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Industry Reports: MANUFACTURING METHODOLOGY The 1947 Interindustry Relations Study

United States Department of Labor, Bureau of Labor Statistics

BLS Report No. 10

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MANUFACTURING METHODOLOGY

The 1947 Interindustry Relations Study

UNITED STATES DEPARTMENT OF LABOR

BUREAU OF LABOR STATISTICS

The 1947 Interindustry Relations Study

The Study of Interindustry Relations for 1947 is a comprehensive analysis of the transactions relationships among the separate industries of the United States in that year. For purposes of this study, the United States economy was subdivided into about 500 separate sectors or activities, the majority of which correspond with conventional industry classifications. A detailed statistical analysis was carried out for each sector of the purchases from and sales to all sectors in 1947, and the results were reconciled within a general framework of national production and consumption data.

This study was made as a part of a continuing interagency program directed primarily toward the improvement of industrial mobilization analysis. It was financed jointly by the United States Air Force, the National Security Resources Board, and the United States Department of Labor.The study was carried on for several years by the Division of Interindustry Economics of the Bureau of Labor Statistics, U. S. Department of Labor, under the general direction of W. Duane Evans, Chief of the Division, and Marvin Hoffenberg, Assistant Chief. Jack Alterman, Sidney A. Jaffe, Philip M. Ritz, and (for a shorter period) Sam H. Schurr were responsible for major parts of the study. Important contributions were made by many members of the staff.

The funds assigned to this project were intended to provide information needed for industrial mobilization applications. However,because the methodology and results of the study are of wider interest, the Bureau of Labor Statistics is undertaking with limited resources some documentation of the study for general use.

These plans include general statements on concepts and procedures applicable to the entire study; methodological reports referring to major economic areas such as manufacturing, mining, and agriculture; and detailed reports for specific sectors or industries giving the basic statistical findings of the study.

The accompanying report describes the study concepts and methodological procedures generally applicable to all the manufacturing sectors in the 1947 Interindustry Relations Study. This report and an earlier one (BLS Report No.9) discussing the concepts and procedures generally applicable to the study as a whole are designed to accompany each of the detailed sector reports in the manufacturing area.

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The 1947 Interindustry Relations Study

UNITED STATES DEPARTMENT OF LABOR
Martin P. Durkin - Secretary

BUREAU OF LABOR STATISTICS
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The 1947 Interindustry Relations Study

Introduction

The following report has general applicability to all of the industry studies in the manufacturing area of the 1947 Interindustry Relations Study. This, together with the more general statement, Industry Reports: General Explanations, BLS Report No. 9, is designed primarily to accompany the individual industry reports (i.e., on a 500-sector basis) in the manufacturing area. It describes those facets of the research methodology in this area which are generally applicable to all of the individual reports or which cover specific techniques that have been applied to broad subgroups in the area (e.g., important metal-using sectors, such as the machinery and metal-fabricating industries).

A manufacturing sector in the 1947 Interindustry Relations Study can be considered as the sum of two segments: the basic producing industry and the total of "transfers-in" of like or similar domestic products produced elsewhere plus competitive imports. The producing industry is defined generally on an establishment basis, usually following very closely the industrial delineations of the Standard Industrial Classification system and the 1947 Census of Manufactures. However, the basic industry was sometimes modified in varying degree from the Census industry in response to problems arising in the course of the study. These modifications usually involved redefinitions of the scope of an industry (e.g., to cover manufacturing operations performed in trade or service establishments), but they also included instances of revaluation of an industry's production in order to conform with interindustry output concepts (e.g., the valuation of toll work on a quantity basis like other operations in nonferrous metal refining).

For most of the manufacturing industries, the starting point for each industry study was the material in the published volumes recording the findings of the 1947 Census of Manufactures. This material included for each industry a number of key control totals which became the basis for the preliminary industry accounts,

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1/ Prepared in the Bureau's Division of Interindustry Economics by Philip M. Ritz and Harry Shulman.

some of which may have been modified later in response to specific problems, as suggested above.

As a measure of output the Census provided data on the total value of shipments for most industries. In most cases finished goods inventory change was also recorded. For a few industries actual production rather than shipments was provided. On the cost side of each industry, Census published data on cost of materials, parts, containers, and supplies; cost of fuels and purchased electric energy; cost of contract and commission work; and wages and salaries paid. For some industries, data on consumption of selected materials were also published. This was particularly true for certain metal shapes and forms consumed by the metal fabrication and machinery industries.

Development of Gross Output

Shipments, inventories, and production--basic industry

The shipments figure generally available from the 1947 Census of Manufactures needed adjustment to a production figure and possibly other modifications before it could be used as a measure of an industry's output in the Interindustry Relations Study. Inasmuch as output was defined to refer to current production, an adjustment had to be made for finished goods inventory change. This was necessary from a slightly different point of view also in that the materials consumption data reported by Census referred to materials which went into production during the current year. In some cases this production ended up in part as an increase in finished goods inventory, and in a few cases as an increase in inventory of goods in process. Actually, the inventory adjustment needed to convert shipments to production was performed in each case for finished goods but only rarely for goods in process. The reason for this was that the inventory data reported by Census were explicit only for finished goods; the goods in process inventory was presented in combination with raw materials inventory. In only a few instances was it feasible to separate the latter.

Electric energy sales--basic industry

The shipments (and production) figures had to be modified further to take account of sales of surplus electric energy produced by many of the industries. Receipts for this item had

to be included not only because they represented legitimate production but also to make output consistent with the reported fuels consumption data, which included fuels used in generating this electricity.

Modifications of Census data--basic industry

In addition to general undercoverage in the 1947 Census of Manufactures, it omitted the logging industry and certain types of manufacturing operations (such as government manufacturing activities and manufacturing operations in wholesale and retail trade) for a number of industries.

In the case of government manufacturing operations, estimates were made of several of these activities (e.g., operation of the Government Printing Office and government ordnance plants) and were incorporated with the appropriate private industry, thus augmenting both primary shipments and output of the industries involved. The activities of navy yards, however, were not added to the private shipbuilding industry because of the unavailability of information.

The omission of manufacturing operations in trade establishments was especially important in the food processing industries. Where sufficient information was available to estimate the value of such activities, such estimates were made and added to the output of the relevant industries. Among the industries for which outputs were augmented because of production in trade were the meat packing, processed dairy products, confectionery products, and baking products industries.

As to the general undercoverage in the 1947 Census of Manufactures, it was estimated by the Bureau of the Census that about 10 percent of the manufacturing establishments were not covered. It is believed, however, that in terms of value of products the undercoverage was much less serious, probably less than 2 percent; hence no general across-the-board adjustment was made. For a few specific industries, including sawmills, some estimate of the undercoverage was made and added to the total output of the relevant industries.

Another modification of the output of an industry was by revaluation, such as was generally done for nonferrous metals

processed on a toll basis by the nonferrous smelting and refining industries. In the 1947 Census of Manufactures metals processed on a toll basis were included in the output values of the relevant industries to the extent of toll receipts only. This raised a problem in assigning values to the quantities of metals allocated to the various consuming industries. The combination of outputs with such substantially different sets of unit values (i.e., toll vs. non-toll) would have created a serious heterogeneity in the product composition of each of the affected industries. Shifts in the proportions of toll and non-toll output in later years could cause serious problems in translating the dollar output of the industry into physical quantities. Hence, a full commercial value was imputed to the metals processed on a toll basis, thus increasing the output of the relevant industries by an amount equal to the excess of the imputed value over the corresponding toll receipts. In order to balance the increased output figure, it was also necessary to make a corresponding entry on the input side and to increase the control total for cost of materials accordingly.

In the case of the logging industry, which had been completely omitted from Census coverage, an estimate of its output was prepared and the sector included in the Interindustry Relations Study.

The estimating details relating to the above enumerated modifications are explained in considerable detail in the appropriate industry reports.

Additions to basic industry--"transfers-in"

After the basic industry was defined, certain additions to each industry's primary production were considered. These additions, labeled "transfers-in," were made necessary by the need to consider the allocation of like or similar products produced by other industries or imported. The most common transfers-in were the so-called "secondary products" of other domestic industries and the "competitive imports" from the foreign trade sector. There were a few domestic transfers-in other than secondary products that also had to be considered. This general area of consideration is discussed in Industry Reports: General Explanations, BLS Report No. 9, but the incidence is so general in the manufacturing sectors as to require a more detailed discussion here.

Secondary products, the important consideration, could have been distributed to consuming industries in several ways. In one method, the secondary products could be distributed directly from the producing to the consuming industries. There were two difficulties with this procedure. First, the detailed product information given in the 1947 Census of Manufactures (Standard Table VI, Vol. II) covered shipments of primary products wherever made with no information on producing industry. The information given for the producing industry (Standard Table V, Vol. II) is in consolidated form and not sufficiently detailed for distribution purposes. Secondly, most of the information available on distributions was in terms of products rather than industries. This method was, therefore, rejected.

A second method which was considered involved the exclusion from an industry's output of all secondary products produced in that industry and the inclusion of all products primary to the industry wherever made. The difficulty with this method was that it meant a redefinition of the industry from an establishment to a commodity basis. This might have been analytically desirable, but practically all available statistical sources were based on establishment definitions like those in the Standard Industrial Classification. This would have created problems in the use of these sources both for the 1947 Interindustry Relations Study and for future modifications and analysis. For instance, the input information published in the 1947 Census of Manufactures for each industry would have required the difficult task of adjustment to exclude inputs relating to the manufacture of secondary products. This method also was rejected.

A compromise between the first two methods was adopted finally. Secondary products were retained as part of the output of the producing industry, thus avoiding the necessity of making corresponding adjustments in the input control totals published in the 1947 Census of Manufactures. However, they were not distributed directly from the producing industries to the consuming industries. Rather, they were "transferred," in the sense of "fictitious sales," to the industries of primary production to be distributed together with the primary outputs of those industries. Thus, the total supply of a commodity was to be distributed from one source, the industry of primary production.

Consequently, the output figure for an industry was modified to include, in addition to its own production of primary and secondary products (and certain miscellaneous receipts), the value of products primary to it but made elsewhere as a secondary

product. This increment to output was called a "domestic transfer-in." In some instances there were transfers-in of domestically produced products that were considered primary products in both the industry where produced and the industry to which transferred. These usually occurred when two or more industries produced one or more similar primary products which were more readily distributable from one industry.

A further modification of output occurred whenever imported commodities were identical with or closely substitutable for the primary products of an industry. These "competitive imports" were also transferred-in to the primary industry in much the same sense as domestic transfers-in. The entire supply of primary products was then distributed directly to consuming industries. At the same time the products which were not distributed directly (secondary products and others transferred-out) became indirect allocations to other industries.

Thus, the gross output of an industry included the primary industry's production and the sum of all transfers-in, whether domestic or foreign in origin. In order to balance an industry's inputs with its gross output, as now defined, it was necessary to add these transfers-in to the input side as well.

A basic industry as an aggregate of Census industries

A number of manufacturing industries in the Interindustry Relations Study were composites of individual Census of Manufactures industries. Usually, such aggregations were made where either input or output distribution information was more readily available for the aggregation than for the individual component industries or where industrial integration made interindustry transactions among the aggregate essentially meaningless. In such aggregations, products which were secondary to the individual component industries often became primary to the composite industry. For instance, the individual Census industries comprising the interindustry Apparel sector show aggregate shipments of secondary products valued at $798,619,000. However, an analysis of the individual items indicated that only $4,586,000 of these were products primary to Census industries which were not components of the composite Apparel sector. The remainder was primary to component Census apparel industries and hence also primary to the composite Apparel sector. Consequently, $794,033,000 of shipments were automatically shifted from the secondary products category where initially classified to become primary products of the composite category.

Inputs to Primary Industry

Cost of materials, fuels, etc.

As indicated earlier, the 1947 Census of Manufactures published for most industries the cost of materials, fuel, electricity, and contract work actually consumed during the year. This figure served as one of the important control values in the input reports. However, it had to be modified to take into consideration some of the output modifications indicated previously. Where the outputs of industries had been augmented to include government manufacturing operations, or manufacturing operations in trade, or Census undercoverage, or revaluation of toll work, the cost of materials had to be increased accordingly to include inputs associated with the additions to outputs. Usually, the adjustments to the cost of materials values as well as to the individual input values were proportional to the increases in outputs, i.e., the input structure for the increased output was assumed to be the same as for output of the basic industry. In the case of toll work revaluation, the cost of materials was augmented by the same amount as the primary products shipments, thus leaving unchanged the nonmaterial charges residual for the industry.

One additional modification was introduced in the cost of materials value to compensate for special treatment accorded force-account construction 2/ maintenance. In the Census treatment of an industry, all costs associated with force-account construction maintenance were included in the cost structure of the industry. Hence, material costs associated with such force-account construction maintenance were included in the Census value for cost of materials. However, in the Interindustry Relations Study all construction activity, both contract and force-account, was included in the scope of the construction industry, with the individual industries purchasing maintenance construction services. Consequently, individual inputs associated with force-account construction maintenance were eliminated from the input structures of the industries in order to avoid duplications.

2/ "Force-account construction," as performed by private concerns, is that accomplished by employees of a private business organization not in the construction industry for the use of the organization in its normal business operations.

Such adjustments were estimated for each industry and applied to the cost of materials controls. In general, individual input entries were not affected because they were originally estimated only for the commodities produced. However, because of inability to identify the items in all cases, specific materials inputs may still include varying amounts chargeable to force-account construction maintenance. 3/

Entries representing both domestic and foreign transfers-in were made on the input side to balance the entries on the output side. These input entries, however, do not refer to materials entering into the production of the products transferred in, but rather to the values of the products themselves, because the former have already been accounted for in the originating industries.

Nonmaterial charges

In the Interindustry Relations Study the nonmaterial charges included purchased services as well as factor payments and other charges, and was derived as the residual after subtracting the cost of materials, supplies, fuel, electricity, and contract work from total inputs to primary industry, the latter being identical in value with total production of primary industry. In the 1947 Census of Manufactures, the item most similar to nonmaterial charges is "value added," which was there defined as the difference between total shipments of an industry and the cost of materials, fuel, electricity, and contract work, and was intended as a measure of the contribution of the manufacturing process to the value of finished manufactured products.

The nonmaterial charges item differs from the Census "value added," and tends to exceed the latter for several reasons. First, there was the difference between production and shipments of an industry. Where there was a net increase in finished goods inventory of the producing industry (which had been the case for most manufacturing industries in 1947) shipments were lower than production; consequently, Census "value added," which was based on shipments, was less than the nonmaterial charges item, which was based on production. Second, as indicated earlier, modifications were introduced in the cost of materials figures for

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3/ The costs associated with force-account construction maintenance which had to be excluded from Census costs of materials were those charged to current account by the reporting establishments.

many industries to correspond with changes in the production figures. These generally tended to increase the nonmaterial charges item. Third, in the Interindustry Relations Study the cost of materials control was reduced to exclude material costs associated with force-account construction maintenance, as indicated earlier. As total inputs were not affected, this again tended to increase the nonmaterial charges residual.

The purchased services item for an industry represents a summation of the individual service allocations by the relevant service industries to the industry under consideration. The method of allocating services to the different industries varies with each industry and is explained in greater detail in the output reports of the service industries. Included in this item are Federal Government and State and local government excise taxes on the few services where relevant. Similar excise taxes on material purchases are included in cost of materials.

The factor payments and other charges item is derived by subtracting purchased services from the nonmaterials charges control total. This item includes: taxes paid to government, except excises and duties; factor costs, such as wages and salaries, employer contributions to private pension plans, royalties, interest, entrepreneurial income, and corporate profits after taxes; conventional nonfactor charges, such as transfer payments, depreciation and amortization, capital outlays charged to current expense, and losses and accidental damage to capital; and special types of nonfactor charges, such as charges for business travel and entertainment, banking service cash charges to business, and claim payments. In the 1947 Interindustry Relations Study the above factor costs and both types of nonfactor costs appeared as payments to the "households" sector.

Allocation Procedures and Sources

Distribution of inputs

For intermediate industries, corresponding input and output controls are identical, i.e., gross input is identical with gross output and total input to primary industry is identical with total output (production) of primary industry. Thus, once the output controls were developed, the corresponding input controls were automatically established.

The main input problem was the development of distribution patterns, i.e., the determination of the industrial sources of the purchases. Such distributions were not developable by any standard method. For each industry the method had some unique features geared to the available information and to the inherent problems. Nevertheless, several basic sources supplied some information for all the manufacturing industries and additional information for many of them.

1. Consumption of fuels and purchased electric energy: This information was published in the 1947 Census of Manufactures for every covered industry. The electric energy purchased was given separately and the fuel consumption total was further broken down into components, such as bituminous coal, anthracite, coke, fuel oils, gas, and other fuel, so that the industrial source for each type of fuel could be identified with relative ease.

2. Consumption of selected metal mill shapes and forms and rough and semifinished castings: This information was published in the 1947 Census of Manufactures for most metal-consuming industries in the primary metals industries group, the fabricated metal products group, the machinery groups, the transportation equipment group, and a few other industries. In general, the remaining industries were presumed to consume no more than relatively small amounts of metal in unfabricated or semifabricated form.

In the case of a few industries for which metal consumption represented a significant input though not a large part of total output of the respective metals, it was possible to estimate such from other sources.

3. Consumption of other specified materials: For a number of industries data were provided by the 1947 Census of Manufactures on consumption of specified materials, such as animals slaughtered by the meat packing industry, selected agricultural products consumed by the prepared feeds industry, flour used by the bakery industries, and lumber products consumed in some of the lumber manufacturing industries.

4. MB-234 materials purchases survey: This was a survey of 1949 materials purchases by a sample of some 1,500 establishments in the metal fabricating industries, conducted by the U. S. Bureau of the Census for the Munitions Board, with summary data made available to the Bureau of Labor Statistics. Control totals from individual reports were

reconciled with corresponding controls in reports collected for the 1949 Annual Survey of Manufactures of the Census Bureau and then adjusted on an industry basis to conform with industry control totals from the 1947 Census of Manufactures. This survey provided most of the basic input (purchases) data for the industries sampled.

5. Glass survey: The U. S. Bureau of the Census conducted a survey for the Bureau of Labor Statistics of materials purchased by major glass manufacturing plants. Data were obtained from 77 plants operated by 11 companies. The information obtained made it possible to fill in most of the major gaps on the input side for the glass industry.

6. Trade associations and individual companies: During the course of the project a great many trade associations and individual companies were approached for information and review of estimates. However, the acquisition and use of material from these sources created problems, inasmuch as such data generally were not geared to the 1947 Interindustry Relations Study and normally required considerable adjustment before they could be made applicable to an industry.

7. Engineering and chemical process data: These data were obtained from engineering and chemical processes handbooks. The formulas and "flow charts" incorporated in these handbooks were extremely useful in making initial estimates of the materials requirements, particularly in the chemicals industries. These estimates were modified when appraised in the light of other data but were of major importance in developing the preliminary estimates of use of certain key materials.

8. Other books and periodicals: Generally, these sources did not supply any specific input patterns for manufacturing industries. However, they were useful in supplying background information and direction for further research.

9. IIR-002: An unpublished Census Bureau tabulation of listed imports for consumption into continental United States in 1947, grouped by I-O category and compiled for the Bureau of Labor Statistics. The noncompetitive imports are components of the cost of materials control totals. The competitive imports, however, are only input entries designed to balance to augmented output entries, as indicated earlier.

10. Output reports of other industries: For some industries direct input patterns were not available. However, output reports of other industries indicated distributions of products to some of these industries. These output distributions were retabulated by consuming industry and incorporated in the relevant input reports.

Distribution of outputs

The gross output was distributed by two main types of allocations. The least important was the indirect allocation or transfer-out of secondary products and other transferred products to the relevant primary or "dummy" industry for distribution to consuming industries. The major distribution was the allocation of primary products directly to consuming industries.

Transfers of secondary products were indicated in part in the 1947 Census of Manufactures (Standard Table V). Judgment estimates were made for transferring other secondary products. A considerable amount of secondary products remained unallocated in many of the industry reports.

The distribution of primary products to consuming industries was a major task for the industry analyst and gave rise to many problems. As in the case of the distribution of inputs, no standard procedure was applicable to all manufacturing industries. However, for most industries the first attempt in distributing the primary products took the form of a commodity flow analysis. The product detail shown in the Census was studied to determine which of the products could be categorized as being essentially household items or producers' durable goods or intermediate goods for industry use. Where products could be put in any two or all three categories, attempts were made to determine roughly the percentage belonging to each category. Difficult problems arose in the determination of such percentages. For instance, large Diesel engines normally were capitalized by most industries but treated as current account expenditures in the tractor industry when they were incorporated into tractors. Another example was provided by television sets, which were sold mostly to households, but some were sold to bars and grills and other amusement places where they might have been considered producers' durable equipment. In these and other cases there was little information upon which to base distribution of commodities to the various categories. By necessity, such determinations had to be quite rough and based almost entirely on judgment rather

than on quantitative data or precise estimating techniques. Most estimates derived in this fashion were tentative, because some of these products, regardless of category, were exported or purchased by Federal or State and local governments. Moreover, separate analyses of other sectors occasionally led to some modifications.

Having grouped the commodities into those tentatively belonging to the households, producers' durable goods, and intermediate categories, the next task was to make the necessary modifications for other final demand uses and distribute the residual intermediate category to the individual consuming industries. The following were some of the procedures and sources used in this connection:

1. Trade and other publications: Publications such as Facts for Industry, Minerals Year Book, Yearbook of the American Bureau of Metal Statistics, Lumber Industry Facts, Petroleum Facts and Figures, Cotton Counts its Customers, and Industrial Marketing contained extensive information which could be utilized either directly or in some modified form for purposes of distribution of output. In some instances, output distribution information available from these publications for aggregates of commodities and industries could be broken down into finer detail by various procedures utilizing related information gathered from other sources.

2. Individual companies and trade associations: As indicated earlier, many trade associations and a number of individual companies were contacted for whatever information and assistance they could provide that might be useful in developing input and output distributions for various industries. In general, not much of this type of information could be utilized directly in the studies. However, in some instances such information was useful for developing estimating techniques and checking previous estimates.

3. Related information: In some industries where no direct distribution information was available, an attempt was made to obtain data on the use of other products or equipment which could reasonably be assumed to have a high correlation with the use of the particular products under analysis. This information then could be used to devise a system of weights for distributing the products to consuming industries. For example, parts for various industrial machinery were distributed to industries which use such machinery, on the basis of either inventory information on the

ownership of such machinery or relative production by industries using such machinery in their production processes.

4. Input reports of consuming industries: For many products, direct distribution patterns were not available. However, input reports of other industries often indicated consumption of such items, based on the MB-234 survey and other data. Expenditure distributions determined for the construction and government sectors were particularly useful in this regard. Such input data were retabulated by producing industry and incorporated in the relevant output reports.

5. EIR-002: This is an unpublished Census Bureau tabulation of listed exports of U. S. merchandise from continental United States, grouped by I-O category and compiled for the Bureau of Labor Statistics.

Allocation of marketing charges

Several kinds of marketing (or distribution) charges can be distinguished: transportation charges, which include railroad transportation, other water transportation, trucking, air transportation, petroleum pipelines, and warehousing, storage, and stockyards; trade margins, which include wholesale and retail trade margins; and taxes, which include Federal transportation excise taxes, other Federal excise taxes, and State and local excise taxes. Each of these distribution charges was developed as an aggregate to be associated with the sum of the primary products of each producing industry, including transfers-in.

In general, transportation charges, including Federal excise taxes on transportation, were allocated in direct proportion with the value of each individual transaction, unless there was information available to justify differential allocation. Wholesale trade margins were also frequently allocated in proportion to the transactions. Special consideration was given to transactions involving exports, government, and intermediate industries. Retail trade margins were allocated mostly to households, although in some instances they were also allocated to producers' durable goods and intermediate products transactions. Federal excise taxes, other than on transportation, and State and local excise taxes were generally allocated along with those sales where such taxes were considered to be relevant, e.g., sales to consumers. No taxes were allocated with transactions involving government and exports.

Reconciliation of input-output estimates

In many instances input estimates and output distributions were made independently. Therefore, it was necessary at some stage to set up a system whereby such estimates could be reconciled. This was done by retabulating the input estimates by producing industry and comparing such tabulations with the respective output distributions. In instances of difference, the estimates were reconciled where possible. Where no clear-cut decision could be reached in favor of one or the other of the estimates, the estimate most consistent with the other estimates in the particular report was usually presented. In such cases the discussion may have included the reasons for both estimates.

Distribution of miscellaneous receipts

The output of most manufacturing industries included receipts from activities that were not readily classifiable within the categories of primary or secondary production. Such receipts arose from contract and commission work, repair work, sale of scrap and salable refuse, and miscellaneous nonmanufacturing activities, and were shown in the 1947 Census of Manufactures for each industry in the indicated detail, under the general heading of "Miscellaneous Receipts." In distributing the output of each industry it was also necessary to distribute the miscellaneous receipts component, i.e., to determine the industrial sources of such receipts.

In general, there was very little information available to aid in the distribution of the receipts from contract and commission work, repair work, and miscellaneous nonmanufacturing activities. For a few industries where the background information permitted reasonable assumptions with regard to some item of the miscellaneous receipts, such assumptions were made and the items distributed accordingly. Thus, in the case of the apparel industry, it was reasonable to assume that most of the contract and commission work was for other plants of the same industry, except for some estimated amount of contract work for government. Hence, the receipts from contract and commission work in that industry were distributed to government and to the apparel industry itself. For most industries, however, the available information was inadequate for making such assumptions and the receipts from the enumerated activities were left unallocated.

In the case of scrap the situation was different. Sufficient information on scrap consumption had been developed

in the input studies of the various industries to enable the distribution of practically all the known scrap production. Here the difficulty lay in the fact that most of the scrap consumption information was not in sufficient detail to indicate the exact nature and industrial source of such scrap. Most of the scrap consumption information could be categorized only as either metal or nonmetal. The problem was solved, therefore, by setting up two "dummy" industries--I-O 5093.1, Waste Products, Metal, and I-O 5093.2, Waste Products, Nonmetal--to which most of the scrap would be transferred from the producing industries and which would serve as the central sources from which scrap would be distributed to the consuming industries. It was usually possible to classify the producing industry's scrap as metal or nonmetal by considering the type of products produced. Scrap produced outside of manufacturing was added to the scrap stockpile by means of inventory depletions (i.e., from previous years).

Here, too, there were a few instances where both the scrap production and consumption information appeared in sufficient detail to enable the distribution of such scrap directly from the producing industry to the consuming industries. Where such information was available, the direct method of distribution was employed. For most industries, however, the indicated indirect method was necessary.