.2	1 569.3	2 449.7	(D)
Yuma	E4	36	9	1.1	12.0	.8	1.5	7.8	27.1	49.7	77.6	1.4

¹Payroll, employment, and sales data for some small single-unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for other establishments whose reports were not received at time data were tabulated. The following symbols are shown where estimated data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

²Includes establishments with payroll at any time during year.

³Value added by manufacture for 1982 is computed using inventory data reported at cost or market prior to any adjustment to LIFO cost. This uniform instruction is a change from prior years in which respondents were permitted to value their inventories using any generally accepted accounting method. Consequently, 1982 data for value added by manufacture are not comparable to prior year data.

⁴Aggregate of cost of materials and value of shipments includes extensive duplication, since products of some industries are used as materials by others (see appendixes).

Table 5. Statistics by Selected Industry Group and Industry for the State: 1982 and 1977

[Includes operating manufacturing establishments and auxiliaries. Includes industry groups and industries with 150 employees or more. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

SIC code	Industry	E ¹	1982										1977		
			All establishments ²		All employees		Production workers			Value added by manufacture ⁴ (million dollars)	Cost of materials ⁵ (million dollars)	Value of shipments ⁵ (million dollars)	New capital expenditures (million dollars)	All employees ³ (1,000)	Value added by manufacture ⁴ (million dollars)
			Total (no.)	With 20 employees or more (no.)	Number ³ (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						
	All industries	E1	3 407	854	149.8	3 036.9	86.7	165.2	1 423.4	6 162.4	6 726.3	12 907.2	765.2	110.9	3 332.9
20	Food and kindred products	E1	188	69	6.6	106.7	3.8	7.6	54.3	348.8	730.6	1 086.8	21.5	6.0	193.8
201	Meat products	E2	28	10	.6	7.3	.5	1.0	5.4	19.7	142.0	161.7	1.2	1.1	21.7
2011	Meat packing plants	E2	20	8	.5	5.7	.4	.8	4.1	15.9	128.5	144.5	1.1	1.0	18.7
202	Dairy products	-	18	7	.8	16.7	.4	.8	7.2	56.8	167.6	224.0	3.4	.9	28.1
2026	Fluid milk	-	11	6	.7	15.2	.3	.7	6.5	53.3	161.8	214.8	3.2	CC	(D)
203	Preserved fruits and vegetables	-	14	5	.5	5.9	.4	.8	4.1	20.7	26.2	46.4	(D)	.6	13.5
2032	Canned specialties	-	4	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.4	10.2
204	Grain mill products	E2	18	7	.5	6.9	.3	.6	4.6	54.4	96.8	150.0	3.4	.4	21.9
2047	Dog, cat, and other pet food	-	3	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
2048	Prepared feeds, n.e.c.	E4	11	4	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
205	Bakery products	-	31	9	1.6	25.9	.7	1.4	13.5	46.2	47.0	93.2	2.4	1.1	29.1
2051	Bread, cake, and related products	-	30	9	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
206	Sugar and confectionery products	E1	6	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
2063	Beet sugar	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
207	Fats and oils	-	10	5	.4	6.7	.4	.8	4.9	16.1	52.6	79.9	2.7	.4	16.3
2074	Cottonseed oil mills	-	3	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
208	Beverages	E1	25	16	1.4	27.7	.5	1.1	8.6	107.4	164.9	272.6	6.2	1.0	45.2
2086	Bottled and canned soft drinks	E1	23	15	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
209	Miscellaneous foods and kindred products	E6	38	8	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
2099	Food preparations, n.e.c.	E6	28	6	.5	4.4	.3	.6	2.5	11.7	10.8	22.4	(D)	.2	6.1
22	Textile mill products	-	12	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
228	Yarn and thread mills	-	2	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
2281	Yarn mills, except wool	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)

See footnotes at end of table.

Table 5. Statistics by Selected Industry Group and Industry for the State: 1982 and 1977—

Con.

[Includes operating manufacturing establishments and auxiliaries. Includes industry groups and industries with 150 employees or more. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

SIC code	Industry	E¹	1982										1977		
			All establishments²		All employees		Production workers			Value added by manufacture⁴ (million dollars)	Cost of materials⁵ (million dollars)	Value of shipments⁶ (million dollars)	New capital expenditures (million dollars)	All employees³ (1,000)	Value added by manufacture⁴ (million dollars)
			Total (no.)	With 20 employees or more (no.)	Number³ (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						
23	Apparel and other textile products...	E1	119	43	5.7	51.6	4.8	8.6	40.0	105.4	111.0	219.2	2.9	5.6	75.8
2311	Men's and boys' suits and coats.....	-	2	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
232	Men's and boys' furnishings.....	-	17	14	2.6	22.0	2.3	4.1	17.6	40.4	45.1	89.3	.2	2.4	37.2
2321	Men's and boys' shirts and nightwear.....	-	7	6	.8	6.0	.7	1.3	4.1	12.5	10.7	22.9	.1	.7	7.2
2322	Men's and boys' underwear.....	-	2	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
2327	Men's and boys' separate trousers.....	-	3	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
2328	Men's and boys' work clothing.....	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
2329	Men's and boys' clothing, n.e.c.....	-	3	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
233	Women's and misses' outerwear.....	E6	20	9	.7	6.7	.6	1.0	5.4	16.2	18.3	34.6	.2	EE	(D)
2331	Women's and misses' blouses.....	E8	4	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.6	5.5
2335	Women's and misses' dresses.....	E8	10	3	.2	1.2	.1	.2	1.0	2.1	2.2	4.4	(Z)	.3	3.8
234	Women's and children's undergarments.....	-	4	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.1	12.8
2341	Women's and children's underwear.....	-	4	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.1	12.8
239	Miscellaneous fabricated textile products.....	E2	72	12	1.1	11.2	.9	1.7	8.3	31.6	25.4	55.3	2.3	.7	9.8
2391	Curtains and draperies.....	E5	35	2	.2	1.8	.2	.3	1.4	4.3	4.4	8.8	(D)	.3	2.9
2392	House furnishings, n.e.c.....	E1	6	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
2394	Canvas and related products.....	-	6	2	.2	2.2	.2	.4	1.6	3.9	3.4	7.3	(D)	(NA)	(NA)
24	Lumber and wood products.....	E2	240	54	4.5	67.2	3.6	6.9	47.8	122.6	190.2	316.2	28.7	5.5	104.3
2411	Logging camps and logging contractors.....	E8	40	2	.2	2.9	.1	.3	2.2	7.1	9.6	18.0	.5	.3	7.7
242	Sawmills and planing mills.....	-	24	9	1.3	19.4	1.2	2.2	15.9	24.7	52.2	79.4	26.0	2.0	39.0
2421	Sawmills and planing mills, general.....	-	20	9	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
243	Millwork, plywood, and structural members.....	E2	102	26	1.6	25.7	1.2	2.4	16.5	46.5	54.3	100.2	1.2	1.7	27.6
2431	Millwork.....	E2	42	11	.8	12.0	.6	1.1	7.8	23.5	34.8	57.5	.6	.6	13.8
2434	Wood kitchen cabinets.....	E4	44	11	.7	10.7	.5	1.0	6.7	16.9	11.8	28.9	.4	.8	9.1
2439	Structural wood members, n.e.c.....	E1	16	3	.2	3.1	.1	.3	2.0	6.0	7.6	13.7	.2	.3	4.7
245	Wood buildings and mobile homes.....	E1	26	12	1.0	15.3	.8	1.5	10.5	34.9	63.2	98.1	.4	1.3	26.9
2451	Mobile homes.....	E1	13	9	.8	11.9	.6	1.2	8.6	27.9	48.8	76.8	.3	1.0	19.9
2452	Prefabricated wood buildings.....	E1	13	3	.2	3.5	.2	.3	1.8	7.0	14.4	21.3	.1	.3	7.0
249	Miscellaneous wood products.....	E4	34	3	.2	2.4	.2	.3	1.8	6.8	7.3	14.2	.3	(NA)	(NA)
2499	Wood products, n.e.c.....	E5	31	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
25	Furniture and fixtures.....	E3	121	31	1.9	23.0	1.6	3.0	16.0	45.8	44.5	90.6	(D)	EE	(D)
251	Household furniture.....	E4	71	19	1.3	13.4	1.1	1.9	9.5	27.7	29.3	56.8	(D)	CC	(D)
2511	Wood household furniture.....	E3	39	9	.8	7.1	.7	1.2	5.5	15.4	14.4	29.5	(D)	.3	3.5
2512	Upholstered household furniture.....	E4	11	6	.2	3.0	.2	.4	2.3	4.9	5.9	10.8	.2	.3	4.3
2515	Mattresses and bedsprings.....	E3	16	3	.2	2.5	.1	.2	1.2	5.9	7.8	13.8	(D)	.2	5.1
254	Partitions and fixtures.....	E2	23	3	.3	3.5	.2	.4	2.6	6.5	4.7	11.2	.3	AA	(D)
2541	Wood partitions and fixtures.....	E2	21	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.2	3.8
259	Miscellaneous furniture and fixtures.....	E4	14	4	.2	3.2	.2	.4	2.0	6.7	6.7	13.3	(D)	(NA)	(NA)
26	Paper and allied products.....	-	33	13	1.4	30.0	1.1	2.0	22.6	78.6	115.8	196.7	(D)	1.2	47.6
2621	Paper mills, except building paper.....	-	3	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
264	Miscellaneous converted paper products.....	-	15	5	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
2642	Envelopes.....	-	4	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
265	Paperboard containers and boxes.....	-	15	6	.4	6.7	.3	.5	4.2	18.9	31.5	50.5	.5	BB	(D)
2653	Corrugated and solid fiber boxes.....	-	11	5	.3	5.3	.2	.4	3.3	15.1	24.2	39.4	(D)	.2	8.6
27	Printing and publishing.....	E2	618	97	10.8	174.6	5.8	10.6	85.4	387.0	214.2	600.8	43.3	7.5	191.2
2711	Newspapers.....	-	87	29	5.2	89.4	1.7	3.0	29.6	199.3	85.8	285.1	27.6	3.9	106.3
273	Books.....	E1	22	5	.3	4.7	.1	.2	1.0	18.0	8.7	26.5	.6	.2	5.6
2731	Book publishing.....	E1	20	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
2741	Miscellaneous publishing.....	E9	21	2	.2	1.9	.1	.1	.4	4.9	2.2	7.0	.1	.2	4.8
275	Commercial printing.....	E3	375	39	3.7	54.7	2.8	5.2	38.8	111.3	84.3	195.3	11.9	2.0	45.5
2751	Commercial printing, letterpress.....	E6	138	10	1.0	11.8	.7	1.4	8.1	23.4	15.4	38.7	1.0	.8	14.6
2752	Commercial printing, lithographic.....	E3	224	27	2.6	40.9	2.0	3.6	29.3	84.7	67.1	151.7	10.8	1.2	30.4
2761	Manifold business forms.....	E1	11	7	.4	8.5	.3	.6	5.3	17.2	18.5	35.6	1.4	.3	8.3
278	Blankbooks and bookbinding.....	E5	17	10	.6	8.2	.5	.9	6.0	18.4	8.0	26.6	1.1	.6	10.4
2782	Blankbooks and looseleaf binders.....	E6	10	7	.4	5.6	.3	.6	4.2	14.6	7.1	22.0	.8	.5	8.6
2789	Bookbinding and related work.....	E5	7	3	.2	2.6	.2	.3	1.8	3.7	.9	4.6	.4	(NA)	(NA)
279	Printing trade services.....	E3	49	5	.3	5.4	.3	.5	3.9	11.9	3.1	14.9	.5	.3	6.5
2791	Typesetting.....	E4	40	4	.2	3.3	.2	.4	2.5	7.2	1.2	8.2	.3	.2	3.1
28	Chemicals and allied products.....	E1	87	17	2.6	42.6	1.7	3.1	24.6	181.4	189.2	365.4	18.7	2.2	157.4
283	Drugs.....	-	11	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
2834	Pharmaceutical preparations.....	-	7	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
284	Soaps, cleaners, and toilet goods.....	-	16	1	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
2844	Toilet preparations.....	-	4	1	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
287	Agricultural chemicals.....	E1	15	5	.3	5.9	.2	.4	3.8	10.6	52.4	62.7	1.6	.2	15.3
2874	Phosphatic fertilizers.....	-	4	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
289	Miscellaneous chemical products.....	E1	18	5	.4	5.9	.2	.4	3.4	12.4	25.7	38.3	1.3	.5	12.2
2892	Explosives.....	-	2	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
2899	Chemical preparations, n.e.c.....	E2	9	4	.2	2.2	.1	.2	1.3	6.8	6.6	13.5	(D)	(NA)	(NA)

See footnotes at end of table.

Table 5. Statistics by Selected Industry Group and Industry for the State: 1982 and 1977—

Con.

[Includes operating manufacturing establishments and auxiliaries. Includes industry groups and industries with 150 employees or more. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

SIC code	Industry	1982											1977		
		E ¹	All establishments ²		All employees		Production workers			Value added by manufacture ⁴ (million dollars)	Cost of materials ⁵ (million dollars)	Value of shipments ⁶ (million dollars)	New capital expenditures (million dollars)	All employ-ees ³ (1,000)	Value added by manufacture ⁴ (million dollars)
			Total (no.)	With 20 employees or more (no.)	Number ³ (1,000)	Payroll (million dollars)	Number (1,000)	Hours (mil-lions)	Wages (million dollars)						
29	Petroleum and coal products -----	E6	19	5	.4	8.9	.2	.3	3.4	18.7	101.9	121.1	4.7	AA	(D)
2911	Petroleum refining -----	E9	3	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
295	Paving and roofing materials -----	E2	15	3	.2	5.3	.1	.2	2.1	10.9	36.8	47.7	(D)	.2	11.7
2951	Paving mixtures and blocks -----	E2	12	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
30	Rubber and miscellaneous plastics products -----	E2	144	41	4.0	57.1	3.0	5.8	35.1	135.2	149.0	285.0	12.6	EE	(D)
3041	Rubber and plastics hose and belting -----	E4	4	3	.3	5.2	.2	.4	2.5	10.5	8.5	19.3	(D)	AA	(D)
3069	Fabricated rubber products, n.e.c. ---	E1	11	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
3079	Miscellaneous plastics products ----	E2	126	36	3.4	49.2	2.6	5.0	30.8	118.4	135.1	253.8	10.9	1.5	35.5
31	Leather and leather products -----	E1	24	7	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.6	12.9
317	Handbags and other personal leather goods -----	-	2	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
3172	Personal leather goods, n.e.c. -----	-	2	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
32	Stone, clay, and glass products -----	E3	226	56	4.7	83.7	3.7	6.9	59.8	216.8	222.3	436.1	24.4	4.4	174.9
3231	Products of purchased glass -----	E1	19	5	.4	5.2	.2	.5	3.3	13.2	14.3	27.6	1.2	(NA)	(NA)
3241	Cement, hydraulic -----	-	4	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
325	Structural clay products -----	-	10	3	.2	3.3	.2	.3	2.3	3.9	7.0	10.5	(D)	.3	3.9
327	Concrete, gypsum, and plaster products -----	E3	151	43	3.4	60.4	2.6	5.0	42.1	131.8	158.9	292.6	16.3	FF	(D)
3271	Concrete block and brick -----	E2	25	6	.4	7.7	.3	.5	4.4	14.2	22.1	36.3	.6	.5	13.2
3272	Concrete products, n.e.c. -----	E5	48	10	.9	15.8	.7	1.3	11.3	35.1	34.2	69.9	(D)	.8	26.5
3273	Ready-mixed concrete -----	E4	73	24	1.9	32.8	1.5	2.9	23.4	69.3	89.6	159.9	4.4	2.0	77.9
329	Miscellaneous nonmetallic mineral products -----	E7	17	1	.2	2.3	.1	.2	1.6	6.5	5.8	12.3	.8	(NA)	(NA)
33	Primary metal industries -----	-	61	33	8.0	194.2	5.9	11.3	140.1	448.6	1 268.1	1 729.0	89.9	8.2	310.4
331	Blast furnace and basic steel products -----	-	2	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
3312	Blast furnaces and steel mills ----	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
332	Iron and steel foundries -----	-	6	5	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
3324	Steel investment foundries -----	-	2	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
3325	Steel foundries, n.e.c. -----	-	3	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
333	Primary nonferrous metals -----	-	12	10	2.7	79.6	1.9	4.1	59.0	157.5	833.6	1 002.3	(D)	3.7	136.7
3331	Primary copper -----	-	9	9	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	3.7	136.7
335	Nonferrous rolling and drawing ----	-	14	11	3.7	88.0	2.8	5.0	64.1	246.1	379.5	630.2	14.4	2.9	126.8
3354	Aluminum extruded products -----	-	4	3	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
3357	Nonferrous wire drawing and insulating -----	-	7	6	2.6	59.0	2.0	3.5	43.0	183.7	238.5	420.6	(D)	EE	(D)
336	Nonferrous foundries -----	E3	16	3	.2	3.3	.2	.4	2.4	6.1	3.5	9.7	.4	.2	2.2
339	Miscellaneous primary metal products -----	E4	7	3	.2	4.3	.2	.4	2.9	10.0	4.5	14.3	.9	.2	3.5
3398	Metal heat treating -----	E6	4	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
34	Fabricated metal products -----	E2	345	92	7.9	116.9	5.6	11.0	78.5	260.2	254.8	513.0	17.5	5.2	114.4
342	Cutlery, hand tools, and hardware ---	E9	8	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
343	Plumbing and heating, except electric -----	E2	17	3	.2	3.5	.2	.3	2.2	10.1	7.6	18.0	.3	(NA)	(NA)
3433	Heating equipment, except electric -----	E2	17	3	.2	3.5	.2	.3	2.2	10.1	7.6	18.0	.3	(NA)	(NA)
344	Fabricated structural metal products -----	E2	167	48	5.0	70.5	3.4	6.5	45.9	140.1	158.6	297.0	6.8	3.3	69.1
3441	Fabricated structural metal -----	E6	21	10	.6	11.7	.5	.9	8.2	27.5	34.9	58.7	1.1	.4	8.5
3442	Metal doors, sash, and trim -----	E1	17	6	.4	5.9	.3	.5	3.2	11.9	10.0	21.7	.4	.2	4.9
3443	Fabricated plate work (boiler shops) -----	E1	16	5	.8	15.4	.6	1.0	10.9	28.1	23.9	52.9	1.4	1.2	22.2
3444	Sheet metal work -----	E2	63	14	1.1	16.3	.8	1.6	10.5	28.1	30.5	59.4	2.7	.8	17.2
3446	Architectural metal work -----	E1	30	4	1.5	12.0	.8	1.7	7.6	27.9	19.3	45.4	(D)	.3	8.3
3448	Prefabricated metal buildings -----	-	9	4	.2	3.5	.2	.3	2.2	5.8	11.4	17.5	.3	.2	5.8
3449	Miscellaneous metal work -----	-	11	5	.4	5.8	.3	.5	3.3	10.7	28.6	41.4	(D)	(NA)	(NA)
345	Screw machine products, bolts, etc. ---	E6	14	4	.3	5.2	.2	.5	3.6	10.4	6.0	16.5	.4	.3	6.4
3451	Screw machine products -----	E5	9	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
346	Metal forgings and stampings -----	E2	25	10	.6	9.6	.5	.9	7.0	20.1	18.4	38.3	4.0	.4	9.0
3469	Metal stampings, n.e.c. -----	E2	25	10	.6	9.6	.5	.9	7.0	20.1	18.4	38.3	4.0	.4	9.0
347	Metal services, n.e.c. -----	E2	40	9	.6	7.3	.5	.9	5.5	14.8	11.4	26.1	1.2	CC	(D)
3471	Plating and polishing -----	E1	28	8	.4	6.1	.4	.7	4.5	12.6	10.0	22.5	1.0	.4	7.2
349	Miscellaneous fabricated metal products -----	E1	59	13	.9	14.8	.7	1.3	9.9	37.3	24.7	62.6	4.7	.4	8.6
3494	Valves and pipe fittings -----	E5	9	4	.2	4.9	.2	.4	3.3	11.8	4.3	16.1	(D)	(NA)	(NA)
3499	Fabricated metal products, n.e.c. ---	E5	33	6	.4	5.0	.3	.6	3.3	9.9	7.2	17.3	(D)	.2	3.6

See footnotes at end of table.

Table 5. Statistics by Selected Industry Group and Industry for the State: 1982 and 1977—

Con.

[Includes operating manufacturing establishments and auxiliaries. Includes industry groups and industries with 150 employees or more. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

SIC code	Industry	1982											1977		
		E ¹	All establishments ²		All employees		Production workers			Value added by manufacture ⁴ (million dollars)	Cost of materials ⁵ (million dollars)	Value of shipments ⁵ (million dollars)	New capital expenditures (million dollars)	All employees ³ (1,000)	Value added by manufacture ⁴ (million dollars)
			Total (no.)	With 20 employees or more (no.)	Number ³ (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						
35	Machinery, except electrical	-	489	104	23.4	547.0	9.8	19.5	165.3	1 112.4	1 344.3	2 398.7	182.3	14.0	731.0
353	Construction and related machinery ..	E3	25	4	.3	5.3	.2	.3	2.7	10.4	8.3	19.3	.5	.3	11.7
354	Metalworking machinery	E1	76	16	1.7	38.9	1.4	2.8	29.8	39.5	51.2	113.9	8.6	1.4	30.1
3544	Special dies, tools, jigs, and fixtures	E2	49	9	.5	10.2	.4	.8	7.7	16.5	5.9	22.4	(D)	AA	(D)
3546	Power driven hand tools	-	4	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
355	Special industry machinery	E1	28	8	.7	13.9	.4	.7	5.8	26.8	20.0	47.2	1.8	.3	6.5
3559	Special industry machinery, n.e.c. ..	E1	19	4	.5	10.5	.3	.5	4.2	20.1	16.6	37.4	1.6	.2	3.1
356	General industrial machinery	E4	22	6	.3	5.0	.2	.3	3.0	9.8	8.5	19.4	.9	.4	12.5
357	Office and computing machines	-	33	21	15.5	395.0	4.0	8.0	67.4	852.8	1 153.3	1 915.5	(D)	7.6	591.1
3573	Electronic computing equipment	-	32	20	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	7.6	591.1
358	Refrigeration and service machinery ..	E1	29	12	2.0	32.1	1.2	2.5	16.8	69.7	62.6	140.0	(D)	1.4	19.9
3585	Refrigeration and heating equipment	E1	11	8	1.8	28.8	1.1	2.3	15.2	56.2	55.3	118.7	(D)	1.2	17.2
3589	Service industry machinery, n.e.c. ..	E1	15	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
359	Miscellaneous machinery, except electrical ..	E2	264	35	2.9	54.5	2.3	4.6	38.3	97.7	36.1	133.6	(D)	EE	(D)
3599	Machinery, except electrical, n.e.c.	E2	260	33	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	2.4	50.5
36	Electric and electronic equipment	-	225	89	36.6	798.9	19.5	35.8	305.9	1 332.5	619.4	1 945.8	218.9	24.1	548.2
362	Electrical industrial apparatus	E1	20	7	.8	14.7	.6	1.1	9.2	27.4	22.8	51.2	5.0	CC	(D)
3621	Motors and generators	-	4	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
3622	Industrial controls	E2	6	3	.2	3.9	.1	.2	2.2	7.3	4.4	12.2	(D)	AA	(D)
3629	Electrical industrial apparatus, n.e.c.	E2	8	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
365	Radio and TV receiving equipment	E6	11	3	.2	2.2	.1	.3	1.5	4.0	5.3	9.3	.2	CC	(D)
366	Communication equipment	-	35	20	10.8	252.0	5.9	11.2	117.1	432.5	195.9	630.5	(D)	5.9	150.8
3662	Radio and TV communication equipment	-	31	18	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
367	Electronic components and accessories	-	115	48	23.8	510.7	12.2	21.8	169.8	829.1	369.2	1 189.1	174.2	16.3	354.5
3674	Semiconductors and related devices	-	22	14	19.0	428.6	9.0	15.3	124.4	651.1	278.1	922.5	156.5	14.3	312.7
3675	Electronic capacitors	-	2	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
3677	Electronic coils and transformers	-	6	3	.4	3.8	.3	.5	2.2	10.9	5.1	15.6	(D)	(NA)	(NA)
3678	Electronic connectors	-	4	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
3679	Electronic components, n.e.c.	E2	81	27	3.4	56.4	2.3	4.4	29.3	116.7	63.3	179.2	(D)	1.4	28.5
369	Miscellaneous electrical equipment and supplies	E1	21	6	.7	15.2	.4	.8	5.6	30.0	18.1	48.1	1.7	.2	8.8
3693	X-ray, electromedical, and electrotherapeutic apparatus	-	2	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
3699	Electrical equipment and supplies, n.e.c.	E3	11	2	.2	2.2	.1	.2	1.3	4.6	3.4	8.0	(D)	(NA)	(NA)
37	Transportation equipment	E2	116	27	17.8	473.2	11.5	23.9	288.5	995.3	955.4	2 013.3	44.7	10.9	399.5
371	Motor vehicles and equipment	E5	32	4	.4	5.3	.2	.5	3.3	9.8	13.0	22.8	.4	.3	6.2
3714	Motor vehicle parts and accessories	E5	19	2	.3	3.9	.2	.3	2.4	7.3	8.5	15.8	.2	.3	4.6
372	Aircraft and parts	-	36	15	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
3721	Aircraft	-	4	1	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
3724	Aircraft engines and engine parts	-	10	7	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
3728	Aircraft equipment, n.e.c.	-	22	7	2.1	53.2	1.8	3.5	41.6	164.4	132.5	258.4	(D)	.2	5.1
373	Ship and boat building and repairing	-	13	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
3732	Boat building and repairing	-	12	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
376	Guided missiles, space vehicles, parts	E8	7	5	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
3761	Guided missiles and space vehicles	E9	1	1	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
3764	Space propulsion units and parts	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
3769	Space vehicle equipment, n.e.c.	E1	5	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
379	Miscellaneous transportation equipment	E4	25	2	.3	3.4	.2	.5	2.3	6.9	10.8	17.6	.1	AA	(D)
3792	Travel trailers and campers	E4	17	2	.2	3.0	.2	.4	2.1	6.3	9.9	16.1	.1	AA	(D)
38	Instruments and related products	-	80	25	5.8	114.4	2.4	4.3	26.3	251.5	119.0	374.4	20.8	4.7	141.3
3811	Engineering and scientific instruments	-	11	4	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	FF	(D)
382	Measuring and controlling devices	-	24	9	2.5	64.1	.4	.8	7.6	102.9	56.4	173.2	9.2	AA	(D)
3823	Process control instruments	-	8	5	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
3825	Instruments to measure electricity	-	11	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
384	Medical instruments and supplies	-	21	6	.8	11.9	.6	1.2	6.0	37.6	29.4	67.1	(D)	BB	(D)
3841	Surgical and medical instruments	E1	5	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
3842	Surgical appliances and supplies	-	14	5	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.3	14.9
3851	Ophthalmic goods	-	10	1	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)

See footnotes at end of table.

Table 5. Statistics by Selected Industry Group and Industry for the State: 1982 and 1977—
Con.

[Includes operating manufacturing establishments and auxiliaries. Includes industry groups and industries with 150 employees or more. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

SIC code	Industry	1982											1977		
		E1	All establishments ²		All employees		Production workers			Value added by manufacture ⁴ (million dollars)	Cost of materials ⁵ (million dollars)	Value of shipments ⁵ (million dollars)	New capital expenditures (million dollars)	All employees ³ (1,000)	Value added by manufacture ⁴ (million dollars)
			Total (no.)	With 20 employees or more (no.)	Number ³ (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						
39	Miscellaneous manufacturing industries	E2	204	25	2.7	36.4	2.0	3.7	23.5	93.2	62.9	153.9	4.3	2.3	50.0
391	Jewelry, silverware, and plated ware	E6	36	1	.2	2.2	.2	.3	1.6	4.2	6.5	10.7	(D)	.4	5.5
3911	Jewelry, precious metal	E6	30	-	.2	1.7	.1	.2	1.1	3.8	5.7	9.5	.1	BB	(D)
394	Toys and sporting goods	-	27	8	1.1	18.1	.9	1.7	11.8	53.1	31.2	82.8	2.6	.8	22.4
3944	Games, toys, and children's vehicles	E1	7	4	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
3949	Sporting and athletic goods, n.e.c.	-	17	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.7	20.2
395	Pens, pencils, and office and art supplies	E7	14	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
399	Miscellaneous manufactures	E3	106	12	.9	11.9	.7	1.1	7.4	24.9	18.8	43.5	1.4	.8	16.6
3993	Signs and advertising displays	E2	37	6	.4	6.4	.2	.5	3.7	11.8	6.5	18.1	.4	.4	6.7
3999	Manufacturing industries, n.e.c.	E3	63	6	.5	5.2	.4	.6	3.4	12.3	11.4	23.8	.9	.4	8.9
-	Auxiliaries	-	56	23	4.0	99.5	-	-	-	-	-	-	-	5.0	-

¹Payroll, employment, and sales data for some small single-unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for other establishments whose reports were not received at time data were tabulated. The following symbols are shown where estimated data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

²Includes establishments with payroll at any time during year.

³Statistics for some industry groups and industries are withheld to avoid disclosing data for individual companies. However, for such industry groups and industries with 150 employees or more, number of establishments is shown and employment size range is indicated by one of the following symbols: AA—150 to 249 employees; BB—250 to 499 employees; CC—500 to 999 employees; EE—1,000 to 2,499 employees; FF—2,500 employees or more. Statistics for industry groups shown include data for all component industries, regardless of whether data are shown for individual industries in the group.

⁴Value added by manufacture for 1982 is computed using inventory data reported at cost or market prior to any adjustment to LIFO cost. This uniform instruction is a change from prior years in which respondents were permitted to value their inventories using any generally accepted accounting method. Consequently, 1982 data for value added by manufacture are not comparable to prior year data.

⁵Aggregate of cost of materials and value of shipments includes extensive duplication, since products of some industries are used as materials by others (see appendixes).

Table 6. Statistics by Selected Industry Group and Industry for Standard Metropolitan Statistical Areas: 1982

[Includes operating manufacturing establishments and auxiliaries. Includes industry groups and industries with 250 employees or more within SMSA's. For information on geographic areas followed by Δ, definition of SMSA's, and explanation of terms, see appendixes. For meaning of abbreviations and symbols, see introductory text]

SIC code	Geographic area and industry	E1	All establishments ²		All employees		Production workers			Value added by manufacture ⁴ (million dollars)	Cost of materials ⁵ (million dollars)	Value of shipments ⁵ (million dollars)	New capital expenditures (million dollars)
			Total (no.)	With 20 employees or more (no.)	Number ³ (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
	Phoenix SMSA	-	2 352	606	108.0	2 210.0	63.7	121.1	1 058.4	4 513.0	3 560.8	8 155.2	462.1
20	Food and kindred products	-	110	45	4.7	79.2	2.7	5.5	41.6	249.8	536.4	786.0	17.2
201	Meat products	E1	17	6	.4	5.4	.4	.7	3.9	15.5	122.9	138.5	1.0
2011	Meat packing plants	E1	12	6	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
202	Dairy products	-	14	6	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
2026	Fluid milk	-	7	5	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
203	Preserved fruits and vegetables	-	9	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
205	Bakery products	-	20	7	1.4	23.0	.6	1.2	12.4	41.5	41.5	83.1	2.2
2051	Bread, cake, and related products	-	19	7	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
207	Fats and oils	-	6	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
208	Beverages	-	13	7	.7	17.1	.3	.6	6.0	71.7	108.4	180.5	(D)
2086	Bottled and canned soft drinks	-	12	6	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
209	Miscellaneous foods and kindred products	E6	16	6	.4	4.3	.2	.5	2.8	10.9	9.0	19.9	1.1
2099	Food preparations, n.e.c.	E6	13	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
23	Apparel and other textile products	E2	83	23	3.0	27.5	2.5	4.3	21.6	52.3	64.9	121.1	.7
232	Men's and boys' furnishings	-	9	6	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
2321	Men's and boys' shirts and nightwear	E1	5	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
2322	Men's and boys' underwear	-	1	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
233	Women's and misses' outerwear	E7	13	5	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
234	Women's and children's undergarments	-	2	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
2341	Women's and children's underwear	-	2	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
239	Miscellaneous fabricated textile products	E3	57	10	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
24	Lumber and wood products	E2	125	39	2.6	40.1	2.0	3.9	26.5	81.3	113.6	195.2	(D)
243	Millwork, plywood, and structural members	E2	68	23	1.3	21.8	1.0	1.9	13.6	38.6	43.0	82.0	1.0
2431	Millwork	E2	26	9	.6	9.3	.4	.8	6.0	17.4	26.2	43.7	.5
2434	Wood kitchen cabinets	E3	30	11	.6	9.7	.5	.9	5.9	15.6	10.4	26.1	.3
245	Wood buildings and mobile homes	E1	21	11	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
2451	Mobile homes	E1	12	8	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)

See footnotes at end of table.

Table 6. Statistics by Selected Industry Group and Industry for Standard Metropolitan Statistical Areas: 1982—Con.

[Includes operating manufacturing establishments and auxiliaries. Includes industry groups and industries with 250 employees or more within SMSA's. For information on geographic areas followed by Δ, definition of SMSA's, and explanation of terms, see appendixes. For meaning of abbreviations and symbols, see introductory text]

SIC code	Geographic area and industry	E1	All establishments ²		All employees		Production workers			Value added by manufacture ⁴ (million dollars)	Cost of materials ⁵ (million dollars)	Value of shipments ⁵ (million dollars)	New capital expenditures (million dollars)
			Total (no.)	With 20 employees or more (no.)	Number ³ (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
	Phoenix SMSA—Con.												
25	Furniture and fixtures	E4	95	27	1.7	20.6	1.4	2.6	14.1	41.7	40.8	82.7	1.8
251	Household furniture	E4	56	16	1.1	11.8	.9	1.7	8.3	25.2	26.6	51.6	.9
2511	Wood household furniture	E4	28	7	.6	5.8	.6	1.0	4.5	13.4	12.4	25.5	.7
26	Paper and allied products	-	22	8	.6	9.9	.4	.8	6.2	25.3	33.7	59.2	(D)
264	Miscellaneous converted paper products	-	11	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
265	Paperboard containers and boxes	-	10	5	.3	5.4	.2	.4	3.4	15.2	24.2	39.5	(D)
2653	Corrugated and solid fiber boxes	-	7	5	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
27	Printing and publishing	E2	399	68	7.9	135.7	4.5	8.2	69.8	281.4	173.4	454.7	39.3
2711	Newspapers	-	39	10	3.4	64.7	1.1	1.8	21.2	129.7	66.2	195.9	(D)
275	Commercial printing	E3	254	34	3.0	46.9	2.3	4.2	33.1	95.9	74.1	169.9	10.7
2751	Commercial printing, letterpress	E6	96	9	.8	10.1	.6	1.1	6.8	19.5	12.8	32.2	.9
2752	Commercial printing, lithographic	E2	148	24	2.1	35.3	1.6	3.0	25.2	73.9	60.0	133.9	9.8
2761	Manifold business forms	-	9	7	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
278	Blankbooks and bookbinding	E5	15	10	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
2782	Blankbooks and looseleaf binders	E6	9	7	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
279	Printing trade services	E3	36	5	.3	4.7	.2	.4	3.5	10.4	2.7	13.1	.4
28	Chemicals and allied products	-	62	10	2.1	32.3	1.3	2.4	18.6	165.4	147.8	307.2	(D)
283	Drugs	-	8	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
2834	Pharmaceutical preparations	-	6	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
284	Soaps, cleaners, and toilet goods	-	14	1	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
2844	Toilet preparations	-	3	1	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
30	Rubber and miscellaneous plastics products	E2	102	29	3.0	43.2	2.2	4.3	26.1	103.3	115.1	220.0	8.4
3079	Miscellaneous plastics products	E2	94	27	2.9	41.5	2.1	4.1	25.0	98.8	113.0	213.4	8.2
31	Leather and leather products	-	10	2	.3	3.2	.2	.2	.9	7.5	2.6	10.2	(D)
32	Stone, clay, and glass products	E2	123	38	2.9	51.7	2.2	4.3	36.3	109.4	127.7	238.3	14.9
3231	Products of purchased glass	E1	15	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
327	Concrete, gypsum, and plaster products	E2	73	31	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3272	Concrete products, n.e.c.	E4	29	10	.8	14.5	.6	1.2	10.4	32.0	32.7	65.3	(D)
3273	Ready-mixed concrete	E2	29	16	1.1	20.7	.9	1.6	14.8	43.6	47.1	91.3	2.5
33	Primary metal industries	-	35	19	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
331	Blast furnace and basic steel products	-	2	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3312	Blast furnaces and steel mills	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
332	Iron and steel foundries	-	6	5	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3325	Steel foundries, n.e.c.	-	3	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
335	Nonferrous rolling and drawing	-	11	8	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3354	Aluminum extruded products	-	4	3	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3357	Nonferrous wire drawing and insulating	-	5	4	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
34	Fabricated metal products	E2	274	73	5.7	93.7	4.3	8.3	63.7	210.2	212.2	420.9	15.8
344	Fabricated structural metal products	E2	122	34	3.0	49.7	2.2	4.1	32.8	94.6	118.5	212.0	5.3
3441	Fabricated structural metal	E5	17	7	.5	8.5	.4	.7	6.4	22.3	25.0	43.1	.9
3442	Metal doors, sash, and trim	-	10	4	.7	4.7	.2	.4	2.4	9.3	6.7	15.8	(D)
3443	Fabricated plate work (boiler shops)	-	10	4	.7	14.2	.5	.9	10.0	25.9	22.5	49.2	1.4
3444	Sheet metal work	E2	47	10	.8	12.2	.6	1.2	7.9	19.1	23.8	43.3	2.2
3449	Miscellaneous metal work	-	8	4	.3	4.5	.2	.4	2.8	8.8	25.1	35.7	.1
345	Screw machine products, bolts, etc.	E6	13	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
346	Metal forgings and stampings	E2	25	10	.6	9.6	.5	.9	7.0	20.1	18.4	38.3	(D)
3469	Metal stampings, n.e.c.	E2	25	10	.6	9.6	.5	.9	7.0	20.1	18.4	38.3	(D)
347	Metal services, n.e.c.	E2	33	7	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3471	Plating and polishing	E1	21	6	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
349	Miscellaneous fabricated metal products	E1	49	11	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3499	Fabricated metal products, n.e.c.	E6	27	5	.3	4.3	.2	.5	2.8	8.9	6.2	15.4	(D)
35	Machinery, except electrical	-	395	85	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
353	Construction and related machinery	E3	20	4	.3	4.9	.2	.3	2.5	9.8	7.7	18.1	.5
354	Metalworking machinery	E2	60	11	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3544	Special dies, tools, jigs, and fixtures	E3	43	8	.5	9.3	.4	.7	6.9	14.8	5.4	20.2	.9
355	Special industry machinery	E1	25	7	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3559	Special industry machinery, n.e.c.	E1	16	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
356	General industrial machinery	E4	18	5	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
357	Office and computing machines	-	28	16	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3573	Electronic computing equipment	-	27	15	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
358	Refrigeration and service machinery	E1	25	12	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3585	Refrigeration and heating equipment	E1	11	8	1.8	28.8	1.1	2.3	15.2	56.2	55.3	118.7	(D)
359	Miscellaneous machinery, except electrical	E2	212	29	2.4	47.5	1.9	3.8	33.3	82.0	29.9	111.8	5.9
3599	Machinery, except electrical, n.e.c.	E2	209	28	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)

See footnotes at end of table.

Table 6. Statistics by Selected Industry Group and Industry for Standard Metropolitan Statistical Areas: 1982—Con.

[Includes operating manufacturing establishments and auxiliaries. Includes industry groups and industries with 250 employees or more within SMSA's. For information on geographic areas followed by Δ, definition of SMSA's, and explanation of terms, see appendixes. For meaning of abbreviations and symbols, see introductory text]

SIC code	Geographic area and industry	E ¹	All establishments ²		All employees		Production workers			Value added by manufacture ⁴ (million dollars)	Cost of materials ⁵ (million dollars)	Value of shipments ⁵ (million dollars)	New capital expenditures (million dollars)
			Total (no.)	With 20 employees or more (no.)	Number ³ (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
36	Phoenix SMSA—Con.												
	Electric and electronic equipment	-	167	68	33.2	748.8	17.2	32.0	284.0	1 228.0	571.5	1 795.6	207.2
366	Communication equipment	-	31	18	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3662	Radio and TV communication equipment	-	28	16	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
367	Electronic components and accessories	-	83	38	21.4	475.6	10.7	19.3	157.4	755.7	343.6	1 092.6	164.6
3674	Semiconductors and related devices	-	18	12	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3678	Electronic connectors	-	4	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3679	Electronic components, n.e.c.	E1	59	22	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
369	Miscellaneous electrical equipment and supplies	E1	14	4	.6	14.1	.3	.6	4.9	27.6	16.8	44.4	(D)
3693	X-ray, electromedical, and electrotherapeutic apparatus	-	2	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
37	Transportation equipment	-	92	20	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
371	Motor vehicles and equipment	E4	29	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
372	Aircraft and parts	-	29	13	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3724	Aircraft engines and engine parts	-	9	6	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3728	Aircraft equipment, n.e.c.	-	17	7	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
376	Guided missiles, space vehicles, parts	-	4	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3764	Space propulsion units and parts	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3769	Space vehicle equipment, n.e.c.	-	3	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
38	Instruments and related products	-	51	13	4.4	90.7	1.6	2.8	18.3	205.9	60.6	269.5	12.1
3811	Engineering and scientific instruments	-	6	1	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
382	Measuring and controlling devices	-	19	7	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3823	Process control instruments	-	8	5	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3851	Ophthalmic goods	-	7	1	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
39	Miscellaneous manufacturing industries ..	E1	147	18	2.1	30.8	1.6	2.9	20.0	79.3	54.5	131.6	3.8
394	Toys and sporting goods	-	18	4	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3949	Sporting and athletic goods, n.e.c.	-	12	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
399	Miscellaneous manufactures	E3	80	11	.8	10.1	.5	.9	6.3	21.0	15.8	36.6	(D)
3993	Signs and advertising displays	E2	27	6	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3999	Manufacturing industries, n.e.c.	E3	48	5	.4	3.9	.3	.5	2.7	9.5	8.9	18.5	.8
-	Auxiliaries	-	38	17	2.8	77.6	-	-	-	-	-	-	-
	-Tucson SMSA	E2	534	121	26.4	551.2	12.1	22.8	178.3	1 062.4	1 658.3	2 613.1	144.8
20	Food and kindred products	E5	38	13	1.0	15.3	.5	1.0	5.8	36.8	81.5	118.1	(D)
208	Beverages	E4	6	4	.4	6.8	.1	.3	1.6	22.4	30.9	53.0	(D)
2086	Bottled and canned soft drinks	E4	5	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
23	Apparel and other textile products	E3	12	4	.5	4.1	.4	.7	3.0	6.3	3.0	9.4	(D)
27	Printing and publishing	E2	118	13	1.8	26.7	.9	1.6	11.2	77.8	30.5	108.0	(D)
2711	Newspapers	E2	10	5	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
275	Commercial printing	E5	74	4	.5	5.6	.4	.6	4.1	10.6	7.0	17.6	(D)
2752	Commercial printing, lithographic	E4	52	3	.4	4.5	.3	.5	3.2	8.3	5.4	13.7	.9
28	Chemicals and allied products	E3	14	3	.3	4.8	.2	.3	2.7	9.2	15.6	25.1	.4
30	Rubber and miscellaneous plastics products	E3	27	7	.7	10.2	.5	1.0	6.0	19.7	17.3	37.4	(D)
3041	Rubber and plastics hose and belting	E5	2	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3079	Miscellaneous plastics products	E3	21	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
32	Stone, clay, and glass products	E3	38	10	1.0	15.4	.8	1.4	11.6	50.9	44.1	92.5	(D)
3241	Cement, hydraulic	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
327	Concrete, gypsum, and plaster products	E7	21	5	.5	7.6	.4	.7	5.3	12.1	19.5	32.0	.3
3273	Ready-mixed concrete	E7	5	4	.3	5.4	.3	.5	3.9	7.3	15.5	23.1	(D)
34	Fabricated metal products	E3	51	16	2.0	21.3	1.2	2.5	13.6	45.2	37.5	81.5	(D)
344	Fabricated structural metal products	E3	34	13	1.9	19.6	1.1	2.3	12.2	42.4	36.0	77.3	1.4
3446	Architectural metal work	-	6	3	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
35	Machinery, except electrical	-	55	13	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
357	Office and computing machines	-	4	4	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3573	Electronic computing equipment	-	4	4	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
359	Miscellaneous machinery, except electrical	E1	28	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3599	Machinery, except electrical, n.e.c.	E2	27	3	.4	4.9	.3	.6	3.7	11.3	3.1	14.2	(D)
36	Electric and electronic equipment	-	40	15	2.8	41.0	1.9	3.0	16.5	84.7	32.0	114.2	(D)
362	Electrical industrial apparatus	-	4	4	.3	4.8	.3	.4	3.6	9.5	6.5	16.2	(D)
367	Electronic components and accessories	-	22	9	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3674	Semiconductors and related devices	-	3	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3679	Electronic components, n.e.c.	E5	16	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
37	Transportation equipment	E6	10	4	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
372	Aircraft and parts	-	4	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3721	Aircraft	-	1	1	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
376	Guided missiles, space vehicles, parts	E9	1	1	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3761	Guided missiles and space vehicles	E9	1	1	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)

See footnotes at end of table.

Table 6. Statistics by Selected Industry Group and Industry for Standard Metropolitan Statistical Areas: 1982—Con.

[Includes operating manufacturing establishments and auxiliaries. Includes industry groups and industries with 250 employees or more within SMSA's. For information on geographic areas followed by Δ, definition of SMSA's, and explanation of terms, see appendixes. For meaning of abbreviations and symbols, see introductory text]

SIC code	Geographic area and industry	E ¹	All establishments ²		All employees		Production workers			Value added by manufacture ⁴ (million dollars)	Cost of materials ⁵ (million dollars)	Value of shipments ⁵ (million dollars)	New capital expenditures (million dollars)
			Total (no.)	With 20 employees or more (no.)	Number ³ (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
	Tucson SMSA—Con.												
38	Instruments and related products	E1	22	7	.8	15.2	.3	.7	3.8	19.2	38.3	57.8	(D)
382	Measuring and controlling devices	-	5	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3825	Instruments to measure electricity	-	3	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
39	Miscellaneous manufacturing industries ..	E4	33	5	.4	3.8	.3	.5	2.2	8.6	5.8	14.5	(D)
--	Auxiliaries	-	5	2	CC	(D)	-	-	-	-	-	-	-

¹Payroll, employment, and sales data for some small single-unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for other establishments whose reports were not received at time data were tabulated. The following symbols are shown where estimated data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

²Includes establishments with payroll at any time during year.
³Statistics for some industry groups and industries are withheld to avoid disclosing data for individual companies. However, for such industry groups and industries with 150 employees or more, number of establishments is shown and employment size range is indicated by one of the following symbols: AA—150 to 249 employees; BB—250 to 499 employees; CC—500 to 999 employees; EE—1,000 to 2,499 employees; FF—2,500 employees or more. Statistics for industry groups shown include data for all component industries, regardless of whether data are shown for individual industries in the group.

⁴Value added by manufacture for 1982 is computed using inventory data reported at cost or market prior to any adjustment to LIFO cost. This uniform instruction is a change from prior years in which respondents were permitted to value their inventories using any generally accepted accounting method. Consequently, 1982 data for value added by manufacture are not comparable to prior year data.

⁵Aggregate of cost of materials and value of shipments includes extensive duplication, since products of some industries are used as materials by others (see appendixes).

Table 7. Statistics by Selected Industry Group and Industry for Selected Counties: 1982

[Includes operating manufacturing establishments and auxiliaries. Includes counties with 450 employees or more and industry groups and industries with 450 employees or more within counties. For information on geographic areas followed by Δ, general geographic information, and explanation of terms, see appendixes. For meaning of abbreviations and symbols, see introductory text]

SIC code	Geographic area and industry	E ¹	All establishments ²		All employees		Production workers			Value added by manufacture ⁴ (million dollars)	Cost of materials ⁵ (million dollars)	Value of shipments ⁵ (million dollars)	New capital expenditures (million dollars)
			Total (no.)	With 20 employees or more (no.)	Number ³ (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
	Cochise County	-	43	14	1.4	22.4	.9	1.9	13.4	43.4	63.3	107.1	2.0
	Coconino County	E2	76	19	2.3	36.2	1.5	2.8	20.6	116.8	147.8	260.9	11.9
24	Lumber and wood products	E1	19	4	.7	11.1	.5	1.0	8.4	19.1	26.9	45.8	1.4
242	Sawmills and planing mills	-	5	3	.5	8.9	.4	.8	6.8	12.3	17.9	31.2	1.1
2421	Sawmills and planing mills, general	-	5	3	.5	8.9	.4	.8	6.8	12.3	17.9	31.2	1.1
	Gila County	-	26	10	1.7	44.9	1.2	2.5	33.6	83.6	388.4	492.3	68.9
33	Primary metal industries	-	4	4	1.4	40.6	1.0	2.1	30.7	74.2	371.0	464.7	(D)
333	Primary nonferrous metals	-	3	3	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3331	Primary copper	-	3	3	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
	Maricopa County (Coextensive with Phoenix, Ariz., SMSA; see table 6.)												
	Mohave County	-	67	14	2.1	41.0	1.5	3.0	26.1	50.3	77.5	147.9	11.4
35	Machinery, except electrical	-	6	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
354	Metalworking machinery	-	3	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3546	Power driven hand tools	-	2	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
	Navajo County	E1	50	9	1.4	27.6	1.1	2.1	21.8	65.8	97.6	168.4	27.9
24	Lumber and wood products	E2	24	5	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
242	Sawmills and planing mills	-	6	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
2421	Sawmills and planing mills, general	-	5	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
26	Paper and allied products	-	1	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
2621	Paper mills, except building paper	-	1	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
	Pima County (Coextensive with Tucson, Ariz., SMSA; see table 6.)												
	Pinal County	-	55	22	2.4	45.1	1.8	3.5	32.2	26.5	535.1	566.0	5.3
33	Primary metal industries	-	5	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
333	Primary nonferrous metals	-	3	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3331	Primary copper	-	3	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)

See footnotes at end of table.

Table 7. Statistics by Selected Industry Group and Industry for Selected Counties: 1982—
Con.

[Includes operating manufacturing establishments and auxiliaries. Includes counties with 450 employees or more and industry groups and industries with 450 employees or more within counties. For information on geographic areas followed by Δ, general geographic information, and explanation of terms, see appendixes. For meaning of abbreviations and symbols, see introductory text]

SIC code	Geographic area and industry	E ¹	All establishments ²		All employees		Production workers			Value added by manufacture ⁴ (million dollars)	Cost of materials ⁵ (million dollars)	Value of shipments ⁵ (million dollars)	New capital expenditures (million dollars)
			Total (no.)	With 20 employees or more (no.)	Number ³ (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
	Santa Cruz County -----	E2	26	5	.6	6.3	.3	.5	2.6	12.4	18.5	30.8	.9
	Yavapai County -----	E1	85	12	1.6	25.2	1.2	2.1	17.9	61.0	51.8	111.4	5.3
	Yuma County -----	E3	60	15	1.4	16.2	1.0	1.9	10.5	35.5	61.6	98.5	1.9
23	Apparel and other textile products -----	-	5	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
232	Men's and boys' furnishings -----	-	3	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)

¹Payroll, employment, and sales data for some small single-unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for other establishments whose reports were not received at time data were tabulated. The following symbols are shown where estimated data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

²Includes establishments with payroll at any time during year.

³Statistics for some industry groups and industries are withheld to avoid disclosing data for individual companies. However, for such industry groups and industries with 150 employees or more, number of establishments is shown and employment size range is indicated by one of the following symbols: AA—150 to 249 employees; BB—250 to 499 employees; CC—500 to 999 employees; EE—1,000 to 2,499 employees; FF—2,500 employees or more. Statistics for industry groups shown include data for all component industries, regardless of whether data are shown for individual industries in the group.

⁴Value added by manufacture for 1982 is computed using inventory data reported at cost or market prior to any adjustment to LIFO cost. This uniform instruction is a change from prior years in which respondents were permitted to value their inventories using any generally accepted accounting method. Consequently, 1982 data for value added by manufacture are not comparable to prior year data.

⁵Aggregate of cost of materials and value of shipments includes extensive duplication, since products of some industries are used as materials by others (see appendixes).

Table 8. Statistics by Selected Industry Group and Industry for Selected Places: 1982

[Includes operating manufacturing establishments and auxiliaries. Includes places with 450 employees or more and industry groups and industries with 450 employees or more within places. For information on geographic areas followed by Δ, general geographic information, and explanation of terms, see appendixes. For meaning of abbreviations and symbols, see introductory text]

SIC code	Geographic area and industry	E ¹	All establishments ²		All employees		Production workers			Value added by manufacture ⁴ (million dollars)	Cost of materials ⁵ (million dollars)	Value of shipments ⁵ (million dollars)	New capital expenditures (million dollars)
			Total (no.)	With 20 employees or more (no.)	Number ³ (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
	Buckeye -----	E2	7	3	.6	6.0	.4	.7	4.3	10.4	8.6	19.3	.4
	Casa Grande -----	-	26	12	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
	Chandler -----	-	46	20	2.8	54.0	1.9	3.7	30.8	144.6	119.7	265.1	34.5
36	Electric and electronic equipment -----	-	5	3	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
367	Electronic components and accessories -----	-	3	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3674	Semiconductors and related devices -----	-	2	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3679	Electronic components, n.e.c. -----	-	1	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
	Douglas -----	-	15	6	.7	13.1	.5	1.1	8.2	22.6	36.7	59.5	.8
	Flagstaff -----	E1	53	15	1.7	26.1	1.1	2.0	14.8	98.8	97.1	191.7	6.9
	Glendale -----	-	94	22	3.6	59.6	2.7	4.9	33.7	156.1	107.7	254.8	10.6
23	Apparel and other textile products -----	-	5	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
232	Men's and boys' furnishings -----	-	2	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
2322	Men's and boys' underwear -----	-	1	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
36	Electric and electronic equipment -----	-	4	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
367	Electronic components and accessories -----	-	2	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3678	Electronic connectors -----	-	1	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
38	Instruments and related products -----	-	1	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3811	Engineering and scientific instruments -----	-	1	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
	Goodyear -----	-	2	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
	Lake Havasu City Δ -----	E2	31	4	.5	5.1	.4	.8	3.6	18.1	11.7	28.0	2.5
	Mesa -----	E1	150	27	7.9	166.3	4.4	7.1	60.1	317.9	146.3	462.4	47.3
36	Electric and electronic equipment -----	-	9	4	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
367	Electronic components and accessories -----	-	5	2	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3674	Semiconductors and related devices -----	-	1	1	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)

See footnotes at end of table.

Table 8. Statistics by Selected Industry Group and Industry for Selected Places: 1982—Con.

[Includes operating manufacturing establishments and auxiliaries. Includes places with 450 employees or more and industry groups and industries with 450 employees or more within places. For information on geographic areas followed by Δ, general geographic information, and explanation of terms, see appendixes. For meaning of abbreviations and symbols, see introductory text]

SIC code	Geographic area and industry	E ¹	All establishments ²		All employees		Production workers			Value added by manufacture ⁴ (million dollars)	Cost of materials ⁵ (million dollars)	Value of shipments ⁵ (million dollars)	New capital expenditures (million dollars)
			Total (no.)	With 20 employees or more (no.)	Number ³ (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
	Tempe	-	318	89	13.0	262.5	8.0	15.3	133.7	626.1	445.8	1 042.6	78.4
23	Apparel and other textile products	-	17	6	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
27	Printing and publishing	E1	37	6	.6	8.4	.3	.5	3.7	16.7	8.3	25.0	1.8
30	Rubber and miscellaneous plastics products	E3	24	7	.7	10.1	.5	1.0	5.7	22.1	22.6	45.1	2.4
3079	Miscellaneous plastics products	E3	21	7	.6	9.8	.5	.9	5.6	21.7	22.2	44.2	2.4
35	Machinery, except electrical	-	77	18	3.8	85.6	1.6	2.9	28.8	174.4	95.0	274.4	16.4
357	Office and computing machines	-	8	6	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3573	Electronic computing equipment	-	8	6	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
36	Electric and electronic equipment	E1	42	19	3.0	60.8	1.5	3.1	22.7	121.1	58.1	182.1	27.2
367	Electronic components and accessories	-	25	11	2.3	45.8	1.2	2.5	17.7	93.4	41.0	136.6	22.5
3674	Semiconductors and related devices	-	6	4	1.4	28.5	.7	1.5	9.9	62.7	19.4	85.7	20.0
3679	Electronic components, n.e.c.	E1	17	7	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
37	Transportation equipment	-	12	6	2.2	54.9	1.9	3.8	44.4	167.0	132.5	261.6	23.2
372	Aircraft and parts	-	11	6	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3728	Aircraft equipment, n.e.c.	-	8	4	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
	Tucson	E2	402	94	24.2	521.6	10.3	19.8	157.0	987.2	1 569.3	2 449.7	(D)
20	Food and kindred products	E4	30	11	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
27	Printing and publishing	E2	105	12	1.7	25.5	.8	1.6	10.7	75.3	29.4	104.4	2.7
2711	Newspapers	E2	7	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
30	Rubber and miscellaneous plastics products	E3	18	5	.6	8.1	.4	.8	4.4	16.7	15.2	32.3	1.7
34	Fabricated metal products	E2	42	14	1.9	20.4	1.2	2.3	13.0	44.0	36.5	79.4	1.5
344	Fabricated structural metal products	E2	30	12	1.8	19.1	1.1	2.2	11.9	41.9	35.3	76.0	1.4
3446	Architectural metal work	-	5	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
35	Machinery, except electrical	-	36	9	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
357	Office and computing machines	-	3	3	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3573	Electronic computing equipment	-	3	3	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
36	Electric and electronic equipment	-	34	14	2.7	40.7	1.8	2.9	16.3	83.9	31.4	112.8	9.7
367	Electronic components and accessories	-	16	8	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3674	Semiconductors and related devices	-	2	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
37	Transportation equipment	E6	7	4	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
372	Aircraft and parts	-	3	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3721	Aircraft	-	1	1	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
376	Guided missiles, space vehicles, parts	E9	1	1	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3761	Guided missiles and space vehicles	E9	1	1	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
38	Instruments and related products	-	17	5	.8	14.3	.3	.6	3.4	17.6	37.1	54.9	2.9
382	Measuring and controlling devices	-	4	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3825	Instruments to measure electricity	-	2	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
-	Auxiliaries	-	4	2	.8	9.4	-	-	-	-	-	-	-
	Yuma	E4	36	9	1.1	12.0	.8	1.5	7.8	27.1	49.7	77.6	1.4
23	Apparel and other textile products	-	3	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
232	Men's and boys' furnishings	-	3	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)

¹Payroll, employment, and sales data for some small single-unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for other establishments whose reports were not received at time data were tabulated. The following symbols are shown where estimated data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

²Includes establishments with payroll at any time during year.
³Statistics for some industry groups and industries are withheld to avoid disclosing data for individual companies. However, for such industry groups and industries with 150 employees or more, number of establishments is shown and employment size range is indicated by one of the following symbols: AA—150 to 249 employees; BB—250 to 499 employees; CC—500 to 999 employees; EE—1,000 to 2,499 employees; FF—2,500 employees or more. Statistics for industry groups shown include data for all component industries, regardless of whether data are shown for individual industries in the group.

⁴Value added by manufacture for 1982 is computed using inventory data reported at cost or market prior to any adjustment to LIFO cost. This uniform instruction is a change from prior years in which respondents were permitted to value their inventories using any generally accepted accounting method. Consequently, 1982 data for value added by manufacture are not comparable to prior year data.

⁵Aggregate of cost of materials and value of shipments includes extensive duplication, since products of some industries are used as materials by others (see appendixes).

Table 9. Distribution of Establishments by Employment Size and Major Group for the State and Counties: 1982—Con.

[Major group descriptions are: 20—food and kindred products; 21—tobacco manufactures; 22—textile mill products; 23—apparel and other textile products; 24—lumber and wood products; 25—furniture and fixtures; 26—paper and allied products; 27—printing and publishing; 28—chemicals and allied products; 29—petroleum and coal products; 30—rubber, plastic, and miscellaneous plastics products; 31—leather and leather products; 32—stone, clay, and glass products; 33—primary metal industries; 34—fabricated metal products; 35—machinery, except electrical; 36—electric and electronic equipment; 37—transportation equipment; 38—instruments and related products; 39—miscellaneous manufacturing industries. For information on geographic areas followed by Δ, general geographic information, and explanation of terms, see appendices. For meaning of abbreviations and symbols, see introductory text.]

Geographic area and employee size class ¹	Establishments in major group—																	Auxil- iaries			
	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36		37	38	39
Pima -----	534	-	-	12	28	15	4	118	14	2	27	12	38	10	51	55	40	10	22	33	5
1 to 19 employees -----	413	-	-	8	27	12	4	105	11	2	20	9	28	8	35	42	25	6	15	28	3
20 to 99 employees -----	92	-	-	3	1	2	-	10	3	-	4	2	9	2	15	10	8	2	5	5	-
100 to 249 employees -----	18	-	-	1	-	1	-	2	-	-	3	1	-	-	1	2	5	1	1	-	-
250 employees or more -----	11	-	-	-	-	-	-	1	-	-	-	-	1	-	1	2	2	2	1	-	-
Pinal -----	55	-	-	5	3	1	-	9	1	-	3	1	5	5	4	8	1	3	-	-	-
1 to 19 employees -----	33	-	-	1	2	-	-	7	-	-	2	-	5	1	3	7	1	1	-	-	-
20 to 99 employees -----	15	-	-	2	1	1	-	2	1	-	1	1	1	1	1	-	-	1	-	-	-
100 to 249 employees -----	6	-	-	2	-	-	-	-	-	-	-	-	-	2	-	1	-	-	-	-	-
250 employees or more -----	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Santa Cruz -----	26	-	-	3	-	1	-	6	-	-	1	-	2	-	1	-	2	-	-	2	4
1 to 19 employees -----	21	-	-	2	-	1	-	6	-	-	-	-	2	-	1	-	2	-	-	1	2
20 to 99 employees -----	4	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
250 employees or more -----	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yavapai -----	85	-	1	4	17	-	-	17	4	-	3	-	13	2	3	9	2	1	3	5	-
1 to 19 employees -----	73	-	1	1	17	-	-	15	4	-	2	-	11	2	3	8	1	1	1	5	-
20 to 99 employees -----	7	-	-	1	-	-	-	2	-	-	1	-	1	-	-	1	-	-	-	-	-
100 to 249 employees -----	4	-	-	2	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
250 employees or more -----	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yuma -----	60	-	1	5	2	1	4	10	2	1	2	1	7	-	6	3	1	1	1	4	2
1 to 19 employees -----	45	-	-	1	2	1	2	9	2	1	2	1	7	-	5	2	1	1	1	4	2
20 to 99 employees -----	11	-	-	2	-	2	2	1	2	1	1	1	4	-	1	1	1	1	1	4	2
100 to 249 employees -----	4	-	-	2	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-

Note: Data on number of establishments by employment size class by four-digit SIC industry for States, counties, and selected places are presented in Location of Manufacturing Plants subject report. This report is available only on computer tape (see introductory text).

¹Only those counties and size classes that include data for manufacturing establishments are shown.

APPENDIX A.

Explanation of Terms

This appendix is in two sections. Section 1 includes items which were requested of all establishments that were mailed census of manufactures forms including annual survey of manufactures (ASM) forms. Note that this section also includes several items (number of establishments and companies and value added) that were not included on the report forms but were derived from information collected on the forms. Section 2 covers supplementary items that were requested only from establishments included in the ASM sample. Results of the supplementary ASM inquiries are included in table 3b of this report.

SECTION 1. ITEMS COLLECTED OR DERIVED BASED ON ALL CENSUS OF MANUFACTURES (INCLUDING ASM) REPORT FORMS

Number of establishments and companies—As discussed in the Introduction, a separate report was required for each manufacturing establishment (plant) with one employee or more. An establishment is defined as a single physical location where manufacturing is performed. A company, on the other hand, is defined as a business organization consisting of one establishment or more under common ownership or control.

If the company operates at different physical locations, even if the individual locations are producing the same line of goods, a separate report was requested for each location. If the company operates in two or more distinct lines of manufacturing at the same location, a separate report was requested for each activity.

An establishment not in operation for any portion of the year was requested to return the report form with the proper notation in the "Operational Status" section of the form. In addition, the establishment was requested to report data on the number of custodial employees, capital expenditures, inventories, or any shipments from inventories during the portion of the year the plant was in operation.

In this report, data are shown for establishments in operation at any time during the year. A comparison with the number of establishments in operation at the end of the year will be provided in the Introduction to Part 1 of the General Summary subject report.

Employment and related items—The regular report forms requested separate information on production workers as of a payroll period for each quarter of the year and on other employees as of the payroll period which included the 12th of March.

All employees—This item includes all full-time and part-time employees on the payrolls of manufacturing establishments during any part of the pay period ending nearest the 12th of the months specified on the report form. Included are all persons on paid sick leave, paid holidays, and paid vacations during these pay periods. Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employees" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average for the payroll periods including the 12th of March, May, August, and November.

Production workers—This item includes workers (up through the line-supervisor level) engaged in fabricating, processing, assembling, inspecting, receiving, storing, handling, packing, warehousing, shipping (but not delivering), maintenance, repair, janitorial and guard services, product development, auxiliary production for plant's own use (e.g., power plant), recordkeeping, and other services closely associated with these production operations at the establishment covered by the report. Employees above the working-supervisor level are excluded from this item.

All other employees—This item covers nonproduction employees of the manufacturing establishment including those engaged in factory supervision above the line-supervisor level. It includes sales (including driver salespersons), sales delivery (highway truck drivers and their helpers), advertising, credit, collection, installation and servicing of own products, clerical and routine office function, executive, purchasing, financing, legal, personnel (including cafeteria, medical, etc.), professional, and technical employees. Also included are employees on the payroll of the manufacturing establishment who are engaged in the construction of major additions or alterations to the plant and who are utilized as a separate work force.

In addition to reports sent to operating manufacturing establishments, information on employment during the payroll period which included March 12 and annual payrolls was also requested of auxiliary units (e.g., administrative offices, warehouses, and research and development laboratories) of multiestablishment companies. These figures are included in manufacturing totals for all geographic levels and as a separate category in tables 1, and 5 through 9.

Payrolls—This item includes the gross earnings of all employees on the payroll of operating manufacturing establishments paid in the calendar year 1982. Respondents were told they could follow the definition of payrolls used for calculating the Federal withholding tax. It includes all forms of compensation, such as salaries, wages, commissions, dismissal pay, all bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. The total includes salaries of officers of corporations, but excludes payments to proprietors or partners of unincorporated concerns. Also excluded are payments

to members of Armed Forces and pensioners carried on the active payroll of manufacturing establishments.

The census definition of payrolls is identical to that recommended to all Federal statistical agencies by the Office of Management and Budget. It should be noted that this definition does not include employers' Social Security contributions or other nonpayroll labor costs, such as employees' pension plans, group insurance premiums, and workers' compensation.

The ASM provides estimates of employers' supplemental labor costs, both those required by Federal and State laws and those incurred voluntarily or as part of collective bargaining agreements. (Supplemental labor costs are explained later in this appendix.)

As in the case of employment figures, the payrolls of separate auxiliary units of multiestablishment companies are not included in the totals for individual industries or industry groups, but are included in the data for the geographic area (State, SMSA, county, place) as a whole.

Production-worker hours—This item covers hours worked or paid for at the plant, including actual overtime hours (not straight-time equivalent hours). It excludes hours paid for vacations, holidays, or sick leave.

Cost of materials—This term refers to direct charges actually paid or payable for items consumed or put into production during the year, including freight charges and other direct charges incurred by the establishment in acquiring these materials. It includes the cost of materials or fuel consumed, whether purchased by the individual establishment from other companies, transferred to it from other establishments of the same company, or withdrawn from inventory during the year.

The important components of this cost item are (1) all raw materials, semifinished goods, parts, components, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year, (2) electric energy purchased, (3) fuels consumed for heat, power, or the generation of electricity, (4) work done by others on materials or parts furnished by manufacturing establishments (contract work), and (5) products bought and resold in the same condition. (See discussion of duplication of data below.)

Value of shipments—This item covers the received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all miscellaneous receipts, such as receipts for contract work performed for others, installation and repair, sales of scrap, and sales of products bought and resold without further processing. Included are all items made by or for the establishments from materials owned by it, whether sold, transferred to other plants of the same company, or shipped on consignment. The net selling value of products made in one plant on a contract basis from materials owned by another was reported by the plant providing the materials.

In the case of multiunit companies, the manufacturer was requested to report the value of products transferred to other establishments of the same company at full economic or commercial value, including not only the direct cost of production but also a reasonable proportion of "all other costs" (including company overhead) and profit. (See discussion of duplication of data below.)

Duplication in cost of materials and value of shipments—The aggregate of the cost of materials and value of shipments figures for industry groups and for all manufacturing industries includes large amounts of duplication, since the products of some industries are used as materials by others. With some important exceptions, such as for motor vehicles and parts, this duplication is not significant at the four-digit industry level. However, it is significant at the two-digit and three-digit industry group level because these totals often include industries that represent successive stages in the production of a finished manufactured product. Examples are the addition of flour mills to bakeries in the "Food" group and the addition of pulp mills to paper mills in the "Paper and Allied Products" group of industries. Estimates of the overall extent of this duplication indicate that the value of manufactured products exclusive of such duplication (the value of finished manufactures) tends to approximate two-thirds of the total value of products reported in the census of manufactures.

Value added by manufacture—This measure of manufacturing activity is derived by subtracting the cost of materials, supplies, containers, fuel, purchased electricity, and contract work from the value of shipments (products manufactured plus receipts for services rendered). The result of this calculation is adjusted by the addition of value added by merchandising operations (i.e., the difference between the sales value and the cost of merchandise sold without further manufacture, processing, or assembly) plus the net change in finished goods and work-in-process between the beginning- and end-of-year inventories.

Because of the change in instructions for reporting inventories for 1982, the 1982 figure for value added is not strictly comparable to prior-year data. This is explained more fully in the inventories section below.

"Value added" avoids the duplication in the figure for value of shipments that results from the use of products of some establishments as materials by others. Value added is considered to be the best value measure available for comparing the relative economic importance of manufacturing among industries and geographic areas.

New and used capital expenditures—For establishments in operation and establishments under construction but not yet in operation, manufacturers were asked to report their new expenditures for (1) permanent additions and major alterations to manufacturing establishments, and (2) machinery and equipment used for replacement and additions to plant capacity if they were of the type for which depreciation accounts were ordinarily maintained.

The totals for new expenditures exclude that portion of expenditures leased from nonmanufacturing concerns, new facilities owned by the Federal Government but operated under contract by private companies, and plant and equipment furnished to the manufacturer by communities and nonprofit organizations. Also excluded are expenditures for used plant and equipment (although reported in the census), expenditures for land, and cost of maintenance and repairs charged as current operating expenses.

Manufacturers were also requested to report the value of all used buildings and equipment purchased during the year at the purchase price. For any equipment or structure transferred to the use of the reporting establishment by the parent company or one of its subsidiaries, the value at which it was transferred to the establishment was to be reported. Furthermore, if the

establishment changed ownership during the year, the cost of the fixed assets (building and equipment) was to be reported under used capital expenditures.

Total expenditures for used plant and equipment is a universe figure; i.e., it is collected on all census forms. However, the breakdown of this figure between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form and is subject to sampling error (see table 3b). The data for total new capital expenditures, new building expenditures, and new machinery expenditures, as well as the data for total used expenditures, are shown in both tables 3a and 3b. The figure in table 3a is a census universe total and may differ from the results of the ASM sample shown in table 3b. Since the figures in table 3b are subject to sampling error, they are not considered as reliable as the universe figures.

End-of-year inventories—Respondents were asked to report their 1981 and 1982 end-of-year inventories at cost or market. Effective with the 1982 Economic Censuses, this change to a uniform instruction for reporting inventories was introduced for all sector reports. Prior to 1982, respondents were permitted

to value inventories using any generally accepted accounting method (FIFO, LIFO, market, to name a few). In 1982, LIFO users were asked to first report inventory values prior to the LIFO adjustment and then to report the LIFO reserve and the LIFO value after adjustment for the reserve.

Because of this change in reporting instructions, the 1982 data for inventories and value added by manufacture included in the tables of this report are not comparable to the prior-year data shown in table 1a of this report and in historical census of manufactures and annual survey of manufactures publications.

In using inventory data by stage of fabrication for "all industries" and at the two-digit industry level, it should be noted that an item treated as a finished product by an establishment in one industry may be reported as a raw material by another establishment in a different industry. For example, the finished-product inventories of a steel mill would be reported as raw materials by a stamping plant. Such differences are present in the inventory figures by stage of fabrication shown for individual industries, industry groups, and "all manufacturing," which are aggregates of figures reported by establishments in specified industries.

SECTION 2. ITEMS COLLECTED ONLY ON ASM REPORT FORMS

Supplemental labor costs—Supplemental labor costs are divided into legally required expenditures and payments for voluntary programs. The legally required portion consists primarily of Federal old age and survivors' insurance, unemployment compensation, and workers' compensation. Payments for voluntary programs include all programs not specifically required by legislation whether they were employer initiated or the result of collective bargaining. They include the employer portion of such plans as insurance premiums, premiums for supplemental accident and sickness insurance, pension plans, supplemental unemployment compensation, welfare plans, stock purchase plans on which the employer payment is not subject to withholding tax, and deferred profit-sharing plans. They exclude such items as company-operated cafeterias, in-plant medical services, free parking lots, discounts on employee purchases, and uniforms and work clothing for employees. While the excluded items do benefit employees and all or part of their cost generally is similar to the items covered in the ASM labor costs statistics, accounting records do not generally provide reliable figures on net employee benefits of these types.

Cost of purchased services—ASM establishments were requested to provide information on the cost of purchased services for the repair of buildings and other structures, the repair of machinery, and communication services. Included in the cost of purchased services for the repair of buildings and machinery are payments made for all maintenance and repair work on buildings and equipment, such as painting, roof repairs, replacing parts, and overhauling equipment. Such payments made to other establishments of the same company and for repair and maintenance of any leased property are also included. Extensive repairs or reconstruction that were capitalized are considered capital expenditures for used buildings and machinery and are, therefore, excluded from this item. Repair and maintenance costs provided by an owner as part of a rental contract or incurred

directly by an establishment in using its own work force are also excluded.

The response coverage ratio shown in table 3b for each of the three types of purchased services listed above is a measure of the extent to which respondents reported for each item. It is derived for each item by calculating the ratio of the weighted employment (establishment data multiplied by sample weight; see section 3) for those ASM establishments that reported the specific inquiry to the weighted total employment for all ASM establishments classified in the industry.

Electric energy used for heat and power—Data on the cost of purchased electric energy were collected on all census forms. However, data on the quantity of purchased electric energy and quantity of generated-less-sold electric energy were collected only on the ASM forms. The cost and quantity of purchased electric energy represent the amount actually used during the year for heat and power. In addition, information was collected on the quantity of electric energy generated by the establishment and the quantity of electric energy sold or transferred to other plants of the same company.

Beginning- and end-of-year depreciable assets—The data encompass all fixed depreciable assets on the books of establishments at the beginning and at the end of the year. The values shown (book value) represent the actual cost of assets at the time they were acquired, including all costs incurred in making the assets usable (such as transportation and installation). Included are all buildings, structures, machinery, and equipment (production, office, and transportation equipment) for which depreciation reserves are maintained. Excluded are non-depreciable capital assets, including inventories and intangible assets, such as patent rights and royalties. Also excluded are land and depletable assets, such as timber and mineral rights.

The definition of fixed depreciable assets is consistent with the definition of capital expenditures. For example, expenditures

include actual capital outlays during the year, rather than the final value of equipment put in place and buildings completed during the year. Accordingly, the value of assets at the end of the year includes the value of construction in progress. In addition, respondents were requested to make certain that assets at the beginning of the year plus new and used capital expenditures, less retirements, equalled assets at the end of the year.

New and used capital expenditures—The data for total new capital expenditures, new building expenditures, new machinery expenditures, and total used capital expenditures are collected on all census forms. However, the breakdown between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form. (See further explanation on capital expenditures in section 1.)

Breakdown of new capital expenditures for machinery and equipment—ASM establishments were requested to separate their capital expenditures for new machinery and equipment into (1) automobiles, trucks, etc., for highway use, (2) computers and peripheral data processing equipment, and (3) all other.

The category "automobiles, trucks, etc., for highway use" is intended to measure expenditures for vehicles designed for highway use that were acquired through a purchase or lease-purchase agreement. Vehicles normally operating off public highways (vehicles specifically designed to transport materials, property, or equipment on mining, construction, logging, and petroleum development projects) are excluded from this item.

The "not specified by kind" or n.s.k. item for expenditures for new machinery and buildings shown in table 3b, represents the total machinery and equipment expenditures for establishments that did not break down their expenditures for the three specific categories. This means that for most industries the specific categories are understated.

Retirements—Included in this item is the gross value of assets sold, retired, scrapped, destroyed, etc., during 1982. When a complete operation or establishment changed ownership, the respondent was instructed to report the value of the assets sold at the original cost as recorded in the books of the seller. The respondent was also requested to report retirements of equipment or structures owned by a parent company that the establishment was using as if it were a tenant.

Rental payments—This item includes rental payments for the use of all items for which depreciation reserves would be maintained if they were owned by the establishment, e.g., structures and buildings, and production, office, and transportation equipment. Excluded are royalties and other payments for the use of intangibles and depletable assets, and land rents where separable.

When an establishment of a multiestablishment company was charged rent by another part of the same company for the use of assets owned by the company, it was instructed to exclude that cost from rental payments. However, the book value (original cost) of these company-owned assets was to be reported as assets of the establishment at the end of the year.

If there were assets at an establishment rented from another company, and the rents were paid centrally by the head office of the establishment, the company was instructed to report these rental payments as if they were paid directly by the establishment.

Depreciation charges—This item includes depreciation and amortization charged during the year against assets. Depreciation charged against fixed assets acquired since the beginning of the year and against assets sold or retired during the year are components of this category. Respondents were requested to make certain that they did not report accumulated depreciation.

APPENDIX B.

Annual Survey of Manufactures (ASM) Sampling and Estimating Methodologies

DESCRIPTION OF SURVEY SAMPLE

The Annual Survey of Manufactures (ASM) contains two components. The mail portion of the survey is a probability sample of about 55,000 manufacturing establishments selected from a total of about 225,000 establishments. These 225,000 establishments represent all manufacturing establishments of multiunit companies and all single-unit manufacturing establishments with five employees or more tabulated in the 1977 Census of Manufactures. This mail portion is supplemented by a Social Security Administration list of new manufacturing establishments opened after 1977. The individual establishments were defined as the sampling unit for this sample. This is a change from the previous ASM sample when companies were used as the sampling unit. The implication of this change is that the probability of selection of any establishment relates only to the size of the establishment itself and is independent of the size of the company with which the establishment is affiliated. The efficiencies associated with the change to an establishment sample have made it possible to reduce the mail sample panel from 70,000 establishments in 1978 to 55,000 establishments in the current panel.

The nonmail portion of the survey includes all single-unit establishments that were tabulated with less than five employees in the 1977 Census of Manufactures. Although this portion contained approximately 125,000 establishments, it accounted for less than 2 percent of the estimate for total value of shipments at the total manufacturing level. This portion was not sampled; rather, the data for every establishment in this group were estimated based on selected information obtained annually from the administrative records of other Federal agencies. This administrative record information, which includes payroll, total employment, industry classification, and physical location of the establishment, was obtained under special conditions, which safeguard the confidentiality of both tax and census records. Estimates for data for these small establishments were developed using industry averages in conjunction with the administrative information.

The corresponding estimates for the mail and nonmail establishments were added together, along with the adjusted base-year differences as defined in Description of Estimating Procedures below. The remaining description of the survey sample relates only to the mail portion of the ASM sample.

All establishments with 250 employees or more in the 1977 census were included in the survey panel with certainty. These establishments collectively account for approximately 65 percent of the total value of shipments for manufacturing establishments in the 1977 census. Smaller establishments were sampled with probabilities ranging from 1.000 down to 0.005 in accordance with mathematical theory for optimum allocation of a sample.

The probabilities of selection assigned to the smaller establishments were proportional to measures of size determined for each establishment. For establishments included in the 1977 Census of Manufactures, the measure of size depended directly upon each establishment's 1977 product class values and the

historic variability of the year-to-year shipments of each product class. Roughly equivalent measures of size were assigned to postcensus birth establishments based on their industry codes and anticipated payroll and employment.

The method of assigning measures of size was used in order to maximize the precision (that is, minimize the variance of estimates of the year-to-year change) in the value of product class shipments. Implicitly, it also gave weight to differences in employment, value added, and other general statistics, for these are highly correlated with value of shipments. Individual sample selection probabilities were obtained by multiplying each establishment's final measure of size by an overall sampling fraction coefficient calculated to yield a total expected sample size.

The sample selection procedure gave each establishment in the sampling frame an independent chance of selection. This method of independent selection permits the rotation of establishments into and out of a given sample panel without introducing a bias into the survey estimates.

DESCRIPTION OF ESTIMATING PROCEDURES

Most of the ASM estimates for the years 1978-1981 were computed using a modified "difference estimate" formula. For each item, a base-year difference was developed. This base-year difference is equal to the difference between the 1977 census published number for an item total and the linear ASM estimate of the total for 1977. The ASM linear estimate was obtained by multiplying each sample establishment's data by its sample weight (the reciprocal of its probability of selection) and summing the weighted values.

This base-year difference was then adjusted to reflect the estimated growth at the four-digit or, in the case of product classes, five-digit based Standard Industrial Classification (SIC) level from 1977 to the year of the survey; for example, 1981. It should be noted that due to processing constraints, the growth factors lagged one year; i.e., if 1981 is the survey year, they were not based on the estimated growth from 1977 to 1981 but rather the growth from 1977 to 1980. This one-year lag had negligible effect on the estimates, particularly at the total manufacturing level where the adjusted base-year difference accounted for less than 1 percent of the estimate for total value of shipments.

These adjusted base-year differences were then added to the corresponding current-year linear estimates, which include the sum of the estimates for the mail and nonmail establishments, to produce the estimates for the years 1978-1981. Estimates developed by this procedure usually are far more reliable than comparable linear estimates developed from the current sample data alone.

The 1982 sample data included in table 3b were also developed using difference estimates. However, since the universe totals for the census year (1977 or 1982) were not known, a modification of the procedure described above was necessary. For each item in table 3b, except purchased services and breakdown of expenditures for new machinery and equipment (see further description in appendix A, section 2), linear

estimates of the publication totals from the ASM mail sample were adjusted by the difference between imputed census totals and the corresponding ASM mail sample estimates of these imputed totals. These imputed totals are obtained by applying industry average ratios to control item values at the establishment level. For example, an imputed total beginning assets figure is obtained by multiplying each establishment's total value of shipments by the industry (four-digit SIC) average for the ratio of beginning assets to shipments.

Separate estimates for the nonmail establishments were not developed. However, their contribution to the publication estimates is reflected in the difference adjustment.

QUALIFICATIONS OF THE DATA

The estimates developed from the sample are apt to differ somewhat from the results of a survey covering all companies in the sampled lists but otherwise conducted under essentially the same conditions as the actual sample survey. The estimates of the magnitude of the sampling errors (the differences between the estimates obtained and the results theoretically obtained from a comparable, complete-coverage survey) are provided by the standard errors of the estimates.

The particular sample selected for the ASM is one of a large number of similar probability samples that, by chance, might have been selected under the same specifications. Each of the possible samples would yield somewhat different sets of results, and the standard errors are measures of the variation of all the possible sample estimates around the theoretical, comparable, complete-coverage values.

Estimates of the standard errors have been computed from the sample data for selected statistics in this report. They are presented in the form of relative standard errors, the standard errors divided by the estimated values to which they refer.

In conjunction with its associated estimate, the relative standard error may be used to define confidence intervals (ranges that would include the comparable, complete-coverage value for specified percentages of all the possible samples).

The complete coverage value would be included in the range:

1. From one standard error below to one standard error above the derived estimate for about two-thirds of all possible samples.
2. From two standard errors below to two standard errors above the derived estimate for about 19 out of 20 of all possible samples.
3. From three standard errors below to three standard errors above the derived estimate for nearly all samples.

An inference that the comparable, complete-survey result would be within the indicated ranges would be correct in approximately the relative frequencies shown. Those proportions, therefore, may be interpreted as defining the confidence that the estimates from a particular sample would differ from complete-coverage results by as much as one, two, or three standard errors, respectively.

For example, suppose an estimated total is shown as 50,000 with an associated relative standard error of 2 percent, that is, a standard error of 1,000 (2 percent of 50,000). There is approximately 67 percent confidence that the interval 49,000 to 51,000 includes the complete-coverage total and about 95 percent confidence that the interval 48,000 to 52,000 includes the complete-coverage total.

In addition to the sample errors, the estimates are subject to various response and operational errors: errors of collection, reporting, coding, transcription, imputation for nonresponse, etc. These operational errors would also occur if a complete canvass were to be conducted under the same conditions as the survey.

Explicit measures of their effects generally are not available. However, it is believed that most of the important operational errors were detected and corrected in the course of the Bureau's review of the data for reasonableness and consistency. The small operational errors usually remain. To some extent, they are compensating in the aggregated totals shown. When important operational errors were detected too late to correct the estimates, the data were suppressed or were specifically qualified in the tables.

As derived, the estimated standard errors included part of the effect of the operational errors. The total errors, which depend upon the joint effect of the sampling and operational errors, are usually of the order of size indicated by the standard error, or only moderately higher. However, for particular estimates, the total error may considerably exceed the standard errors shown.

The concept of complete coverage under the conditions prevailing for the ASM is not identical to the complete coverage of the census of manufactures, as the censuses have been conducted. Nearly all types of operational errors that affect the ASM also occur in the censuses. The ASM and the censuses, are conducted under quite different conditions, and operational errors can be better controlled in the ASM than in the censuses. As a result, for many of the census figures, the errors are of the same order of size as the total errors of the corresponding annual survey estimates. The differences between the census and ASM operating conditions also disturb, to some degree, the comparability of the ASM and census data.

Any figures shown in the tables in this publication having an associated standard error exceeding 15 percent may be of limited reliability. However, the figure may be combined with higher-level totals, creating a broader aggregate, which then may be of acceptable reliability.

APPENDIX C.

Standard Metropolitan Statistical Areas

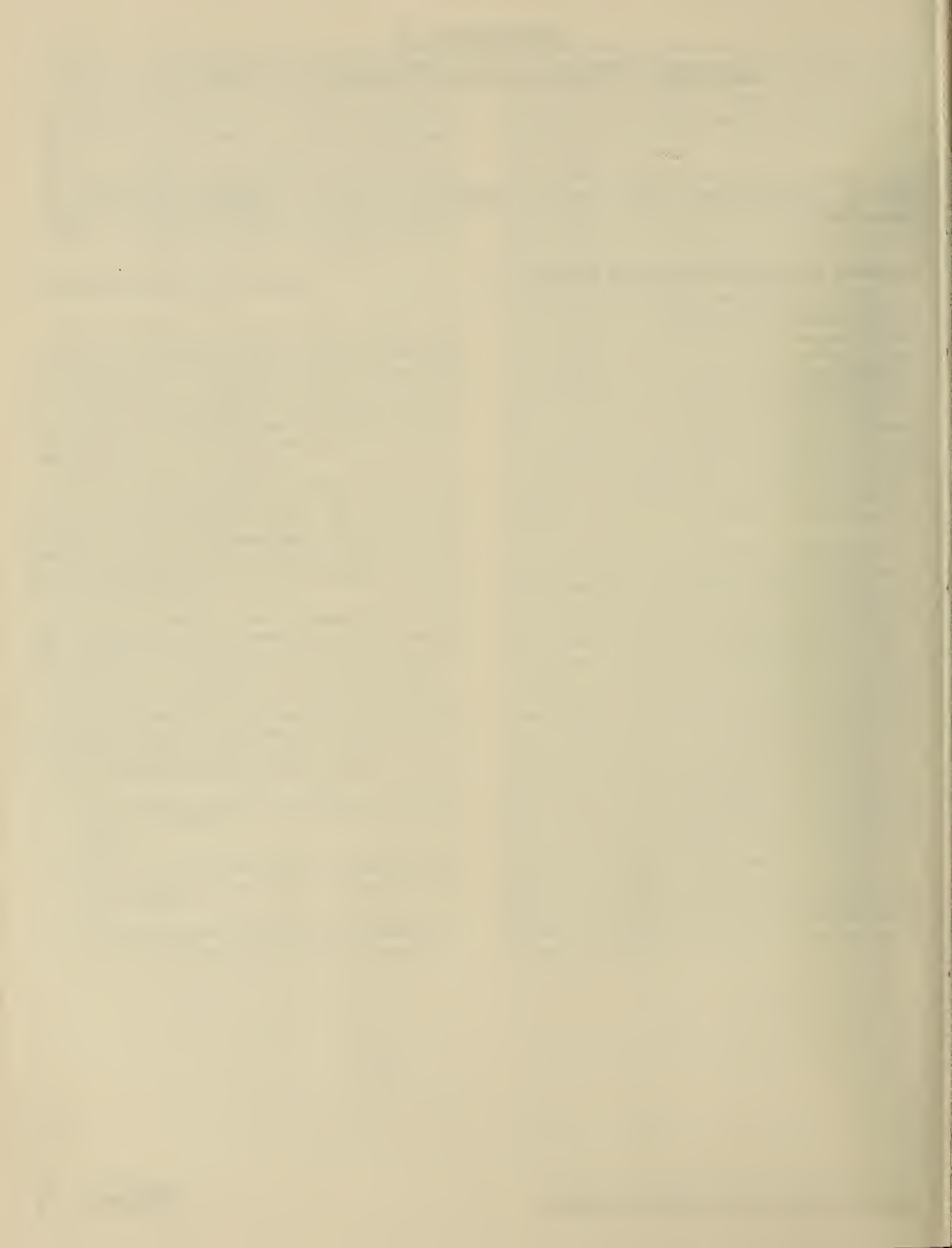
[Titles and definitions shown for SMSA's are those established by the Office of Management and Budget, as of January 1982]

Standard Metropolitan Statistical Areas

SMSA and definition

Phoenix, Ariz.
Maricopa County, Ariz.

Tucson, Ariz.
Pima County, Ariz.



APPENDIX D. Geographic Notes

Apache Junction is in Maricopa and Pinal Counties. It was incorporated in 1978.

Lake Havasu City was incorporated in October 1978.

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Corrections (if there are any) for this publication — **Manufactures, Arizona, MC82-A-3**

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Guide to the 1982 Economic Censuses and Related Statistics

Monthly Product Announcement — A monthly notice of all products released by the Census Bureau during the previous month — useful primarily to persons who plan to purchase publications, tapes, etc., in the future.

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PUBLICATION PROGRAM

1982 CENSUS OF MANUFACTURES

Publications of the 1982 Census of Manufactures, containing preliminary and final data on manufacturing establishments in the United States, are described below. Publication order forms for the specific reports may be obtained from any Department of Commerce district office or from Data User Services Division, Customer Services (Publications), Bureau of the Census, Washington, D.C. 20233

Preliminary Reports

Preliminary industry data are issued in 443 separate reports covering 452 industries (or combinations of industries). Preliminary data for States are grouped and released in reports for each of the nine census geographic divisions.

Final Reports

Final detailed statistics are issued in separate paperbound reports.

Industry series—82 reports (MC82-I-20A to -39D)

Each of the 82 reports provides information for a group of related industries (e.g., "dairy products" includes industries for butter, cheese, milk, etc.). Final figures for the United States are shown for each of the 452 manufacturing industries on quantity and value of products shipped and materials consumed, cost of fuels and electric energy, capital expenditures, assets, rents, inventories, employment, payroll, payroll supplements, hours worked, value added by manufacture, number of establishments, and number of companies. Comparative statistics for earlier years are provided where available.

For each industry, data on value of shipments, value added by manufacture, capital expenditures, employment, and payroll are shown by employment-size class of establishment and degree of primary product specialization. Statistics are given on production of specific products and consumption of energy and various materials by industry.

Geographic area series—51 reports (MC82-A-1 to -51)

A separate report for each State and the District of Columbia presents data for industry groups and industries on value of shipments, cost of materials, value added by manufacture, employment, payroll, hours worked, new capital expenditures, and number of manufacturing establishments for the State, SMSA's, and large industrial counties and places. Comparative statistics for earlier census years are shown for the State and large SMSA's. Manufacturing totals are presented for each county and for places with significant manufacturing activity. Detailed statistics—including inventories, assets, rents, and energy costs—are presented only in statewide totals.

Subject series—10 reports (MC82-S-1 to -10)

Each of the 10 reports contains detailed statistics for an individual subject, such as: selected materials consumed, selected metalworking

operations, manufacturing activity in government establishments, concentration ratios in manufacturing, type of organization, water use in manufacturing, fuels and electric energy consumed (separate publications for industry statistics, and State and SMSA statistics), textile machinery in place, production indexes, and a general National-level summary.

Final Report Volumes

Final paperbound reports subsequently are assembled and reissued in clothbound volumes.

- Volume I. Summary and Subject Statistics—data previously issued in series MC82-S.
 - Volume II. Industry Statistics—data previously issued in series MC82-I.
 - Part 1. Major Groups 20 to 26
 - Part 2. Major Groups 27 to 34
 - Part 3. Major Groups 35 to 39
- Volume III. Geographic Area Statistics—data previously issued in series MC82-A.
 - Part 1. Alabama to Montana
 - Part 2. Nebraska to Wyoming

Microfiche

All published data also are available on microfiche.

Computer Tapes

Selected data—generally detailed information by industry and/or geographic area—also are available on public-use computer tapes. For the selected data, these tapes will provide the same information found in the final reports. Public-use computer tapes are available for users who wish to summarize, rearrange, or process large amounts of data. These tapes, with corresponding technical documentation, are sold by Data User Services Division, Customer Services (Tapes), Bureau of the Census, Washington, D.C. 20233.

OTHER ECONOMIC CENSUSES REPORTS

Data on retail trade, wholesale trade, service industries, construction industries, mineral industries, enterprise statistics, minority-owned businesses, women-owned businesses, and transportation also are issued as part of the 1982 Economic Censuses. A separate series of reports covers the censuses of outlying areas—Puerto Rico, Virgin Islands of the United States, Guam, and the Northern Mariana Islands. All published reports and microfiche are sold by the Superintendent of Documents, U. S. Government Printing Office. Appropriate announcements and order forms describing these products are available free of charge from Data User Services Division, Customer Services (Publications), Bureau of the Census, Washington, D.C. 20233.

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