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Annual Survey of Manufactures

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Introduction

SCOPE

The Annual Survey of Manufactures (ASM) provides sample estimates of statistics for all manufacturing establishments with one or more paid employee. Manufacturing is defined as the mechanical, physical, or chemical transformation of materials or substances into new products. The assembly of components into new products is also considered manufacturing, except when it is appropriately classified as construction.

Establishments in the manufacturing sector are often described as plants, factories, or mills and typically use power-driven machines and materials-handling equipment. Also included in the manufacturing sector are some establishments that make products by hand, like custom tailors and the makers of custom draperies. While manufacturers typically do not sell to the public, some establishments like bakeries and candy stores that make products on the premises may be included.

GENERAL

This report presents manufacturing establishment statistics from the 2000 Annual Survey of Manufactures (ASM). Three reports are issued from this survey.

The report Statistics for Industry Groups and Industries presents 2000 and earlier years data at the three-, four-, five-, and six-digit North American Industry Classification System (NAICS) levels. The 1997 data are from the 1997 Economic Census and include revisions made to the data since its initial release. The report also includes a historic table with data for the all-manufacturing level back to 1977. This report includes statistics for employment, payroll, value added by manufacture, cost of materials consumed, value of shipments, total capital expenditures, supplemental labor costs, fuels and electric energy used, and inventories by stage of fabrication.

The report Geographic Area Statistics presents similar data for each state and the District of Columbia. This report includes statistics at the NAICS three- and four-digit levels for employment, payroll, value added by manufacture, cost of materials consumed, value of shipments, and total capital expenditures. Data for detailed capital expenditures, supplemental labor costs, fuels and electric energy used, and inventories by stage of fabrication are presented at the state level.

The report Value of Product Shipments presents shipments data for the 473 six-digit NAICS product groups and approximately 1,500 seven-digit NAICS product classes.

COMPARABILITY WITH HISTORIC DATA

The adoption of the North American Industry Classification System (NAICS) in the 1997 Economic Census has had a major impact on the comparability of current and historic data. Approximately half of the industries in the manufacturing sector of NAICS do not have comparable industries in the Standard Industrial Classification (SIC) system that was used in the past.

While most of the change affecting the manufacturing sector was change within the sector, some industries left manufacturing and others came into manufacturing. Prominent among those that left manufacturing are logging and portions of publishing. Prominent among the industries that came into the manufacturing sector are bakeries, candy stores where candy is made on the premises, custom tailors, makers of custom draperies, and tire retreading. The net effect of the classification changes are such that if the 1997 value of shipments data for all manufacturers were tabulated on an SIC basis, it would be approximately 3 percent higher.

Another change resulting from the conversion to NAICS is that data for auxiliaries and central administrative offices (CAOs) associated with manufacturers are not presented with the manufacturing data.

It should also be noted that while the Census Bureau published “new capital expenditures” in the past, starting with 1997 it is publishing “total capital expenditures.” The historic data presented in this report have been adjusted to be consistent with the new policy.

DISCLOSURE

In accordance with federal law governing census reports (Title 13, United States Code), no data are published that would disclose the operations of an individual company.

The disclosure analysis for the industry statistics files is based on the total value of shipments. When the total value of shipments cannot be shown without disclosing information for individual companies, the complete line is suppressed except for capital expenditures. However, the
suppressed data are included in higher-level totals. A separate disclosure analysis is performed for capital expenditures that can be suppressed even though value of shipments data are published.

**AVAILABILITY OF MORE FREQUENT MANUFACTURING DATA**

The Census Bureau conducts the ASM in each of the 4 years between the economic census, which is collected for years ending in 2 and 7. The economic census — manufacturing is the sample frame from which the ASM is chosen and presents more detailed data than the ASM. In addition, the Census Bureau conducts a Current Industrial Reports (CIR) program. The CIR publishes product statistics for selected manufacturing industries at the U.S. level annually and, in some cases, monthly and/or quarterly.

The Census Bureau also conducts the monthly Manufacturers’ Shipments, Inventories, and Orders (M3) program, which publishes detailed statistics for manufacturing industries at the U.S. level.

**INDUSTRY CLASSIFICATION OF ESTABLISHMENTS**

Each of the establishments canvassed in the ASM was classified in 1 of 473 manufacturing industries in accordance with the industry definitions in the 1997 NAICS Manual.

In the NAICS system, an industry is generally defined as a group of establishments that have similar production processes. To the extent practical, the system uses supply-based or production-oriented concepts in defining industries. The resulting group of establishments must be significant in terms of number, value added by manufacture, value of shipments, and number of employees.

The coding system works in such a way that the definitions progressively become narrower with successive additions of numerical digits. In the manufacturing sector, there are 21 subsectors (three-digit NAICS), 86 industry groups (four-digit NAICS), 184 NAICS industries (five-digit NAICS) that are comparable with Canadian and Mexican classification, and 473 U.S. industries (six-digit NAICS).

Product classes and products of the manufacturing industries have been assigned codes based on the industry from which they primarily originate. In the NAICS system, there are about 1,500 product classes (seven-digit codes), about 6,000 census products, and an additional 3,700 CIR products (ten-digit codes). The ten-digit products are considered the primary products of the industry with the same first six digits.

In the 1997 Economic Census – Manufacturing, all establishments were classified in particular industries based on the products they produced. If an establishment made products of more than one industry, it was classified in the industry with the largest product value. In the census years, there were no resistance rules or frozen industries.

In ASM years, establishments included in the ASM sample with certainty weights are reclassified by industry only if the change in the primary activity from the prior year is significant or if 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. However, in the following census year, these ASM plants are allowed to shift from one industry to another.

The results of these rules covering the switching of plants from one industry classification to another are that some industries comprise different mixes of establishments in different survey years. Hence, comparisons between prior-year and current-year published totals, particularly at the six-digit NAICS level, should be viewed with caution. This is particularly true for the comparison between the data shown for a census year versus the data shown for the previous ASM year.

**ESTABLISHMENT BASIS OF REPORTING**

The ASM is conducted on an establishment basis. A company operating at more than one location is required to file a separate report for each location or establishment selected in the sample. 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.

**DUPICATION IN COST OF MATERIALS AND VALUE OF SHIPMENTS**

Data for cost of materials and value of shipments include varying amounts of duplication, especially at higher levels of aggregation. This is because the products of one establishment may be the materials of another. The value added statistics avoid this duplication and are, for most purposes, the best measure for comparing the relative economic importance of industries and geographic areas.

**VALUE OF INDUSTRY SHIPMENTS COMPARED WITH VALUE OF PRODUCT SHIPMENTS**

The 1997 Economic Census – Manufacturing shows value of shipments data for industries and products. In the industry statistics tables and files, these data represent the total value of shipments of all establishments classified in a particular industry. The data include the shipments of the products classified in the industry (primary to the industry), products classified in other industries...
(secondary to the industry), and miscellaneous receipts (repair work, sale of scrap, research and development, installation receipts, and resales). Value of product shipments shown in the products statistics tables and files represent the total value of all products shipped that are classified as primary to an industry regardless of the classification of the producing establishment.

**DOLLAR VALUES**

All dollar values presented are expressed in current dollars. Consequently, when making comparisons with prior years, users of the data should consider the changes in prices that have occurred.

All dollar values are shown in thousands of dollars.

**ABBREVIATIONS AND SYMBOLS**

The following abbreviations and symbols are used with the data:

- **A**: Standard error of 100 percent or more.
- **D**: Withheld to avoid disclosing data of individual companies; data are included in higher level totals.
- **N**: Not available or not comparable.
- **S**: Withheld because estimates did not meet publication standards.
- **X**: Not applicable.
- **r**: Revised.
- **nec**: Not elsewhere classified.
- **nsk**: Not specified by kind.
- **–**: Represents zero (page image/print only).
- **NAICS**: North American Industry Classification System.
Appendix A.
Explanation of Terms

BEGINNING- AND END-OF-YEAR INVENTORIES
Respondents were asked to report their beginning-of-year and end-of-year inventories at cost or market. Effective with the 1982 Economic Census, 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). Beginning 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.

Inventory Data by Stage of Fabrication
Total inventories and three detailed components (finished goods, work-in-process, and materials, supplies, fuels, etc.) were collected.
When using inventory data by stage of fabrication, 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 an 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 all publication levels.

TOTAL CAPITAL EXPENDITURES (NEW AND USED)
For establishments in operation and any known plants under construction, manufacturers were asked to report their new and used 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.
Totals for expenditures include the costs of assets leased from nonmanufacturing concerns through capital leases. 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 are excluded. Also excluded are expenditures for land and cost of maintenance and repairs charged as current operating expenses.
For any equipment or structure transferred for 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.

If an establishment changed ownership during the year, the cost of the fixed assets (building and equipment) was to be reported.

QUANTITY OF ELECTRIC ENERGY CONSUMED FOR HEAT AND POWER
Data on the quantity of purchased electric energy were collected. 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 establishments of the same company.

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.
Included in this item are:

1. Cost of parts, components, containers, etc. Includes all raw materials, semifinished goods, parts, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year.
2. Cost of products bought and sold without further processing.
3. Cost of fuels consumed for heat and power. Includes the cost of 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.
4. Cost of purchased electricity. The cost of purchased electric energy represents 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.
5. **Cost of contract work.** This term applies to work done by others on materials furnished by the manufacturing establishment. The actual cost of the material was reported on the cost of materials, parts, and containers line of this item. The term “Contract Work” refers to the fee a company pays to another company to perform a service.

**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. This duplication results, in part, from the addition of related industries representing successive stages in the production of a finished manufactured product. 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 survey.

Duplication of products within individual industries is significant within a number of industry groups; e.g., machinery and transportation industries. These industries frequently include complete machinery and their parts. In this case, the parts made for original equipment are materials consumed for assembly plants in the same industry.

Even when no significant amount of duplication is involved, value of shipments figures are deficient as measures of the relative economic importance of individual manufacturing industries or geographic areas because of the wide variation in ratio of materials, labor, and other processing costs of value of shipments, both among industries and within the same industry.

Before 1962, cost of materials and value of shipments were not published for some industries which included considerable duplication. Since then, these data have been published for all industries at the U.S. level and beginning in 1964, for all geographic levels.

**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 sold 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 multieestablishment 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.

**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. This duplication results, in part, from the addition of related industries representing successive stages in the production of a finished manufactured product. Examples are the addition of flour mills industry products to bakeries in the food group and the addition of pulp mills industry products 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 annual survey.

Duplication of products within individual industries is significant within a number of industry groups; e.g., machinery and transportation industries. These industries frequently include complete machinery and their parts. In this case, the parts made for original equipment are materials consumed for assembly plants in the same industry.

Even when no significant amount of duplication is involved, value of shipments figures are deficient as measures of the relative economic importance of individual manufacturing industries or geographic areas because of the wide variation in ratio of materials, labor, and other processing costs to value of shipments, both among industries and within the same industry.

Before 1962, cost of materials and value of shipments were not published for some industries which included considerable duplication. Since then, these data have been published for all industries at the U.S. level and beginning in 1964, for all geographic levels.

**PAYROLL**

This item includes the gross earnings of all employees on the payrolls of operating manufacturing establishments paid in the calendar year. Respondents were told they could follow the definition of payrolls used for calculating
the federal withholding tax. It includes all forms of compensa-
tion, such as salaries, wages, commissions, dis-
missal pay, bonuses, vacation and sick leave pay, and
compensation in kind, prior to such deductions as employ-
ees' social security contributions, withholding taxes,
group insurance, union dues, and savings bonds. The total
includes salaries of officers of corporations; it excludes
payments to proprietors or partners of unincorporated
concerns. Also excluded are payments to members of
armed forces and pensioners carried on the active payrolls
of manufacturing establishments.

The census definition of payrolls is identical to that recom-
mended to all federal statistical agencies by the Office of
Management and Budget. It should be noted that this defi-
cition does not include employers' social security con-
tributions or other nonpayroll labor costs, such as employ-
ees' pension plans, group insurance premiums, and
workers' compensation.

**PRODUCTION-WORKER HOURS**

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

**VALUE ADDED**

This measure of manufacturing activity is derived by sub-
tracting the cost of materials, supplies, containers, fuel,
purchased electricity, and contract work from the value of
shipments (products manufactured plus receipts for ser-
dices rendered). The result of this calculation is adjusted
by the addition of value added by merchandising opera-
tions (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.

For those industries where value of production is collected
instead of value of shipments, value added is adjusted only
for the change in work-in-process inventories between the beginning and end of year. For those indus-
tries where value of work done is collected, the value
added does not include an adjustment for the change in
finished goods or work-in-process inventories.

“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 avail-
able for comparing the relative economic importance of
manufacturing among industries and geographic areas.

**EMPLOYEES**

This item includes all full-time and part-time employees on
the payrolls of operating manufacturing establishments
during any part of the pay period which included 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 corpora-
tions 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 peri-
ods including the 12th of March, May, August, and Novem-
ber.

**Production Workers**

This item includes workers (up through the line-supervisor
level) engaged in fabricating, processing, assembling,
inspecting, receiving, storing, handling, packing, ware-
housing, 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 associ-
ated with these production operations at the establish-
ment 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 manu-
facturing establishment, including those engaged in fac-
tory supervision above the line-supervisor level. It
includes sales (including driver-salespersons), sales deliv-
ery (highway truck drivers and their helpers), advertising,
credit, collection, installation and servicing of own prod-
ucts, clerical and routine office functions, executive, pur-
chasing, financing, legal, personnel (including cafeteria,
medical, etc.), professional, and technical employees. Also
included are employees on the payroll of the manufactur-
ing establishment engaged in the construction of major
additions or alterations utilized as a separate work force.

**FRINGE BENEFITS**

Fringe benefits consists of 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 legisla-
tion 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, wel-
fare 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.
TOTAL COMPENSATION

This term refers to the annual payroll or gross earnings paid in each calendar year to employees at the establishment. It includes all forms of compensation, such as salaries, wages, commissions, dismissal pay, 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; it excludes payments to proprietors or partners of unincorporated concerns. Also excluded are payments to members of armed forces and pensioners carried on the active payrolls of manufacturing establishments.

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.
Appendix B.
Coverage and Methodology

DESCRIPTION OF THE ASM SURVEY SAMPLE

The ASM sample is selected at 5-year intervals. A new sample is introduced for the second survey year subsequent to each census. Since 1999 was the second survey year following the 1997 census, a new sample was selected based on the 1997 census.

In 1997, both the Census and ASM converted from the SIC system to NAICS for purposes of assigning industrial classifications to establishments. For the most part, the overall scope of the manufacturing sector is similar under both classification systems; however, there are selected activities that are classified as manufacturing under SIC that are considered as nonmanufacturing under NAICS. The reverse is also true.

In 1997, there were approximately 366,000 individual manufacturing establishments. For sample efficiency and cost considerations, the 1997 manufacturing population was partitioned into two components: a mail stratum and a nonmail stratum.

Mail Stratum

The mail stratum of the survey is comprised of larger single-location manufacturing companies and all manufacturing establishments of multiunit companies (companies that operate at more than one physical location). Approximately 200,000 of the 366,000 establishments in the 1997 census were assigned to the mail stratum. On an annual basis, the mail stratum is supplemented with larger, newly active single-location companies identified from a list provided by the Internal Revenue Service (IRS) and new manufacturing locations of multiunit companies identified from the Census Bureau’s Company Organization Survey (COS).

For the 1999 survey, a new sample of approximately 52,000 individual establishments was selected from the mail stratum assembled from the 1997 census. Supplemental samples representing both 1998 and 1999 births (newly active establishments that were not included in the 1997 census) were also selected. Establishments selected for the sample will be mailed an ASM survey questionnaire for each year through 2003.

The 1999-2003 ASM sample design is similar to the one used since 1984. Several adjustments were made, however, to the arbitrary certainty portion of the sample. Companies in the 1997 Census of Manufactures with manufacturing shipments of at least $1 billion were defined as company certainties. (This cutoff was raised for 1999 to compensate for inflation.) For these large companies, each manufacturing establishment is included in the mail sample. For the 1999-2003 sample, there are approximately 500 certainty companies collectively accounting for over 14,000 establishments.

For the remaining portion of the mail component of the survey, the establishment was defined as the sample unit. All establishments with 500 employees or more were defined as employment certainties. (This was raised from 250 in the 1994 sample.) In addition, all establishments producing electronic computers were defined as certainties. A final certainty category, small industry certainties, was added for the 1999 sample. This category assured that all establishments of small industries (20 establishments or less) were included in the sample. Across these four arbitrary certainty classes, there were approximately 16,600 establishments included in the sample with certainty. Collectively, these certainty establishments accounted for approximately 62 percent of the total value of shipments in the 1997 Census of Manufactures.

Smaller establishments in the remaining portion of the mail stratum were sampled with probabilities ranging from .02 to 1.00. The initial probabilities of selection assigned to these establishments were proportionate to a measure-of-size determined for each establishment. The measure-of-size was a function of the establishment’s 1997 industry classification and its 1997 product class data. For each product class and industry, a desired reliability constraint was specified. The product class constraints were based on product class size (1997 shipments) while the industry constraints were a function of both current size (1997 shipments) and change in size since 1992. Using a technique developed by Dr. James R. Chromy of the Research Triangle Institute, the initial establishment probabilities were optimized such that the expected sample satisfied all industry and product class reliability constraints while the sample size was minimized. This technique reduces the likelihood of selecting nonrepresentative samples for individual product classes or industries.

This method of assigning probabilities based on product class shipments is motivated by our primary desire to produce reliable estimates of both product class and industry shipments. The high correlation between shipments and employment, value-added, and other general statistics...
assures that these variables will also be well represented by the sample. The actual sample selection procedure uses an independent chance of selection method (Poisson sampling).

**Nonmail Component**

The initial nonmail component of the ASM traditionally consists solely of small, single-establishment companies from the census of manufactures. For 1999, the initial nonmail component also included approximately 3,600 single-establishment companies that were rotated from the mail stratum to the nonmail stratum in order to prevent their selection in consecutive sample panels. The combined initial nonmail component of the 1999 sample universe contained approximately 166,000 single-establishment companies from the 1997 Census of Manufactures. The nonmail stratum is also supplemented annually using the list of newly active single-location companies provided by the IRS and payroll cutoffs. Companies with payroll below the payroll cutoff are added to the nonmail stratum.

For this portion of the population, sampling is not used. The data for this group are estimated based on selected information obtained annually from the administrative records of the IRS and Social Security Administration (SSA). This administrative information, which includes payroll, total employment, industry classification, and physical location, is obtained under conditions that safeguard the confidentiality of both tax and census records.

**DESCRIPTION OF THE ASM ESTIMATING PROCEDURE**

Most of the ASM estimates derived for the mail stratum are computed using a difference estimator. At the establishment level, there is a strong correlation between the current-year data values and the corresponding 1997 (base) data values. Therefore, within the mailed stratum, for each item at each level of aggregation, an estimate of the “difference” between the current year and the base year is computed from sample cases and added to the corresponding base-year values. For the 1999-2002 ASM estimates, the 1997 Census of Manufactures values serve as the base year. For the 2004 ASM, the base will be updated to the 2002 Economic Census - Manufacturing.

Because of the positive year-to-year correlation, estimates developed using this methodology are generally more reliable than comparable estimates developed from the current sample data alone. Estimates for the capital expenditures variables are not generated using the difference estimator because the year-to-year correlations are considerably weaker. The standard linear estimator is used for these variables.

For the nonmail stratum, estimates for payroll and employment are directly tabulated from the administrative-record data provided by IRS and SSA. Estimates of data other than payroll and employment are developed from industry averages. Although the nonmail stratum contains approximately 202,000 individual establishments in 1999, it accounts for only 2 percent of the estimate for total value of shipments at the total manufacturing level.

Corresponding estimates for the mail and nonmail components are combined to produce the estimates included in this publication.

**QUALIFICATIONS OF THE ASM DATA**

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

The particular sample selected for the ASM is one of many 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 theoretically comparable, complete-coverage values.

Estimates of the standard errors have been computed from the sample data for selected ASM statistics in this report. They are represented 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:

- From one standard error below to one standard error above the derived estimate for about two-thirds of all possible samples.
- From two standard errors below to two standard errors above the derived estimate for about 19 out of 20 of all possible samples.
- 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 at 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, about 95 percent confidence that the interval 48,000 to 52,000 includes the complete-coverage total, and almost certain confidence that the interval 47,000 to 53,000 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 also would 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 during the Census 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 moderately higher. However, for particular estimates, the total error may considerably exceed the standard errors shown. Any figures shown in the tables in this publication having an associated standard error exceeding 15 percent may be combined with higher level totals, creating a broader aggregate, which then may be of acceptable reliability.