
**ABSTRACT OF THE
CENSUS OF MANUFACTURES
1914**

Chapter I.—INTRODUCTION.

This volume gives in condensed form the statistics collected for the census of manufactures of 1914, and makes comparisons with prior censuses. It is designed to meet the requirements of those who desire statistics for the United States as a whole, for the separate industries, and for the states and principal cities. The detail statistics for the different industries in the states and cities are given in the special reports for the states, and similar details for the principal industries are contained in the special reports for the individual industries. Preliminary totals for the manufactures in the states and cities and for the principal industries were made public as quickly as ascertained, the first totals being published in the fall of 1915.

In addition to a brief description of census methods, this volume contains separate chapters dealing with particular subjects and four general tables which assemble the more important data in convenient form. These general tables form the closing chapters of the volume, and are designated as follows:

TABLE 220.—*Capital, expenses, value of products, persons engaged, and power and fuel, for the United States, by industries: 1914.*—This table is confined to the census of 1914, and gives a fairly complete presentation of the census returns for each industry. Further detail, namely, the number of wage earners employed, by months, appears in Chapter VIII, and the statistics as to establishments classified according to character of ownership, size, and prevailing hours of labor are covered by Chapters VI, VII, and IX, respectively.

TABLE 221.—*Comparative summary, by geographic divisions and states, 1914, 1909, 1904, and 1899.*—This table shows, for all industries combined, in each geographic division and state, for each of the four censuses, the number of establishments in each state, the average number of wage earners employed, primary horsepower, capital, the amount paid for wages, the cost of materials, and the value of products.

TABLE 222.—*Capital, expenses, value of products, persons engaged, and power and fuel, by geographic divisions and states: 1914.*—This table contains, for all industries combined in each state, the same data which are shown in Table 220 for each industry in the United States as a whole.

TABLE 223.—*Summary for industries: Comparative for the United States, by states for 1914.*—This table presents statistics for each of the industries reported in 1914, and shows for each industry, so far as available, comparative data for a number of census years, also separate totals for 1914, for all states which can be given without disclosing the operations of individual concerns. It shows the same items as are given in Table 221, with the addition of "value added by manufacture" (value of products less cost of materials).

Scope of census.—Census statistics of manufactures are compiled primarily for the purpose of showing the absolute and relative magnitude of the different branches of industry covered and their growth or decline. Incidentally, the effort is made to present data throwing light upon character of ownership, size of establishments, and germane subjects. When such use of the data is made it is imperative to note that owing to the limitations of the statistics, no attempt is made to derive from them figures for average wages, cost of production, or profits.

The census did not cover establishments which were idle during the entire year or those which had a value of products of less than \$500, nor the manufacturing done in educational, eleemosynary, and penal institutions.

The censuses of 1914, 1909, and 1904 were taken in conformity with the provision of the law which directs that the canvass shall "be confined to manufacturing establishments conducted under what is known as the factory system, exclusive of the so-called neighborhood, household, and hand industries." In arranging for the census a broad construction was given to the term "factory system." In order that the factory industries should be properly represented, it was decided to include all establishments, provided the annual products amounted to \$500.

Broadly speaking, the instructions were to exclude the following classes of establishments:

- (1) All establishments reporting products valued at less than \$500 during the census year.
- (2) Establishments doing only work to the order of the individual customer, such as custom tailoring, dressmaking, millinery, and shoemaking establishments, the aim being to confine the census to establishments producing for the general or wholesale trade. Of course, this rule did not apply to large concerns manufacturing to meet special orders.

(3) Establishments engaged in the building industries other than those manufacturing building materials for the general trade.

(4) Establishments engaged in the so-called neighborhood industries and hand trades, such as blacksmithing, harness making, and tinsmithing, in which little, if any, power machinery is used, and which usually do only a local business.

(5) Small custom flour, feed, and grist mills and sawmills grinding or sawing for toll or for local consumption exclusively.

(6) Retail stores which incidentally manufacture on a small scale, particularly where it is impossible to distinguish the data relating to the manufacturing business from those relating to the mercantile business.

(7) Educational, eleemosynary, and penal institutions engaged in manufacturing industries.

Most of the establishments of classes 3 and 4 would have been excluded in any case under the rule applying to those of class 2, their work being done mainly to individual order.

Manufacturing establishments operated by the Federal Government were canvassed, but the data are not included with those for other manufacturing establishments, but are presented separately.

It is not to be supposed that the special agents in different parts of the United States succeeded in every case in interpreting these instructions exactly alike. The magnitude of the totals other than those for the number of establishments would not, however, be materially affected by differences in interpretation of the instructions, since the establishments as to which doubt might arise are in nearly all cases small establishments. Where statistics for 1899 are given they have been reduced to a comparative basis by including, so far as possible, only the so-called factory industries. Table 1, therefore, does not give the totals for censuses prior to 1899, but comparisons for the earlier censuses are made in Table 2. The comparability of the statistics has been preserved by the use, as far as possible, of the same form of schedule at the different censuses. Some unimportant changes were made in the form for 1909, principally in the inquiries concerning employees. The same form was used for 1909 and 1914, except that the schedule for the latter census contained no inquiry concerning amounts expended for rent of offices or machinery, for royalties, use of patents, insurance, ordinary repairs, advertising, traveling expenses, and other sundries. These items of expense were not deemed necessary in order to determine the magnitude of the different industries. They are of interest in so far as they might be of assistance in computations as to the cost of production and profits. Since, however, the census data are not collected for this purpose, and can not properly be so used, it was thought advisable to omit inquiries which in no wise enhance the value of the statistics.

The establishment.—As a rule, the term "establishment" represents a single plant or factory, but in some cases it represents two or more plants which were operated under a common ownership or for which one set of books of account was kept.

If, however, the plants constituting an establishment as thus defined were not all located within the same city or state, separate reports were secured in order that the figures for each plant might be included in the statistics for the city or state in which it was located. In some instances separate reports were secured for different industries carried on in the same establishment.

Period covered.—The returns relate to the calendar year 1914, or the business year which corresponded most nearly to that calendar year, and cover a year's operations, except for establishments which began or discontinued business during the year.

Statistics of capital.—*Description of inquiry.*—The census act of 1914, like those for prior censuses, directed that the schedule for manufacturing establishments should include an inquiry concerning capital. The following form of inquiry, which was substantially the same as that employed at the censuses of 1899, 1904, and 1909, was used at the census of 1914.

A mount of capital invested—owned and borrowed.—The answer should show the total amount of capital, both owned and borrowed, on the last day of the business year reported. All the items of fixed and live capital may be taken at the amounts carried on the books. If land or buildings are rented, that fact should

be stated and no value given. If a part of the land or buildings is owned, the remainder being rented, that fact should be so stated and only the value of the owned property given. Do not include securities and loans representing investments in other enterprises.

Land, buildings, machinery, and tools.....	\$.....
Materials, stocks in process, finished products, fuel, and miscellaneous supplies.....
Cash, bills receivable, and sundries.....
Total.....

Borrowed and rented capital.—It will be noted that this form of inquiry regarding capital calls for borrowed capital as well as for that owned by the proprietors of the establishment. In other words, the amount of the various classes of assets is called for without any deduction on account of liabilities whether current or of a more or less permanent character. It is obvious that capital borrowed by a manufacturer for constructing plants or for conducting business is just as truly employed in the manufacturing industry as capital owned by him and similarly invested.

The census schedule did not call for the value of rented property used by manufacturers, but the amount paid for rent is shown as a separate item in Table 220.

Classes of capital not distinguished in tables.—The inquiry on the schedule for 1914 called for three principal classes of capital separately. The distinction of these three classes was made with a view to conveying a correct understanding of what should be included in the total for all capital rather than with the expectation that accurate data for the separate items would be secured. As a matter of fact, while a majority of the establishments reported separate amounts for the three items, many failed to distinguish them, and in many other cases the separation was based on estimate only. In some instances the entire amount of capital investment was—usually incorrectly—placed opposite one of the three items. In view of these conditions, it was not considered worth while to publish the statistics for the three classes of capital separately in the tables of the census reports, and accordingly only the totals for all capital are shown in such tables.

Defectiveness of statistics of capital.—The statistics of capital have been frequently referred to in the reports of previous censuses as defective and, in fact, almost worthless, and it has been repeatedly recommended by the census authorities that the inquiry should be omitted from the schedule. Experience at the census of 1914 confirms the belief that the statistics are of little value. There are, of course, some establishments which have accounting systems such that a correct return for capital can be made, but this is not true of the great majority canvassed, and the figures for capital do not show the actual amount of the capital invested in manufacturing enterprises.

Some of the reasons why it can not be expected that uniform returns as to capital will be secured by census methods may be briefly mentioned:

- (1) Many concerns have no capital accounts whatever.
- (2) Capital invested in buildings and machinery always depreciates as the result of wear and tear unless maintained by further expenditure. The great majority of establishments make no allowances for depreciation on their books, and have no definite idea as to the relation between the original cost or value of buildings and machinery and their present value; nor in most cases do they know what it would cost to reproduce such property either wholly new or in its actual condition.
- (3) The invention of new machinery, the opening up of new supplies of raw material, or other changes in conditions of production, or changes in demand for the class of goods manufactured, may render worthless an investment in a manufacturing enterprise or greatly reduce its value.

(4) The proprietors of many manufacturing establishments have purchased them as going concerns. In such cases they are likely to enter on their books as the value of the property the amount paid for it, which may bear no relation whatever to the original investment, or to the present physical valuation of the property, or to the cost of reproducing it.

(5) Some corporations engaged in manufacturing industries have issued capital stock and other securities in excess of the actual cost of their properties and assets, or even in excess of the capitalization of the present earning capacity of their plants according to prevailing capitalization rates. In such cases it frequently happens that an arbitrary value is assigned to the assets of the corporation in order to balance its securities, and this arbitrary value is likely to be reported to the Census Bureau rather than the actual value.

In view of these and other difficulties encountered in obtaining statistics of capital, it is proper to say that the statistics as actually published in the present census report and in previous census reports have almost no significance. They do not show with any close approximation to accuracy the relative amounts of capital actually invested in different industries or in different localities, nor do they furnish a correct measure of the increase from census to census in the amount of capital invested in all industries combined or in any particular industry. Changes in the method of calculating capital, or in the ownership or in the form of organization of an establishment, may result in the reporting of a much larger or much smaller amount at one census than at another without any corresponding change in the actual investment. The percentages of increase or decrease in the capital reported are in many cases so inconsistent with the percentages of increase or decrease in value of products, value added by manufacture, number of wage earners, and other items, as to force the conclusion that the figures for capital are incomparable. There are, of course, good reasons why in some cases the statistics of capital should show a movement from census to census different from that of other items covered by the census inquiry, but these reasons can not explain all of the differences in the movements appearing in the statistics.

Rent and taxes.—[The rent reported is confined to that paid for factory or works and does not include that paid for other buildings or offices.] The taxes include internal revenue, corporation income tax, and state, county, and local taxes. In some instances the amount of the corporation tax for 1914 had not been ascertained when the report was prepared and the amount paid for 1913 was given. In the manufacture of distilled liquor the amount of internal-revenue tax greatly exceeds the cost of manufacture. In this and other industries subject to the tax, its inclusion greatly increases the value of the product.

Amount paid for contract work.—It is the practice of manufacturers in some industries to have work done under contract or on a piece price basis by persons who do not work in the factory. This practice is common in the clothing industry and in the manufacture of gloves, shoes, and other products where the work is supervised by subcontractors or done at the homes of the persons contracted with. The amounts paid for such work represent wages almost entirely, but as it was not paid to the regular employees of the manufacturer it is not included in the amount paid as wages. It is shown as a separate item in Table 220. If the contract work is done in some establishment returned to the census the employees engaged on it and their wages are, of course, reported. Therefore the combination of the amounts shown for contract work and wages results in considerable duplication.

Materials.—The following instructions were given in regard to the inquiry concerning materials:

Materials, mill supplies, and fuel: Total cost of all used during the year covered by this report.—This inquiry relates to all materials and mill supplies of every description, whether raw or partly manufactured, or whether entering into the product, used as containers, or consumed in the process of manufacture; and all fuel, whether used for heat or power or in process of manufacture, as in making coke, gas, or pig iron. The data should embrace the cost only of these articles that were actually used during the year covered by the report. The cost of materials produced in the plant itself and used by it for further manufactures should not be duplicated. If freight paid on materials is kept in a separate account, enter in the proper line below; otherwise include the cost in answers to the first three items.

In addition to the inquiry in the general schedule used for every manufacturing establishment, there were in various special schedules used for certain industries inquiries regarding the quantity and cost of specific materials used.

The total cost of materials as shown in the census reports includes not only that of materials which become component parts of the product, but also that of materials essential to production by machinery, such as fuel and lubricants, as well as that of articles necessary for the conveyance of the product to the consumer, such as packing boxes, cans, and crates.

The schedule was designed to ascertain the cost of materials delivered at the factory. In many cases the reports gave directly the cost of materials so delivered, while in other cases the freight charges paid by the manufacturers on materials were reported as a separate item.

The schedule called for the cost of materials used during the year, which in some cases is different from that of materials purchased during the year.

The total cost of materials as shown in the census reports represents simply the sum of the amounts reported by all establishments. There is extensive duplication in this total, due to the use of the products of one establishment as the materials of another.

Value of products and value added to materials by manufacture.—The schedule for the census of 1914 contained the following instructions for the reply to the inquiry as to value of products:

Products: Value of products and work performed during the year.—Give the selling value or price at the factory or works, and account for all products manufactured during the year (whether sold or not), including by-products. The principal products should be enumerated separately and the total value given for each, which value should include that of the containers, if sold with the goods. "All other products manufactured during the year" should include the total value of all products other than those for which separate values are given. "Amounts received for custom work and repairing" should include also amounts received for work done on materials furnished by others.

In addition to the inquiry in the general schedule, there were in various special schedules used for important industries inquiries regarding the quantity and value of specified products.

It will be noted that the schedule called for the selling value or price of the products. The value, if correctly reported, thus includes the profit of the manufacturer.

The value called for was what may be called the net value at the factory. Some manufacturers sell goods at prices which include delivery, but the special agents collecting the statistics were instructed in such cases to deduct freight and other delivery charges wherever possible. Products are often sold on the basis of a list price subject to large discounts, and the instructions were that such discounts should be deducted. In other words, every effort was made to secure the true net selling value of the products at the factory.

The inquiry called for the value of products manufactured during the year, and not the value of products sold during the year. In the case of a large majority of establishments the products manufactured during the year are substantially the same as the products sold, but there are important exceptions. The special agents were instructed, where the books of the manufacturers would permit, to ascertain accurately the value of the products manufactured by adding to the amount of sales the increase in the value of the stock of manufactured goods (or of stocks in process of manufacture) on hand at the end of the year as compared with the beginning of the year, or by deducting from the sales the decrease in such stocks.

In the case of the repair shops of steam and electric railroads, few if any products are manufactured for sale, but the work is done or the products manufactured solely or principally for the use and benefit of the railroads operating the establishments. In such cases the value reported usually represents the operating cost or cost of production, as no market value can be assigned to the work or the products and as it is not customary for such establishments to make any allowance for profit in assigning a value to them.

Somewhat akin to the case of railroad repair shops is that of establishments which make partly finished products, or containers and auxiliary articles, for the use of other manufacturing establishments under the same ownership. A wood-pulp plant, for

example, may make pulp for use in a paper factory owned by the same concern. In such cases the Bureau of the Census accepted as the value of products the "transfer value" assigned by the manufacturer. Such transfer value is based sometimes on market prices, sometimes on cost of manufacture, and sometimes on an arbitrary basis.

The value of products in the case of certain establishments represents merely the receipts for work performed on materials or commodities. In many cases manufacturing establishments do not own the principal materials on which they work or the finished products as they leave the plant.

In the case of repair work it would be incorrect to report the value of the complete article after repair as a value produced by the establishment making the repairs. In the case of establishments which perform certain processes for other manufacturing establishments the inclusion of the entire value of the article as it leaves their hands would involve a duplication, since the final value of the same article when completed is reported by the establishment for which the work is done.

Value added to materials by manufacture.—Manufacturing is a transformation of materials. The economic importance of the processes of manufacture can not be judged correctly by the quantity or value of the products leaving the factories, but must be judged by the addition to the utility or to the money value of the materials. The value created by the manufacturing processes is in most cases substantially the difference between the cost of the materials and the value of the products. In comparing manufacturing industries with one another this relation of the value of finished products to the cost of materials must be constantly borne in mind. One industry may turn out products valued at the same amount as those turned out by another industry, but the first may, by the manufacturing processes, have added several times as much value to the materials as the second.

For this reason statistics of "value added by manufacture" are presented. These statistics in each case represent the difference between the value of products and the cost of materials. The statistics of value added by manufacture are particularly valuable because they are almost entirely free from the duplication that appears in the total value of products. In a few industries, however, there is some duplication even in this item, due to the fact, already mentioned, that certain establishments do contract work on materials furnished by other establishments either in the same industry or in affiliated industries.

It is sometimes contended that in deducting cost of materials in order to arrive at "value added by manufacture," the cost of fuel, payments for rent of power, and the cost of lubricants and other "mill supplies" ought not to be treated as part of the cost of materials, but that the expenditures for these purposes should rather be looked upon as expenditures upon those materials which become a constituent part of the product. It was impossible to distinguish the cost of mill supplies from other materials, and in many cases the cost or part of the cost of fuel and power can not be separated. In particular, freight charges on all materials were often reported as a single item, including the charges on fuel and mill supplies, as well as on those materials which become a constituent part of the product. Consequently, it has been deemed preferable in all cases to deduct the total cost of materials, including fuel and mill supplies, from the value of products in calculating the value added by manufacture.

Duplication in value of products.—The value of products as reported by manufacturing establishments duplicates to a large extent the value of products of the industries producing raw materials—the agricultural, mining, and fishery industries. This, however, is by no means the only duplication involved in the census statistics of value of products. There is even greater duplication within the manufacturing industries themselves, due to the fact that the products of one establishment frequently become the materials for other establishments, and in small measure

to "contract work," before mentioned. The total value of products as shown in the census reports is simply the sum of the amounts reported by all establishments.

Cost of manufacture and profits.—Census data do not show the entire cost of manufacture, and consequently can not be used to show profits. No account has been taken of depreciation, interest, rent of offices and buildings other than factory or works, insurance, ordinary repairs, advertising, and other sundry expenses. The sum of the reported expenses—salary and wage payments, cost of materials, and rent and taxes—can not therefore be taken as representing the total cost of production, nor be used, by comparison with value of products, to determine the amount of profit made by manufacturing establishments.

Primary horsepower.—This item represents the total primary power generated by the manufacturing establishments plus the amount of power, principally electric, rented by them from other concerns. It does not cover the electric power developed by the primary power of the establishments themselves, the inclusion of which would evidently result in duplication.