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## Industry Reports: General Explanations - The 1947 Interindustry Relations Study

U.S. Department of Commerce

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**Industry Reports:**  
**GENERAL EXPLANATIONS**

**The 1947 Interindustry Relations Study**

**UNITED STATES DEPARTMENT OF LABOR**  
**Martin P. Durkin - Secretary**  
**BUREAU OF LABOR STATISTICS**  
**Ewan Clague - Commissioner**

**Washington 25, D. C.**  
**March 1953**



## 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 inter-agency 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 concepts and procedures generally applicable to all areas encompassed by the study and includes a description of data sources and estimating techniques common to a majority of the sectors.

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## INDUSTRY REPORTS: GENERAL EXPLANATIONS 1/

### The 1947 Interindustry Relations Study

#### Introduction

This report describes in general terms the concepts followed and procedures employed in carrying on the research leading to the individual industry studies comprising the basic documentation of the 1947 Interindustry Relations Study. The initial and major objective of the BLS program in this field was the development of the empirical foundations of a set of structural relationships which would relate the transactions (purchases and sales of goods and services) among all the intermediate (processing or nonautonomous) industries of the domestic economy to one another. At the same time, transactions with final demand (autonomous) sectors would be shown in order to complete the purchases and sales pictures of each industry. The transactions data and the structural relationships (input coefficients) developed therefrom for the intermediate industries are eventually organized in square arrays in the familiar interindustry relations, or "input-output," tables. These tables are the result of analytical studies of about 500 industries.

The basic data comprising these individual industry studies have intrinsic value independent of any particular analytical purpose for which they may be employed, because each study constitutes in effect a complete current account 2/ purchasing and marketing analysis for a single sector in the 1947 base period. Despite changes which may have occurred since, the relationships presented are informative. Where changes are great, the 1947 data provide a good take-off point for applying current information in order to develop relationships more applicable to current or future periods.

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1/ Prepared in the Branch of Industry Economic Studies of the Bureau's Division of Interindustry Economics by Philip M. Ritz and Gabriel G. Rudney.

2/ Although the 1947 Interindustry Relations Study collected information representing only current account transactions, capital goods were distributed only to special investment sectors. No attempt was made to distribute such capital goods to actual purchasing industry.

Generally, each industry report may be considered as comprising three sections: the general explanations applicable to each sector in the 1947 study (to be found herein); a methodological statement covering the broad area in which the industry is classified (e.g., agriculture, mining, and manufacturing); and the specific industry study, composed of a general narrative summary and detailed industry tabulations.

(e). The general explanations provide a broad background for the 1947 study, including a discussion of the period of study, coverage, classification, and sources. In addition, explanation is given of special interindustry concepts, such as valuation of production, current and capital account transactions, secondary products, transfers, and dummy industries. The valuations of various measures such as gross output, primary product shipments, marketing charges, gross inputs, cost of materials, nonmaterial inputs, and factor payments are also explained. Furthermore, the special characteristics of the final demand sectors are described.

(b). The methodological section for the broad area within which an industry is classified discusses procedures, methods, sources, and concepts which are largely standardized for all the individual sectors in the general group.

(c). The detailed industry analysis, presented in two parts, follows the methodological section. The first part is a summary statement in which the industry is defined, principal sources are listed, unique methodological implications are explained, and, where feasible, a comparison is made between BIS estimates and similar government or private estimates. In some instances, particularly for the nonmanufacturing reports, this material may include supplementary tabular presentations.

The second part consists of detailed estimates of cost structure and output distribution which are embodied in three tables: Table I--Summary of Transactions, 1947, portrays the relevant control totals from which gross inputs and gross output are derived; Table II--Inputs to the Primary Industry, 1947, describes the input structure of the industry; and Table III--Outputs, 1947, reflects the product detail and output distribution of the industry.

### Period of Study

For obvious reasons, the study data almost necessarily must be compiled for a calendar year. The year 1947 was the inevitable choice as the latest year for which a complete Census of Manufactures was available. The selection of a specific time period for the study did not, of course, limit analysis exclusively to data collected for that year. Available recorded information for years other than calendar year 1947 was investigated and used as a guide in establishing the distribution of production or the details of material requirements for 1947.

### Coverage

The 1947 study covered the flow of goods and services within the continental United States during that year. The coverage extended to all real economic transactions, including many for which imputations were made. Financial transactions were excluded except in a few special instances.

The American economy was divided for study purposes into two broad areas: a producing or processing area and a final demand or final consumption area. The producing (intermediate or endogenous) area encompassed the entire interrelated industrial system engaged in all forms of production and distribution ranging from the production of basic raw materials to end-product deliveries to final consumers. Included were the agricultural, mining, manufacturing, trade, transportation, utilities, and services sectors of the economy. The final demand (autonomous or exogenous) area, by definition, included those sectors of the economy--households, investors, government, and foreign countries--which consume the designated end-products of the producing area.

### Classification

The system of industry classification generally employed was that which showed the greatest possible degree of industry detail within the limits of data availability. In some cases relatively unimportant industries were grouped. The final designations approximated the 4-digit level of the Standard Industrial Classification for most of the manufacturing sectors and both 2-digit and 3-digit groupings for

most nonmanufacturing activities. Product groupings were used for agriculture and mining. The final industry tabulations distinguished about 450 separate intermediate sectors. Some of the final demand areas can be split further with available data so as to provide close to 500 different sectors in all.

A complete breakdown of sectors on a product basis would have provided the clear-cut differentiation best suited for economic analysis, but available statistics (primarily Census of Manufactures data in the important manufacturing area) dictated a sector classification based on operations of establishments in most of the broad areas. Thus, most manufacturing industries were classified on an establishment basis, approximating those of the 1947 Census of Manufactures.

However, numerous departures from the establishment-type classification were necessary and desirable in light of available data and special operational problems. For example, agricultural sectors were more simply represented by a commodity classification. Construction was classified on an activity basis. Trade activities were defined processes, both wholesale and retail. Mining industries were generally classified on a commodity basis, but the definitions embodied in the Standard Industrial Classification were closely adhered to so that the products were grouped in accordance with the major producing industry concept of the SIC. The BIS classification also included a few "dummy" sectors, such as waste products, which were added to the system to account for groups of items with multitudinous origins and destinations.

The final demand area was composed of six broad sectors: households, gross private capital formation, construction, inventory change, foreign trade, and government. These are similar to, but not identical with, the components of the United States Department of Commerce measure, "Gross National Product." The purchases of these sectors include the familiar personal consumption expenditures, government expenditures for goods and services, private capital formation (including net change in inventories), and United States exports. All of these are designated as end-product deliveries of the processing system to final demand sectors. The outputs of these sectors include government taxes, wages and salaries, entrepreneurial net income, other factor payments, capital consumption allowances, United States imports, and various minor items.



The detail of the BIS interindustry classification by relationship with the Census of Manufactures and with the Standard Industrial Classification has been published by the Bureau of Labor Statistics and is available upon request. This classification listing includes related material which indicates salient control totals, gives brief industry definitions, shows type of source material used, and briefly compares totals for manufacturing industries with those in the 1947 Census of Manufactures.

### Explanation of Basic BIS Concepts

#### Valuation of Production

The 1947 study concerned itself with "real" flows of goods and services. Money flows, e.g., transfer of money for financial claims or for previously existing assets, were excluded. However, monetary values were used in the study to measure production and its allocations to users. Dollar estimates may be given physical significance by regarding them as representative of the physical amounts transacted in 1947 valued at the average prices prevailing during the year.

Production may be measured in terms of either producer's value or purchaser's value. Between the two lie such margin or spread items as rail, inland water, truck, air and pipeline transportation costs; warehousing and storage charges; wholesale and retail trade margins; and Federal and State and local government excise taxes. These items were specifically identified in the industry analyses, in which source materials were assembled and estimates made in terms of both producer's and purchaser's values.

#### Current and Capital Account Transactions

A complete accounting of an industry's transactions would record both current account and capital outlays. If such an accounting procedure were followed in an interindustry relations study, gross investment expenditures would be reflected in each industry's cost structure and consequently appear in its input coefficients. However, as there is no a priori reason to expect stability (in the sense of a proportionate relationship) between output and investment, input

ratios which included capital outlays would not have served the primary purpose of the 1947 study; namely, the determination of structural relationships between industries. Therefore, transactions among the processing sectors of the economy were limited only to current account flows.

An analysis of capital transactions was necessary, however, because all productive activities were encompassed in the study. Capital outlays were handled by simply aggregating them in the relevant final demand segment of the economy, usually gross private capital formation. In some instances, items which were capital goods in nature were allocated to other final purchasers, such as government and foreign trade (exports).

### Secondary Products

The type of data available on manufacturing industries from the Census of Manufactures made it necessary to adhere to an industrial classification based upon establishment units. The fact that a single establishment may have produced a wide variety of products complicated this type of classification for interindustry purposes. Each establishment was classified in the industry where its principal commodities were primary by definition. However, an establishment could have produced "secondary" commodities that were outside the commodity scope of the industry in which it was classified.

Conceptually, there was no reason why secondary products could not have been allocated from producing industries and charged to consuming industries in the same way as primary products of the same establishments. However, this would have been operationally difficult, because much of the information describing the cost structure of industries and transactions between sectors was based on commodity use, and not on the industry classification of producing establishments. In translating such commodity information on costs of a particular industry to a classification by producing industries, no determination could be made of the amount obtained from the industry where the commodity was a primary product and the amount obtained as secondary products from other industries. An arbitrary pro rata division by means of the amounts produced in each industry would have been extremely time-consuming. Therefore, all products of the same kind were considered as comprising one common pool from which allocations

to industries consuming that product could be made. (The transfer device by which this was accomplished is explained later.)

### Dummy Industries

The basic study tabulations included several dummy industries which were set up to account for groups of commodities supplied from a wide variety of sources and shipped to numerous destination industries. The advantage of establishing such sectors can best be described by citing an example. One of the dummy industries was "Motor Vehicle Replacement Parts." In many instances the volume of purchases of such replacement parts by an industry could be identified but no information was available on purchases of specific commodities in these categories. From the analysis of the industries producing such commodities it was possible to designate the items which would generally fall in the category. First, the commodities which could be directly charged to consuming industries were treated as direct allocations. The balance for each producing sector was then allocated in a transfer sense to the dummy "Motor Vehicle Replacement Parts" sector, from which it was charged to consuming industries as aggregates. This procedure was utilized also for "Waste Materials, Metal" and "Waste Materials, Nonmetal."

### Transfers

In order to handle secondary products and competitive imports (explained later) and certain other transactions, such as those concerned with dummy industries, it was necessary to establish certain artificial or indirect allocations, called "transfers." A "transfer" is an indirect allocation in the sense that a transaction amount is arbitrarily shifted from one sector to another so that distribution to the actual user will take place from the latter sector. In general, a transfer is a device for simplifying allocation procedures. With respect to domestic production, transfers may apply to more than secondary products, although the usage is often synonymous.

### The Tables of an Industry Report

Every report for an intermediate industry includes the three basic tables described below. <sup>3/</sup> Some reports, particularly those for service industries, include additional auxiliary tables which contain information used in developing some of the data in the basic tables.

Table I--Summary of Transactions--is designed to show the development of the gross output and the equivalent gross input totals for an industry and their relationship to some of the significant components. The primary breakdowns shown on both the input and output sides are between components dealing with the basic or primary industry, such as "total inputs to primary industry" and "total production of primary industry," and "transfers-in." Each of these sub-totals is further broken down into its significant components. Thus, on the input side, the "total inputs to primary industry" is broken down into "cost of materials, supplies, etc." and "nonmaterial charges," and the "transfers-in" are divided into "domestic" and "competitive imports." On the output side, "total production of the primary industry" is separated into shipments of products directly allocated to consuming industries, shipments of products which are transferred to other industries for distribution, and inventory change of the primary industry; transfers-in are not further broken down, because all the detail is shown on the input side.

Table II--Inputs to Primary Industry--gives the industrial distribution of inputs relating only to the primary industry. These industrial distributions, shown both in producer's and purchaser's values, are classified as follows: (1) cost of materials, parts, containers, and supplies; (2) cost of fuels and purchased electric energy; (3) purchased contract and commission work; (4) marketing charges on material purchases (these apply only to the column showing industrial distributions in producer's value); (5) purchased services; and (6) factor payments and other charges.

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<sup>3/</sup> The reports for the autonomous sectors, however, may differ somewhat. The construction reports, for example, contain only input tables.

Table III--Outputs--gives the industrial distribution of all shipments <sup>4/</sup> of an industry, including also inventory depletions of products primary to the producing industry held both by the producing industry and elsewhere. The plan of table III is to show separately direct distribution of primary shipments or receipts, direct distribution of miscellaneous receipts, and indirect distribution of secondary products and other receipts which have been transferred to other industries for distribution.

Section A of table III deals with the development of the control total for primary product shipments. Such total consists generally of three components: (1) primary product shipments of the primary industry, including inventory depletions, if any; (2) transfers-in; and (3) inventory depletions of products primary to the industry under consideration but held elsewhere. It will be noted that the first two components appear in table I; the third component does not because it is not part of gross output. It must be estimated separately for table III, however, because inventory depletions enter into product distributions that determine the inputs to receiving industries. Similarly, the inventory increase, if any, of the producing industry is not included in the primary products shipments control total because it does not enter into the distributions to consuming sectors shown in table III. However, it is shown as a component of the distribution to the inventory sector in a transactions table of an interindustry relations presentation.

Section B of table III gives the marketing charges, by type of charge, that apply to the primary product shipments. The total of such marketing charges added to the total of primary product shipments of section A yield the purchaser's value of such shipments.

Section C of table III presents the industrial distribution of the primary product shipments, both in producer's and purchaser's values. Each industrial distribution

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<sup>4/</sup> Shipments apply to commodity-producing industries. For noncommodity-producing industries the concept of receipts is generally applicable.

is shown in as much product detail as possible and subtotals are given for final demand allocations as distinguished from intermediate allocations.

Section D of table III shows the industrial distribution of the miscellaneous receipts, if any, which are directly allocated. Distributions are shown separately for each item. In most instances these items remained unallocated because of the difficulty of identifying either the item or the purchaser.

Section E of table III provides the distribution of the transfers-out which, in most cases, involve secondary products, scrap and salable refuse, and surplus electric energy.

The primary product shipments appendix to table III consists of two parts. Part A gives a detailed breakdown of the primary products shipments control total as developed in section A of table III, with indications as to the source of such product, i.e., domestic production, competitive imports, or inventory depletions. Part B gives an industrial distribution for each product and represents a rearrangement on a product basis of the distribution in section C of table III. Frequently, products could not be completely distributed as such, because distributions to some sectors could not be identified in detail. In such cases, the residuals of all such products of an industry were distributed together as one product.

#### Explanation of BLS Statistical Measures

The various types of statistical measures differentiated in the industry estimates are explained here. Their definitions reflect to some extent compromises made between the conceptually desirable and the practically possible under a given classification system and with available data.

#### Industry Gross Output on an Establishment Basis

Gross output of an industry classified on an establishment basis was defined for interindustry study purposes as a composite of the following items:

1. Total current production of establishments primarily engaged in the manufacture of a given product or products or the provision of a given service. This total includes the manufacture of not only primary products but also secondary products of the industry and receipts from other activities such as contract and commission work, electric energy and scrap produced and sold, and various nonmanufacturing operations.
2. Transfers-in of primary products or activities from elsewhere.
  - a. Secondary production of the given products (or services) currently produced in other domestic industries.
  - b. Imports for consumption during 1947 of the given products (or services), including shipments from noncontiguous territories of the United States.

If, as in some industries, primary product shipments (discussed on p. 13) exceeded primary industry production in 1947, then gross output (before transfers-in) was less than shipments by the amount of inventory depletions of finished product within the producing industry. When inventories of finished product increased within the producing industry, shipments were less than this primary industry production component of gross output.

The inclusion of items 2a and 2b in gross output arose from the operational difficulty of allocating separately a product from both its primary industries and from other industries or from abroad. For study purposes, therefore, the supply of the product, no matter where produced, was considered as a meaningful aggregate from which allocations to industries consuming this product could be made directly. This was handled operationally as "transfers-in" to the BLS industry of imports and secondary manufacture of the products in other domestic industries. As indicated above in the general discussion of "transfers," part of the primary production of an industry could sometimes be transferred also. This was specifically true in a few cases where a primary product of an industry was identical with or very similar to a primary product of another industry.

For the same reason, secondary products of the primary industry were "transferred-out" to respective primary industries. Thus, for example, toilet preparations manufactured by the drugs and medicines industry were treated as a "sale" to the toilet preparations industry, with subsequent sales by that industry to consumers.

Scrap and electric energy produced and sold by an industry were similarly transferred-out to their respective primary industries. However, other miscellaneous receipts, such as for contract and commission work, were directly allocated or left undistributed.

#### Industry Gross Output on an Activity Basis

Gross output of an industry classified on an activity basis was measured in terms of either gross receipts or margins. Any competitive imports were included in gross output and were handled by the same transfer device described above. However, the treatment differed for secondary revenues of activity-type industries for which source data were on an establishment basis. For example, gross output of trade establishments was measured both inclusive of trade functions performed by service establishments and exclusive of service functions performed in trade establishments. This procedure may appear on the surface the same as that described for gross output on an establishment basis, but the two differ materially. In the establishment case, secondary products were allowed to remain in the gross output of the industry of origin but were also distributed in the form of a "sale" to the industry where such products were defined as primary production. In the activity case, the transfer device was rarely used for secondary revenues. Alternatively, the procedure generally adopted was to include all of the primary activity, no matter where originating, and to exclude other activities of the establishments primarily engaged in the activity. However, under unique circumstances, the transfer device was used in a few instances for some activity-type industries.

#### Industry Gross Output on a Product Basis

Gross output of an industry classified on a product basis was measured in terms of annual physical production



valued at average yearly unit prices. Competitive imports were included here also by means of the transfer device. Transfer of secondary production was not required except in a few product-type industries.

#### Shipments of Primary Products

Shipments of primary products in 1947 included those of domestic and foreign origin described above, and, in addition, depletions during 1947 of inventories held outside of the producing industry. Inventory depletions outside the producing industry, although a component of primary product shipments, were not part of the gross output of the producing industry. Inventory depletions within the producing industry were, as described earlier, part of primary product shipments of the primary industry, but they also did not enter gross output. Inventory depletions were nonexistent in industries classified on an activity-basis.

Primary product shipments or primary revenues were distributed to final demand sectors (for final or ultimate consumption) and/or to processing industries (for intermediate use in producing products or services which are sold directly to final users or ultimately become incorporated in products or services which are sold to such users).

Final demand allocations included goods and services for household consumption; both current account goods and services and producers' durable equipment purchased for governmental use; and similar items to the foreign trade sector as exports. Also included were producers' durable equipment and certain other capital goods items for non-governmental domestic use which were allocated directly from the producing industry to the gross private capital formation sector rather than to individual industries. Similarly, new construction activity was carried on, not by the actual contracting industries, but by a number of construction sectors handling the entire activity of new construction. New construction was allocated to capital formation and to government in the same manner as producer's durable equipment. Maintenance construction also was treated as an activity (or a group of several), but was allocated as a current account cost. Purchases of building materials

and various services for construction purposes thus became inputs to the construction sectors. Shipments of goods to all sectors implied consumption or use during 1947; goods purchased and not used, and which eventually became part of additions to stocks, were considered final products allocated to the inventory change sector. (See detailed discussion of final demand sectors on p. 17.)

A common intermediate allocation needing special mention is the so-called "intra-industry" shipment. In most cases this represented the value of real sales (or interplant transfers) of primary products or services among establishments within the industry. Primary products of the industry consumed within the establishments where produced were generally excluded. In general, only transactions clearly representing the movement of goods from one production stage to another were included. This was true whether the transactions were intraindustry or were not.

#### Marketing Charges on Primary Product Shipments

Shipments of primary products incur marketing charges in their delivery to the consumer. These were defined, for study purposes, as the value (such as freight costs, trade margins, and excise taxes) added to commodities during the distribution process. Inasmuch as commodities were allocated directly from industry of origin to industry of destination, they were not charged to the distributive industries unless actually used by them. Products charged directly to distributive industries were those consumed in the operation of their productive activity, e.g., gasoline purchased for use by the trucking industry in transporting goods as contrasted with the value of the gasoline carried as freight or the charge for carrying it.

#### Gross Input

The gross input of the producing industry in 1947 was valued, by definition, at the same level as gross output and covered all costs consistent with that definition of gross output. More specifically, the gross input total included:

1. Input requirements for total production of establishments in the primary industry. These comprised the cost of materials, parts, containers, and supplies; the cost of fuels and purchased electric energy; purchased contract and commission work; marketing charges on material purchases; service charges; and, finally, factor payments and other charges;
2. Secondary production of primary products or services produced elsewhere;
3. Foreign production of primary products or services (competitive imports) imported in 1947.

Secondary production and imports (2 and 3 above) were "transfers-in" to the primary industry and were included in both gross input and gross output in order to maintain equality between the two measures. On the output side, "transfers-in" may be considered as part of the common pool of primary products in 1947 (as already mentioned) from which allocations to consuming industries were made. On the input side, "transfers-in" may be viewed as secondary production and import requirements of primary products necessary to have satisfied total demand for those products in 1947.

Cost of Materials, Parts, Containers, and Supplies.

These costs were defined to include the value of material items other than fuels actually consumed during 1947 which were either purchased from current production, withdrawn from inventories, or imported and had no domestic counterpart. These latter inputs were defined as noncompetitive in nature; competitive imports were purchased from the counterpart domestic industry (see discussion on p. 23).

Cost of Fuels and Purchased Electric Energy.

These were material purchases not incorporated within the products of an industry. However, fuels may have been consumed as either embodied or nonembodied commodities, but only the latter appeared in this category. For example, coal used to make coke differs conceptually from coal used as fuel and appeared as a material cost rather than as a fuel.

Purchased electric energy did not cover total electric energy consumed by an industry because electric energy produced and consumed within the industry was not measured.

Contract and Commission Work. These costs referred to payments by an industry for processing operations performed on their materials, the title to which remained with the industry. Cost of contract and commission work did not include such costs as maintenance and repair and new construction performed on a contract basis for the establishment.

Marketing Charges on Material Inputs. These charges were similar in concept to those on output shipments described earlier. The charges assigned represented the total of each of such charges associated with the purchase of all material inputs.

Service Charges. These were payments to intermediate service industries other than those engaged in distributive operations. Excise taxes (marketing charges) were included in the purchaser's values of the few purchased services to which they applied.

Factor Payments and Other Charges. These were applicable to the producing industry and were characteristically of two kinds:

1. Payments to households. In a broad sense these encompassed net incomes accruing to entrepreneurs, corporations (after taxes), investors, etc. Payments included wages and salaries, proprietors' income, corporate profits after taxes, interest, etc. Depreciation and other capital consumption allowances were also included in this category as were a number of minor items not readily classifiable by purchasing sector.
2. Tax payments to government, excluding both excise taxes incurred in the purchase of material and service inputs and customs duties paid on imports.

### Explanation of Final Demand Sectors

The designation of both end-product deliveries to final demand and the sectors which receive (or purchase) these items is essentially arbitrary. The names of the sectors and the working rules which determine their allocations, either as a purchaser of inputs or a seller of outputs, are to a great extent the result of an attempt to keep the accounts similar to the national income and product accounts of the U. S. Department of Commerce. <sup>5/</sup> The exact definitions and the fine detail of the allocations are, however, the result of operational requirements of the interindustry relations system. Frequently the classification system and exact definitions will be changed to fit an analytic framework consistent with a particular problem under consideration. In general, however, the interindustry system as most usually presented has the final demand sectors indicated in these reports. For purposes of consistent presentation and analytic application of the interindustry relations system, both the 1947 final product allocations to final demand and conversely the inputs originating from these sectors (charges against final demand or product) are important and appear in each industry study. It is evident that much of the input detail has been condensed from that which was initially gathered. The special characteristics of the final demand sectors are explained in the following paragraphs. Not all the items mentioned will appear in each report.

#### Households

Purchases by households included personal consumption expenditures and direct personal taxes. Also included were expenditures by farm households for personal living requirements. Thus, food and a few other items produced and consumed on farms were included, but items entering as costs of farm operation were not. Household purchases of dwelling units for own occupancy were not included in this sector but were considered to be investment expenditures and included in gross private capital formation. Some expenditures by individuals in connection with

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<sup>5/</sup> To the extent that final demand sectors are similar to the Gross National Product (GNP) categories of the Commerce Department, so are the intermediate sectors of the interindustry relations systems similar to those which have been excluded (netted out) from the GNP accounts.

business activities were included, such as hand tools purchased by carpenters. Travel and entertainment expenses of individuals related to business activities for the most part were included in this sector.

Material purchases by households were expressed in both producer's and purchaser's values, i.e., both exclusive and inclusive of marketing charges. Transportation costs, trade margins, and excise taxes related to such purchases were also shown separately as individual aggregates purchased directly by households from the respective distributive industries. Household purchases of second-hand items were accounted for only to the extent of the gross trade margins involved. Sales taxes were treated in the same way as excise taxes, i.e., as household payments to a government sector. The exception was sales taxes reported as part of operating costs in trade. These were shown as tax payments by trade itself and were counter-balanced by increasing household payments to trade by an equivalent amount.

Rental payments by households covered both rents paid by tenants and imputed rents of home owners. The rental concept employed here was the "space rent" used by the Department of Commerce in its consumption expenditures estimate. Under this concept household outlays for fuel and power were shown as direct payments to the fuel and power industries rather than part of rents. <sup>6/</sup>

Practically all maintenance of residential buildings was charged as a cost to the rental industry rather than to households. Nevertheless a small amount of maintenance was charged to households, representing maintenance outlays paid by tenants themselves.

Receipts of households represented, for study purposes, all incomes accruing to final demand sectors except receipts accruing to foreign trade for imports, and tax receipts accruing to government.

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<sup>6/</sup> The 50-sector interindustry relations tables, presented in October 1951, and the 200-sector tables, presented in October 1952, were somewhat different in this regard. In these tables rental payments by households included all utility costs as well as "space rent."

Receipts of households may be segregated into factor and nonfactor payments. Factor payments consisted of wages and salaries, employer contributions to private pension plans, royalties, interest, entrepreneurial income, and corporate profits (after taxes). Nonfactor payments consisted of such items as transfer payments (including contributions and gifts), depreciation and amortization, capital outlays charged to current expense, losses and accidental damage to fixed capital (uninsured), business travel and entertainment (including reimbursement for personal car use), banking service cash charges to business, and claim payments (primarily nonlife insurance). There were a few other minor items which differentiate the household account from factor payments in the national income sense.

### Government

This area was divided into two separate sectors, Federal Government and State and local government. Federal Government covered the general activities of government related to the domestic economy as well as foreign countries, and included many financial activities of such government corporations as Commodity Credit Corporation, Reconstruction Finance Corporation, and the Federal Deposit Insurance Corporation. However, industrial activities of government corporations were excluded from the government sectors and were included in the related intermediate industries. These included operations of the TVA fertilizer plant, RFC tin smelting and synthetic rubber plants, the Government Printing Office, and other diverse operations. The State and local government sector included all local bodies - States, cities, counties, townships, and special districts (except school districts which were covered in the education industry).

Government receipts represented all tax and nontax revenues on current account. Corporate income taxes were estimated on an accrual basis and other tax receipts on a collection basis. Corporate income tax receipts were allocated to the industry legally liable for payment except for the prorated tax liability from interest income, which was allocated to households.

Excise taxes, including general sales taxes were handled as marketing charges, i.e., such taxes were allocated

to industries purchasing taxed goods or services rather than to industries legally responsible for payment.

Customs duties associated with competitive imports were allocated to the comparable domestic producing industry, and the few customs duties associated with noncompetitive imports were allocated directly to using industries. This treatment of duties was consistent with the competitive and noncompetitive import allocation procedures discussed for the foreign trade sector.

Government purchases of goods and services included capital goods and transfer payments. All public new and maintenance construction (including force account) were considered as purchases from the construction sector rather than as purchases of construction materials, services, and other cost items pertaining to such construction activity. Similarly, government expenditures for health and education were treated as purchases from the hospital and education industries rather than as purchases of individual items pertaining to such activities. However, purchases of capital equipment for use in public construction, hospitals, education, and related public fields were charged directly to the government sectors.

Government interest payments (except payments to social insurance funds) and unilaterals were treated on a net basis. Government payments to social insurance funds and contributions to such funds are real costs to government for services rendered and were consequently treated as intragovernment transactions. Intragovernment transactions also include payments of one government sector to another, such as, Federal grants-in-aid to the States.

#### Gross Private Capital Formation

Purchases by the capital sector were for goods and services charged by business to capital account. Generally, such purchases consisted of new plant and equipment. However, other costs of acquiring capital assets, wherever identified, were also charged to this sector.



Outlays for new private construction were shown as flows from the construction sectors to this sector. (See construction sector for more detail.) Outlays for equipment comprised most of the other expenditures by the capital sector. The capital sector was extended for study purposes to include: (1) Expenditures for labor charged to capital account (if readily identifiable, as installation of telephone equipment); (2) payments to title abstract companies; (3) commissions on transfers of real property; (4) architectural and engineering fees not included in current construction costs; (5) margins on sales of second-hand producers' durable equipment; (6) value of work performed in motion-picture production; and (7) selected minor items normally capitalized by an industry.

Receipts of the capital sector were defined conceptually as capital consumption by business and measured in terms of depreciation and other capital consumption allowances. However, such measurements were not readily available for individual industries, and hence no attempt was made to estimate such charges. Consequently, such items as depreciation were included as part of a residual category in the household sector. (See household sector detail on p. 17.)

#### New and Maintenance Construction

These types of construction represented for study purposes all construction activity in the economy. All material and nonmaterial purchases required for either new or maintenance construction were charged as inputs to the construction sector. For example, purchase of steel rails was a charge to construction rather than to the railroad industry. No distinction was made between force account and contract construction. Oil and gas well drilling costs were included as part of construction expenditures.

The sector's output was the value of all new and maintenance construction put-in-place during 1947 by private and public enterprise. New private construction was allocated to gross private capital formation. New and maintenance public construction flowed to the government sectors. Private maintenance construction was distributed to most sectors of the economy.

### Inventory Change

Inventory change represented the sector to which all stock additions in the economy during 1947 were sold and from which all stock depletions were purchased. In this study inventory change was measured only when it referred to finished products (as distinguished from materials in process). Raw materials in the stocks of a purchasing sector were included insofar as they contributed to inventory change outside the producing industry. Additions and depletions were differentiated between those arising within and outside of a producing sector. Inventory values shown for the producing industry were on a net basis for a given product or product group; i.e., for a producing industry there were either additions or depletions but not both. Inventory values outside the producing industry were on a gross basis in the sense that several outside sectors were recognized; i.e., for a product or product group there could be a depletion for some sector (e.g., trade) and additions for others (e.g., government).

The above information on inventory change describes the treatment in the output table of an industry report (table III and Appendices). In an interindustry relations table, however, there are normally some differences in handling. For example, all inventory change within a producing industry is netted, so that product detail is in effect eliminated. Other differences relate mostly to the fact that an industry output table (such as table III) must account for the supply of each product available for distribution, whereas an interindustry transactions table is concerned mainly with current production. Such a transactions table may include various devices for recording depletions or additions outside the producing industry but they clearly do not enter gross output even though they form a part of available supply.

In the output tables of an industry report, inventory additions (net) within a producing industry do not appear explicitly as part of primary product shipments; but the production which led to these increases in inventory is part of gross output (as shown in table I). Inventory depletions within a producing industry are not shown explicitly in the output tables either, but they do appear as part of primary product shipments. They appear also in table I. The output tables do show inventory depletions and inventory additions outside the producing industry. The former appears in the build-up of the supply of the producing industry's products and the latter appears in the distribution of that supply.

Inventory data underlying the estimates were expressed, for the most part, in terms of book value. Few adjustments of these book values to average yearly values were made except in the fields of agriculture and trade. For these areas the estimates were generally revalued to place all inventory changes in terms of 1947 average prices.

### Foreign Trade

Foreign trade was defined as a sector representing the sum total of all economies outside the continental United States. Foreign trade's purchases were therefore identical with exports of United States merchandise plus shipments to noncontiguous territories; its receipts were identical with United States imports for consumption plus shipments from the territories.

Generally, foreign trade transactions were limited to the purchase and sale of goods and services. Capital money flows and changes in gold stock were eliminated. Exports of used items were similarly eliminated except for distributive charges incurred in selling and transporting them to the port of exportation. Imported used items, however, were included because such products were in effect "new" to the United States economy - the question of current productive activity being completely irrelevant in this case. Foreign trade also included (net) unilateral transactions for which there were no tangible compensations.

For study purposes, foreign trade's output was classified into two general categories - competitive and non-competitive imports. Competitive imports were defined to include imported products or services similar in nature and/or highly substitutable for products or services produced commercially in continental United States. Noncompetitive imports comprised those products or services without similar or closely substitutable domestic production. Competitive imports included such items as natural rubber and bananas; the former was substitutable for synthetic rubber and the latter for domestic fruit. Examples of noncompetitive imports included green coffee beans, cacao beans, tea, jute burlap, and manila hemp. In addition, noncompetitives were defined to include net private and net Government unilaterals abroad, U. S. personal expenditures abroad, and payments (principally by Government and the ocean transportation industry) for goods and services received abroad.

Competitive and noncompetitive imports were subjected to different allocation procedures. Competitive imports were transferred to domestic industries producing comparable primary products, from which they were allocated to industries using them in their production process. Noncompetitive imports were simply distributed directly to consuming sectors.