Introduction

This publication presents the 1987 benchmark input-output (I-O) accounts for the U.S. economy. It provides the estimates for both the summary (that is, at the two-digit I-O level) and the detailed (six-digit I-O level) industries and commodities in one publication. In addition, it provides estimates for tables that the Bureau of Economic Analysis (BEA) has not published for a number of years, and it provides more specific information than has been published in recent years on the use of the U.S. accounts and on the methods underlying them.

Organization of the publication

The text consists of two parts and four appendixes. The first part of the text combines the text of the article "Benchmark Input-Output Accounts for the U.S. Economy, 1987," which appeared in the April 1994 issue of the SURVEY OF CURRENT BUSINESS, with that of the report "Benchmark Input-Output Accounts for the U.S. Economy, 1987: Requirements Tables," which appeared in the May 1994 SURVEY. This part discusses the steps taken to speed up the 1987 benchmark's completion, improvements made to the tables, the concepts and methods underlying the U.S. I-O accounts, and how the I-O accounts are used. It also includes supplementary tables that relate the I-O accounts to the national income and product accounts (NIPA's); these tables permit more extensive analyses with the I-O estimates. The second part of the text describes how to read the detailed tables, which appear in the general format that was introduced in the publication *1982 Benchmark Input-Output Accounts of the United States*.

The text also reproduces the two appendixes that previously appeared in the April SURVEY. Appendix A provides a list of selected SURVEY articles about the I-O accounts; appendix B provides a concordance between the codes used in the I-O accounts and the 1987 Standard Industrial Classification (SIC) system. This volume includes two additional appendixes: Appendix C describes the components of the measures of output, intermediate inputs, and value added; and appendix D provides the mathematical derivation of the I-O total requirements tables.

The tables presenting the 1987 I-O benchmark estimates are divided into two complementary parts. The first part presents the summary estimates as they were presented in the April and May issues of the SURVEY. The second part presents the corresponding detailed estimates. It provides the I-O estimates for the make and use tables and the estimates of the total output requirements from industries and commodities to meet demand, as well as the 15 largest industries or commodities and their contribution to meeting that demand for a commodity. It also contains detailed estimates for the I-O commodity composition of the NIPA personal consumption expenditures (PCE) and producers' durable equipment (PDE) expenditures components.

All estimates developed for the 1987 benchmark I-O study are available on diskettes (see the section "Availability of Estimates" on page M-27). For other assistance, contact the Interindustry Economics Division at (202) 606–5586, or write to Interindustry Economics Division (BE-51), Bureau of Economic Analysis, U.S. Department of Commerce, Washington, DC 20230.

Summary Series

This publication presents the 1987 benchmark I-O accounts for the U.S. economy.[1] This part of the publication is in two sections. The first section addresses the 1987 benchmark; it discusses the steps taken to speed up the benchmark's completion and then describes some improvements that have been made in the tables. The second section describes the concepts and methods underlying the U.S. I-O accounts and illustrates how the I-O tables are used.

The 1987 I-O estimates presented on pages 2–42 are in summary form; that is, they are aggregated to 95 two-digit I-O industries from 480-industry six-digit detail. The make (production) of commodities by industries is shown in table 1. The use (consumption) of commodities by industries is shown in table 2.1, and the components of value added by industries in table 2.2. The commodity-by-industry direct requirements for a dollar of industry output are shown in table 3.1, and the component detail for the value added input coefficients in table 3.2. The commodity-by-commodity total requirements, direct and indirect, for a dollar of delivery to final use are shown in table 4. The industry-by-commodity total requirements, direct and indirect, for a dollar of delivery to final use are shown in table 5. (See the section "Availability of Estimates," on page M-27, for information on ordering diskettes containing the estimates.)

The 1987 benchmark I-O estimates will be incorporated into the NIPA's during the next comprehensive NIPA revision, which is tentatively scheduled for release in late 1995.

The 1987 Benchmark Accounts

In recognition of user needs—expressed, for example, by the interagency Working Group on the Quality of Economic Statistics—BEA has developed a program to speed up the availability of I-O accounts.[2] For I-O benchmarks, which are prepared primarily from the Census Bureau's quinquennial economic censuses, the long-term goal is to make the I-O tables available within 5 years of a census year and within 1 year after release of all economic census data.

For the 1987 benchmark, BEA devised a set of procedures that captured the most important parts of the 1987 economic census data, but that abbreviated the normal time-consuming process of assembling a wide variety of other data for constructing components not based on economic census data. These procedures enabled BEA to complete the 1987 tables faster than otherwise would have been the case and to turn its resources toward the 1992 benchmark at the earliest possible time.

Procedures for the 1987 benchmark

In preparing benchmark I-O accounts, BEA relies heavily on economic census data covering mining, construction, manufacturing, wholesale trade, retail trade, transportation, and selected services. The data are released by the Census Bureau as they are completed, over a period of time that usually begins about 1 year after the end of the census year and continues for about 30 months. (For example, the planned release dates for the 1992 census year extend from early 1994 through late 1996.) To estimate outputs and inputs and to allocate commodities across industries and final users, BEA must augment the economic census data with data from hundreds of other sources, such as the U.S. Department of Agriculture, U.S. Department of Transportation, U.S. Department of Treasury, Office of Management and Budget, and other government agencies and private organizations.

In preparing the 1987 benchmark I-O accounts, BEA used standard I-O procedures for the estimates of industry and commodity output, except for new construction (see table A on page M-3, and for more information on the components of the measures of output and intermediate inputs, see appendix C, which begins on page A-8). For previous benchmarks, approximately 50 construction industries were analyzed and estimated separately. For the 1987 benchmark, the economic census total for construction output was distributed among

1. Earlier benchmarks covered 1947, 1958, 1963, 1967, 1972, 1977, and 1982. BEA also has produced annual I-O accounts based on less comprehensive source data. The most recent annual accounts, for 1987, were presented in the April 1992 SURVEY OF CURRENT BUSINESS.

2. See "Improving the Quality of Economic Statistics: The 1992 Economic Statistics Initiative," SURVEY 71 (March 1991): 4–5.

only five industries—four related to mining and one "all other" category, which covers the remaining industries within new construction and maintenance and repair construction.

BEA also used standard I-O procedures for the estimates of industry intermediate inputs where hard data were readily available—primarily for material inputs from the economic censuses. In previous benchmarks, the standard procedure has been to supplement these economic census data with estimates of other intermediate inputs from hundreds of other information sources. For the 1987 benchmark, BEA estimated these intermediate inputs by first extrapolating 1982 benchmark estimates to 1987 based on the change in industry out-

Table A.—Principal Data Sources for Industry or Commodity Outputs, 1987 Benchmark

Industry or Commodity	Source
Agriculture, forestry, and fisheries	U.S. Department of Agriculture farm statistics National Oceanic and Atmospheric Administration *Fisheries of the United States*
Mining	Census Bureau *1987 Census of Mineral Industries*
Construction	Census Bureau *1987 Census of Construction Industries*, *Census of Service Industries*, and value of construction put-in-place series
Manufacturing	Census Bureau *1987 Census of Manufactures*
Transportation	Interstate Commerce Commission *Transport Statistics in the United States* Association of American Railroads *Freight Commodity Statistics* Census Bureau *1987 Census of Transportation*, *Motor Freight Transportation and Warehousing Survey*, and *Services Annual Survey* U.S. Army Corps of Engineers *1987 Waterborne Commerce of the United States* Department of Transportation *Air Carrier Financial Statistics* and *National Transportation Statistics*
Communications	Trade sources annual reports Federal Communications Commission *Statistics of Communication Common Carriers*
Utilities	Department of Energy—Energy Information Administration *Natural Gas Annual*, *Electric Sales and Revenue*, and *Financial Statistics of Selected Electric Utilities* American Gas Association *Gas Facts* Census Bureau *1987 Census of Mineral Industries* Trade sources financial statements
Wholesale and retail trade	Census Bureau *1987 Census of Retail Trade* and *1987 Census of Wholesale Trade*
Finance	Federal Deposit Insurance Corporation *Statistics on Banking* Federal Reserve Board *Annual Report* Federal Home Loan Bank Board financial reports Office of Thrift Supervision *Saving and Home Financing Source Book* National Credit Union Administration *Yearend Statistics for Federally Insured Credit Unions* HSN Consultants, Inc. *The Nilson Report* Federally sponsored credit agencies annual reports State and Federal regulatory agencies annual reports
Insurance	Trade sources financial statements Health Care Financing Administration private health insurance data A. M. Best and Company *Best's Aggregates and Averages* Mortgage Insurance Companies of America *Factbook*
Real estate	National Association of Realtors *1987 Home Sales Yearbook* Census Bureau *1990 Census of Housing* and *1987 Census of Construction Industries* U.S. Department of Agriculture farm statistics Internal Revenue Service tabulations of tax returns
Services	Census Bureau *1987 Census of Service Industries* Internal Revenue Service tabulations of tax returns BEA tabulations of Bureau of Labor Statistics data on wages and salaries covered by State unemployment insurance U.S. Department of Education *Digest of Educational Statistics*
Government enterprises	Federal and State and local government agency reports Office of Management and Budget Federal budget data Census Bureau *1987 Census of Governments*
Noncomparable imports	Census Bureau general imports and imports for consumption data Estimated as part of the balance of payments accounts
Scrap	Census Bureau *1987 Census of Manufactures*
General government	Estimated as part of the national income and product accounts
Household	Estimated as part of the national income and product accounts
Inventory valuation adjustment	Estimated as part of the national income and product accounts

put, and then by adjusting the extrapolated estimates to be consistent with—or to balance—commodity and industry outputs (see table B below).

Value added components were prepared using the same procedures as in the past.[3] Data for compensation of employees and for indirect business tax and nontax liability are from the U.S. Department of Treasury, Office of Management and Budget, Bureau of Labor Statistics, and Census Bureau; NIPA estimates are also used.

For most final use components—PCE, gross private fixed investment, change in business inventories, exports of goods and services, and imports of goods and services—BEA used the same data and procedures as in the past.[4] Most estimates of PCE and gross private fixed investment were prepared with the commodity-flow method.[5] Inventories held by industries were based on economic census and Internal Revenue Service data. Exports and imports of goods and services were based on data from the Census Bureau and the U.S. balance of payments accounts.

For Federal Government and State and local government final use components, a combination of new and old procedures was used. Total expenditures by type of purchase, for Federal Government and for State and local governments, were obtained from the NIPA's, as in the past. Government purchases by I-O commodity were estimated using 1982 benchmark I-O estimates as weights, a new procedure for the 1987 estimates.

Some procedures used to prepare the 1987 benchmark I-O accounts suggest certain caveats. First, the technology represented by the relationships of commodity inputs to industry outputs in the use table (as well as in the commodity-by-commodity and industry-by-commodity total requirements tables) is a hybrid of that in 1987 and that represented in the 1982 benchmark I-O accounts. Second, other value added was derived as a residual for most industries after subtracting total intermediate inputs, compensation of employees, and indirect business tax and nontax liability from total industry output.[6] (For a few industries, estimates of other value added were available from other data sources; for example, other value added estimates for agriculture are from the U.S. Department of Agriculture.) As a result, the other value added component includes estimating errors from other parts of the I-O accounts. For studies requiring comparisons of value added components, users

3. Value added equals gross output (sales or receipts and other operating income, plus inventory change) minus intermediate inputs (consumption of goods and services purchased from other industries or imported). It includes compensation of employees, indirect business tax and nontax liability, and other value added.

4. In the I-O accounts, change in business inventories covers commodities wherever held; capital purchases—PDE and structures—are included in gross private fixed investment; and imported commodities are included with domestically produced commodities in both final use and intermediate use.

5. The commodity-flow method generally begins with an estimate of the total supply of a commodity available for domestic uses; it then either attributes a fixed percentage of supply to final users, or it adjusts for intermediate purchases and attributes the residual to final users. For more information, see U.S. Department of Commerce, Bureau of Economic Analysis, *Personal Consumption Expenditures*, Methodology Paper Series MP-6 (Washington, DC: U.S. Government Printing Office, June 1990): 31–34.

6. For most I-O industries, other value added includes consumption of fixed capital, proprietors' income, corporate profits, and business transfer payments. For banking and for credit agencies other than banks, other value added also includes net interest. For owner-occupied dwellings and for real estate agents, managers, operators, and lessors, it also includes rental income. For the six industries covering the Federal Government and State and local government enterprises, it also includes current surplus less government subsidies.

Table B.—Principal Data Sources and Methods for Estimating Intermediate Inputs and Components of Value Added, 1987 Benchmark

Component	Source or method
Intermediate inputs	For census-covered industries, selected purchased services; in addition, for manufacturing and mining, materials consumed from 1987 economic censuses. For gas and electric utility industries, selected inputs from trade sources; for agriculture industries, inputs from U.S. Department of Agriculture. For most remaining industries, 1982 estimate extrapolated by change in industry output and adjusted to balance commodity and industry outputs.
Compensation of employees	For census-covered industries, payroll and benefits from Census Bureau 1987 economic censuses. For noncensus-covered industries, BEA tabulations of Bureau of Labor Statistics data on wages and salaries covered by State unemployment insurance; other labor income estimated as part of the national income and product accounts.
Indirect business tax and nontax liability.	For Federal excise taxes, collections from Internal Revenue Service; for customs duties, receipts from *Monthly Treasury Statement*; and for nontaxes (such as fines), receipts from the *Budget of the United States*, prepared by the Office of Management and Budget. For State and local governments, receipts from Census Bureau 1987 economic census and annual and quarterly surveys.
Other value added	For most industries, residual method: Total industry output less total intermediate inputs, compensation of employees, and indirect business tax and nontax liability.

may find BEA's estimates of gross product originating by industry more useful.[7]

Improvements and other changes

The 1987 benchmark I-O tables differ from previous tables in several respects. The 1987 summary (that is, two-digit I-O level) tables, which begin on page 2, cover 95 two-digit I-O industries instead of the 85 two-digit I-O industries used previously. For the new summary tables, 14 two-digit I-O industries were aggregated into 7, and 12 two-digit I-O industries were disaggregated into 30.[8] With one exception, the aggregations involved small, declining industries; new construction and maintenance and repair construction were aggregated because of the abbreviated procedures used for the 1987 benchmark. The disaggregations involved large, growing industries. The new aggregations and disaggregations of two-digit I-O industries are shown along with the detailed industries in "Appendix B: Industry Classification of the 1987 Benchmark Input-Output Accounts," which begins on page A-2. (The newly disaggregated industries are designated with an alphabetical suffix to the two-digit I-O industry number.)

The industry classification of the I-O accounts is now based on the 1987 SIC; the 1982 benchmark tables and subsequent annual tables were based on the 1972 SIC. In addition, the 1987 benchmark tables incorporate all of the 1991 comprehensive NIPA revisions, including the change from gross national product to gross domestic product (GDP).[9]

Introduction to the U.S. I-O Accounts

The I-O accounts for the U.S. economy show the production of commodities by each of nearly 500 industries, in the "make" table, and the consumption of commodities by these industries, in the "use" table. Chart 1, on page M-6, illustrates the make and use tables in matrix form in, respectively, the upper and lower panels. The commodity composition of GDP and the industry distribution of value added are also shown in the use table.

BEA prepares benchmark I-O accounts primarily from data that the Census Bureau collects every 5 years in its economic censuses for mining, construction, manufacturing, wholesale trade, retail trade, transportation, and selected services, as well as in its census of governments. Data from the U.S. Department of Agriculture, U.S. Department of Transportation, U.S. Department of Treasury, and other government agencies and private sources are also used.

The I-O accounts show compactly the relationships between all industries in the economy and all the commodities they produce and use. Estimates for commodities are typically shown at producers' prices.[10] When producers' prices are used, transportation costs and wholesale and retail trade margins are treated as commodities that are separately produced and used by industries (see the section "Definitions and conventions for valuation" on page M-20).

The I-O accounts consist of five basic sets of tables: (1) Make, (2) use, (3) commodity-by-industry direct requirements, (4) commodity-by-commodity total requirements, and (5) industry-by-commodity total requirements.[11] These tables can be presented at both the summary (two-digit) and the detailed (six-digit) I-O levels. In addition, for the 1987 benchmark summary tables, estimates for the value added components of the use table and of the commodity-by-industry direct requirements table are presented in separate tables.

The make table

The make table (table 1 of the "Summary Tables," which begins on page 2), in the upper panel of chart 1, shows the dollar value, in producers' prices, of each commodity produced by each industry. In each row, there is one "diagonal" cell that shows the value of production of the commodity for which the corresponding industry has been designated the "primary" producer. Entries in the other cells in the row show the value

7. See Robert P. Parker, "Gross Product by Industry, 1977–90," SURVEY 73 (May 1993): 33–54; and Robert E. Yuskavage, "Gross Product by Industry, 1988–91," SURVEY 73 (November 1993): 33–44.

8. The net addition of industries resulting from the aggregations and disaggregations of 1982 I-O industries is 11. In addition, the rest of the world is no longer technically considered to be an industry because of the change from GNP to GDP as the primary measure of final demand. Thus, there is a net increase of 10 industries in the 1987 benchmark.

9. The 1991 NIPA revision was described in the following SURVEY articles: "A Preview of the Comprehensive Revision of the National Income and Product Accounts: Definitional and Classificational Changes," September 1991; "A Preview of the Comprehensive Revision of the National Income and Product Accounts: New and Redesigned Tables," October 1991; and "The Comprehensive Revision of the U.S. National Income and Product Accounts: A Review of Revisions and Major Statistical Changes," December 1991.

10. Estimates for commodities in purchasers' prices can be derived by adjusting for transportation costs and for wholesale and retail trade margins; these costs and margins are included on the diskettes that can be ordered for the 1987 benchmark I-O (see the section "Availability of Estimates" on page M-27).

11. In the designation of I-O tables, the row is referred to first and the column second. Thus, tables in which commodities appear in the rows and industries in the columns are designated "commodity-by-industry" tables, and tables in which industries appear in the rows and commodities in the columns are designated "industry-by-commodity" tables.

CHART 1

The U.S. Input-Output Accounts

MAKE TABLE: INDUSTRIES PRODUCING COMMODITIES

		COMMODITIES									TOTAL INDUSTRY OUTPUT
		Agricultural products	Minerals	Construction	Manufactured products	Transpor-tation	Trade	Finance	Services	Other*	
INDUSTRIES	Agriculture										
	Mining										
	Construction										
	Manufacturing										
	Transportation										
	Trade										
	Finance										
	Services										
	Other*										
TOTAL COMMODITY OUTPUT											

USE TABLE: COMMODITIES USED BY INDUSTRIES AND FINAL USES

		INDUSTRIES										FINAL USES (GDP)							TOTAL COMMODITY OUTPUT
		Agricul-ture	Mining	Construc-tion	Manufac-turing	Transpor-tation	Trade	Finance	Services	Other*	Total inter-mediate use	Personal consumption expenditures	Gross private fixed investment	Change in business inventories	Exports of goods and services	Imports of goods and services	Government purchases	GDP	
COMMODITIES	Agricultural products																		
	Minerals																		
	Construction																		
	Manufactured products																		
	Transportation																		
	Trade																		
	Finance																		
	Services																		
	Other*																		
	Noncomparable imports																		
	Total inter-mediate inputs																		
VALUE ADDED	Compensation of employees																		
	Indirect business tax and nontax liability																		
	Other value added**																		
	Total																		
TOTAL INDUSTRY OUTPUT																			

TOTAL COMMODITY OUTPUT
PRIMARY PRODUCT OF THE INDUSTRY
TOTAL INDUSTRY OUTPUT

* The I-O accounts use two classification systems, one for industries and another for commodities, but both generally use the same I-O numbers and titles. "Other" includes government enterprises and I-O special industries; for more information, see " Appendix B.–Classification of the 1987 Benchmark Input-Output Accounts."

** For most industries, this item includes consumption of fixed capital, proprietors' income, corporate profits, and business transfer payments. For banking and/or credit agencies other than banks, it also includes net interest. For owner-occupied dwellings and/or real estate agents, managers, operators, and lessors, it also includes rental income. For the six industries covering the Federal Government and State and local government enterprises, it also includes current surplus less government subsidies.

U.S. Department of Commerce, Bureau of Economic Analysis

of production of commodities for which the industry is a "secondary" producer.[12] For example, the newspapers and periodicals *industry* (row 26A) is the primary producer of the newspapers and periodicals *commodity* (column 26A). It is also a secondary producer of the following commodities: Paper and allied products, except containers (column 24); other printing and publishing (column 26B); rubber and miscellaneous plastics products (column 32); miscellaneous manufacturing products (column 64); and advertising (column 73D). The sum of all entries in a row is the total output by the industry.

The entries in each column of the make table represent the production by both primary and secondary producers of the commodity named at the head of the column. For example, computer and data processing services (column 73A) includes the output by the primary producer—the computer and data processing services industry (row 73A)—and by the following secondary producers: Computer and office equipment (row 51); audio, video, and communication equipment (row 56); scientific and controlling instruments (row 62); finance (row 70A); and other business and professional services, except medical (row 73C). The sum of all entries in a column is the total output of the commodity.

An industry's share of the production of a commodity can be calculated from the values in the make table by expressing the entries in a given column as a percentage of the column total. From the 1987 benchmark, for example, column 62 in table 1 shows that the production of scientific and controlling instruments (commodity I-O 62) totaled $86 billion, of which the scientific and controlling instruments industry (industry I-O 62) produced $80 billion, or about 93 percent of the total.

The industry and commodity output totals for this table are estimated primarily from the quinquennial economic censuses, conducted by the Census Bureau (see table A on page M-3). The economic census data, which are on an SIC basis, cover most establishments with payrolls. Information from other government and private sources is used for I-O industries not covered by the economic census data, such as finance, insurance, real estate, utilities, and schools and religious organizations. Data from other government agencies are also used to supplement the economic census data for some industries.

BEA makes two adjustments to the economic census data. First, it adds estimates of the output for establishments without payrolls that are not covered by the economic census data. Second, BEA adjusts for misreported tax return information; this adjustment is necessary because, in some cases, the Census Bureau data for expenses and receipts reflect tax return records rather than information collected directly from survey reports.[13]

BEA also adjusts the economic census data based on the SIC to the I-O industry classification system to attain greater homogeneity in the input structures for commodities produced by an I-O industry. This type of adjustment is discussed in the section "Definitions and conventions for classification" on page M-12.

The use table

The use table (table 2 of the "Summary Tables") is presented in two parts: Table 2.1 shows the dollar value, in producers' prices, of each commodity used by each industry and by each final user; table 2.2 shows detail, in producers' prices, on the value added components used by each industry in table 2.1 to produce its output. In table 2.1, entries in a row show the use of the commodity named at the beginning of the row by each industry or final user named at the head of the column. For example, the *commodity* radio and TV broadcasting (row 67) is used by the *industries* radio and TV broadcasting (column 67) and advertising (column 73D), as well as by persons—that is, as part of PCE (column 91).

In table 2.2, industries are shown in the rows, and total output, total intermediate inputs, and the components of value added are shown in the columns. For example, the total output for the radio and TV broadcasting industry (row 67) was $29 billion, of which $10 billion was labor compensation, $1 billion was indirect business tax and nontax liability, $3 billion was other value added, and $16 billion was intermediate inputs. The column totals for industries in table 2.1 equal the right-hand row totals in table 2.2. For example, the *column total* for the radio and TV broadcasting industry in table 2.1 equals the *row total* for that industry in table 2.2, or $29 billion. (The relationship between value added and other parts of the use table is depicted in the bottom panel of chart 1.)

In table 2.1, industry uses sum to total intermediate use, shown in the right-hand column of the industries portion, and the final uses sum to GDP, shown in the right-hand column of the final uses portion. The total output of each commodity is the sum of all intermediate uses of the commodity by industries and all sales to final users. The total output of each industry is the sum of all

12. Primary and secondary products and the classification of industries are discussed further in the section "Definitions and conventions for classification" on page M-12.

13. See Robert P. Parker, "Improved Adjustments for Misreporting of Tax Return Information Used to Estimate the National Income and Product Accounts, 1977," SURVEY 64 (June 1984): 17–25.

intermediate inputs consumed by the industry—that is, the raw materials, semifinished products, and services that the industry purchases—and of the value added by the industry. For the economy as a whole, the total of all final uses of commodities equals the total value added by all industries, or GDP.

The rows in table 2.1 show the wide variation in the proportion of commodity output that is sold directly to final users. For example, the 1987 use table shows that some commodities, such as apparel (the primary product of industry I-O 18), were sold almost entirely to final users; therefore, the demand for these commodities is affected primarily by changes in the buying patterns of final users. Other commodities, such as industrial and other chemicals (I-O 27A), were used almost entirely as intermediate inputs. For these commodities, the connection between production and final uses is primarily indirect and can be traced mainly through industrial users' sales of commodities to final users.

The rows also show the wide variation in the direct usage of commodities by industries. For example, the 1987 use table shows that paper and allied products, except containers (I-O 24), with $81 billion of commodity output, were used by nearly all industries. The largest user was other printing and publishing (I-O 26B), which used $15 billion, or 18 percent of total commodity output. In contrast, metal containers (I-O 39), with $12 billion of commodity output, were used by only 20 industries. The largest user was food and kindred products (I-O 14), which used $9 billion, or 74 percent of total commodity output.

The rows in table 2.2 show the wide variation in the use of value added inputs by industries to produce their outputs. For example, the real estate and royalties industry (I-O 71B) required $280 billion of value added inputs, or 74 percent of its total output; of this, $27 billion was for labor compensation, $53 billion was for indirect business tax and nontax liability, and $200 billion was for other value added. In contrast, the livestock and livestock products industry (I-O 1) required $15 billion of value added inputs, or 17 percent of its total output; of this, $3 billion was for labor compensation, $1 billion was for indirect business tax and nontax liability, and $11 billion was for other value added.

BEA estimates intermediate inputs in the use table through a number of processes. The economic censuses are the primary source for data on intermediate inputs; however, BEA must supplement these data to cover establishments without payrolls and industries not covered by the economic censuses. BEA also separates information for some broader categories of purchases into I-O commodities; for example, BEA separates data on purchases of office supplies into purchases of postal service, paper, envelopes, etc., using commodity-shipment proportions and other available information. BEA also uses related information that is available to make I-O estimates of inputs for which there is little hard data. For example, fees paid by industries for accounting services are estimated on the basis of industry employment. (Table B, on page M-4, shows the principal methods and sources used for the 1987 benchmark.)

BEA estimates the final uses of commodities either by incorporating data into the I-O accounts directly from other sources after minor adjustment, or—for PCE and PDE—by employing the commodity-flow method. An example of source data incorporated directly with only minor adjustments is exports of goods, which is obtained from the balance of payments accounts.

In the commodity-flow method, an estimate is first developed for the total supply of a commodity for domestic use. Then either a fixed percentage of total supply is attributed to final users, or the total supply is adjusted for intermediate purchases and the residual is attributed to final users.[14]

An example of commodity flow using the fixed percentage method can be illustrated by examining its use in estimating PCE for polishes and sanitation goods; in this case, approximately 40 percent of total output is allocated to PCE. An example of commodity flow using the residual method can be illustrated by examining its use in estimating PCE for wheat flour. First, an estimate is made for the total domestic supply of wheat flour: Total wheat flour sales by domestic firms, minus wheat flour exports, plus wheat flour imports. Next, an estimate is made for total consumption of wheat flour by intermediate users, including food manufacturers—of bread, cookies, crackers, and frozen bakery products—and restaurants. The wheat flour consumed by all intermediate users is then subtracted from domestic supply; government purchases of wheat flour are also subtracted. The residual is then assumed to be the wheat flour purchased by persons and is included in PCE.

The components of value added (see footnotes 3 and 6) are estimated using different methods. Compensation of employees by industry is estimated directly from source data. Indirect business tax and nontax liability by industry is either estimated directly from source data or is extrapolated based on the 1982 benchmark. For most industries, other value added is derived as a residual after subtracting total intermediate inputs, compensation of employees, and indirect business tax and nontax liability from total industry output (that is, in-

14. See *Personal Consumption Expenditures*, pages 31–34.

dustry sales receipts). For a few industries, estimates of other value added were available from other data sources; for example, other value added estimates for agriculture are from the U.S. Department of Agriculture.

The commodity-by-industry direct requirements table

The commodity-by-industry direct requirements for a dollar of industry output table (table 3 of the "Summary Tables") is presented in two parts: Table 3.1 shows the input coefficients for each commodity that an industry requires to produce a dollar of output; table 3.2 shows component detail for the value added input coefficients that an industry requires to produce a dollar of output. The input coefficients in both tables are also referred to as "direct requirements coefficients." The coefficients for total intermediate inputs plus the total value added for each industry equal 1.00000.

Tables 3.1 and 3.2 are derived from tables 2.1 and 2.2, respectively, by dividing each industry's commodity or value added component by that industry's total output. However, table 3.1, unlike table 2.1, does not include the components of final uses or GDP.

In table 3.1, each column shows, for the industry named at the head of the column, the input coefficients for the commodities and for the total value added that an industry directly requires to produce a dollar of output. Each row names the commodity or the total value added that the industry requires. For example, to produce a dollar of output, the radio and TV broadcasting *industry* (column 67) has direct requirements for 1.60 cents (calculated as 100 x 0.01601 from the table) of the *commodity* radio and TV broadcasting (row 67) and 0.28 cent of the *commodity* advertising (row 73D).

In table 3.2, industries are shown in the rows, and total output, total intermediate inputs, and the components of value added required to produce a dollar of output are shown in the columns.[15] For example, to produce a dollar of output, the radio and TV broadcasting industry (row 67) has direct requirements for 45.79 cents of value added; these requirements consist of 33.63 cents of labor compensation, 2.04 cents of indirect business tax and nontax liability, and 10.12 cents of other value added. The industry has direct requirements of 54.21 cents for intermediate inputs, which are shown in detail in column 67 of table 3.1.

The information in table 3.1 can be used with the make table (table 1 of the "Summary Tables") to trace the changes in an industry's output, as well as the changes in that industry's total requirements for other industries' output, that result from a change in final uses of a commodity. For example, tables 1 and 3.1 can be used to trace the direct effects on all industries producing household appliances of a $1 million increase in sales of household appliances to final users.

Table 1 shows that total output of the *commodity* household appliances (column 54) was about $16 billion. The household appliances *industry* (row 54) produced $15 billion, or 95 percent, of this commodity; the audio, video, and communication equipment *industry* (row 56) produced $0.3 billion, or 2 percent, and 21 other industries produced the rest. Based on these proportions, production in the household appliances industry would initially increase $950,000 ($1,000,000 x 0.95) to meet the $1 million increase in household appliances sold to final users. Production in the audio, video, and communication equipment industry would increase $20,000 ($1,000,000 x 0.02), and production in the 21 other industries would increase $30,000.

Table 3.1 can then be used to determine the commodities required by each industry to produce its share of the $1 million of household appliances sold to final users. The commodities required by the household appliances industry will be traced first. Column 54 in table 3.1 shows that the household appliances industry would require, in addition to other commodity inputs, $4,921 ($950,000 x 0.00518) of household appliances (row 54); to provide this commodity input, the industry's production would have to increase an additional $4,675 ($4,921 x 0.95). Thus, the increase in the production of the household appliances industry would be $954,675 ($950,000 for final users plus $4,675 for its own intermediate use). This production in turn would require $71,085 ($954,675 x 0.07446) of primary iron and steel manufacturing (row 37), $39,886 ($954,675 x 0.04178) of rubber and miscellaneous plastics products (row 32), and so on down column 54 in table 3.1. From table 3.2, the value added required by the household appliances industry would total $409,823 ($954,675 x 0.42928). Of this total, $227,489 ($954,675 x 0.23829) is compensation of employees, $7,867 ($954,675 x 0.00824) is indirect business tax and nontax liability, and $174,467 ($954,675 x 0.18275) is other value added.

The information in tables 1 and 3.1 now can be used to trace the continuing repercussions on the output of other industries from the $954,675 of additional output produced by the household appliances industry. For example, to supply the primary iron and steel manufacturing required by the household appliances industry, the primary iron and steel manufacturing industry (column 37 in table 3.1) requires $5,995 ($39,886 x 0.15029) of its own products (row 37 in table 3.1) plus $585

15. For the caveats on using the value added estimates, see page M-4.

($45,881 x 0.01275) of general industrial machinery and equipment (row 49), $976 ($45,881 x 0.02128) of coal mining (row 7), and so on. Similarly, all the other industries that produce primary iron and steel manufacturing (column 37 in table 1) as secondary products—for example, primary nonferrous metals manufacturing (row 38 in table 1)—would also require commodities to produce their shares of the output of primary iron and steel manufacturing that is required by the household appliances industry.

Similarly, the continuing effects of each industry producing its share of the $1 million of household appliances sold to final users can be traced, and the increase in production required from each industry can be derived. For each industry producing household appliances, either as a primary product or as a secondary product, the direct requirements coefficients corresponding to that same industry are used from tables 3.1 and 3.2.[16] For example, for household appliances as a primary product of the household appliances industry, the direct requirements coefficients from column 54 in table 3.1 are used; for household appliances as a secondary product of the audio, video, and communication equipment industry, the coefficients from column 56 are used.

Alternatively, the total commodity and industry outputs resulting from changes in final uses can be calculated more easily from the total requirements tables. These tables—which combine the information shown in tables 1, 3.1, and 3.2—completely trace and summarize the continuing repercussions of a dollar change in final use of a specified commodity.

The commodity-by-commodity total requirements table

The commodity-by-commodity total requirements table (table 4 of the "Summary Tables") shows the inputs for each commodity that are directly and indirectly required to deliver a dollar of the commodity to final users. The head of each column names the commodity delivered to final users, and each row shows the total production of the commodity that is required. The coefficients in this table are referred to as "commodity-by-commodity total requirements coefficients." The table is derived from both the make and use tables.[17]

In the household appliances example, the total requirements for each commodity can be calculated from the entries in column 54. Providing consumers with $1 million of household appliances would require $1,005,120 ($1,000,000 x 1.00512) of household appliances (row 54) from all industries. Similarly, it would require $24,830 ($1,000,000 x 0.02483) of paperboard containers and boxes (row 25), $41,080 ($1,000,000 x 0.04108) of plastics and synthetic materials (row 28), and so on.

The total at the bottom of each column in table 4 is the sum of all the changes in commodity outputs that are required to deliver a dollar of a commodity to final users. Because each total change is a dollar multiple of the initial dollar spent for the output of the given commodity, the total change in output is often called the total commodity output multiplier.

The total commodity output multipliers can be used to estimate the impact of changes in the final uses of commodities on total commodity output. For example, for the household appliances commodity (column 54), the total commodity output multiplier is 2.14598 (the sum of all the entries in the column). The total dollar change in all commodity output that is required for an additional $1,000,000 of household appliances delivered to final users is $2,145,980 ($1,000,000 x 2.14598).

The industry-by-commodity total requirements table

The industry-by-commodity total requirements table (table 5 of the "Summary Tables") shows the input requirements coefficients for the output from each industry that is directly and indirectly required to deliver a dollar of a commodity to final users. The head of each column names the commodity delivered to final users, and each row shows the total production that is required from an industry. The coefficients in this table are referred to as "industry-by-commodity total requirements coefficients." The table is also derived from both the make and use tables.[18]

The calculations made using this table are similar to those for the commodity-by-commodity total requirements table. For example, to provide final users with an additional $1 million of household appliances, the household appliances industry (row 54) is required to produce $955,360 ($1,000,000 x 0.95536) of industry output; the paperboard containers and boxes industry (row 25) is required to produce $24,810 ($1,000,000 x 0.02481) of industry output, the plastics and synthetic materials industry (row 28) is required to produce

16. For a discussion of the "industry-based technology assumption," which underlies this approach, see page M-13.

17. The derivation of this table and the industry-by-commodity total requirements table is shown in appendix D, which begins on page A-37, and is contained on the diskettes that are offered for sale (see the section "Availability of Estimates" on page M-27).

18. See footnote 17.

$36,130 ($1,000,000 x 0.03613) of industry output, and so on.

The total at the bottom of each column in table 5 is the sum of all the changes in industry outputs that are required to deliver a dollar of a commodity to final users. Because each total change is a dollar multiple of the initial dollar spent for the output of the given industry, the total change in output is often called the total industry output multiplier.

The total industry output multipliers can be used to estimate the impact of changes in the final uses of commodities on total industry output. For example, the total industry output multiplier for the household appliances commodity (column 54) is 2.13254 (the sum of all the entries in the column). The total dollar change in the output of all industries that is required for an additional $1,000,000 of household appliances delivered to final uses is $2,132,540 ($1,000,000 x 2.13254).

Total multipliers

The total multipliers in tables 4 and 5 of the "Summary Tables" (and 4A and 5A of the "Detailed Tables") are similar but not identical. The main reason for the difference is that the commodity multiplier includes "noncomparable imports," which by definition do not have a domestic-industry counterpart and are not included in the total industry multiplier in the industry-by-commodity total requirements table.

When using the two total requirements tables, one should be aware that the amount of output required to deliver a dollar of a commodity to final users includes both imported and domestically supplied commodities. However, both the total commodity output multiplier and the total industry output multiplier represent the output required as if all of the commodity were domestically supplied. Therefore, if a portion of the commodity is imported, the impact on domestic output would be lower than that implied by the multiplier.

Uses of the I-O accounts

The I-O accounts have a variety of statistical and analytical uses. For example, they can provide an economic framework to assess data quality and completeness, and they can be used as an analytical economic tool to study industry production. This section describes some uses of the I-O accounts in preparing economic statistics and in studying interindustry relationships within the economy, as well as some of the assumptions analysts must make when they use I-O accounts as an economic tool.

The use of I-O accounts requires certain simplifying assumptions. Among these is the assumption that interindustry relationships established in the I-O accounts for a benchmark year will remain stable over time and through a range of output levels. Users of I-O tables generally must make the assumption that changes in interindustry relationships occur only gradually—for example, that the interindustry relationships represented in the 1987 benchmark are applicable for a band of years surrounding 1987. Also, I-O accounts implicitly assume that all adjustments to a change in final demand are achieved instantly and without price changes. For analyses that require different assumptions, other economic tools may be more appropriate.

Statistical uses.—The I-O accounts are used in several ways to prepare economic statistics. For the NIPA comprehensive revisions, they are the single most important regular source for estimating the expenditure components of GDP and for parts of several income components. Because the I-O accounts have an internally consistent framework that tracks the input and output flows in the economy, any estimating weaknesses in the national economic accounts become readily apparent when they are compared with the I-O accounts. For the NIPA revisions, the NIPA estimates of PCE and PDE are based on the final use components of the I-O benchmark accounts, with additional adjustments to reflect the definitional, classificational, and statistical changes incorporated into the NIPA's since completion of the I-O accounts.[19]

The I-O benchmark accounts are also used as a framework to weight and calculate index numbers for price, volume, and value. For example, BEA uses the I-O-based detailed estimates of PDE to weight producer price indexes for calculating the constant-dollar NIPA estimates of PDE.

Analytical uses.—The I-O accounts are an important analytical tool because they show the interdependence among various producers and consumers in the economy. Because of their industry detail, the I-O accounts can be used for analyzing a wide range of related empirical issues.

The main contribution of the I-O accounts to economic analysis is that they permit analysts to measure the repercussions that changes in final uses have on industries and commodities, both directly and indirectly. For example, an increase in consumer demand for motor vehicles will initially have a direct effect that will increase the production of cars, which in turn will have

19. For more information on the I-O accounts and their relationship to the NIPA's, see *Personal Consumption Expenditures*, pages 17 and 31–34.

indirect effects, including increased steel production. Increased steel production will in turn require more chemicals, more iron ore, more limestone, and more coal. Increased car production will also require more upholstery fabrics, and the increased production of these fabrics will require more natural fibers, more synthetic fibers, and more plastics. Further, increased production of synthetic fibers will require more electricity and containers, and so on.

These repercussions are only a few in the continuing chain resulting from the initial increase in consumer demand for motor vehicles. Through I-O analysis, it is possible to trace this chain throughout the economy, measuring the direct and indirect effects on the output of each industry and commodity. Within the I-O accounts, these effects are quantified in coefficient tables. These tables can be used, for example, to determine the impact of a disaster on the economy or, when supplemented with additional information, to compute the effect on employment of an increased demand for U.S. exports. The Federal Emergency Management Agency, the U.S. Department of Defense, and the Census Bureau, among others, have found the I-O accounts to be useful for such studies.

When the U.S. I-O accounts are augmented with regional data, they can show economic impacts by region. For example, a State Government agency has used regional I-O accounts to estimate the economic effects of a high-speed intercity rail project on the State's economy, and a private consulting group has used regional I-O accounts to analyze the impact of a sports stadium on the local economy. BEA's Regional Economic Analysis Division helps planners and analysts estimate the regional impacts of project and program expenditures by industries.[20]

Definitions and conventions for classification

The I-O accounts use two classification systems, one for industries and another for commodities, but both classification systems generally use the same I-O numbers and titles. In the I-O industry classification system, output typically represents the total output of all establishments in each industry, regardless of whether the commodities produced are primary to the industry (that is, make up the largest proportion of the establishment's output) or are secondary (that is, primary to another industry). In the I-O commodity classification system, output represents the total output of the product or service, regardless of the classification of the establishments that produce it. This section discusses first the I-O industry classification system and then the I-O commodity classification system.

The I-O industry classification system is based on the SIC system, which classifies establishments into industries based on their primary products or services.[21] Establishments are defined as economic units that are generally at a single physical location where business is conducted or where services or industrial operations are performed. Establishments are classified into an SIC industry on the basis of their primary products or services.[22]

The I-O industry classification system adjusts the SIC system primarily to attain a greater degree of homogeneity in the structure of inputs to the commodities produced by an I-O industry.[23] These adjustments, which affect primary and secondary production, are called redefinitions in I-O terminology. Other adjustments are made to the SIC system to ensure that similar commodities are grouped together. These adjustments, which also affect primary and secondary production, are called reclassifications. The I-O system also provides for other industries and "special" industries that the SIC does not; these are discussed later in this section.

In a redefinition, the input purchases and the output sales receipts for a particular secondary product or service are moved from the SIC-defined industry to the I-O-defined industry. The input structure of the redefined product or service is assumed to be the same as that for the I-O industry in which the product or service is primary; this assumption is called, in I-O terminology, the commodity-based technology assumption.[24]

20. A typical I-O table in the Regional Input-Output Modeling System is derived mainly from two data sources: (1) The U.S. benchmark I-O accounts, and (2) BEA's four-digit SIC county wage-and-salary data. For more information, see U.S. Department of Commerce, Bureau of Economic Analysis, *Regional Multipliers: A User Handbook for the Regional Input-Output Modeling System (RIMS II), Second Edition* (Washington, DC: U.S. Government Printing Office, 1992).

21. The I-O two-digit and six-digit industry categories and their composition in terms of the 1987 SIC codes are given in appendix B, which begins on page A-2.

22. For a discussion of the SIC system, see Office of Management and Budget, Executive Office of the President, *Standard Industrial Classification Manual: 1987*, (Springfield, Virginia: National Technical Information Service, 1987): 11–18.

23. Fewer I-O adjustments to SIC-defined industries may be necessary for the 1997 and subsequent benchmark I-O accounts when the North American Industry Classification System (NAICS) is completed. The proposed NAICS is expected to be a common international system—covering the United States, Canada, and Mexico—for grouping establishments by similarity of production process. For a discussion, see Jack E. Triplett, "Economic Concepts for Economic Classifications," SURVEY 73 (November 1993): 45–56.

24. The I-O commodity-based technology assumption and the I-O industry-based technology assumption (discussed on page M-13) are important when estimating the total requirements tables. The significance of these assumptions is discussed elsewhere in the economic I-O literature. See, for example, United Nations, *System of National Accounts, 1993*, prepared under the auspices of the Inter-Secretariat Working Group on National Accounts (New

An example of a redefinition involves restaurants located in hotels. Both inputs and outputs of these restaurants are moved from the hotels and lodging places industry (the industry of the establishment where the product or service occurs) to the eating and drinking places industry (the industry where the product or service is primary). The input structure related to the output of restaurants located in hotels is assumed to be similar to that for the eating and drinking places industry.

Redefinitions are used in the following cases:

- Construction work (both new construction and maintenance and repair) performed by all industries is redefined to the construction industries. Construction work performed by and for nonconstruction industries is referred to as "force-account construction."
- Manufacturing in trade and service industries is redefined to the appropriate manufacturing industries.
- Retail trade in service industries is redefined to the retail trade industry. Services in the trade industries are redefined to service industries. Some services are also redefined within service industries.
- Manufacturers' wholesale sales of purchased goods (resales) are redefined to the wholesale trade industry.
- Rental activities of all industries are redefined to the real estate and rental industries.
- The preparation of meals and beverages in most industries is redefined to the eating and drinking industry.

Redefinitions affect a number of industries; however, for most industries, the total output involved is small. Examples of industries with large dollar amounts of redefinitions of secondary products or services out of or into the industry are automotive repair and services (I-O 75), with $131 billion of total industry output after $1 billion has been redefined out and $39 billion has been redefined in from a number of other industries; eating and drinking places (I-O 74), with $209 billion of total industry output after $1 billion out and $34 billion in; wholesale trade (I-O 69A), with $424 billion of total output after $46 billion out and $22 billion in; and retail trade (I-O 69B), with $421 billion of total output after $69 billion out and $7 billion in.

In a reclassification, the I-O system creates a secondary product or service from an SIC-defined primary product or service. For these reclassified products and services and for all other SIC-defined secondary products and services that are not redefinitions, the I-O system moves the output receipts from the SIC-defined product or service class to the I-O-defined primary product or service class. In this case, total output for the affected industry remains unchanged; however, output for each affected commodity group changes.

An example of a reclassification involves the newspaper industry. The SIC defines the primary product or service classes of this industry as newspaper subscriptions and sales and newspaper advertising. The I-O system considers the primary product or service of the newspaper industry to consist of newspaper subscriptions and sales. It considers the advertising component to be secondary and, therefore, moves advertising receipts or output to the advertising commodity group. Total output for the I-O newspaper *industry* remains unchanged, but output for the newspaper *commodity* is reduced, and output for the advertising *commodity* is increased.

Reclassifications affect about 70 commodities; however, for the most part, the dollar values involved are not very large. Examples of commodities with large dollar amounts of reclassified sales receipts are the newspapers and periodicals industry (I-O 26A), with $16 billion of commodity output after $33 billion has been moved out to the advertising commodity (I-O 73D); and the crude petroleum and natural gas commodity (I-O 8), with $68 billion of commodity output after $12 billion has been moved out to the gas production and distribution (utilities) commodity (I-O 68B).

When the total requirements tables are calculated, inputs and outputs of each I-O-defined secondary product or service are moved to their particular I-O-defined commodity groups. The input structures of secondary products or services are assumed to be similar to those for the industries in which the products or services are produced; this assumption, in I-O terminology, is called the industry-based technology assumption (see footnote 24).

As mentioned earlier, the I-O system also provides for other industries and "special" industries that the SIC does not. The I-O system replaces the SIC-defined government-owned establishments with two industries to cover government enterprises as defined in the NIPA's—Federal Government enterprises (I-O 78) and State and local government enterprises (I-O 79). The I-O system also provides "special" industries, such as general government (I-O 82), in which output and value added are defined as general government compensation of employees, and the inventory valuation adjustment

York: United Nations, 1993): chapter 15, in particular pages 367–70; and Ronald E. Miller and Peter D. Blair, *Input-Output Analysis: Foundations and Extensions* (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1985): 149–99.

Table C.—Input-Output Commodity Composition of NIPA Final Demand,

[Millions

Commodity number	Personal consumption expenditures				Gross private fixed investment				Change in business inventories				Exports of goods and services				Imports of goods and services	
	Producers' prices	Transportation costs	Wholesale and retail trade margins	Purchasers' prices	Producers' prices	Transportation costs	Wholesale and retail trade margins	Purchasers' prices	Producers' prices	Transportation costs	Wholesale and retail trade margins	Purchasers' prices	Producers' prices	Transportation costs	Wholesale and retail trade margins	Purchasers' prices	Producers' prices	Transportation costs
1	3,090	96	1,034	4,219	0	0	0	0	–719	4	3	–711	485	17	14	515	–808	0
2	15,682	3,215	13,806	32,703	0	0	0	0	–4,261	119	246	–3,896	12,747	1,129	2,069	15,946	–2,353	0
3	3,763	52	1,652	5,466	0	0	0	0	101	1	10	113	544	6	37	587	–3,747	0
4	647	0	0	647	0	0	0	0	0	0	0	0	122	0	0	122	–16	0
5+6	0	0	0	0	446	23	21	489	19	–1	(*)	18	559	63	14	636	–1,349	0
7	138	41	62	241	0	0	0	0	1,100	342	27	1,468	2,663	780	61	3,503	–65	0
8	0	0	0	0	84	0	0	84	–1,758	15	8	–1,735	1,494	8	56	1,558	–28,965	0
9+10	36	33	21	89	0	0	0	0	–8	17	1	9	633	237	10	880	–734	0
11	0	0	0	0	358,627	0	0	358,627	0	0	0	0	15	0	0	15	0	0
12	0	0	0	0	17,300	0	0	17,300	0	0	0	0	81	0	0	81	0	0
13	1,099	5	1,078	2,182	198	0	0	198	457	(*)	11	468	2,725	27	32	2,784	–467	0
14	201,153	5,019	100,843	307,016	0	0	0	0	1,771	43	239	2,053	12,111	585	1,388	14,084	–18,538	0
15	20,774	121	13,651	34,546	0	0	0	0	242	2	108	351	2,591	12	587	3,190	–880	0
16	1,047	13	1,024	2,084	0	0	0	0	599	5	29	633	1,407	15	99	1,521	–3,601	0
17	4,992	113	4,173	9,278	2,369	53	963	3,385	412	6	25	443	782	24	58	863	–919	0
18	71,153	360	60,712	132,225	0	0	0	0	1,446	6	123	1,575	1,197	3	117	1,318	–25,395	0
19	10,088	49	9,245	19,381	0	0	0	0	333	1	33	367	362	2	69	433	–1,772	0
20+21	1,820	43	1,646	3,508	3,920	11	2,478	6,409	1,157	48	147	1,352	3,645	236	430	4,311	–6,399	0
22+23	19,469	132	17,015	36,616	15,467	128	2,672	18,266	596	2	46	644	684	8	93	785	–5,287	0
24	11,902	357	7,712	19,972	0	0	0	0	916	39	66	1,021	5,922	313	313	6,548	–9,914	0
25	292	7	148	447	0	0	0	0	127	1	3	132	262	6	18	286	–126	0
26A	11,741	400	4,808	16,949	0	0	0	0	449	16	14	480	555	25	22	601	–226	0
26B	10,923	267	9,177	20,366	0	0	0	0	1,188	22	132	1,342	1,062	14	137	1,213	–1,335	0
27A	978	134	929	2,040	795	0	0	795	515	50	56	622	14,630	910	1,027	16,567	–10,727	0
27B	784	31	691	1,506	0	0	0	0	138	10	124	272	542	20	255	816	–990	0
28	0	0	0	0	0	0	0	0	502	37	14	553	5,364	525	205	6,094	–2,009	0
29A	23,958	164	16,617	40,738	0	0	0	0	1,199	6	186	1,392	2,959	16	564	3,539	–7,590	0
29B	25,019	886	16,865	42,770	0	0	0	0	558	12	67	636	983	30	126	1,139	–1,281	0
30	194	10	89	294	0	0	0	0	197	8	22	228	342	17	43	402	–214	0
31	60,189	2,468	33,098	95,755	0	0	0	0	3,001	86	501	3,588	6,128	278	1,258	7,664	–13,332	0
32	11,669	2,072	12,647	26,388	155	4	36	196	1,292	73	136	1,500	3,233	209	434	3,876	–9,702	0
33+34	13,619	63	13,745	27,427	0	0	0	0	467	2	62	530	666	7	46	719	–9,700	0
35	1,518	39	1,922	3,479	0	0	0	0	179	5	31	214	777	22	142	941	–1,837	0
36	2,705	104	3,017	5,826	0	0	0	0	606	34	74	715	1,019	64	122	1,205	–4,513	0
37	11	2	11	25	13	0	0	13	1,204	56	150	1,410	1,407	77	178	1,663	–10,824	0
38	72	2	57	131	36	1	5	42	864	13	43	921	3,303	63	298	3,665	–6,992	0
39	0	0	0	0	21	1	1	23	24	1	1	25	166	3	6	174	–155	0
40	525	14	404	942	2,811	20	296	3,127	557	4	53	614	869	10	113	992	–961	0
41	1,464	15	1,551	3,030	0	0	0	0	237	2	8	247	2,123	26	56	2,206	–2,261	0
42	3,600	102	3,626	7,327	1,945	106	389	2,440	604	10	161	775	2,634	112	597	3,343	–6,573	0
43	461	5	228	693	2,302	27	171	2,500	208	1	18	227	2,899	29	471	3,398	–2,102	0
44+45	248	2	247	497	16,909	513	6,700	24,122	333	17	133	483	6,063	270	1,205	7,538	–5,402	0
46	0	0	0	0	5,032	97	1,033	6,162	42	1	13	56	540	10	122	671	–1,321	0
47	583	3	523	1,108	13,439	181	2,100	15,720	50	1	14	65	2,335	28	290	2,653	–4,911	0
48	176	2	113	291	15,053	185	2,551	17,789	198	(*)	6	204	2,696	30	430	3,156	–4,993	0
49	0	0	0	0	11,072	96	714	11,882	153	1	15	169	4,182	38	369	4,589	–6,947	0
50	117	4	98	220	747	8	123	878	101	4	8	113	1,660	58	123	1,840	–604	0
51	3,290	46	2,221	5,557	33,476	122	7,525	41,122	331	3	20	354	13,167	174	2,418	15,759	–17,329	0
52	883	8	822	1,713	7,186	75	2,543	9,804	306	1	34	340	1,217	10	364	1,591	–1,504	0
53	161	3	113	277	5,878	106	820	6,803	110	2	19	131	1,847	24	148	2,019	–3,346	0
54	11,997	319	7,770	20,086	2,657	72	1,448	4,177	3	–2	–6	–4	943	24	107	1,074	–2,950	0
55	2,278	46	2,233	4,556	435	4	110	549	608	7	106	721	1,358	14	268	1,641	–3,341	0
56	18,387	164	16,605	35,156	21,728	132	1,338	23,198	446	4	58	508	4,137	41	394	4,572	–20,190	0
57	263	2	144	409	0	0	0	0	787	4	47	838	12,596	130	1,518	14,244	–13,704	0
58	5,277	140	3,993	9,410	2,755	27	153	2,936	361	5	38	403	2,404	38	334	2,776	–4,511	0
59A	101,875	2,626	24,316	128,816	62,933	1,622	4,878	69,433	8,115	202	319	8,636	12,918	325	515	13,758	–61,157	0
59B	3,133	108	2,107	5,348	6,591	55	323	6,969	1,745	55	145	1,945	10,874	362	938	12,174	–16,950	0
60	316	1	88	405	8,843	7	135	8,985	2,132	–2	–2	2,127	22,891	177	338	23,405	–6,875	0
61	11,043	82	5,067	16,191	3,183	72	376	3,632	1,070	6	92	1,167	1,278	17	63	1,358	–2,937	0
62	4,456	16	4,396	8,868	33,814	131	3,692	37,637	1,285	1	42	1,327	10,311	48	1,082	11,441	–9,990	0
63	4,625	21	7,956	12,602	5,653	24	2,093	7,770	398	2	171	570	2,224	9	748	2,981	–5,696	0
64	27,179	400	30,458	58,036	3,876	255	1,052	5,183	2,181	27	506	2,714	2,831	79	690	3,599	–15,769	0
65A	9,990	0	0	9,990	0	0	0	0	0	0	0	0	731	0	0	731	–135	0
65B	6,151	0	0	6,151	0	0	0	0	0	0	0	0	300	0	0	300	0	0
65C	3,472	0	0	3,472	0	0	0	0	0	0	0	0	7,209	0	0	7,209	3,264	0
65D	29,349	0	0	29,349	0	0	0	0	0	0	0	0	10,186	0	0	10,186	–5,711	0
65E	1,596	0	0	1,596	0	0	0	0	0	0	0	0	1,958	0	0	1,958	0	0
66	61,963	0	0	61,963	4,389	0	0	4,389	0	0	0	0	2,496	0	0	2,496	0	0
67	1,326	0	0	1,326	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68A	63,318	0	0	63,318	0	0	0	0	0	0	0	0	134	0	0	134	–986	0
68B	25,544	0	0	25,544	0	0	0	0	0	0	0	0	161	0	0	161	–1,763	0
68C	14,864	0	0	14,864	0	0	0	0	0	0	0	0	37	0	0	37	0	0
69A	0	0	0	0	0	0	0	0	0	0	0	0	1,275	0	0	1,275	15,533	0
69B	262	0	0	262	0	0	0	0	0	0	0	0	85	0	0	85	0	0
70A	135,789	0	0	135,789	0	0	0	0	0	0	0	0	12,598	0	0	12,598	–161	0
70B	81,638	0	0	81,638	0	0	0	0	0	0	0	0	2,906	0	0	2,906	–3,078	0
71A	325,144	0	0	325,144	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71B	122,178	0	0	122,178	23,701	0	0	23,701	0	0	0	0	10,830	0	0	10,830	0	0
72A	20,180	0	0	20,180	0	0	0	0	0	0	0	0	49	0	0	49	0	0
72B	48,030	0	0	48,030	0	0	0	0	0	0	0	0	31	0	0	31	0	0
73A	855	0	322	1,177	10	0	0	10	39	0	13	52	928	0	0	928	–104	0
73B	31,456	0	0	31,456	7,509	0	0	7,509	0	0	0	0	2,398	0	0	2,398	–391	0
73C	12,602	0	313	12,915	0	0	0	0	59	0	0	59	1,546	0	0	1,546	–740	0
73D	661	0	0	661	0	0	0	0	0	0	0	0	475	0	0	475	–253	0
74	169,638	0	0	169,638	0	0	0	0	0	0	0	0	271	0	0	271	0	0
75	67,684	0	202	67,886	0	0	0	0	7	0	0	7	31	0	0	31	0	0
76	47,411	0	0	47,411	0	0	0	0	0	0	0	0	1,222	0	0	1,222	–64	0
77A	363,015	0	0	363,015	0	0	0	0	0	0	0	0	16	0	0	16	0	0
77B	148,974	0	0	148,974	0	0	0	0	0	0	0	0	144	0	0	144	–9	0
78	6,430	0	0	6,430	0	0	0	0	0	0	0	0	169	0	0	169	0	0
79	14,152	0	0	14,152	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	29,295	527	1,542	31,365	0	0	0	0	85	18	7	110	0	0	0	0	–78,696	0
81	13,705	0	20,253	33,959	–24,960	0	3,598	–21,361	1,969	39	156	2,164	4,267	457	992	5,716	–2,068	0
82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	–31,136	0	0	–31,136	0	0	0	0	0	0	0	0	31,653	0	0	31,653	0	0
84	7,709	0	0	7,709	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	0	0	0	0	0	0	0	0	–17,817	0	0	–17,817	0	0	0	0	0	0
T	**2,566,099**	**20,949**	**485,204**	**3,072,252**	**678,397**	**4,155**	**50,339**	**732,891**	**21,616**	**1,492**	**4,929**	**28,037**	**315,267**	**8,286**	**25,019**	**348,572**	**–490,442**	**0**

* Less than $500,000 in absolute value.

1. The values shown in the producers' prices columns for I-O's 65 and 69 are for direct purchases of trade and transportation services. The corresponding values in the use table include the trade margins and transportation costs associated with all purchases by each industry or category of final uses.

in Producers' and Purchasers' Prices, 1987 Benchmark [1]

of dollars]

Imports of goods and services		Federal Government purchases, national defense				Federal Government purchases, nondefense				State and local government purchases, education				State and local government purchases, other				Com-modity number
Whole-sale and retail trade margins	Purchas-ers' prices	Produc-ers' prices	Trans-portation costs	Whole-sale and retail trade margins	Purchas-ers' prices	Produc-ers' prices	Trans-portation costs	Whole-sale and retail trade margins	Purchas-ers' prices	Produc-ers' prices	Trans-portation costs	Whole-sale and retail trade margins	Purchas-ers' prices	Produc-ers' prices	Trans-portation costs	Whole-sale and retail trade margins	Purchas-ers' prices	
0	–808	2	(*)	(*)	2	10	(*)	(*)	11	30	(*)	2	32	54	1	3	57	1
0	–2,353	0	0	0	0	750	0	0	750	220	55	65	340	368	61	99	528	2
0	–3,747	0	0	0	0	–1,112	0	0	–1,112	6	(*)	1	8	–419	(*)	3	–416	3
0	–16	38	0	0	38	84	0	0	84	284	0	0	284	756	0	0	756	4
0	–1,349	–142	–5	–1	–148	1	(*)	0	1	0	0	0	0	0	0	0	0	5+6
0	–65	56	17	1	74	29	9	1	38	21	4	(*)	26	11	2	(*)	13	7
0	–28,965	5	0	0	5	–177	34	20	–124	0	0	0	0	0	0	0	0	8
0	–734	–2	–2	0	–3	4	4	0	9	0	0	0	0	–19	102	6	89	9+10
0	0	7,495	0	0	7,495	8,055	0	0	8,055	10,091	0	0	10,091	61,020	0	0	61,020	11
0	0	4,358	0	0	4,358	1,900	0	0	1,900	5,912	0	0	5,912	19,816	0	0	19,816	12
0	–467	20,365	42	39	20,446	2,380	0	1	2,381	1	0	0	1	116	1	11	128	13
0	–18,538	189	3	18	210	1,836	1	7	1,844	3,739	81	450	4,271	2,114	60	260	2,435	14
0	–880	0	0	0	0	0	0	0	0	–1	0	–1	–1	–10	(*)	–7	–17	15
0	–3,601	105	(*)	2	107	10	0	0	10	58	1	4	63	84	1	6	91	16
0	–919	3	0	(*)	3	27	(*)	2	30	8	(*)	1	9	43	1	5	49	17
0	–25,395	566	5	54	625	1	0	(*)	1	15	0	–1	14	838	10	83	931	18
0	–1,772	140	1	34	175	45	(*)	11	57	95	(*)	17	112	347	2	58	406	19
0	–6,399	32	1	2	34	13	(*)	1	14	59	4	11	74	55	2	6	63	20+21
0	–5,287	39	(*)	5	45	90	1	12	103	992	7	159	1,158	784	2	151	937	22+23
0	–9,914	124	3	14	141	243	6	26	275	1,183	48	77	1,308	1,057	33	87	1,178	24
0	–126	42	(*)	(*)	43	31	0	(*)	31	32	1	2	35	125	3	9	137	25
0	–226	15	1	(*)	16	138	1	1	139	302	12	11	325	154	5	5	164	26A
0	–1,335	428	2	20	450	669	16	48	733	3,403	86	278	3,768	1,466	15	62	1,543	26B
0	–10,727	1,793	66	79	1,938	100	–13	12	99	567	37	39	642	1,635	104	124	1,863	27A
0	–990	9	(*)	3	12	15	1	3	20	111	4	46	161	213	12	61	286	27B
0	–2,009	13	1	(*)	14	1	(*)	0	1	1	(*)	0	1	1	(*)	0	1	28
0	–7,590	472	3	96	570	324	2	66	392	86	1	18	105	2,778	19	566	3,363	29A
0	–1,281	160	4	24	189	42	2	10	54	119	5	24	147	321	12	50	383	29B
0	–214	1	0	0	1	5	(*)	1	6	228	12	30	271	66	3	9	78	30
0	–13,332	2,649	109	651	3,408	545	21	127	692	3,789	131	897	4,816	4,142	141	1,018	5,301	31
0	–9,702	480	71	87	637	157	12	27	195	88	9	26	123	1,260	52	236	1,549	32
0	–9,700	47	1	6	54	4	0	(*)	4	(*)	0	0	(*)	105	1	9	115	33+34
0	–1,837	22	(*)	1	23	37	1	6	44	66	2	13	80	207	5	40	252	35
0	–4,513	51	2	12	65	57	2	9	67	66	1	8	75	104	5	12	121	36
0	–10,824	78	8	5	91	72	4	1	76	6	1	(*)	7	51	6	5	61	37
0	–6,992	395	6	25	426	250	5	20	274	4	(*)	(*)	5	54	2	3	58	38
0	–155	57	1	3	60	0	0	0	0	4	0	0	4	3	0	(*)	3	39
0	–961	491	12	59	562	168	2	15	185	0	0	0	0	1	0	(*)	1	40
0	–2,261	110	1	8	119	28	(*)	1	29	216	2	3	221	61	(*)	4	66	41
0	–6,573	407	22	120	549	75	3	39	117	177	7	84	269	373	10	273	656	42
0	–2,102	1,879	18	378	2,275	167	2	3	172	0	0	0	0	265	3	11	279	43
0	–5,402	303	10	49	362	18	1	3	22	84	2	30	116	1,274	45	263	1,581	44+45
0	–1,321	312	6	95	413	9	(*)	1	10	4	0	1	5	9	(*)	3	12	46
0	–4,911	180	1	13	194	40	(*)	2	42	134	2	20	156	102	2	12	116	47
0	–4,993	76	1	18	95	6	0	1	7	69	1	6	75	5	0	(*)	5	48
0	–6,947	542	6	91	639	18	0	2	20	(*)	0	0	(*)	162	1	12	176	49
0	–604	2,573	95	175	2,843	84	2	4	90	116	5	9	129	135	4	11	150	50
0	–17,329	3,493	49	645	4,187	675	7	97	779	1,196	15	347	1,558	786	8	230	1,024	51
0	–1,504	101	1	20	122	21	0	7	28	476	5	178	658	179	2	77	257	52
0	–3,346	467	8	94	570	168	2	36	206	140	1	14	155	132	1	12	146	53
0	–2,950	38	1	4	43	4	(*)	(*)	5	101	2	8	112	134	3	13	150	54
0	–3,341	41	(*)	6	47	21	(*)	5	26	284	2	72	358	189	1	45	235	55
0	–20,190	4,964	21	227	5,211	301	1	12	314	335	2	39	377	368	2	44	414	56
0	–13,704	5,884	62	718	6,663	28	0	2	30	81	1	9	90	94	1	10	105	57
0	–4,511	1,577	14	102	1,693	95	1	6	101	71	1	11	83	120	2	22	144	58
0	–61,157	609	15	25	649	131	3	5	140	1,288	33	52	1,373	4,426	114	180	4,721	59A
0	–16,950	1,050	27	97	1,174	43	1	4	47	294	10	96	400	422	14	172	608	59B
0	–6,875	33,306	97	360	33,763	1,206	5	0	1,211	0	0	0	0	20	0	(*)	20	60
0	–2,937	6,754	5	20	6,780	405	1	4	410	103	5	15	124	411	8	23	443	61
0	–9,990	23,710	91	341	24,141	1,540	5	144	1,688	517	2	38	557	2,732	12	648	3,392	62
0	–5,696	704	3	253	959	425	2	150	577	1,015	4	365	1,384	1,589	7	572	2,168	63
0	–15,769	123	6	33	162	–547	2	–112	–657	1,184	38	319	1,541	747	13	200	960	64
0	–135	234	0	0	234	469	0	0	469	2,169	0	0	2,169	229	0	0	229	65A
0	0	2,309	0	0	2,309	2,368	0	0	2,368	483	0	0	483	486	0	0	486	65B
0	3,264	677	0	0	677	130	0	0	130	0	0	0	0	89	0	0	89	65C
0	–5,711	1,817	0	0	1,817	648	0	0	648	876	0	0	876	990	0	0	990	65D
0	0	0	0	0	0	0	0	0	0	3	0	0	3	65	0	0	65	65E
0	0	1,954	0	0	1,954	1,899	0	0	1,899	2,519	0	0	2,519	3,021	0	0	3,021	66
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67
0	–986	1,734	0	0	1,734	937	0	0	937	4,541	0	0	4,541	7,180	0	0	7,180	68A
0	–1,763	465	0	0	465	114	0	0	114	685	0	0	685	987	0	0	987	68B
0	0	184	0	0	184	53	0	0	53	1,018	0	0	1,018	–35	0	0	–35	68C
0	15,533	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69A
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69B
0	–161	0	0	0	0	1,400	0	0	1,400	0	0	0	0	9,366	0	0	9,366	70A
0	–3,078	36	0	0	36	1,710	0	0	1,710	666	0	0	666	161	0	0	161	70B
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71A
0	0	547	0	0	547	696	0	0	696	713	0	0	713	5,850	0	0	5,850	71B
0	0	692	0	0	692	254	0	0	254	–1,237	0	0	–1,237	2,073	0	0	2,073	72A
0	0	65	0	0	65	60	0	0	60	301	0	0	301	597	0	0	597	72B
0	–104	2,833	0	0	2,833	1,300	0	0	1,300	1,402	0	0	1,402	3,845	0	0	3,845	73A
0	–391	7,561	0	0	7,561	538	0	0	538	1,729	0	0	1,729	–73	0	0	–73	73B
0	–740	15,944	0	0	15,944	4,963	0	0	4,963	4,136	0	0	4,136	7,298	0	0	7,298	73C
0	–253	79	0	0	79	5	0	0	5	416	0	0	416	181	0	0	181	73D
0	0	371	0	0	371	768	0	0	768	–5,546	0	0	–5,546	2,138	0	0	2,138	74
0	0	94	0	0	94	92	0	0	92	823	0	0	823	1,400	0	0	1,400	75
0	–64	823	0	0	823	179	0	0	179	189	0	0	189	–1,641	0	0	–1,641	76
0	0	–352	0	0	–352	965	0	0	965	–10	0	0	–10	–32,747	0	0	–32,747	77A
0	–9	1,127	0	0	1,127	6,199	0	0	6,199	–15,934	0	0	–15,934	–318	0	0	–318	77B
0	0	312	0	0	312	97	0	0	97	128	0	0	128	1,354	0	0	1,354	78
0	0	80	0	0	80	31	0	0	31	171	0	0	171	187	0	0	187	79
0	–78,696	8,673	0	0	8,673	1,443	1	1	1,444	43	10	4	57	6	1	1	8	80
0	–2,068	–104	0	0	–104	778	0	0	778	683	0	4	687	1,589	0	2	1,591	81
0	0	108,244	0	0	108,244	42,383	0	0	42,383	173,286	0	0	173,286	142,873	0	0	142,873	82
0	0	–161	0	0	–161	–356	0	0	–356	0	0	0	0	0	0	0	0	83
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85
0	**–490,442**	**286,011**	**911**	**5,131**	**292,052**	**91,883**	**149**	**843**	**92,875**	**213,720**	**918**	**3,899**	**218,272**	**271,585**	**918**	**5,818**	**278,320**	T

Table D.—Input-Output Commodity Composition of NIPA Personal Consumption Expenditures, in Producers' and Purchasers' Prices, 1987 Benchmark

[Millions of dollars]

NIPA code/I-O number	Producers' prices	Transportation costs	Wholesale and retail trade margins	Purchasers' prices
3. Food purchased for off-premise consumption (n.d.)				
Total	**211,016**	**7,811**	**111,975**	**330,802**
1	1,722	19	644	2,385
2	11,383	2,585	9,323	23,291
3	2,584	48	1,346	3,978
9+10	2	1	1	4
14	194,576	4,863	100,017	299,456
27A	60	9	43	112
69B	5	0	0	5
80	1,201	285	603	2,089
81	–516	0	0	–516
4. Purchased meals and beverages (n.d.)				
Total	**172,236**	**0**	**0**	**172,236**
65A	36	0	0	36
65D	93	0	0	93
74	169,638	0	0	169,638
76	2,434	0	0	2,434
77B	35	0	0	35
5. Food furnished to employees (including military) (n.d.)				
Total	**6,464**	**200**	**899**	**7,563**
1	158	2	8	167
2	174	42	61	276
3	25	(*)	4	30
14	6,107	156	827	7,090
6. Food produced and consumed on farms (n.d.)				
Total	**714**	**0**	**0**	**714**
1	107	0	0	107
2	138	0	0	138
14	470	0	0	470
7. Tobacco products (n.d.)				
Total	**20,774**	**121**	**13,651**	**34,546**
15	20,774	121	13,651	34,546
12. Shoes and other footwear (n.d.)				
Total	**12,264**	**60**	**13,703**	**26,027**
32	2,801	34	3,465	6,299
33+34	9,463	26	10,213	19,703
81	(*)	0	25	25
14. Women's and children's clothing and accessories, except shoes (n.d.)				
Total	**50,938**	**358**	**47,121**	**98,416**
16	660	7	666	1,333
18	43,726	200	40,297	84,223
19	98	1	121	220
24	3,141	92	2,651	5,883
26B	166	20	184	369
32	84	3	97	184
33+34	2,997	21	2,642	5,661
64	222	14	261	496
69B	2	0	0	2
81	–158	0	203	45
15. Men's and boys' clothing and accessories, except shoes (n.d.)				
Total	**28,267**	**177**	**21,310**	**49,754**
16	95	1	92	188
18	27,345	159	20,404	47,908
19	69	1	73	142
32	34	1	33	68
33+34	750	8	514	1,271
64	101	7	105	212
81	–126	0	90	–36
16. Standard clothing issued to military personnel (n.d.)				
Total	**133**	**1**	**13**	**146**
16	25	(*)	2	27
18	80	(*)	9	89
33+34	28	(*)	2	30
17. Cleaning, storage, and repair of clothing and shoes (s.)				
Total	**8,328**	**0**	**0**	**8,328**
72A	62	0	0	62
72B	8,266	0	0	8,266
18. Jewelry and watches (d.)				
Total	**12,698**	**27**	**13,505**	**26,230**
62	1,599	4	1,463	3,065
64	11,624	23	11,926	23,573
81	–525	0	116	–409
19. Other misc. personal, clothing and jewelry services (s.)				
Total	**9,443**	**0**	**0**	**9,443**
72B	9,428	0	0	9,428
73C	15	0	0	15
21. Toilet articles and preparations (n.d.)				
Total	**17,370**	**405**	**12,203**	**29,979**
19	69	1	66	135
29B	15,497	309	10,795	26,601
32	20	1	17	37
42	589	25	347	960
54	427	12	256	695
58	221	13	175	408
64	549	45	548	1,142
22. Barbershops, beauty parlors, and health clubs (s.)				
Total	**16,078**	**0**	**0**	**16,078**
72A	311	0	0	311
72B	13,513	0	0	13,513
76	2,254	0	0	2,254
24. Owner-occupied nonfarm dwellings-space rent (s.)				
Total	**321,380**	**0**	**0**	**321,380**
71A	321,380	0	0	321,380
25. Tenant-occupied nonfarm dwellings-rent (s.)				
Total	**120,032**	**0**	**0**	**120,032**
71B	120,032	0	0	120,032
26. Rental value of farm dwellings (s.)				
Total	**4,888**	**0**	**0**	**4,888**
71A	3,764	0	0	3,764
71B	1,124	0	0	1,124
27. Other housing (s.)				
Total	**16,808**	**0**	**0**	**16,808**
72A	16,808	0	0	16,808
29. Furniture, including mattresses and bedsprings (d.)				
Total	**18,091**	**108**	**16,270**	**34,469**
22+23	17,882	108	16,011	34,001
81	208	0	259	468
30. Kitchen and other household appliances (d.)				
Total	**12,837**	**324**	**8,620**	**21,781**
22+23	18	(*)	9	27
38	54	1	36	91
40	445	14	351	809
52	712	7	651	1,370
54	11,380	301	7,408	19,089
58	222	2	120	344
81	6	0	45	50
31. China, glassware, tableware, and utensils (d.)				
Total	**6,520**	**121**	**8,090**	**14,732**
20+21	381	9	506	896
32	1,956	34	2,484	4,473
35	1,000	24	1,382	2,406
36	765	14	864	1,643
38	18	1	21	40
41	1,350	12	1,431	2,793
42	600	28	791	1,419
64	415	1	498	914
69B	27	0	0	27
81	8	0	114	122
32. Other durable house furnishings (d.)				
Total	**17,946**	**566**	**17,748**	**36,260**
17	4,776	108	4,006	8,891
19	1,371	6	1,095	2,472
20+21	1,357	32	1,107	2,495
22+23	1,569	23	995	2,587
26B	72	0	48	119
32	203	5	202	410
33+34	127	3	109	239
35	358	12	375	745
36	1,146	17	917	2,080
40	80	(*)	53	133
42	1,495	32	1,827	3,354
44+45	248	2	247	497
47	583	3	523	1,108
48	176	2	113	291
50	88	1	80	170
51	237	3	311	551
52	16	(*)	17	32
53	81	1	56	138
54	104	3	72	179
55	1,035	34	1,033	2,102
56	793	3	535	1,331
61	35	3	32	69
62	481	3	377	860
64	1,268	98	1,508	2,874
69B	200	0	0	200
80	725	173	673	1,571
81	–677	0	1,439	763
33. Semidurable house furnishings (n.d.)				
Total	**9,749**	**154**	**9,427**	**19,330**
16	267	5	265	536
17	81	2	81	165
18	3	0	3	6
19	7,768	35	7,187	14,990
26B	79	0	63	142
31	2	0	2	3
32	435	9	431	875
35	150	3	155	308
37	11	2	11	25
41	114	3	121	237
64	675	58	919	1,651
69B	3	0	0	3
80	161	38	170	369
81	(*)	0	21	20
34. Cleaning and polishing preparations, and miscellaneous household supplies and paper products (n.d.)				
Total	**20,022**	**950**	**12,123**	**33,095**
3	56	2	18	76
9+10	35	32	20	86
17	94	1	40	135
19	84	1	39	124
24	5,919	180	2,864	8,963
25	292	7	148	447
26B	23	0	11	34
27A	178	21	125	324
27B	784	31	691	1,506
29B	9,358	561	5,904	15,823
30	194	10	89	294
32	237	5	119	361
36	327	52	154	534
42	431	3	185	620
53	74	2	51	127
55	807	8	777	1,592
58	823	11	577	1,411

Table D.—Input-Output Commodity Composition of NIPA Personal Consumption Expenditures, in Producers' and Purchasers' Prices, 1987 Benchmark—Continued

[Millions of dollars]

NIPA code/I-O number	Producers' prices	Transportation costs	Wholesale and retail trade margins	Purchasers' prices
64	305	23	312	641
35. Stationery and writing supplies (n.d.)				
Total	**3,882**	**135**	**6,005**	**10,022**
24	1,086	36	1,378	2,500
26B ...	2,220	55	3,658	5,932
27A ...	240	39	309	588
32	6	(*)	10	16
64	331	4	650	985
37. Electricity (s.)				
Total	**63,318**	**0**	**0**	**63,318**
68A ...	63,318	0	0	63,318
38. Gas (s.)				
Total	**25,544**	**0**	**0**	**25,544**
68B ...	25,544	0	0	25,544
39. Water and other sanitary services (s.)				
Total	**20,800**	**0**	**0**	**20,800**
68C ...	14,672	0	0	14,672
79	6,128	0	0	6,128
40. Fuel oil and coal (n.d.)				
Total	**6,102**	**305**	**4,794**	**11,201**
7	138	41	62	241
20+21	83	2	33	118
27A ...	192	23	79	294
31	5,498	239	4,620	10,356
68C ...	192	0	0	192
41. Telephone and telegraph (s.)				
Total	**51,879**	**0**	**0**	**51,879**
66	51,049	0	0	51,049
72A ...	830	0	0	830
42. Domestic service (s.)				
Total	**8,242**	**0**	**0**	**8,242**
73C ...	533	0	0	533
84	7,709	0	0	7,709
43. Other household operation (s.)				
Total	**24,691**	**2**	**20**	**24,714**
54	44	2	16	63
65B ...	5,996	0	0	5,996
65C ...	114	0	0	114
65D ...	36	0	0	36
69B ...	12	0	0	12
70B ...	3,275	0	0	3,275
72B ...	4,131	0	0	4,131
73B ...	92	0	0	92
73C ...	4,712	0	0	4,712
78	6,269	0	0	6,269
81	10	0	4	14
45. Drug preparations and sundries (n.d.)				
Total	**27,762**	**232**	**19,012**	**47,006**
24	1,620	43	682	2,345
27A ...	74	4	35	112
29A ...	23,958	164	16,617	40,738
31	24	1	17	41
32	323	12	227	561
54	41	1	18	60
55	7	0	5	12
62	1,718	7	1,413	3,137
46. Ophthalmic products and orthopedic appliances (d.)				
Total	**2,688**	**13**	**5,337**	**8,038**
58	194	3	284	480
62	548	2	1,014	1,564
63	1,940	8	4,040	5,988
81	6	0	0	6
47. Physicians (s.)				
Total	**99,923**	**0**	**0**	**99,923**
77A ...	99,923	0	0	99,923
48. Dentists (s.)				
Total	**26,416**	**0**	**0**	**26,416**
77A ...	26,416	0	0	26,416
49. Other professional medical services (s.)				
Total	**38,652**	**0**	**0**	**38,652**
73C ...	495	0	0	495
77A ...	38,158	0	0	38,158
51. Hospitals (s.)				
Total	**165,479**	**0**	**0**	**165,479**
77A ...	165,479	0	0	165,479
55. Nursing homes (s.)				
Total	**29,510**	**0**	**0**	**29,510**
77A ...	29,510	0	0	29,510
56. Health insurance (s.)				
Total	**21,305**	**0**	**0**	**21,305**
70B ...	21,305	0	0	21,305
61. Brokerage charges and investment counseling (s.)				
Total	**23,398**	**0**	**0**	**23,398**
70A ...	23,398	0	0	23,398
62. Bank service charges, trust services, and safe deposit box rental (s.)				
Total	**18,349**	**0**	**0**	**18,349**
70A ...	18,349	0	0	18,349
63. Services furnished without payment by financial intermediaries except life insurance carriers and private noninsured pension plans (s.)				
Total	**93,475**	**0**	**0**	**93,475**
70A ...	93,475	0	0	93,475
64. Expense of handling life insurance (s.)				
Total	**41,459**	**0**	**0**	**41,459**
70B ...	41,459	0	0	41,459
65. Legal services (s.)				
Total	**31,069**	**0**	**0**	**31,069**
73B ...	31,069	0	0	31,069
66. Funeral and burial expenses (s.)				
Total	**6,259**	**23**	**1,105**	**7,387**
36	466	21	1,081	1,569
42	11	2	24	36
65D ...	90	0	0	90
71B ...	1,022	0	0	1,022
72B ...	4,670	0	0	4,670
67. Other personal business (s.)				
Total	**12,087**	**0**	**0**	**12,087**
66	203	0	0	203
70A ...	568	0	0	568
70B ...	37	0	0	37
72B ...	1,230	0	0	1,230
73B ...	295	0	0	295
73C ...	1,331	0	0	1,331
73D ...	661	0	0	661
77B ...	7,541	0	0	7,541
78	161	0	0	161
80	62	0	0	62
70. New autos (d.)				
Total	**73,642**	**1,898**	**17,934**	**93,474**
59A ...	73,642	1,898	17,934	93,474
71. Net purchases of used autos (d.)				
Total	**14,070**	**0**	**14,209**	**28,280**
81	14,070	0	14,209	28,280
72. Other motor vehicles (d.)				
Total	**33,839**	**747**	**10,453**	**45,039**
59A ...	28,232	728	6,382	35,342
61	3,982	19	1,315	5,317
81	1,625	0	2,756	4,381
73. Tires, tubes, accessories, and other parts (d.)				
Total	**12,029**	**2,174**	**11,036**	**25,238**
19	120	1	117	238
29B ...	164	16	166	346
32	5,419	1,936	5,364	12,719
35	11	(*)	10	21
42	279	5	279	563
50	29	3	18	50
52	155	1	154	310
55	330	3	290	622
56	646	4	625	1,275
57	38	(*)	26	65
58	2,186	97	1,857	4,139
59B ...	3,133	108	2,107	5,348
81	–479	0	22	–457
74. Repair, greasing, washing, parking, storage, rental, and leasing (s.)				
Total	**67,759**	**0**	**202**	**67,961**
75	67,684	0	202	67,886
76	57	0	0	57
77B ...	18	0	0	18
75. Gasoline and oil (n.d.)				
Total	**54,666**	**2,229**	**28,460**	**85,355**
31	54,666	2,229	28,460	85,355
76. Bridge, tunnel, ferry, and road tolls (s.)				
Total	**2,016**	**0**	**0**	**2,016**
79	2,016	0	0	2,016
77. Motor vehicle insurance (s.)				
Total	**15,522**	**0**	**0**	**15,522**
70B ...	15,522	0	0	15,522
79. Mass transit systems (s.)				
Total	**4,583**	**0**	**0**	**4,583**
65A ...	4,583	0	0	4,583
80. Taxicab (s.)				
Total	**2,359**	**0**	**0**	**2,359**
65A ...	2,359	0	0	2,359

Table D.—Input-Output Commodity Composition of NIPA Personal Consumption Expenditures, in Producers' and Purchasers' Prices, 1987 Benchmark—Continued

[Millions of dollars]

NIPA code/I-O number	Producers' prices	Transportation costs	Wholesale and retail trade margins	Purchasers' prices
82. Railway (s.)				
Total	**576**	**0**	**0**	**576**
65A	576	0	0	576
83. Bus (s.)				
Total	**1,364**	**0**	**0**	**1,364**
65A	1,364	0	0	1,364
84. Airline (s.)				
Total	**19,935**	**0**	**0**	**19,935**
65D	19,935	0	0	19,935
85. Other intercity transportation (s.)				
Total	**2,061**	**0**	**0**	**2,061**
65A	177	0	0	177
65B	155	0	0	155
65C	133	0	0	133
65E	1,596	0	0	1,596
87. Books and maps (d.)				
Total	**7,887**	**149**	**4,968**	**13,004**
26B	7,875	149	4,924	12,948
69B	13	0	0	13
81	–1	0	44	43
88. Magazines, newspapers, and sheet music (n.d.)				
Total	**12,020**	**444**	**5,039**	**17,503**
26A	11,741	400	4,808	16,949
26B	421	44	231	695
81	–142	0	0	–142
89. Nondurable toys and sport supplies (n.d.)				
Total	**11,514**	**157**	**13,674**	**25,345**
1	134	9	19	162
3	319	0	257	576
13	406	4	397	807
17	41	1	46	88
24	137	6	138	281
26B	67	0	60	127
27A	235	37	338	610
32	62	2	79	143
53	6	(*)	6	12
55	100	1	128	229
58	186	2	169	357
63	1,472	7	2,146	3,624
64	8,339	89	9,892	18,320
72B	11	0	0	11
81	–1	0	1	(*)
90. Wheel goods, sports and photographic equipment, boats, and pleasure aircraft (d.)				
Total	**14,023**	**146**	**11,406**	**25,575**
13	693	1	681	1,376
19	508	3	549	1,060
32	91	30	121	242
33+34	217	4	245	466
42	194	8	173	375
43	461	5	228	693
58	38	1	5	44
60	316	1	88	405
61	7,025	60	3,720	10,806
62	111	(*)	129	241
63	1,214	6	1,770	2,989
64	2,490	27	3,270	5,787
73C	505	0	0	505
81	159	0	427	586
91. Video and audio products, computing equipment, and musical instruments (d.)				
Total	**23,508**	**254**	**19,356**	**43,118**
33+34	37	(*)	20	58
51	3,052	43	1,911	5,006
56	16,948	157	15,444	32,550
57	212	1	118	331
58	1,407	13	806	2,226
64	861	12	568	1,441
73A	855	0	322	1,177
80	115	27	87	229
81	22	0	78	100
92. Radio and television repair (s.)				
Total	**3,510**	**0**	**0**	**3,510**
57	13	0	0	13
72B	3,168	0	0	3,168
73C	329	0	0	329
93. Flowers, seeds, and potted plants (n.d.)				
Total	**4,128**	**590**	**4,432**	**9,149**
2	3,988	588	4,423	8,998
73C	130	0	0	130
80	10	2	9	21
95. Motion picture theaters (s.)				
Total	**3,443**	**0**	**0**	**3,443**
65D	12	0	0	12
76	3,362	0	0	3,362
77B	70	0	0	70
96. Legitimate theaters and opera, and entertainments of nonprofit institutions (except athletics) (s.)				
Total	**4,087**	**0**	**0**	**4,087**
76	3,938	0	0	3,938
77B	149	0	0	149
97. Spectator sports (s.)				
Total	**3,366**	**0**	**0**	**3,366**
76	1,942	0	0	1,942
77B	1,424	0	0	1,424
98. Clubs and fraternal organizations (s.)				
Total	**7,098**	**0**	**0**	**7,098**
76	5,056	0	0	5,056
77B	2,041	0	0	2,041
99. Commercial participant amusements (s.)				
Total	**6,051**	**0**	**0**	**6,051**
65C	1,171	0	0	1,171
76	4,880	0	0	4,880
100. Pari-mutuel net receipts (s.)				
Total	**3,010**	**0**	**0**	**3,010**
76	3,010	0	0	3,010
101. Other recreational expenditures (s.)				
Total	**56,808**	**68**	**1,105**	**57,982**
1	969	66	363	1,398
3	778	1	28	806
4	647	0	0	647
65A	896	0	0	896
65C	313	0	0	313
65D	126	0	0	126
66	10,711	0	0	10,711
67	1,326	0	0	1,326
70B	39	0	0	39
72A	2,170	0	0	2,170
72B	3,614	0	0	3,614
73C	4,553	0	313	4,866
76	20,114	0	0	20,114
77A	3,529	0	0	3,529
77B	802	0	0	802
79	6,007	0	0	6,007
80	(*)	2	1	3
81	214	0	401	615
103. Higher education (s.)				
Total	**33,788**	**0**	**0**	**33,788**
77B	33,788	0	0	33,788
104. Nursery, elementary, and secondary schools (s.)				
Total	**14,496**	**0**	**0**	**14,496**
77B	14,496	0	0	14,496
105. Other private education and research (s.)				
Total	**13,692**	**0**	**0**	**13,692**
76	365	0	0	365
77B	13,328	0	0	13,328
106. Religious and welfare activities (s.)				
Total	**75,284**	**0**	**0**	**75,284**
77B	75,284	0	0	75,284
108. Foreign travel by U.S. residents (s.)				
Total	**33,932**	**0**	**0**	**33,932**
65C	1,741	0	0	1,741
65D	9,058	0	0	9,058
80	23,134	0	0	23,134
109. Expenditures abroad by U.S. residents (n.d.)				
Total	**3,888**	**0**	**0**	**3,888**
80	3,888	0	0	3,888
110. Expenditures in the United States by nonresidents (s.)				
Total	**–30,323**	**0**	**0**	**–30,323**
83	–30,323	0	0	–30,323
111. Personal remittances in kind to nonresidents (n.d.)				
Total	**–813**	**0**	**0**	**–813**
83	–813	0	0	–813
Personal consumption expenditures				
Total	**2,566,099**	**20,949**	**485,204**	**3,072,252**
Durable commodities (d.)				
Total	**249,778**	**6,528**	**158,931**	**415,237**
Nondurable commodities (n.d.)				
Total	**673,095**	**14,328**	**323,840**	**1,011,264**
Services (s.)				
Total	**1,643,226**	**93**	**2,433**	**1,645,752**

*Less than $500,000.

NOTE.—The identifying numbers for the personal consumption categories are those used in table 2.4 in the *National Income and Product Accounts of the United States, Volume 2, 1959–88.*

Personal consumption expenditures of scrap, used and secondhand goods (I-O 81) from other final demand components are shown net of corresponding sales. (Sales among persons cancel.) However, the trade margin has been measured on all sales of used goods—both among persons and between personal consumption expenditures and other final demand categories—to the extent that such sales pass through trade channels. The trade margin is usually the largest part of the value of used goods in purchasers' prices.

Table E.—Input-Output Commodity Composition of NIPA Producers' Durable Equipment Expenditures, in Producers' and Purchasers' Prices, 1987 Benchmark

[Millions of dollars]

NIPA code/I-O number	Producers' prices	Transportation costs	Wholesale and retail trade margins	Purchasers' prices
5. Computers and peripheral equipment				
Total	**29,802**	**74**	**6,652**	**36,528**
51	29,809	74	5,878	35,761
81	–7	0	774	767
6. Office equipment except computers				
Total	**4,259**	**52**	**1,820**	**6,131**
50	517	7	105	628
51	3,455	45	1,605	5,106
73A	10	0	0	10
73B	232	0	0	232
81	46	0	109	155
7. Communication equipment				
Total	**40,319**	**168**	**1,562**	**42,050**
13	198	0	0	198
38	36	1	5	42
51	213	2	41	256
56	21,663	132	1,319	23,113
58	2,643	22	137	2,801
62	9,546	12	61	9,619
66	4,389	0	0	4,389
73B	1,585	0	0	1,585
81	47	0	0	47
8. Instruments				
Total	**11,669**	**58**	**2,129**	**13,856**
62	11,137	58	2,129	13,324
73B	502	0	0	502
81	30	0	0	30
9. Photocopy and related equipment				
Total	**8,635**	**30**	**2,520**	**11,185**
62	2,635	6	427	3,067
63	5,653	24	2,093	7,770
73B	304	0	0	304
81	44	0	0	44
11. Fabricated metal products				
Total	**6,285**	**148**	**696**	**7,129**
5+6	446	23	21	489
27A	795	0	0	795
37	13	0	0	13
39	21	1	1	23
40	2,811	20	296	3,127
42	1,931	106	378	2,414
46	4	0	0	4
73B	264	0	0	264
12. Engines and turbines				
Total	**1,811**	**27**	**171**	**2,009**
43	2,302	27	171	2,500
73B	64	0	0	64
81	–556	0	0	–556
13. Metalworking machinery				
Total	**13,442**	**168**	**2,137**	**15,747**
47	12,651	165	1,977	14,793
48	228	3	46	278
73B	558	0	0	558
81	4	0	114	118
14. Special industry machinery, n.e.c.				
Total	**16,182**	**187**	**2,683**	**19,052**
32	78	3	18	99
42	14	(*)	11	26
48	14,615	179	2,463	17,257
49	821	6	30	856
52	2	0	0	2
58	10	(*)	1	11
73B	640	0	0	640
81	2	0	160	162
15. General industrial, including materials handling, equipment				
Total	**16,167**	**189**	**1,855**	**18,211**
44+45	36	1	7	44
46	5,029	97	1,033	6,159
48	2	0	(*)	2
49	10,238	90	683	11,011
50	197	1	17	214
73B	667	0	0	667
81	–1	0	116	114
16. Electrical transmission, distribution, and industrial apparatus				
Total	**11,794**	**147**	**1,263**	**13,203**
47	788	16	123	927
53	5,878	106	820	6,803
62	4,719	25	320	5,064
73B	410	0	0	410
18. Trucks, buses, and truck trailers				
Total	**26,585**	**614**	**2,696**	**29,895**
59A	21,685	559	2,104	24,347
59B	6,591	55	323	6,969
81	–1,690	0	270	–1,421
19. Autos				
Total	**24,652**	**1,063**	**3,121**	**28,836**
59A	41,248	1,063	2,775	45,086
81	–16,596	0	346	–16,250
20. Aircraft				
Total	**9,144**	**11**	**564**	**9,718**
22+23	179	2	32	213
60	8,843	7	135	8,985
62	876	2	6	883
81	–754	0	391	–363
21. Ships and boats				
Total	**1,657**	**2**	**165**	**1,824**
61	1,301	2	153	1,456
81	356	0	13	369
22. Railroad equipment				
Total	**1,311**	**31**	**20**	**1,361**
61	1,285	31	7	1,322
73B	33	0	0	33
81	–7	0	13	6
24. Furniture and fixtures				
Total	**15,756**	**125**	**2,701**	**18,582**
22+23	15,109	125	2,631	17,865
73B	664	0	0	664
81	–16	0	69	53
25. Tractors				
Total	**3,913**	**99**	**2,400**	**6,411**
44+45	3,925	99	2,347	6,371
81	–12	0	52	41
26. Agricultural machinery, except tractors				
Total	**3,281**	**92**	**1,739**	**5,112**
44+45	3,134	92	1,169	4,395
58	11	(*)	1	12
73B	168	0	0	168
81	–32	0	570	537
27. Construction machinery, except tractors				
Total	**7,116**	**261**	**1,430**	**8,807**
44+45	6,847	261	1,247	8,354
73B	313	0	0	313
81	–43	0	183	140
28. Mining and oilfield machinery				
Total	**924**	**29**	**279**	**1,232**
8	84	0	0	84
44+45	801	29	123	952
49	14	(*)	1	15
73B	45	0	0	45
81	–20	0	156	136
29. Service industry machinery				
Total	**7,581**	**76**	**2,544**	**10,201**
50	34	1	1	35
52	7,184	75	2,543	9,802
73B	346	0	0	346
81	18	0	0	18
30. Electrical equipment, n.e.c.				
Total	**6,294**	**51**	**958**	**7,302**
48	208	3	42	252
54	391	11	40	441
55	435	4	110	549
58	91	5	16	113
62	4,901	28	750	5,679
73B	270	0	0	270
81	–2	0	0	–2
31. Other nonresidential equipment				
Total	**8,163**	**353**	**3,529**	**12,044**
17	1,087	24	442	1,554
20+21	5	(*)	1	6
32	62	1	10	73
44+45	2,167	32	1,808	4,007
61	598	40	217	855
64	3,876	255	1,052	5,183
73B	445	0	0	445
81	–77	0	0	–77
32. Sale of equipment scrap, excluding autos				
Total	**–2,520**	**0**	**0**	**–2,520**
81	–2,520	0	0	–2,520
33. Residential (landlord durables)				
Total	**3,807**	**92**	**1,966**	**5,864**
17	1,282	29	521	1,832
22+23	179	1	9	189
32	15	(*)	8	23
54	2,266	61	1,409	3,736
56	65	(*)	19	85
Producers' durable equipment				
Total	**278,028**	**4,144**	**47,598**	**329,771**

(*) Less than $500,000.

NOTE.—The identifying numbers for the producers' durable equipment categories are those used in table 5.8 in the *National Income and Product Accounts of the United States, Volume 2, 1959–88.*

(I-O 85), which is a NIPA adjustment to derive GDP (see appendix B, which begins on page A-2, for a complete listing of I-O special industries).

The I-O commodity classification system is closely related to that for industries. Each commodity receives the code of the industry in which the commodity is the primary product. This code is then used to group production of the commodity in the industry in which it is the primary product with its production in other industries in which it is a secondary product.

In several cases, the I-O commodity classification differs from that specified by the industry classification. If the same commodity is the primary product of more than one SIC industry, all of the I-O commodity is assigned the I-O commodity number that corresponds to the I-O industry that is the largest producer of the commodity. This results in there being no commodity output for the following detailed I-O commodity groups: Forest products (commodity 2.0701); knit outerwear mills (commodity 18.0201); knit underwear and nightwear mills (commodity 18.0202); knitting mills, n.e.c. (commodity 18.0203); fertilizers, mixing only (commodity 27.0202); cold-rolled steel sheet, strip, and bars (commodity 37.0104); steel pipe and tubes (commodity 37.0105); secondary nonferrous metals (commodity 38.0600); Federal electric utilities (78.0200); State and local government passenger transit (commodity 79.0100); and State and local government electric utilities (commodity 79.0200).

Definitions and conventions for valuation

Transactions in commodities are typically valued in I-O accounts at producers' prices, which exclude distribution costs (transportation costs and wholesale and retail trade margins), but include excise taxes collected and paid by producers. Transportation costs and trade margins are shown as separate purchases by the users of the commodities. The sum of the producers' value, transportation costs, and trade margins equals the purchasers' value.

The I-O tables do not trace actual flows of commodities to and from wholesale trade and retail trade. If trade were shown as buying and reselling commodities, industrial and final users would make most of their purchases from a single source—trade. To show the relationship between the production of commodities and their purchase by intermediate and final users, commodities are shown as if they move directly to users, bypassing trade. The margin associated with a commodity is shown as a separate purchase of the commodity from wholesale trade and retail trade by users. Transportation costs are the freight charges paid to bring the commodity from the producer to the user, either intermediate or final. All transportation costs are included in the transportation rows (in the "Summary Tables," rows 65A-E) of the use table.

Wholesale trade has one primary product—distributive services for the sale of goods to retailers, intermediate users, and final users other than for PCE. Examples of distributive services provided by wholesalers include merchandise handling, stocking, selling, and billing.

Wholesale trade output is measured one way for merchant wholesalers and agents and brokers (on own account) and another way for manufacturers' sales branches. For merchant wholesalers and agents and brokers (on own account), wholesale margin is measured as wholesale sales receipts less the cost of goods sold plus taxes collected by the distributor. For manufacturers' sales branches, it is measured as expenses plus taxes collected by the sales branches.

Nonmargin output occurs when the wholesale trade service is purchased separately from the commodity. Nonmargin output includes, for example, a sales commission paid to a wholesaler acting as a broker. Nonmargin output is measured as the sum of expenses on goods sold by manufacturers' sales offices, commissions on goods sold by agents and brokers, and customs duties. Wholesale trade output—both margin and nonmargin—is included in the wholesale trade row (in the "Summary Tables," row 69A) of the use table.

Retail trade has one primary product—distributive services for the sale of goods to persons. Retail output is defined as the retail margin, which is measured as retail sales less the cost of goods sold plus the taxes collected—if any—by retail trade establishments.

Retail trade margins also apply to some purchases of goods by other users; for example, retail trade margins apply to some purchases of personal computers by business and are included in gross private fixed investment. All retail trade margins are included in the retail trade row (in the "Summary Tables," row 69B) of the use table.

Imports of goods and services, a component of final uses, are treated in one of two ways, depending on whether or not they are comparable to U.S. commercially produced goods and services. Those that are comparable are included in the use table along with the distribution of the output of their domestic counterparts. The U.S. domestic port values of imported commodities are shown as negative entries in the imports of goods and services column of final use (in the "Summary Tables," column 95), so that the row total for a commodity equals the domestic output of that commodity. Other

imported goods and services—those not comparable to U.S. commercially produced goods and services, and those purchased and used abroad by U.S. residents—are shown in the use table row for noncomparable imports (in the "Summary Tables," row 80). Examples of noncomparable imports are coffee beans and parakeets; an example of goods purchased and used abroad by U.S. residents is food purchased by U.S. military personnel stationed abroad. The total value of all noncomparable imports is shown as a single negative entry in the imports of goods and services column (in the "Summary Tables," column 95).

Imports of goods *by commodity* (the entries in column 95 of the "Summary Tables") are valued at U.S. domestic port values plus duties. Imports of services are valued at producers' values. The entries for transportation imports and for trade imports include adjustments that convert the *total of all commodity imports* of goods and services to a foreign port value equivalent. This adjustment is made for conceptual consistency between the I-O accounts and the NIPA's and the balance of payments accounts.

Exports of goods and services by commodity are valued in U.S. producers' prices. Total exports, however, include transportation costs and wholesale trade margins (which are shown as separate entries) and are thus valued in U.S. purchasers' prices, which are considered to be equivalent to U.S. domestic port values. Exports, like imports, are also a component of final uses.

Inventory change, another component of final uses, represents the change in inventory of each commodity, wherever held, over the benchmark year. It is stated at book value—that is, at its original cost—in the use table. The inventory valuation adjustment, which converts total inventory change from book value to replacement cost, is shown as a single entry for the total of all commodities (in the "Summary Tables," row 85, column 93).

Supplementary tables

Four supplementary tables that can be used with the five basic sets of summary I-O tables are provided on pages M-14–19 and on this page. Three (tables C-E) cover the I-O commodity composition of NIPA final demand, of NIPA PCE, and of NIPA PDE; a fourth (table F) reconciles I-O exports of goods and services and imports of goods and services with NIPA estimates. (Two detailed tables, D.1 and E.1, that are comparable to summary tables D and E are provided on pages 391–96.)

The commodity composition tables are necessary as bridges between the I-O accounts and the NIPA's because the two sets of accounts are based on different valuations and definitions. In the I-O accounts, final use categories are expressed in producers' prices; in the NIPA's, final demand categories are expressed in purchasers' prices. Before the I-O total requirements tables can be used to measure and analyze the changes in commodity or industry output requirements arising from changes in the level or composition of NIPA final demand, NIPA final demand categories must be converted to equivalent I-O final use categories. That is to say, the analysis should be consistent with I-O final use commodities that are valued at producers' prices for the I-O year, with separate entries for transportation costs and trade margins.

Table C shows the I-O commodity composition in 1987 of each NIPA category of final demand in producers' and purchasers' prices. It provides a bridge between I-O commodities in producers' prices and NIPA final demand categories in purchasers' prices. For each I-O commodity within a category of NIPA final demand, the table shows the transportation costs and trade margins included in the purchasers' prices.

Table D shows the I-O commodity composition in 1987 of each NIPA category of PCE (as listed in NIPA table 2.4) in producers' and purchasers' prices.[25] It provides a bridge between I-O commodities in producers' prices and NIPA PCE categories in purchasers' prices. For each I-O commodity within a NIPA category, the table shows the transportation costs and trade margins included in the purchasers' prices.

Table E shows the I-O commodity composition in 1987 of each NIPA category of PDE expenditures (as listed in NIPA table 5.8) in producers' and purchasers' prices. It provides a bridge between I-O commodities

25. The abbreviations in parentheses after the NIPA titles designate whether the NIPA category is a durable (d.), a nondurable (n.d.), or a service (s.).

Table F.—Relation of Exports and Imports in the Input-Output Accounts to the National Income and Product Accounts, 1987 Benchmark

[Millions of dollars]

	1987
Exports of goods and services, NIPA	363,952
Less: U.S. merchandise returned	6,781
Reexports	8,875
Plus: Statistical revisions, BPA	276
Equals: Exports of goods and services, I-O	348,572
Imports of goods and services, NIPA	507,050
Less: U.S. merchandise returned	6,781
Reexports	8,875
Plus: Statistical revisions, BPA	–952
Equals: Imports of goods and services, I-O	490,442

NIPA National income and product accounts
BPA Balance of payments accounts
I-O Input-output accounts

in producers' prices and NIPA PDE categories in purchasers' prices. For each commodity, the table shows the transportation costs and trade margins included in the purchasers' prices. This table is useful for analyses relating the effects of changes in investment on industry and commodity output.

Table F reconciles the I-O estimates of exports and imports of goods and services with those in the NIPA's. The same adjustments are made for both exports and imports; therefore, there is no net effect on total GDP. The adjustments are necessary because the NIPA's—unlike the I-O accounts—include in imports the U.S. merchandise that is returned to the United States from other countries and in exports the foreign merchandise that is reexported from the United States to other countries.[26] The NIPA's also exclude definitional and statistical revisions to the balance of payments accounts between NIPA comprehensive revisions.

26. U.S. merchandise returned consists of domestically produced goods that were previously exported to other countries for processing or assembly, or both, and then returned to the United States. An example would be articles of metal that are manufactured in the United States, then exported for further processing abroad, and then returned to the United States for more processing. Reexports consists of commodities of foreign origin that were previously imported into the United States and then exported from the United States in substantially the same condition as when imported. An example would be imported foreign-made monitors that are purchased by U.S. personal computer manufacturers, joined with U.S.-made consoles, and then exported to a third foreign country.

Detailed Series

How to read the tables

The tables for the detailed series (that is, at the six-digit I-O level) of I-O estimates for industries and commodities cover 480 industries and more than 500 commodities. These tables, which begin on page 45, are presented in columnar form with zeros omitted, so that they are easy to use, especially for users who are interested in only a few industries or commodities. This presentation is in contrast to that for the tables for the summary series (two-digit I-O level) of I-O estimates, which are typically presented in matrix form, where all estimates can be viewed simultaneously.

The make table for industries

The make table for industries (table 1A (rows) of the "Detailed Tables") shows the industries and the commodities that they produced, in millions of dollars at producers' prices, for six-digit industries and commodities.[27] This table presents information that corresponds to that presented in the rows in the summary I-O make table (table 1 of the "Summary Tables").

The information for each industry is contained in three columns. The first column shows the I-O code for the six-digit producing industry. The second column shows the I-O codes for the six-digit commodities that the industry produced. The third column shows the total value of the commodities that the industry produced and then the value of the output of the commodities listed in the second column. For example, the first entry in the table shows, in the first column, the six-digit *industry* 1.0100, dairy farm products. The second column shows that this industry produced four *commodities*: 1.0100, dairy farm products; 4.0001, agricultural, forestry, and fishery services; 14.0600, fluid milk; and 76.0206, other amusement and recreation services.[28] The third column shows that the total value of commodities produced by the dairy farm products industry was $18,507.1 million in producers' prices in 1987. This total consisted of $15,833.4 million, $81.6 million, $2,581.7 million, and $10.4 million for the commodities shown in the second column.

The make table for commodities

The make table for commodities (table 1B (columns) of the "Detailed Tables") shows the commodities and the industries that produced them, in millions of dollars at producers' prices, for six-digit commodities and industries. This table presents information that corresponds to that presented in the columns in the summary I-O make table (table 1 of the "Summary Tables").

The information for each commodity is contained in three columns. The first column shows the I-O code for the six-digit commodity that was produced. The second column shows the I-O codes for the six-digit industries that produced the commodity, either as a primary producer or as a secondary producer. The third column shows the total value of the output of that commodity and then the values of the commodity output produced by the industries listed in the second column. For example, the first entry in the table shows, in the first column, the six-digit *commodity* 1.0100, dairy farm products. The second column shows that there was only one producing industry, the six-digit *industry* 1.0100, dairy farm products. The third column shows that the total value of dairy farm products produced by the dairy farm products industry was $15,833.4 million in producers' prices in 1987.

Similarly, moving down the first column to the first multiple-industry entry, we see that for the *commodity* 3.0001, forestry products, the total value of output of this commodity was $6,371.7 million (shown in the third column). This output was produced by three *industries* (shown in the second column): 1.0302, miscellaneous livestock, which produced $243.3 million; 2.0701, forest products, $1,788.1 million; and 3.0001, forestry products, $4,340.3 million.

27. The I-O accounts use two classification systems, one for industries and another for commodities, but both systems generally use the same I-O numbers and titles. For further information, see the section "Definitions and conventions for classification," on page M-12, and "Appendix B: Industry Classification of the 1987 Benchmark Input-Output Accounts," which begins on page A-2.

28. The other amusement and recreation services commodity consists of receipts that the dairy farm products industry receives for services provided at public golf courses, amusement parks, and the like. The full list of service areas is provided by the related SIC codes shown in appendix B.

The use table for commodities

The use table for commodities (table 2A (rows) of the "Detailed Tables") shows for each commodity, the dollar value used by each industry and final user, in millions of dollars at producers' prices, for six-digit commodities, industries, and final uses. This table presents information that corresponds to that presented in the rows in the summary I-O use table (table 2.1 of the "Summary Tables").

The information for each commodity is contained in three columns. The first column shows the I-O code for the six-digit commodity that was used. The second column shows the I-O codes for the six-digit industries and the final users of the commodity. The third column shows the total value of the commodity that the industries used and then the value of the commodity used by each industry and final user listed in the second column. For example, the first entry in the table shows, in the first column, the six-digit *commodity* 1.0100, dairy farm products. The second and third columns show that most of the $15,833.4 million of this commodity was used by 13 *industries*, but that some of it was sold to final users (that is, PCE) and some of it went into inventories. For example, $191.6 million of the commodity was used by 1.0301, the meat animals industry; $1.2 million by 2.0100, the cotton industry; $5.0 by 2.0201, the food grains industry; $94.3 million was sold to 91.0000, PCE; and $2.7 million went into 93.0000, change in business inventories.

The use table for industries

The use table for industries (table 2B (columns) of the "Detailed Tables") shows the industries and the commodities and value added components that they used, in millions of dollars at producers' prices, for six-digit industries and commodities. This table presents information that corresponds to that presented in the columns in the summary I-O use table (tables 2.1 and 2.2 of the "Summary Tables").

The information for each industry is contained in three columns. The first column shows the I-O code for a six-digit industry or final user. The second column shows the I-O codes for the six-digit commodities and value added components that were used. The third column shows the total value of the commodities and value added that the industry used and then the values for each commodity and value added component. For example, the first entry in the table shows, in the first column, the six-digit *industry* 1.0100, dairy farm products. The second and third columns show that this industry used 88 different commodities and 3 value added components to produce its output. For example, of the $18,507.1 million in *commodities* and *value added* that it used, $27.8 million was in food grains, 2.0201; $8,736.2 million in feed grains, 2.0202; $1,060.0 million in agricultural, forestry, and fishery services, 4.0001; $848.7 million in compensation of employees, 88.0000; and $1,928.2 in other value added, 90.0000, which includes components such as consumption of fixed capital, corporate profits, and business transfer payments.[29]

Commodity output requirements for each commodity

The commodity requirements for each commodity table (table 4A of the "Detailed Tables") shows the six-digit commodities that were required directly and indirectly to deliver a dollar of a commodity to final users. This table presents information that corresponds to that presented in the summary I-O commodity-by-commodity total requirements table (table 4 of the "Summary Tables"); however, this table presents the 15 largest required commodities and an "all other" category that summarizes the requirements for the remaining commodities.[30] For a majority of the commodities, the largest 15 required account for at least 75 percent of the total requirements. At the maximum, the "all other" category accounts for approximately 33 percent of the total multiplier (for I-O 61.0603, motor homes). The largest coefficient in any "all other" category is 0.02939 (for I-O 14.1502, prepared feeds, n.e.c., where it accounts for less than 1 percent of the multiplier). The coefficients in this table are referred to as "commodity-by-commodity total requirements coefficients."

The information for each commodity is contained in three columns. The first column shows the I-O code for the six-digit commodity that was delivered to final users. The second column shows the I-O codes for the 15 largest six-digit commodities that were required directly and indirectly to deliver a dollar of this commodity to final users. The third column shows the total commodity output multiplier, which is the total amount of commodity output required to deliver a dollar of the commodity listed in the first column to final users, and then the requirements for the 15 commodities and the "all other" group that appear in the second column. For example, the first entry in the table shows, in the first column, the six-digit *commodity* 1.0100, dairy farm products, that

29. For the composition of value added and other value added, see footnotes 3 and 6.

30. Multipliers for all commodities are contained on the diskettes offered for sale in the section "Availability of Estimates," on page M-27.

was delivered to final users (that is, in I-O terminology, demanded by final users). The second column shows that among the *commodities* required to deliver a dollar of this commodity to final users were, for example, 1.0100, dairy farm products; 2.0202, feed grains; and 2.0600, oil bearing crops. The third column shows that the total *commodity* output required to deliver a dollar of the *commodity* dairy farm products was $2.82038. The requirements for dairy farm products were $1.00681; for feed grains, $0.51149; for oil bearing crops, $0.02732; and for "all other," $0.54193.

Industry output requirements for each commodity

The industry output requirements for each commodity table (table 5A of the "Detailed Tables") shows the output required directly and indirectly from each industry to deliver a dollar of a commodity to final users. This table presents information that corresponds to that presented in the summary I-O industry-by-commodity total requirements table (table 5 of the "Summary Tables"); however, this table presents the 15 largest producing industries and an "all other" group, which summarizes the requirements for the remaining industries that produced output used in the commodity. For a majority of the commodities, the largest 15 required account for at least 75 percent of the total requirements. At the maximum, the "all other" category accounts for approximately 38 percent of the total multiplier (for I-O 14.3202, food preparations, n.e.c.). The largest coefficient in any "all other" category is 0.03374 (for I-O 38.1400, nonferrous forgings, where it accounts for slightly more than 1 percent of the multiplier). The coefficients in this table are referred to as "industry-by-commodity total requirements coefficients."

The information for each industry is contained in three columns. The first column shows the I-O code for the six-digit commodity that was delivered to final users. The second column shows the I-O codes for the 15 largest six-digit industries that produced outputs used, directly and indirectly, in the production of the commodity listed in the first column. The third column shows the total industry output multiplier, which is the total amount of industry output required to deliver a dollar of the commodity listed in the first column to final users, and then the requirements for the 15 largest industries and the "all other" group that appear in the second column. For example, the first entry in the table shows, in the first column, the six-digit *commodity* 1.0100, dairy farm products, which was delivered to final users. The second column shows, for example, that the *industries* 1.0100, dairy farm products; 2.0202, feed grains; and 2.0600, oil bearing crops, produced outputs used in the production of this commodity. The third column shows that the total *industry* output required to deliver a dollar of the *commodity* dairy farm products was $2.81400. Of this, the dairy farm products industry was required to produce $1.00735; feed grains, $0.51342; oil bearing crops, $0.02855; and "all other" industries, $0.55775.

I-O commodity composition of NIPA PCE

The I-O commodity composition of NIPA PCE table (table D.1 of the "Detailed Tables") shows the six-digit I-O commodity composition of each NIPA PCE category (as listed by line number code in NIPA table 2.4) in millions of dollars valued at producers' prices. The table also provides information by six-digit I-O code for transportation costs and wholesale and retail trade margins for the sum of the commodities within each PCE category. By providing these costs and margins, the table provides a bridge between I-O commodities valued in producers' prices and NIPA PCE valued in purchasers' prices. This table presents information that corresponds to that presented in the summary I-O commodity composition of PCE table (table D, beginning on page M-16).

The information for each PCE category is contained in two columns under each NIPA code number and title. The first column shows the six-digit codes for the I-O commodities, transportation costs, and wholesale and retail trade margins that constituted the NIPA category. The second column shows, as the first entry, the total for the I-O commodity composition of the NIPA PCE category valued in purchasers' prices; this total is composed of the sum of the commodities valued in producers' prices and the transportation costs and trade margins in the category. The second entry is the total for the six-digit I-O commodities valued in producers' prices. This entry is followed by the values for the individual commodities, the total for transportation costs and for wholesale and retail trade margins, and the values for the individual transportation costs and wholesale and retail trade margins for the NIPA category.

For example, the first entry in the table shows the NIPA code 3 and category title "Food purchased for off-premise consumption (n.d.)." As shown in the first column, in 1987 this category consisted of I-O *commodities* such as 1.0200, poultry and eggs; 2.0202, feed grains; 2.0401, fruits; and *transportation costs and trade margins* such as 65.0100, railroads and related services, and 69.0100, wholesale trade. The second column shows that the total value of the commodities in the

NIPA category, in purchasers' prices, was $330,802.4 million. The total value of the six-digit commodities in the category, in producers' prices, was $211,016.1 million, which consisted of $1,721.7 million for poultry and eggs, $173.9 million for feed grains, $4,198.5 million for fruits, and so on down the column. The entry for transportation costs and trade margins shows that they totaled $119,786.3 million and consisted of $1,077.4 million for railroads and related services, $35,171.8 million for wholesale trade, and so on.

I-O commodity composition of NIPA PDE expenditures

The I-O commodity composition of NIPA PDE expenditures table (table E.1 of the "Detailed Tables") shows the six-digit I-O commodity composition of each NIPA PDE category (as listed by line number code in NIPA table 5.8) in millions of dollars valued at producers' prices. The table also provides information by six-digit I-O code for transportation costs and wholesale and retail trade margins for the sum of the commodities within each PDE category. By providing these costs and margins, the table provides a bridge between I-O commodities valued in producers' prices and NIPA PDE valued in purchasers' prices. This table presents information that corresponds to that presented in the summary I-O commodity composition of PDE expenditures table (table E, on page M-19).

The information for each PDE category is contained in two columns under each NIPA code number and title. The first column shows the six-digit codes for the I-O commodities, transportation costs, and wholesale and retail trade margins that constituted the NIPA category. The second column shows, as the first entry, the total for the I-O commodity composition of the NIPA PDE category valued in purchasers' prices; this total is composed of the sum of the commodities valued in producers' prices and the transportation costs and trade margins in the category. The second entry is the total for the six-digit I-O commodities valued in producers' prices. This entry is followed by the values for the individual commodities, the total for transportation costs and for wholesale and retail trade margins, and the values for the individual transportation costs and wholesale and retail trade margins for the NIPA category.

For example, the first entry in the table shows the NIPA code 5 and title "Computers and peripheral equipment." As shown in the first column, in 1987 this category consisted of the I-O *commodities* 51.0103, electronic computers; 51.0104, computer peripheral equipment; 81.0002, used and secondhand goods; and *transportation costs and trade margins* such as 65.0100, railroads and related services, and 69.0100, wholesale trade. The second column shows that the total value of the commodities in the NIPA category, in purchasers' prices, was $36,527.7 million. The total value of the six-digit commodities in the category, in producers' prices, was $29,802.1 million, which consisted of $16,502.7 million for electronic computers and $13,306.1 million for computer peripheral equipment, less $6.7 million in sales of used goods. The entry for transportation costs and trade margins shows that they totaled $6,725.6 million and consisted of $0.5 million for railroads and related services, $6,139.7 million for wholesale trade, and so on.

Availability of Estimates

The estimates from the 1987 benchmark I-O accounts are available on diskette at the summary, two-digit level (95 I-O industries) and the detailed, six-digit level (480 I-O industries). The two-digit estimates can be ordered for "all," and the six-digit estimates can be ordered for "transactions," "total requirements," "NIPA final demand," and "NIPA PCE and PDE." The "all" diskettes contain the make table, use table, direct requirements coefficients table, estimates by commodity of transportation costs and of wholesale and retail trade margins, and industry-by-commodity and commodity-by-commodity total requirements coefficients. The "transactions" diskettes contain the make table, use table, direct requirements coefficients table, and estimates by commodity of transportation costs and of wholesale and retail trade margins. The "total requirements" diskettes contain industry-by-commodity or commodity-by-commodity coefficients. The "NIPA final demand" diskettes contain the I-O commodity composition of NIPA final demand. The "NIPA PCE and PDE" diskettes contain the I-O commodity composition of the NIPA PCE and PDE expenditures categories. Each product includes information on the mathematical derivation of the coefficients tables. The BEA accession numbers and the prices for these products are listed below.

For further information about I-O products or when ordering by MasterCard or Visa, call the Interindustry Economics Division at (202) 606–5585. To order by mail, write to the Public Information Office, Order Desk, BE-53, Bureau of Economic Analysis, U.S. Department of Commerce, Washington, DC 20230. Specify the item, accession number, and price of the product. For foreign shipment, add 25 percent to the total amount of the order. A check or money order payable to "Bureau of Economic Analysis" must accompany all written orders. Be sure to include a return address.

Item	BEA accession number	Price
Diskettes (3 1/2" HD):		
1987 benchmark six-digit, transactions (set of diskettes)	51–94–40–001	$40
1987 benchmark six-digit, industry-by-commodity total requirements (set of diskettes)	51–94–40–002	40
1987 benchmark six-digit, commodity-by-commodity total requirements (set of diskettes)	51–94–40–003	40
1987 benchmark two-digit, all	51–94–40–004	20
1987 benchmark commodity composition of NIPA final demand	51–94–40–005	20
1987 benchmark PCE and PDE by NIPA category	51–94–40–006	20

BEA's 1987 benchmark I-O accounts, at both the summary and detailed levels, are also available on CD-ROM through the Commerce Department's National Economic, Social, and Environmental Data Bank (NESE-DB) CD-ROM. The NESE-DB CD-ROM is produced quarterly in February, May, August, and November. Call STAT-USA at (202) 482–1986 for more information or to place an order. The NESE-DB CD-ROM is available for public use at over 900 Federal Depository Libraries.

Appendix A

Chronological List of Selected SURVEY OF CURRENT BUSINESS Input-Output Articles

1. Morris R Goldman, Martin L. Marimont, and Beatrice N. Vaccara, "The Interindustry Structure of the United States: A Report on the 1958 Input-Output Study," November 1964.

2. "Industrial Impact of the 1966 Housing and Commercial Building Decline," November 1966.

3. "Input-Output Structure of the U.S. Economy: 1963," November 1969.

4. Allan H. Young and Claiborne M. Ball, "Industrial Impacts of Residential Construction and Mobile Home Production," October 1970.

5. Beatrice N. Vaccara, "An Input-Output Method for Long-Range Economic Projections," July 1971, Part I.

6. Philip M. Ritz and Eugene P. Roberts, "Industry Inventory Requirements: An Input-Output Analysis," November 1973.

7. "The Input-Output Structure of the U.S. Economy: 1967," February 1974.

8. Irving Stern, "Industry Effects of Government Expenditures: An Input-Output Analysis," May 1975.

9. Philip M. Ritz, "The Input-Output Structure of the U.S. Economy, 1972," February 1979.

10. Philip M. Ritz, Eugene P. Roberts, and Paula C. Young, "Dollar-Value Tables for the 1972 Input-Output Study," April 1979.

11. "The Input-Output Structure of the U.S. Economy, 1977," May 1984.

12. "Benchmark Input-Output Accounts for the U.S. Economy, 1982," July 1991.

13. "Annual Input-Output Accounts of the U.S. Economy, 1987," April 1992.

14. "Benchmark Input-Output Accounts for the U.S. Economy, 1987," April 1994.

15. "Benchmark Input-Output Accounts for the U.S. Economy, 1987: Requirements Tables," May 1994.

Appendix B

Industry Classification of the 1987 Benchmark Input-Output Accounts

[The titles in boldface represent the industries used for the summary version of the 1987 tables. An asterisk preceding an SIC code indicates that the SIC industry is included in more than one I-O industry. For a description of the systems used in the I-O accounts, see the section ''Definitions and conventions for classification.'']

	I-O industry number and title	Related 1987 SIC codes
	AGRICULTURE, FORESTRY, AND FISHERIES	
1	**Livestock and livestock products:**	
	1.0100 Dairy farm products	024,*019, *0259, *029
	1.0200 Poultry and eggs	0251-3, *0259, *019, *0219, *029
	1.0301 Meat animals	0211-4, *0219, *019, *0259, *029
	1.0302 Miscellaneous livestock	0271-3, *0279, *019, *0219, *0259, *029
2	**Other agricultural products:**	
	2.0100 Cotton	0131, *019, *0219, *0259, *029
	2.0201 Food grains	*011, *019, *0219, *0259, *029
	2.0202 Feed grains	*011, *0139, *019, *0219, *0259, *029
	2.0203 Grass seeds	*0139, *019, *0219, *0259, *029
	2.0300 Tobacco	0132, *019, *0219, *0259, *029
	2.0401 Fruits	0171-2, 0174-5, *0179, *019, *0219, *0259, *029
	2.0402 Tree nuts	0173, *0179, *019, *0219, *0259, *029
	2.0501 Vegetables	0134, *0139, 016, *019, *0219, *0259, *029, *0119
	2.0502 Sugar crops	0133, *019, *0219, *0259, *029
	2.0503 Miscellaneous crops	*0119, *0139, *019, *0219, *0259, *029
	2.0600 Oil bearing crops	0116, *0119, *0139, *0219, *0259, *029
	2.0701 Forest products	*018, *019, *0219, *0259, *029
	2.0702 Greenhouse and nursery products	*018, *019, *0219, *0259, *029
3	**Forestry and fishery products:**	
	3.0001 Forestry products	081, 083, 097
	3.0002 Commercial fishing	091
4	**Agricultural, forestry, and fishery services:**	
	4.0001 Agricultural, forestry, and fishery services	0254, *0279, 071-2, 075-6, 085, 092
	4.0002 Landscape and horticultural services	078
	MINING	
5+6	**Metallic ores mining:**	
	5.0000 Iron and ferroalloy ores	101, 106
	6.0100 Copper ore	102
	6.0200 Nonferrous metal ores, except copper	103-4, 109, *108
7	**Coal mining:**	
	7.0000 Coal	122-3, *124
8	**Crude petroleum and natural gas:**	
	8.0000 Crude petroleum and natural gas	131-2, *138
9+10	**Nonmetallic minerals mining:**	
	9.0001 Dimension, crushed and broken stone	141-2
	9.0002 Sand and gravel	144
	9.0003 Clay, ceramic, and refractory minerals	145
	9.0004 Nonmetallic mineral services and miscellaneous minerals.	*148, 149
	10.0000 Chemical and fertilizer minerals	147
	CONSTRUCTION	
11+12	**Construction:**	
	11.0000 New and maintenance and repair	15-17, 6552
	11.0601 Petroleum and natural gas well drilling	*138
	11.0602 Petroleum, natural gas, and solid mineral exploration.	*138, *108, *124, *148
	11.0603 Access structures for solid mineral development.	*108, *124, *148
	12.0215 Maintenance and repair of petroleum and natural gas wells.	*138
	MANUFACTURING	
13	**Ordnance and accessories:**	
	13.0100 Guided missiles and space vehicles	3761
	13.0200 Ammunition, except for small arms, n.e.c.	3483
	13.0300 Tanks and tank components	3795
	13.0500 Small arms	3484
	13.0600 Small arms ammunition	3482
	13.0700 Ordnance and accessories, n.e.c.	3489
14	**Food and kindred products:**	
	14.0101 Meat packing plants	2011
	14.0102 Sausages and other prepared meat products.	2013
	14.0105 Poultry slaughtering and processing	2015
	14.0200 Creamery butter	2021
	14.0300 Natural, processed, and imitation cheese	2022
	14.0400 Dry, condensed, and evaporated dairy products.	2023
	14.0500 Ice cream and frozen desserts	2024
	14.0600 Fluid milk	2026
	14.0700 Canned and cured fish and seafoods	2091

I-O industry number and title		Related 1987 SIC codes
14.0800	Canned specialties	2032
14.0900	Canned fruits, vegetables, preserves, jams, and jellies.	2033
14.1000	Dehydrated fruits, vegetables, and soups	2034
14.1100	Pickles, sauces, and salad dressings	2035
14.1200	Prepared fresh or frozen fish and seafoods.	2092
14.1301	Frozen fruits, fruit juices, and vegetables	2037
14.1302	Frozen specialties, n.e.c.	2038
14.1401	Flour and other grain mill products	2041
14.1402	Cereal breakfast foods	2043
14.1403	Prepared flour mixes and doughs	2045
14.1501	Dog and cat food	2047
14.1502	Prepared feeds, n.e.c.	2048
14.1600	Rice milling	2044
14.1700	Wet corn milling	2046
14.1801	Bread, cake, and related products	2051, *546
14.1802	Cookies and crackers	2052
14.1803	Frozen bakery products, except bread	2053
14.1900	Sugar	2061-3
14.2001	Candy and other confectionery products	2064
14.2002	Chocolate and cocoa products	2066
14.2003	Chewing gum	2067
14.2004	Salted and roasted nuts and seeds	2068
14.2101	Malt beverages	2082
14.2102	Malt	2083
14.2103	Wines, brandy, and brandy spirits	2084
14.2104	Distilled and blended liquors	2085
14.2200	Bottled and canned soft drinks	2086
14.2300	Flavoring extracts and flavoring syrups, n.e.c.	2087
14.2400	Cottonseed oil mills	2074
14.2500	Soybean oil mills	2075
14.2600	Vegetable oil mills, n.e.c.	2076
14.2700	Animal and marine fats and oils	2077
14.2800	Roasted coffee	2095
14.2900	Edible fats and oils, n.e.c.	2079
14.3000	Manufactured ice	2097
14.3100	Macaroni, spaghetti, vermicelli, and noodles.	2098
14.3201	Potato chips and similar snacks	2096
14.3202	Food preparations, n.e.c.	2099
15	**Tobacco products:**	
15.0101	Cigarettes	211
15.0102	Cigars	212
15.0103	Chewing and smoking tobacco and snuff	213
15.0200	Tobacco stemming and redrying	214
16	**Broad and narrow fabrics, yarn and thread mills:**	
16.0100	Broadwoven fabric mills and fabric finishing plants.	221-3, 2261-2
16.0200	Narrow fabric mills	224
16.0300	Yarn mills and finishing of textiles, n.e.c.	2269, 2281-2
16.0400	Thread mills	2284
17	**Miscellaneous textile goods and floor coverings:**	
17.0100	Carpets and rugs	227
17.0600	Coated fabrics, not rubberized	2295
17.0700	Tire cord and fabrics	2296
17.0900	Cordage and twine	2298
17.1001	Nonwoven fabrics	2297
17.1100	Textile goods, n.e.c.	2299
18	**Apparel:**	
18.0101	Women's hosiery, except socks	2251
18.0102	Hosiery, n.e.c.	2252
18.0201	Knit outerwear mills	2253
18.0202	Knit underwear and nightwear mills	2254
18.0203	Knitting mills, n.e.c.	2259
18.0300	Knit fabric mills	2257-8
18.0400	Apparel made from purchased materials	231-8, *3999
19	**Miscellaneous fabricated textile products:**	
19.0100	Curtains and draperies	2391
19.0200	Housefurnishings, n.e.c.	2392
19.0301	Textile bags	2393
19.0302	Canvas and related products	2394
19.0303	Pleating and stitching	2395
19.0304	Automotive and apparel trimmings	2396
19.0305	Schiffli machine embroideries	2397
19.0306	Fabricated textile products, n.e.c.	2399
20+21	**Lumber and wood products:**	
20.0100	Logging	241
20.0200	Sawmills and planing mills, general	2421
20.0300	Hardwood dimension and flooring mills	2426
20.0400	Special product sawmills, n.e.c.	2429
20.0501	Millwork	2431
20.0502	Wood kitchen cabinets	2434
20.0600	Veneer and plywood	2435-6
20.0701	Structural wood members, n.e.c.	2439
20.0702	Prefabricated wood buildings and components.	2452
20.0703	Mobile homes	2451
20.0800	Wood preserving	2491
20.0901	Wood pallets and skids	2448
20.0903	Wood products, n.e.c.	2499
20.0904	Reconstituted wood products	2493
21.0000	Wood containers, n.e.c.	2441, 2449
22+23	**Furniture and fixtures:**	
22.0101	Wood household furniture, except upholstered.	2511
22.0102	Household furniture, n.e.c.	2519
22.0103	Wood television and radio cabinets	2517
22.0200	Upholstered household furniture	2512
22.0300	Metal household furniture	2514
22.0400	Mattresses and bedsprings	2515
23.0100	Wood office furniture	2521
23.0200	Office furniture, except wood	2522
23.0300	Public building and related furniture	253
23.0400	Wood partitions and fixtures	2541
23.0500	Partitions and fixtures, except wood	2542
23.0600	Drapery hardware and window blinds and shades.	2591
23.0700	Furniture and fixtures, n.e.c.	2599
24	**Paper and allied products, except containers:**	
24.0100	Pulp mills	261
24.0400	Envelopes	2677
24.0500	Sanitary paper products	2676
24.0701	Paper coating and glazing	2671-2
24.0702	Bags, except textile	2673-4
24.0703	Die-cut paper and paperboard and cardboard.	2675
24.0705	Stationery, tablets, and related products	2678
24.0706	Converted paper products, n.e.c.	2679
24.0800	Paper and paperboard mills	262-3
25	**Paperboard containers and boxes:**	
25.0000	Paperboard containers and boxes	265
26A	**Newspapers and periodicals:**	
26.0100	Newspapers	271
26.0200	Periodicals	272
26B	**Other printing and publishing:**	
26.0301	Book publishing	2731
26.0302	Book printing	2732
26.0400	Miscellaneous publishing	274
26.0501	Commercial printing	275
26.0601	Manifold business forms	276
26.0602	Blankbooks, looseleaf binders and devices.	2782
26.0700	Greeting cards	277
26.0802	Bookbinding and related work	2789
26.0803	Typesetting	2791
26.0806	Platemaking and related services	2796
27A	**Industrial and other chemicals:**	
27.0100	Industrial inorganic and organic chemicals.	281 (excl. *2819), 2865, 2869
27.0401	Gum and wood chemicals	2861
27.0402	Adhesives and sealants	2891
27.0403	Explosives	2892
27.0404	Printing ink	2893
27.0405	Carbon black	2895
27.0406	Chemicals and chemical preparations, n.e.c.	2899
27B	**Agricultural fertilizers and chemicals:**	
27.0201	Nitrogenous and phosphatic fertilizers	2873-4
27.0202	Fertilizers, mixing only	2875
27.0300	Pesticides and agricultural chemicals, n.e.c.	2879
28	**Plastics and synthetic materials:**	
28.0100	Plastics materials and resins	2821
28.0200	Synthetic rubber	2822
28.0300	Cellulosic manmade fibers	2823
28.0400	Manmade organic fibers, except cellulosic.	2824
29A	**Drugs:**	
29.0100	Drugs	283
29B	**Cleaning and toilet preparations:**	
29.0201	Soap and other detergents	2841
29.0202	Polishes and sanitation goods	2842
29.0203	Surface active agents	2843
29.0300	Toilet preparations	2844

I-O industry number and title		Related 1987 SIC codes
30	**Paints and allied products:**	
30.0000	Paints and allied products	285
31	**Petroleum refining and related products:**	
31.0101	Petroleum refining	291
31.0102	Lubricating oils and greases	2992
31.0103	Products of petroleum and coal, n.e.c.	2999
31.0200	Asphalt paving mixtures and blocks	2951
31.0300	Asphalt felts and coatings	2952
32	**Rubber and miscellaneous plastics products:**	
32.0100	Tires and inner tubes	301
32.0200	Rubber and plastics footwear	302
32.0300	Fabricated rubber products, n.e.c.	306
32.0400	Miscellaneous plastics products, n.e.c.	308
32.0500	Rubber and plastics hose and belting	3052
32.0600	Gaskets, packing, and sealing devices	3053
33+34	**Footwear, leather, and leather products:**	
33.0001	Leather tanning and finishing	311
34.0100	Boot and shoe cut stock and findings	313
34.0201	Shoes, except rubber	3143-4, 3149
34.0202	House slippers	3142
34.0301	Leather gloves and mittens	315
34.0302	Luggage	316
34.0303	Women's handbags and purses	3171
34.0304	Personal leather goods, n.e.c.	3172
34.0305	Leather goods, n.e.c.	319
35	**Glass and glass products:**	
35.0100	Glass and glass products, except containers.	321, 3229, 323
35.0200	Glass containers	3221
36	**Stone and clay products:**	
36.0100	Cement, hydraulic	324
36.0200	Brick and structural clay tile	3251
36.0300	Ceramic wall and floor tile	3253
36.0400	Clay refractories	3255
36.0500	Structural clay products, n.e.c.	3259
36.0600	Vitreous china plumbing fixtures	3261
36.0701	Vitreous china table and kitchenware	3262
36.0702	Fine earthenware table and kitchenware	3263
36.0800	Porcelain electrical supplies	3264
36.0900	Pottery products, n.e.c.	3269
36.1000	Concrete block and brick	3271
36.1100	Concrete products, except block and brick.	3272
36.1200	Ready-mixed concrete	3273
36.1300	Lime	3274
36.1400	Gypsum products	3275
36.1500	Cut stone and stone products	328
36.1600	Abrasive products	3291
36.1700	Asbestos products	3292
36.1900	Minerals, ground or treated	3295
36.2000	Mineral wool	3296
36.2100	Nonclay refractories	3297
36.2200	Nonmetallic mineral products, n.e.c.	3299
37	**Primary iron and steel manufacturing:**	
37.0101	Blast furnaces and steel mills	3312
37.0102	Electrometallurgical products, except steel.	3313
37.0103	Steel wiredrawing and steel nails and spikes.	3315
37.0104	Cold-rolled steel sheet, strip, and bars	3316
37.0105	Steel pipe and tubes	3317
37.0200	Iron and steel foundries	332
37.0300	Iron and steel forgings	3462
37.0401	Metal heat treating	3398
37.0402	Primary metal products, n.e.c.	3399
38	**Primary nonferrous metals manufacturing:**	
38.0100	Primary smelting and refining of copper	3331
38.0400	Primary aluminum	3334, *2819
38.0501	Primary nonferrous metals, n.e.c.	3339
38.0600	Secondary nonferrous metals	334
38.0700	Rolling, drawing, and extruding of copper	3351
38.0800	Aluminum rolling and drawing	3353-5
38.0900	Nonferrous rolling and drawing, n.e.c.	3356
38.1000	Nonferrous wiredrawing and insulating	3357
38.1100	Aluminum castings	3363, 3365
38.1200	Copper foundries	3366
38.1300	Nonferrous castings, n.e.c.	3364, 3369
38.1400	Nonferrous forgings	3463
39	**Metal containers:**	
39.0100	Metal cans	3411
39.0200	Metal shipping barrels, drums, kegs, and pails.	3412
40	**Heating, plumbing, and fabricated structural metal products:**	
40.0100	Enameled iron and metal sanitary ware	3431
40.0200	Plumbing fixture fittings and trim	3432
40.0300	Heating equipment, except electric and warm air furnaces.	3433
40.0400	Fabricated structural metal	3441
40.0500	Metal doors, sash, frames, molding, and trim.	3442
40.0600	Fabricated plate work (boiler shops)	3443
40.0700	Sheet metal work	3444
40.0800	Architectural and ornamental metal work	3446
40.0901	Prefabricated metal buildings and components.	3448
40.0902	Miscellaneous structural metal work	3449
41	**Screw machine products and stampings:**	
41.0100	Screw machine products, bolts, etc.	3451-2
41.0201	Automotive stampings	3465
41.0202	Crowns and closures	3466
41.0203	Metal stampings, n.e.c.	3469
42	**Other fabricated metal products:**	
42.0100	Cutlery	3421
42.0201	Hand and edge tools, except machine tools and handsaws.	3423
42.0202	Saw blades and handsaws	3425
42.0300	Hardware, n.e.c.	3429
42.0401	Plating and polishing	3471
42.0402	Coating,engraving, and allied services, n.e.c..	3479
42.0500	Miscellaneous fabricated wire products	3495-6
42.0700	Steel springs, except wire	3493
42.0800	Pipe, valves, and pipe fittings	3491-2, 3494, 3498
42.1000	Metal foil and leaf	3497
42.1100	Fabricated metal products, n.e.c.	3499
43	**Engines and turbines:**	
43.0100	Turbines and turbine generator sets	3511
43.0200	Internal combustion engines, n.e.c.	3519
44+45	**Farm, construction, and mining machinery:**	
44.0001	Farm machinery and equipment	3523
44.0002	Lawn and garden equipment	3524
45.0100	Construction machinery and equipment	3531
45.0200	Mining machinery, except oil field	3532
45.0300	Oil and gas field machinery and equipment.	3533
46	**Materials handling machinery and equipment:**	
46.0100	Elevators and moving stairways	3534
46.0200	Conveyors and conveying equipment	3535
46.0300	Hoists, cranes, and monorails	3536
46.0400	Industrial trucks and tractors	3537
47	**Metalworking machinery and equipment:**	
47.0100	Machine tools, metal cutting types	3541
47.0200	Machine tools, metal forming types	3542
47.0300	Special dies and tools and machine tool accessories.	3544-5
47.0401	Power-driven handtools	3546
47.0402	Rolling mill machinery and equipment	3547
47.0404	Electric and gas welding and soldering equipment.	3548
47.0405	Industrial patterns	3543
47.0500	Metalworking machinery, n.e.c.	3549
48	**Special industry machinery and equipment:**	
48.0100	Food products machinery	3556
48.0200	Textile machinery	3552
48.0300	Woodworking machinery	3553
48.0400	Paper industries machinery	3554
48.0500	Printing trades machinery and equipment	3555
48.0600	Special industry machinery, n.e.c.	3559
49	**General industrial machinery and equipment:**	
49.0100	Pumps and compressors	3561, 3563
49.0200	Ball and roller bearings	3562
49.0300	Blowers and fans	3564
49.0500	Mechanical power transmission equipment.	3566, 3568
49.0600	Industrial process furnaces and ovens	3567
49.0700	General industrial machinery and equipment, n.e.c.	3569
49.0800	Packaging machinery	3565
50	**Miscellaneous machinery, except electrical:**	
50.0100	Carburetors, pistons, rings, and valves	3592
50.0200	Fluid power equipment	3593-4
50.0300	Scales and balances, except laboratory	3596

I-O industry number and title	Related 1987 SIC codes
50.0400 Industrial and commercial machinery and equipment, n.e.c.	3599
51 Computer and office equipment:	
51.0102 Calculating and accounting machines	3578
51.0103 Electronic computers	3571
51.0104 Computer peripheral equipment	3572, 3575, 3577
51.0400 Office machines, n.e.c.	3579
52 Service industry machinery:	
52.0100 Automatic vending machines	3581
52.0200 Commercial laundry equipment	3582
52.0300 Refrigeration and heating equipment	3585
52.0400 Measuring and dispensing pumps	3586
52.0500 Service industry machinery, n.e.c.	3589
53 Electrical industrial equipment and apparatus:	
53.0200 Power, distribution, and specialty transformers.	3612
53.0300 Switchgear and switchboard apparatus	3613
53.0400 Motors and generators	3621
53.0500 Relays and industrial controls	3625
53.0700 Carbon and graphite products	3624
53.0800 Electrical industrial apparatus, n.e.c.	3629
54 Household appliances:	
54.0100 Household cooking equipment	3631
54.0200 Household refrigerators and freezers	3632
54.0300 Household laundry equipment	3633
54.0400 Electric housewares and fans	3634
54.0500 Household vacuum cleaners	3635
54.0700 Household appliances, n.e.c.	3639
55 Electric lighting and wiring equipment:	
55.0100 Electric lamp bulbs and tubes	3641
55.0200 Lighting fixtures and equipment	3645-8
55.0300 Wiring devices	3643-4
56 Audio, video, and communication equipment:	
56.0100 Household audio and video equipment	3651
56.0200 Prerecorded records and tapes	3652
56.0300 Telephone and telegraph apparatus	3661
56.0500 Communication equipment	3663, 3669
57 Electronic components and accessories:	
57.0100 Electron tubes	3671
57.0200 Semiconductors and related devices	3674
57.0300 Other electronic components	3672, 3675-9
58 Miscellaneous electrical machinery and supplies:	
58.0100 Storage batteries	3691
58.0200 Primary batteries, dry and wet	3692
58.0400 Electrical equipment for internal combustion engines.	3694
58.0600 Magnetic and optical recording media	3695
58.0700 Electrical machinery, equipment, and supplies, n.e.c.	3699
59A Motor vehicles (passenger cars and trucks):	
59.0301 Motor vehicles and passenger car bodies	3711
59B Truck and bus bodies, trailers, and motor vehicles parts:	
59.0100 Truck and bus bodies	3713
59.0200 Truck trailers	3715
59.0302 Motor vehicle parts and accessories	3714
60 Aircraft and parts:	
60.0100 Aircraft	3721
60.0200 Aircraft and missile engines and engine parts.	3724, 3764
60.0400 Aircraft and missile equipment, n.e.c.	3728, 3769
61 Other transportation equipment:	
61.0100 Ship building and repairing	3731
61.0200 Boat building and repairing	3732
61.0300 Railroad equipment	374
61.0500 Motorcycles, bicycles, and parts	375
61.0601 Travel trailers and campers	3792
61.0603 Motor homes	3716
61.0700 Transportation equipment, n.e.c.	3799
62 Scientific and controlling instruments:	
62.0101 Search and navigation equipment	381
62.0102 Laboratory apparatus and furniture	3821
62.0200 Mechanical measuring devices	3823-4, 3829
62.0300 Environmental controls	3822
62.0400 Surgical and medical instruments and apparatus.	3841
62.0500 Surgical appliances and supplies	3842
62.0600 Dental equipment and supplies	3843
62.0700 Watches, clocks, watchcases, and parts	387
62.0800 X-ray apparatus and tubes	3844
62.0900 Electromedical and electrotherapeutic apparatus.	3845
62.1000 Laboratory and optical instruments	3826-7
62.1100 Instruments to measure electricity	3825
63 Ophthalmic and photographic equipment:	
63.0200 Ophthalmic goods	385
63.0300 Photographic equipment and supplies	386
64 Miscellaneous manufacturing:	
64.0101 Jewelry, precious metal	3911
64.0102 Jewelers' materials and lapidary work	3915
64.0104 Silverware and plated ware	3914
64.0105 Costume jewelry	3961
64.0200 Musical instruments	393
64.0301 Games, toys, and children's vehicles	3944
64.0302 Dolls and stuffed toys	3942
64.0400 Sporting and athletic goods, n.e.c.	3949
64.0501 Pens, mechanical pencils, and parts	3951
64.0502 Lead pencils and art goods	3952
64.0503 Marking devices	3953
64.0504 Carbon paper and inked ribbons	3955
64.0700 Fasteners, buttons, needles, and pins	3965
64.0800 Brooms and brushes	3991
64.0900 Hard surface floor coverings, n.e.c.	3996
64.1000 Burial caskets	3995
64.1100 Signs and advertising specialties	3993
64.1200 Manufacturing industries, n.e.c.	*3999
TRANSPORTATION, COMMUNICATIONS, AND UTILITIES	
65A Railroads and related services; passenger ground transportation:	
65.0100 Railroads and related services	40, 474, *4789
65.0200 Local and suburban transit and interurban highway passenger transportation.	41
65B Motor freight transportation and warehousing:	
65.0300 Motor freight transportation and warehousing.	42, *4789
65C Water transportation:	
65.0400 Water transportation	44
65D Air transportation:	
65.0500 Air transportation	45
65E Pipelines, freight forwarders, and related services:	
65.0600 Pipelines, except natural gas	46
65.0701 Freight forwarders and other transportation services.	473, 4783, 4785, *4789
65.0702 Arrangement of passenger transportation	472
66 Communications, except radio and TV:	
66.0000 Communications, except radio and TV	481-2, 484, 489
67 Radio and TV broadcasting:	
67.0000 Radio and TV broadcasting	483
68A Electric services (utilities):	
68.0100 Electric services (utilities)	491, *493
68B Gas production and distribution (utilities):	
68.0200 Gas production and distribution (utilities)	492, *493
68C Water and sanitary services:	
68.0301 Water supply and sewerage systems	494, 4952
68.0302 Sanitary services, steam supply, and irrigation systems.	4953, 4959, 496-7, *493
WHOLESALE AND RETAIL TRADE	
69A Wholesale trade:	
69.0100 Wholesale trade	50, 51
69B Retail trade:	
69.0200 Retail trade, except eating and drinking	52-7 (excl. *546), 59, *7389, 8042
FINANCE, INSURANCE, AND REAL ESTATE	
70A Finance:	
70.0100 Banking	60
70.0200 Credit agencies other than banks	61, 67 (excl. 6732)
70.0300 Security and commodity brokers	62

	I-O industry number and title	Related 1987 SIC codes
70B	**Insurance:**	
	70.0400 Insurance carriers	63
	70.0500 Insurance agents, brokers, and services	64
71A	**Owner-occupied dwellings:**	
	71.0100 Owner-occupied dwellings	.....
71B	**Real estate and royalties:**	
	71.0201 Real estate agents, managers, operators, and lessors.	65 (excl. 6552)
	71.0202 Royalties	.....
	SERVICES	
72A	**Hotels and lodging places:**	
	72.0100 Hotels and lodging places	70
72B	**Personal and repair services (except auto):**	
	72.0201 Laundry, cleaning, garment services, and shoe repair.	721, 725
	72.0202 Funeral service and crematories	726
	72.0203 Portrait photographic studios, and other miscellaneous personal services.	722, 729
	72.0204 Electrical repair shops	762
	72.0205 Watch, clock, jewelry, and furniture repair	763-4
	72.0300 Beauty and barber shops	723-4
73A	**Computer and data processing services:**	
	73.0104 Computer and data processing services	737
73B	**Legal, engineering, accounting, and related services:**	
	73.0301 Legal services	81
	73.0302 Engineering, architectural, and surveying services.	871
	73.0303 Accounting, auditing and bookkeeping, and miscellaneous services, n.e.c.	872, 89
73C	**Other business and professional services, except medical:**	
	73.0101 Miscellaneous repair shops	769
	73.0102 Services to dwellings and other buildings	734
	73.0103 Personnel supply services	736
	73.0105 Management and consulting services, testing and research labs.	874, 8731-2, 8734
	73.0106 Detective and protective services	7381-2
	73.0107 Miscellaneous equipment rental and leasing.	735
	73.0108 Photofinishing labs and commercial photography.	7384, 7335-6
	73.0109 Other business services	732, 7383, *7389, 7331, 7334, 7338
73D	**Advertising:**	
	73.0200 Advertising	731
74	**Eating and drinking places:**	
	74.0000 Eating and drinking places	58
75	**Automotive repair and services:**	
	75.0001 Automotive rental and leasing, without drivers.	751
	75.0002 Automotive repair shops and services	753, 7549
	75.0003 Automobile parking and car washes	752, 7542
76	**Amusements:**	
	76.0101 Motion picture services and theaters	781-3
	76.0102 Video tape rental	784
	76.0201 Theatrical producers (except motion picture), bands, orchestras and entertainers.	792
	76.0202 Bowling centers	793
	76.0203 Professional sports clubs and promoters	7941
	76.0204 Racing, including track operation	7948
	76.0205 Physical fitness facilities and membership sports and recreation clubs.	7991, 7997
	76.0206 Other amusement and recreation services.	791, 7992-3, 7996, 7999
77A	**Health services:**	
	77.0100 Doctors and dentists	801-3, 8041
	77.0200 Hospitals	806
	77.0301 Nursing and personal care facilities	805
	77.0302 Other medical and health services, including veterinarians.	074, 8043, 8049, 807-9
77B	**Educational and social services, and membership organizations:**	
	77.0401 Elementary and secondary schools	821
	77.0402 Colleges, universities, and professional schools.	822
	77.0403 Private libraries, vocational schools, and educational services, n.e.c.	823-4, 829
	77.0501 Business associations and professional membership organizations.	861-2
	77.0502 Labor organizations, civic, social, and fraternal associations.	863-4
	77.0503 Religious organizations	866
	77.0504 Other membership organizations	84, 865, 869, 8733, 6732
	77.0600 Job training and related services	833
	77.0700 Child day care services	835
	77.0800 Residential care	836
	77.0900 Social services, n.e.c.	832, 839
	GOVERNMENT ENTERPRISES	
78	**Federal Government enterprises:**	
	78.0100 U.S. Postal Service	43
	78.0200 Federal electric utilities	(1)
	78.0500 Other Federal Government enterprises	(1)
79	**State and local government enterprises:**	
	79.0100 State and local government passenger transit.	(1)
	79.0200 State and local government electric utilities.	(1)
	79.0300 Other State and local government enterprises.	(1)
	SPECIAL INDUSTRIES	
80	**Noncomparable imports:**	
	80.0000 Noncomparable imports	(2)
81	**Scrap, used and secondhand goods:**	
	81.0001 Scrap	(3)
	81.0002 Used and secondhand goods	(3)
82	**General government industry:**	
	82.0000 General government industry	(4)
83	**Rest of the world adjustment to final uses:**	
	83.0001 Rest of the world adjustment to final uses	(5)
84	**Household industry:**	
	84.0000 Household industry	(6)
85	**Inventory valuation adjustment:**	
	85.0000 Inventory valuation adjustment	(7)
	VALUE ADDED	
	88.0000 Compensation of employees	(8)
	89.0000 Indirect business tax and nontax liability	(8)
	90.0000 Other value added	(8)
	FINAL USES	
	91.0000 Personal consumption expenditures	(9)
	92.0000 Gross private fixed investment	(9)
	93.0000 Change in business inventories	(9)
	94.0000 Exports of goods and services	(9)
	95.0000 Imports of goods and services	(9)
	96.0000 Federal Government purchases, national defense.	(9)
	97.0000 Federal Government purchases, nondefense.	(9)
	98.0001 State and local government purchases, elementary and secondary public school systems.	(9)
	98.0002 State and local government purchases, public educational facilities beyond high school.	(9)
	98.0003 State and local government purchases, other education and libraries.	(9)
	99.1001 State and local government purchases, hospitals and categorical health programs.	(9)
	99.1002 State and local government purchases, public welfare institutions and activities.	(9)
	99.1003 State and local government purchases, public sewerage systems, capital account only.	(9)
	99.1004 State and local government purchases, sanitation.	(9)
	99.2001 State and local government purchases, police.	(9)
	99.2002 State and local government purchases, fire fighting organizations and auxiliary services.	(9)
	99.2003 State and local government purchases, correctional institutions.	(9)
	99.3001 State and local government purchases, public highways (excluding non-capital expenditures of toll roads).	(9)
	99.3002 State and local government purchases, waterports and airports, capital account only.	(9)
	99.3003 State and local government purchases, government-operated transit systems, capital account only.	(9)

I-O industry number and title	Related 1987 SIC codes
99.3004 State and local government purchases, other commerce activities, n.e.c., capital account only.	(9)
99.3005 State and local government purchases, gas and electric utilities, capital account only.	(9)
99.3006 State and local government purchases, government-operated water supply facilities, capital account only.	(9)
99.3007 State and local government purchases, redevelopment projects, capital account only.	(9)
99.3008 State and local government purchases, natural and agricultural resources and recreation facilities.	(9)
99.3009 State and local government purchases, other general government activities, n.e.c.	(9)
ADDENDUM: Special commodity groupings	
11 New construction:	
11.0101 Residential 1-unit structures, nonfarm	
11.0102 Residential 2-4 unit structures, nonfarm	
11.0103 Residential garden apartments	
11.0104 Residential high-rise apartments	
11.0105 Residential additions and alterations, nonfarm.	
11.0106 Hotels and motels	
11.0107 Dormitories and other group housing	
11.0201 Industrial buildings	
11.0202 Office buildings	
11.0203 Warehouses	
11.0204 Garages and service stations	
11.0205 Stores and restaurants	
11.0206 Religious buildings	
11.0207 Educational buildings	
11.0231 Hospitals	
11.0232 Residential institutions and other health-related facilities.	
11.0241 Amusement and recreation buildings	
11.0250 Other nonfarm buildings	
11.0301 Telephone and telegraph facilities	
11.0302 Railroads	
11.0303 Electric utility facilities	
11.0304 Gas utility facilities	
11.0305 Petroleum pipelines	
11.0306 Water supply facilities	
11.0307 Sewer system facilities	
11.0308 Local transit facilities	
11.0400 Highways and streets	
11.0501 Farm housing units and additions and alterations.	
11.0502 Farm service facilities	
11.0601 Petroleum and natural gas well drilling	
11.0602 Petroleum, natural gas, and solid mineral exploration.	
11.0603 Access structures for solid mineral development.	
11.0701 Military facilities	
11.0702 Dams and reservoirs	
11.0703 Other conservation and development facilities.	
11.0704 Other nonbuilding facilities	
12 Maintenance and repair construction:	
12.0100 Nonfarm residential structures	
12.0201 Other nonfarm buildings	
12.0202 Farm residential buildings	
12.0203 Farm service facilities	
12.0204 Telephone and telegraph facilities	
12.0205 Railroads	
12.0206 Electric utility facilities	
12.0207 Gas utility facilities	
12.0208 Petroleum pipelines	
12.0209 Water supply facilities	
12.0210 Sewer facilities	
12.0211 Local transit facilities	
12.0212 Military facilities	
12.0213 Conservation and development facilities	
12.0214 Highways and streets	
12.0215 Petroleum and natural gas wells	
12.0216 Other nonbuilding facilities	

1. Although the SIC assigns the same codes to activities of both private firms and government agencies, SIC codes in the I-O accounts are used only for classifying private activities.
2. Noncomparable imports include imported goods and services that are not commercially produced in the United States, and goods and services that are produced abroad and used abroad by U.S. residents—for example, defense spending abroad.
3. Industry output is zero because there is no primary producing industry. Scrap is a secondary product of many industries, and used goods are sales and purchases typically between final uses. The sales are shown as negative values in the use table.
4. Industry output is defined as the compensation of general government employees except for those engaged in construction work; their compensation is included in the construction industry. It also excludes the compensation of employees of government enterprises.
5. The commodity entries include adjustments to PCE and government purchases that eliminate items that are actually exports.
6. Industry output is defined as the compensation of domestic household workers.
7. The inventory valuation adjustment converts the inventory changes based on withdrawals valued primarily at historical cost as reported by most businesses to replacement cost, the valuation used in the I-O accounts.
8. There are no related SIC codes since these categories are not industries, but are categories of income.
9. There are no related SIC codes since these categories are not industries, but are categories of final uses.

Appendix C

Components of the Measures of Output and Intermediate Inputs

This appendix supplements information provided in tables A and B in the text. It provides information on the components of the measures of industry and commodity output and intermediate inputs for the 1987 I-O benchmark. The material in this appendix is arranged by major industry group. For each group, the text discusses the most important I-O conventions, components, and adjustments that are made to derive the output and input measures. The tables that follow each major group show more detail on the components and adjustments for each two-digit I-O industry and commodity output measure. In the tables, components are listed generally by importance (size) or commonality to all included detailed industries, and adjustments are listed generally by order of I-O code.

As discussed in the text, the measures of industry and commodity output for the I-O accounts are prepared with several different types of data or different estimating procedures—value of shipments data, receipts or revenue data, expense data, and imputation or extrapolation procedures.[31] For I-O purposes, value of shipments data, adjusted for inventory change, provide the best measures of output; however, this type of data is generally available only for the manufacturing and mining industries. Receipts or revenue data are used for most of the other industries, because in many cases these data are the next best available measures of output or production. Receipts or revenue data give the value that an industry received for the goods and services that it provided. Expense data are sometimes used to value output when receipts or revenue data are unavailable, on the assumption that the costs of producing a product approximate the value of that product. Expense data are also used to value the output of nonprofit institutions that serve households; this treatment is consistent with the NIPA's.

Imputation procedures are used for some transactions that are not valued in the marketplace. Extrapolation procedures, based on appropriate indicators, are used for some transactions when current data are not available. Finally, for the wholesale and retail trade industries, output is measured as a residual, or generally as the difference between receipts or revenues and the cost of goods sold.

Generally, in the I-O accounts, industry output is intended to reflect the value of production for all establishments in a given industry as listed in appendix B, which begins on page A-2. Commodity output is intended to reflect the value of production of a commodity regardless of the industry classification of the establishments that produced the commodity. As noted in the text, the accounts are based on the SIC, but they incorporate a number of redefinitions and reclassifications of data, so there is not a strict correspondence between the two systems.[32]

Most of the inputs for the 1987 benchmark were estimated by extrapolating 1982 benchmark estimates by the change in industry output from 1982 to 1987. These estimates were then adjusted during the process of balancing commodities to equal commodity output totals. Other value added was calculated as a residual. In most cases, census data on selected inputs including compensation were also used.

I-O 1–4 Agriculture, Forestry, and Fisheries

Output

The output of the agriculture, forestry, and fisheries industries is measured based on the value of the commodities produced, rather than on the establishments that produced the output, because there are no data on

31. Imputations include both those that are part of the NIPA's, as well as others that are estimated for the I-O accounts.

32. See the section "Definitions and conventions for classification" on page M-12.

production of commodities by type of farm, either from the quinquennial census of agriculture or from any other source.[33]

When industry output is estimated on a commodity basis, two assumptions are made. First, it is assumed that each agricultural commodity is made in one industry only, although, in actuality, most establishments produce many agricultural products. For example, dairy farms are assumed to produce all domestically produced milk and to not produce any other agricultural products. Second, it is assumed that agricultural establishments produce secondary products, including services, that should be contained in the industry output measure. For example, all farms, including dairy farms, are assumed to provide recreational services and custom work (agricultural services) and to produce food that is processed on the farm and then either consumed by the farmer or sold.

The measure of output excludes the value of farm products attributable to nonfarm households or to industrial establishments and fish caught for sport or personal use; these exclusions are consistent with the NIPA's. Output also excludes cash subsidies paid directly to farmers. As discussed in the section "Definitions and

33. The I-O accounts exclude veterinary services from I-O 4 and include them with health services (I-O 77A).

Components of Industry and Commodity Output Measures for Agriculture, Forestry, and Fisheries

Industry output measure	Commodity output measure
1 Livestock and livestock products	
Includes: Cash marketings of products Inventory accumulation Farm-home consumption* Produced and consumed feed* Manure* Recreational services Custom work Custom feeding fees Interfarm, intrastate shipments of livestock Animal work power*	Industry output measure *Less:* Fur pelts (included in I-O 3) Custom work (included in I-O 4) Farm-home consumption (included in I-O 14) Processed bulk milk and packaged milk (included in I-O 14) Recreational services (included in I-O 76)
2 Other agricultural products	
Includes: Cash marketings of products Inventory accumulation (including CCC collateral) Farm-home consumption* Produced and consumed feed and seed* Recreational services Custom work Farm product warehousing and storage for CCC Forest products (including stumpage, Christmas trees, saw logs, and firewood) Greenhouse and nursery products	Industry output measure *Less:* Forest products (included in I-O 3) Custom work (included in I-O 4) Processed foods produced on farms (included in I-O 14) Saw logs and firewood (included in I-O 20+21) Farm product warehousing and storage for CCC (included in I-O 65B) Recreational services (included in I-O 76)
3 Forestry and fishery products	
Includes: Purchases of stumpage, less government production (split between I-O's 2 and 3) Christmas trees (split between I-O's 2 and 3) Game preserve products Forest nursery products Forest products (split between I-O's 2 and 3) Fishery landings	Industry output measure *Plus:* Fur pelts (from I-O 1) Forest products (from I-O 2)
4 Agricultural, forestry, and fishery services	
Includes: Poultry hatcheries Agricultural services Forestry services Fish hatcheries Landscape and horticultural services Employee tips Landscape services (redefined from I-O's 11+12 and 69B) Farm product preparation services (redefined from I-O 69A) Grooming and boarding of pets at pet shops (redefined from I-O 69B) *Excludes:* Cost of resales Custom slaughter of meat animals (redefined to I-O 14) Margin on sales of nursery plants (redefined to I-O 69B)	Industry output measure *Plus:* Custom work (from I-O's 1 and 2)

* Imputation
CCC Commodity Credit Corporation

conventions for classification," on page M-12, within other agricultural products (I-O 2), there is no commodity output for the detailed commodity group forest products, because all products of the industry are considered to be primary to other industries and portions are reclassified to other detailed commodity groups in forestry and fishery products (I-O 3), agricultural, forestry, and fishery services (I-O 4), and lumber and wood products (I-O 20+21).

Inputs

Inputs to the agriculture, forestry, and fisheries industries were estimated either from USDA data or by extrapolating 1982 I-O benchmark estimates by the change in industry output from 1982 to 1987. In all cases, BEA data on compensation by industry were also used.

For the agricultural products industries, inputs were estimated from USDA data for major types of inputs and were distributed to specific products by assuming that 1987 distributions were the same as those for 1982. Other value added was calculated by subtracting these inputs, BEA data on compensation by industry, and indirect business taxes from output.

For the other industries in this group, inputs were estimated by extrapolating 1982 benchmark estimates by the change in industry output from 1982 to 1987. These estimates were then adjusted during the process of balancing commodities to equal commodity output totals. Other value added was calculated in the same way as for agricultural products industries.

I-O 5–10 Mining

Output

The output of the mining industries is measured based on the value of shipments of both primary and secondary products for establishments with payrolls. Shipments are adjusted to a measure of production using the change in inventories of mined or quarried products. Estimates are included for the shipments of establishments with no payrolls and for other economic activities not covered by the census of mineral industries; an example would be receipts for research and development performed by auxiliaries and paid for by the Federal Government.

A number of mining activities are included in other industries. The most important are those included in the construction industries (I-O 11+12). In the I-O accounts, mining operations to develop mineral properties (that is, activities resulting in permanent improvements to the mine site) are considered to be construction activities; this treatment is consistent with the NIPA's.

For the solid mineral industries, the following activities are excluded from mining and included in construction: Exploration work, including geophysical and other exploratory surveying; prospect and test drilling; sinking mine shafts and driving mine tunnels. For the oil and gas industries, the following activities are excluded: Drilling of new wells and exploration. The excluded drilling activities include cementing, surveying, and acidizing, hydrofracturing, perforating casings, running, cutting, and drilling-in. However, the costs of drilling operations such as pumping wells and installation of equipment are not excluded, because they are considered to be mining activities.

Other adjustments are made to some of the mining industries and commodities. For example, reselling activities are redefined to wholesale trade (I-O 69A). Additionally, by I-O convention, when the same product is made in a mining industry and in a manufacturing industry, the industry output for that product is included with that of the industry where the activity occurred, and the commodity output is included with that of the manufacturing commodity. An example of this occurs in the treatment of processed feldspar. Processed feldspar produced by mining establishments is included in the

Components of Industry and Commodity Output Measures for Mining

Industry output measure	Commodity output measure
5+6 Metallic ores mining	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of mined or quarried products Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries *Excludes:* Cost of resales Solid mineral exploration (included in I-O 11+12) New access structures (included in I-O 11+12) Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of mined or quarried products Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries *Excludes:* Cost of resales Solid mineral exploration (included in I-O 11+12) New access structures (included in I-O 11+12) Margin on resales (included in I-O 69A)

Components of Industry and Commodity Output Measures for Mining—Continued

Industry output measure	Commodity output measure
7 Coal mining	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of mined or quarried products R&D at auxiliaries *Excludes:* Cost of resales Solid mineral exploration (included in I-O 11+12) New access structures (included in I-O 11+12) Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of mined or quarried products R&D at auxiliaries *Excludes:* Cost of resales Solid mineral exploration (included in I-O 11+12) New access structures (included in I-O 11+12) Margin on resales (included in I-O 69A)
8 Crude petroleum and natural gas	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of mined or quarried products R&D at auxiliaries *Excludes:* Cost of resales Residue gas shipments included in SIC 1321 commodity shipments (to avoid double counting) Oil and gas well drilling (included in I-O 11+12) Oil and gas well exploration (included in I-O 11+12) Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of mined or quarried products R&D at auxiliaries Natural gas liquids (from I-O 68B) *Excludes:* Cost of resales Residue gas shipments included in SIC 1321 commodity shipments (to avoid double counting) Oil and gas well drilling (included in I-O 11+12) Oil and gas well exploration (included in I-O 11+12) Liquified petroleum gases (included in I-O 31) Natural gas sold to final users for fuel or energy (included in I-O 68B) Margin on resales (included in I-O 69A)
9+10 Nonmetallic minerals mining	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of mined or quarried products Estimate of undercoverage of source data, including nonemployers *Excludes:* Cost of resales Solid mineral exploration (included in I-O 11+12) New access structures (included in I-O 11+12) Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of mined or quarried products Estimate of undercoverage of source data, including nonemployers *Excludes:* Cost of resales Solid mineral exploration (included in I-O 11+12) New access structures (included in I-O 11+12) Potash, soda, and borate minerals (included in I-O 27A) Prepared fluorspar (included in I-O 27A) Processed feldspar, mica, talc, and gypsum (included in I-O 36) Prepared barite (included in I-O 36) Margin on resales (included in I-O 69A)

R&D Research and development

nonmetallic minerals mining industry (I-O 9+10), but the commodity output of this product is included in the manufacturing commodity stone and clay products (I-O 36).

Inputs

Inputs to the mining industry were estimated primarily from census of mineral industries data on selected materials and supplies, fuels consumed, electricity usage, and communication services purchased. Other Census Bureau data on expenses of mining establishments, including payroll expenses, were used to estimate as many inputs as possible. The remaining inputs were estimated by extrapolating 1982 benchmark estimates by the change in industry output from 1982 to 1987. These estimates were then adjusted during the process of balancing commodities to equal commodity output totals. Other value added was calculated as a residual.

I-O 11+12 Construction

Output

The output of the construction industries is measured on an activity, or commodity, basis. In the I-O accounts, all construction work is assumed to be performed by the construction industry, and all nonconstruction activities of the construction industries are redefined out to other industries; therefore, industry and commodity output are the same. The industries and commodities are types of structures. For the 1987 I-O benchmark, the I-O measure used estimates that were part of the NIPA's, and all the new and maintenance and repair construction industries, except those related to mining, were combined into one industry. For commodities, all of the detail from earlier benchmarks was maintained.

The estimates, which were based on data by type of project or building, include contract construction

receipts for establishments with and without payrolls, as well as the value of force-account construction work (that is, work performed by an establishment's own employees).[34] Adjustments were made to exclude double-counting of subcontractors and to include receipts not reported in the source data.

The construction industry covers establishments primarily engaged in new work, additions, alterations, reconstruction, installations, and repairs. Construction work includes mechanical installations such as plumbing, heating, electrical work, elevators, and other similar structural components, as well as sidewalks, roads, and utility connections. For nonutility structures, the measure includes certain types of equipment, such as boilers and overhead traveling cranes, and the erection of fixed, largely site-fabricated equipment that is not housed in a building, such as a petroleum refinery or comparable chemical plant. For utilities, new construction includes components in plant accounts that are designated as structures rather than equipment.

34. The force-account construction estimates also include the value of labor and materials used in new residential construction performed by households on a do-it-yourself basis.

Output also includes various activities, such as drilling and exploration and improvements to mine sites, which are considered to be construction and not mining; this treatment is consistent with the NIPA's. A number of small adjustments involve redefinitions with the manufacturing and trade industries and the inclusion of engineering and architectural services that are capitalized and embedded in the value of finished construction projects.

Inputs

Inputs to the construction industry were generally estimated by the commodity flow methodology. In this process, each commodity was reviewed to determine if it was a construction material. If it was, an input to construction was generally estimated by subtracting all other purchases by all nonconstruction industries from total commodity supply, and then allocating the remainder to construction. For inputs other than construction materials, the estimates were generally made by extrapolating 1982 estimates, using the change in industry output from 1982 to 1987, and then balancing the commodities until they equalled the total output for

Components of Industry and Commodity Output Measures for Construction

Industry output measure	Commodity output measure
11+12 Construction	
Includes: Contract construction receipts Force-account construction activity* Revenues of land subdividers and developers Construction activities excluded from mining industries (from I-O's 5+6, 7, 8, and 9+10) Engineering and architectural services included in value of construction Estimate of undercoverage of source data Construction work by wholesalers (redefined from I-O 69A) Construction and installation work by retailers (redefined from I-O 69B) Repair of central air-conditioning equipment (redefined from I-O 72B) *Excludes:* Cost of resales Double counting of subcontractors Landscape services (redefined to I-O 4) Millwork (redefined to I-O 20+21) Paving mixtures (redefined to I-O 31) Concrete products and ready-mix concrete (redefined to I-O 36) Fabricated structural metal and sheet metal work (redefined to I-O 40) Commercial lighting fixtures (redefined to I-O 55) Trucking receipts of construction establishments (redefined to I-O 65B) Other telephone equipment installation charges (redefined to I-O 66) Margin on resales (redefined to I-O's 69A and 69B) Property management receipts of construction establishments (redefined to I-O 71B) Engineering and architectural services of construction establishments (redefined to I-O 73B) Repair services of construction establishments (redefined to I-O 73C) Equipment rental receipts (redefined to I-O 73C)	Industry output measure

* Imputation

each commodity. The compensation estimate was taken from the census of construction, and then estimates of compensation related to force-account construction, plus other adjustments, were added to derive compensation consistent with the I-O definition of this industry.

Inputs to the mining-related construction industries were based on data from the census of mineral industries, and the methodology that was used generally followed that for the mining industries.

I-O 13–64 Manufacturing

Output

The output of manufacturing industries is measured based on the value of shipments of both primary and secondary products, including miscellaneous receipts. For a few industries, output is estimated using the value of production, with an adjustment to finished product inventories to return to a shipments concept.[35] Shipments data are adjusted to a measure of production using the change in inventories of work-in-process and finished goods, less the cost of goods purchased for resale. Additions are made for research and development performed at auxiliaries and sold to the Federal Government, for services provided to foreign affiliates, for establishments with no payrolls, for misreporting by establishments covered by the census, and for excise taxes levied directly on the manufacturer.

A number of activities are redefined in and out of manufacturing industries. A redefinition out to wholesale trade (I-O 69A) is made for the margin on resales (the difference between the receipts from resales and the cost of goods resold). This redefinition affects most manufacturing industries.

The I-O classification system for manufacturing industries is consistent with the SIC system except for three activities that have input patterns different from their respective SIC industries. The classification is changed to provide more meaningful interindustry relationships for the following industries: Establishments primarily engaged in dressing and dyeing furs, in SIC 39996, are classified in I-O 18, apparel; establishments primarily producing alumina, in SIC 28195, are classified in I-O 38, primary nonferrous metals manufacturing; and receipts of retail bakeries that both bake and sell, in SIC 546, are included in I-O 14, food and kindred products.

With a few exceptions, commodity output is measured in the same way as industry output; it is based on data for shipments of commodities, wherever made, by manufacturing establishments. The output of many manufacturing commodities is adjusted to exclude the value of scrap sold, which is included with the output of other scrap in I-O 81.

As discussed in the section "Definitions and conventions for classification," on page M-12, there is no output for some commodities. Within apparel (I-O 18), portions of the output of three detailed commodity groups (knit outerwear mills, knit underwear and nightwear mills, and knitting mills, n.e.c.) are reclassified to another detailed apparel group (apparel made from purchased materials) and to a detailed group within I-O 19, miscellaneous fabricated textile products (house-furnishings, n.e.c.). Within agricultural fertilizers and chemicals (I-O 27B), the output of the detailed commodity group fertilizers, mixing only, is reclassified to nitrogenous and phosphatic fertilizers. Within primary iron and steel manufacturing (I-O 37), the output of two detailed commodity groups (cold-rolled steel sheet, strip, and bars and steel pipe and tubes) is reclassified to blast furnaces and steel mills. Within primary nonferrous metals manufacturing (I-O 38), portions of the output of the detailed commodity group secondary nonferrous metals are reclassified to three other detailed commodity groups (primary smelting and refining of copper, primary aluminum, and primary nonferrous metals, n.e.c.).

Inputs

Inputs to manufacturing industries were estimated primarily from census of manufactures data on materials and supplies, fuels consumed, electricity usage, and communication services purchased. Other Census Bureau data on expenses of manufacturing establishments, including payroll expenses, were used to estimate as many inputs as possible. The remaining inputs were estimated by extrapolating 1982 benchmark estimates by the change in industry output from 1982 to 1987. These estimates were then adjusted during the process of balancing commodities to equal commodity output totals. Other value added was calculated as a residual.

35. For 1987, the census of manufactures reported the value of production instead of the value of shipments for the following SIC's: 2032, 2033, 2035, 2037, 2038, 2085, 2091, 2092, 2111, 2121, 2131, 2141, and 3731.

Components of Industry and Commodity Output Measures for Manufacturing

Industry output measure	Commodity output measure
13 Ordnance and accessories	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Manufacturers' excise taxes *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Manufacturers' excise taxes *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
14 Food and kindred products	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates Manufacturers' excise taxes Custom slaughter of meat animals (redefined from I-O 4) Food processing by wholesalers (redefined from I-O 69A) Bakery products baked by retail establishments (redefined from I-O 69B) *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates Manufacturers' excise taxes Farm-home consumption (from I-O 1) Processed foods produced on farms (from I-O's 1 and 2) Custom slaughter of meat animals (from I-O 4) Food processing by wholesalers (from I-O 69A) Bakery products baked by retail establishments (from I-O 69B) *Excludes:* Cost of resales Margin on resales (included in I-O 69A)
15 Tobacco products	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Manufacturers' excise taxes Tobacco stemming and redrying at wholesalers (redefined from I-O 69A) *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Manufacturers' excise taxes Tobacco stemming and redrying at wholesalers (from I-O 69A) *Excludes:* Cost of resales Margin on resales (included in I-O 69A)
16 Broad and narrow fabrics, yarn and thread mills	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates Commission finishing by wholesalers (redefined from I-O 69A) *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates Commission finishing by wholesalers (from I-O 69A) *Excludes:* Cost of resales Wool tops and noils (included in I-O 17) Miscellaneous housefurnishings (included in I-O 19) Diapers (included in I-O 19) Textured, crimped, or bulked filament yarns made from purchased yarns (included in I-O 28) Margin on resales (included in I-O 69A)
17 Miscellaneous textile goods and floor coverings	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates Wool tops and noils (from I-O 16) *Excludes:* Cost of resales Margin on resales (included in I-O 69A)

Components of Industry and Commodity Output Measures for Manufacturing—Continued

Industry output measure	Commodity output measure
18 Apparel	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates Furs dressed by wholesalers (redefined from I-O 69A) Custom made garments (redefined from I-O 69B) *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates Furs dressed by wholesalers (from I-O 69A) Custom made garments (from I-O 69B) *Excludes:* Cost of resales Miscellaneous housefurnishings (included in I-O 19) Margin on resales (included in I-O 69A)
19 Miscellaneous fabricated textile products	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates Miscellaneous housefurnishings (from I-O's 16 and 18) Diapers (from I-O 16) *Excludes:* Cost of resales Margin on resales (included in I-O 69A)
20+21 Lumber and wood products	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Millwork (redefined from I-O's 11+12 and 69A) *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Saw logs and firewood (from I-O 2) Millwork (from I-O's 11+12 and 69A) Bark and mill residue (from I-O 24) *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
22+23 Furniture and fixtures	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
24 Paper and allied products, except containers	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Manufacturers' excise taxes *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Manufacturers' excise taxes *Excludes:* Cost of resales Bark and mill residue (included in I-O 20+21) Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)

Components of Industry and Commodity Output Measures for Manufacturing—Continued

Industry output measure	Commodity output measure
25 Paperboard containers and boxes	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
26A Newspapers and periodicals	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Advertising revenues (included in I-O 73D)
26B Other printing and publishing	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates Printing work by wholesalers (redefined from I-O 69A) *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates Printing work by wholesalers (from I-O 69A) *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Telephone directory, shopping news, catalog, and directory printing and publishing (included in I-O 73D) Other advertising products (included in I-O 73D)
27A Industrial and other chemicals	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Manufacturers' excise taxes *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Manufacturers' excise taxes Potash, soda, and borate minerals (from I-O 9+10) Prepared fluorspar (from I-O 9+10) Aromatics and liquified refinery gases, made in refineries, for chemical uses (from I-O 31) Light oil derivatives and coke oven tar (from I-O 37) Cyclic crudes and intermediates (from I-O 68B) *Excludes:* Cost of resales Aromatics and liquified refinery gases, not made in refineries, not for chemical uses (included in I-O 31) Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
27B Agricultural fertilizers and chemicals	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Manufacturers' excise taxes *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Manufacturers' excise taxes Ammonia (from I-O 37) *Excludes:* Cost of resales Margin on resales (included in I-O 69A)

Components of Industry and Commodity Output Measures for Manufacturing—Continued

Industry output measure	Commodity output measure
28 Plastics and synthetic materials	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Textured, crimped, or bulked filament yarns made from purchased yarns (from I-O 16) *Excludes:* Cost of resales Margin on resales (included in I-O 69A)
29A Drugs	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A)
29B Cleaning and toilet preparations	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A)
30 Paints and allied products	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A)
31 Petroleum refining and related products	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Manufacturers' excise taxes Paving mixtures (redefined from I-O 11+12) *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Manufacturers' excise taxes Liquified petroleum gases (from I-O 8) Paving mixtures (from I-O 11+12) Aromatics and liquified refinery gases, not made in refineries, not for chemical uses (from I-O 27A) Gasoline and oil (from I-O 68B) *Excludes:* Cost of resales Aromatics and liquified refinery gases, made in refineries, for chemical uses (included in I-O 27A) Margin on resales (included in I-O 69A)

Components of Industry and Commodity Output Measures for Manufacturing—Continued

Industry output measure	Commodity output measure
32 Rubber and miscellaneous plastics products	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates Manufacturers' excise taxes *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates Manufacturers' excise taxes *Excludes:* Cost of resales Margin on resales (included in I-O 69A)
33+34 Footwear, leather, and leather products	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A)
35 Glass and glass products	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
36 Stone and clay products	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Concrete products and ready-mix concrete (redefined from I-O 11+12) *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Processed feldspar, mica, talc, and gypsum (from I-O 9+10) Prepared barite (from I-O 9+10) Concrete products and ready-mix concrete (from I-O 11+12) South Dakota Cement Plant revenues (from I-O 79) *Excludes:* Cost of resales Margin on resales (included in I-O 69A)
37 Primary iron and steel manufacturing	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Light oil derivatives and coke oven tar (included in I-O 27A) Ammonia (included in I-O 27B) Noninsulated ferrous wire rope, cable, and strand (included in I-O 42) Fencing and fence gates (included in I-O 42) Ferrous wire cloth and other ferrous woven wire products (included in I-O 42) Other fabricated ferrous wire products (included in I-O 42) Coke oven gas (included in I-O 68B) Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)

Components of Industry and Commodity Output Measures for Manufacturing—Continued

Industry output measure	Commodity output measure
38 Primary nonferrous metals manufacturing	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Apparatus wire and cordage (from I-O 58) *Excludes:* Cost of resales Nonferrous wire cloth (included in I-O 42) Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
39 Metal containers	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
40 Heating, plumbing, and fabricated structural metal products	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Fabricated structural metal and sheet metal work (redefined from I-O 11+12) *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Fabricated structural metal and sheet metal work (from I-O 11+12) *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
41 Screw machine products and stampings	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
42 Other fabricated metal products	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Jewelry engraving (redefined from I-O 69B) *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Noninsulated ferrous wire rope, cable, and strand (from I-O 37) Fencing and fence gates (from I-O 37) Ferrous wire cloth and other ferrous woven wire products (from I-O 37) Other fabricated ferrous wire products (from I-O 37) Nonferrous wire cloth (from I-O 38) Jewelry engraving (from I-O 69B) *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)

Components of Industry and Commodity Output Measures for Manufacturing—Continued

Industry output measure	Commodity output measure
43 Engines and turbines	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
44+45 Farm, construction, and mining machinery	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Equipment rental and leasing (included in I-O 73C) Sales of scrap (included in I-O 81)
46 Materials handling machinery and equipment	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
47 Metalworking machinery and equipment	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
48 Special industry machinery and equipment	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
49 General industrial machinery and equipment	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)

Components of Industry and Commodity Output Measures for Manufacturing—Continued

Industry output measure	Commodity output measure
50 Miscellaneous machinery, except electrical	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Machine shop job work (redefined from I-O 69A) *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Machine shop job work (from I-O 69A) *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
51 Computer and office equipment	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Computer-related services (included in I-O 73A) Sales of scrap (included in I-O 81)
52 Service industry machinery	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
53 Electrical industrial equipment and apparatus	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
54 Household appliances	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
55 Electric lighting and wiring equipment	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Commercial lighting fixtures (redefined from I-O 11+12) *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Commercial lighting fixtures (from I-O 11+12) *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)

Components of Industry and Commodity Output Measures for Manufacturing—Continued

Industry output measure	Commodity output measure
56 Audio, video, and communication equipment	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Packaged computer software (included in I-O 73A) Prerecorded video tapes (included in I-O 76)
57 Electronic components and accessories	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A)
58 Miscellaneous electrical machinery and supplies	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Manufacturers' excise taxes Custom built parts (redefined from I-O 69A) *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Manufacturers' excise taxes Custom built parts (from I-O 69A) *Excludes:* Cost of resales Apparatus wire and cordage (included in I-O 38) Margin on resales (included in I-O 69A)
59A Motor vehicles (passenger cars and trucks)	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Manufacturers' excise taxes *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Manufacturers' excise taxes Vehicles produced on purchased chassis (from I-O 59B) *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
59B Truck and bus bodies, trailers, and motor vehicles parts	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Manufacturers' excise taxes Custom built parts (redefined from I-O 69A) *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Manufacturers' excise taxes Custom built parts (from I-O 69A) *Excludes:* Cost of resales Vehicles produced on purchased chassis (included in I-O 59A) Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)

Components of Industry and Commodity Output Measures for Manufacturing—Continued

Industry output measure	Commodity output measure
60 Aircraft and parts	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
61 Other transportation equipment	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Railroad equipment manufactured for own use by railroads* Boat repair at marinas (redefined from I-O 65C) Boat repair at boat dealers (redefined from I-O 69B) *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Railroad equipment manufactured for own use by railroads* Boat repair at marinas (from I-O 65C) Boat repair at boat dealers (from I-O 69B) *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
62 Scientific and controlling instruments	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Manufacturers' excise taxes *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates Manufacturers' excise taxes *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Computer-related services (included in I-O 73A) Engineering services (included in I-O 73B) Sales of scrap (included in I-O 81)
63 Ophthalmic and photographic equipment	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers R&D at auxiliaries Services provided to foreign affiliates *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Sales of scrap (included in I-O 81)
64 Miscellaneous manufacturing	
Includes: Industry shipments, including miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates Manufacturers' excise taxes Lapidary work (redefined from I-O 69A) Cutting and setting stones to order (redefined from I-O 69B) *Excludes:* Cost of resales Margin on resales (redefined to I-O 69A)	*Includes:* Commodity shipments Miscellaneous receipts Change in inventories of work-in-process and finished goods Estimate of undercoverage of source data, including nonemployers Services provided to foreign affiliates Manufacturers' excise taxes Lapidary work (from I-O 69A) Cutting and setting stones to order (from I-O 69B) *Excludes:* Cost of resales Margin on resales (included in I-O 69A) Advertising displays and specialties (included in I-O 73D)

* Imputation
R&D Research and development

I-O 65A-68C Transportation, Communications, and Utilities

Output

The output of the transportation, communications, and utilities industries is generally measured based on revenues for basic operations. Adjustments are made to include the value of scrap generated within the industry, tips received by employees, other incidental operating revenues, and an estimate for establishments and revenues not included in source data.

In transportation, industry and commodity output for railroads and related services, passenger ground transportation (I-O 65A), include AMTRAK revenues. Commodity output also includes the Long Island Railroad and Alaska Railroad, and State and local government transit systems, which are reclassified from State and local government enterprises (I-O 79). Government subsidies are not included.

Industry and commodity output for motor freight transportation and warehousing (I-O 65B) include delivery and warehousing revenues of retailers. Commodity output includes the freight revenues of bus companies and excludes revenues for trash hauling and disposal.

Industry and commodity output for water transportation (I-O 65C) include storage and docking at boat dealers and exclude boat repairs and merchandise sales at marinas. Commodity output also includes the revenues of the Alaska Ferry, a State and local government enterprise.

Industry and commodity output for air transportation (I-O 65D) include excise taxes on freight and passenger transportation and air travel facilities. Commodity output also includes landing and other fees collected by State and local government airports.

Industry and commodity output for pipelines, freight forwarders, and related services (I-O 65E) include the pipeline transportation of petroleum and other commodities, excluding natural gas. For freight forwarders, industry output includes revenues for transportation services, which are reclassified as the commodity output of the various transportation services.

In communications, commodity output for communications, except radio and TV (I-O 66), includes equipment rental revenues, Federal and State and local government excise taxes on telephone and telegraph services, installation revenues, an imputed value of installations performed by an establishment's own workers, and an estimate of revenues for the use of overseas facilities. Revenues from retailing by cable TV are redefined to the retail trade industry (I-O 69B). For 1987, other communications services were estimated by extrapolating 1982 benchmark estimates using FCC information.

Industry output for radio and TV broadcasting (I-O 67) includes the revenues for air time sold for commercial advertisements. For profit-making establishments, output is measured by revenues. For nonprofits, output is measured by expenses plus an adjustment for depreciation (which is not included in expenses); this treatment is consistent with the NIPA's. Adjustments are also made to exclude revenues originating outside the United States and to remove certain commissions paid to talent representatives. Commodity output excludes advertising revenues, which are reclassified to advertising (I-O 73D).

Components of Industry and Commodity Output Measures for Transportation, Communications, and Utilities

Industry output measure	Commodity output measure
65A Railroads and related services; passenger ground transportation	
Includes: Operating and other revenues of Class I, II, and III railroads Operating and other revenues of switching and terminal companies Estimate of undercoverage of source data Employee tips Scrap revenues AMTRAK operating and dining car revenues Freight car rental revenues Operating revenues of private local and suburban transit companies Sightseeing and other revenues of local bus companies Charter bus revenues Intercity bus revenues School bus revenues Taxicab revenues Bus terminal and service facilities revenues *Excludes:* Rental receipts (redefined to I-O 71B)	Industry output measure *Plus:* Freight forwarder rail transportation (from I-O 65E) Long Island Railroad freight revenues (from I-O 79) Alaska Railroad operating revenues (from I-O 79) Publicly owned local transit revenues (from I-O 79) *Less:* Freight revenues of transit companies (included in I-O 65B) Sales of scrap (included in I-O 81)

Components of Industry and Commodity Output Measures for Transportation, Communications, and Utilities—Continued

Industry output measure	Commodity output measure
65B Motor freight transportation and warehousing	
Includes: Motor freight transportation revenues Warehousing revenues Trucking terminal revenues Stockyard revenues Employee tips Trucking receipts of construction firms (redefined from I-O 11+12) Warehousing revenues of wholesalers (redefined from I-O 69A) Delivery charges of retailers (redefined from I-O 69B) Storage charges of retailers (redefined from I-O 69B) *Excludes:* Rental receipts (redefined to I-O 71B)	Industry output measure *Plus:* Farm product warehousing and storage for CCC (from I-O 2) Freight revenues of transit companies (from I-O 65A) Freight forwarder truck transportation (from I-O 65E) Freight forwarder warehousing (from I-O 65E) *Less:* Trash and garbage hauling (included in I-O 68C)
65C Water transportation	
Includes: Water transportation revenues Estimate of undercoverage of source data Marine cargo handling revenues Revenues of marinas Docking services at boat dealers (redefined from I-O 69B) Cleaning and maintenance of boats by boat dealers (redefined from I-O 69B) *Excludes:* Cost of resales Boat repair at marinas (redefined to I-O 61) Margin on resales (redefined to I-O 69B)	Industry output measure *Plus:* Freight forwarder water transportation (from I-O 65E) Alaska Ferry (from I-O 79)
65D Air transportation	
Includes: Domestic and international passenger and freight air transportation revenues Federal taxes on air fares, air freight, and air facilities Employee tips Revenues of airports, flying fields, and miscellaneous services Estimate of undercoverage of source data Repair receipts (redefined from I-O's 69A and 69B) Aircraft storage receipts (redefined from I-O 69B) *Excludes:* Rental receipts (redefined to I-O 71B)	Industry output measure *Plus:* Freight forwarder air transportation (from I-O 65E) Landing fees and other revenues of State and local government airports (from I-O 79)
65E Pipelines, freight forwarders, and related services	
Includes: Petroleum pipeline revenues (regulated and nonregulated) Arrangement of freight transportation revenues Arrangement of passenger transportation revenues Packing, crating, inspection, and weighing services revenues Miscellaneous transportation services revenues *Excludes:* Cost of resales (transportation services purchased by freight arrangers) Rental receipts (redefined to I-O 71B)	Industry output measure *Less:* Freight forwarder rail transportation (included in I-O 65A) Freight forwarder truck transportation (included in I-O 65B) Freight forwarder warehousing (included in I-O 65B) Freight forwarder water transportation (included in I-O 65C) Freight forwarder air transportation (included in I-O 65D)
66 Communications, except radio and TV	
Includes: Independent telephone services revenues Local exchange telephone revenues AT&T telephone services revenues Radiotelephone revenues Non-AT&T long distance revenues Telephone equipment rental Adjustment for uncollectible revenues Federal excise taxes on telephone services State & local excise taxes on telephone services Estimate of undercoverage of source data Overseas facilities adjustment Telephone and telegraph equipment installation* Cable TV equipment installation* Telegraph services revenues Cable and other pay TV revenues COMSAT services revenues Other communications services revenues Other telephone equipment installation charges (redefined from I-O 11+12) Excludes: Cost of resales Margin on resales (redefined to I-O 69B) Rental receipts (redefined to I-O 71B) Telephone directory advertising revenues (redefined to I-O 73D)	Industry output measure *Less:* Cable and pay TV advertising revenues (included in I-O 73D)

In utilities, industry output for electric services (utilities) (I-O 68A) is estimated by adjusting revenues to remove the value of electricity that is resold, the value of imported electricity, and rate refunds. Commodity output is estimated from industry output with a number of adjustments, including the addition of the value of electricity generated by Federal and State and local government enterprises (I-O's 78 and 79).

Industry output for gas production and distribution (utilities) (I-O 68B) consists only of the revenues of investor-owned utilities; sales by State and local government utilities and the value of imports are excluded. Commodity output includes gas sold to final users, gas sold for resale, and sales of gas by State and local government utilities, but does not include natural gas used as a raw material.

For 1987, industry output for water and sanitary services (I-O 68C) was based on limited information. It included an assumption that private sewerage systems were 3 percent of government systems, because data were not available for private sewerage systems. Commodity output for sewerage systems is assumed to be primary to State and local government enterprises (I-O 79). Commodity output for water supply includes the revenues of State and local government water utilities (I-O 79). Commodity output also includes the value of trash hauled by trucking firms.

Inputs

Most of the inputs to the transportation, communications, and utilities industries were estimated by extrapolating 1982 benchmark estimates by the change in industry output from 1982 to 1987. These estimates were then adjusted during the process of balancing commodities to equal commodity output totals. Trade source data on compensation and on some inputs for the electric and gas utility industries were also used. Other value added was calculated at a residual.

Components of Industry and Commodity Output Measures for Transportation, Communications, and Utilities—Continued

Industry output measure	Commodity output measure
67 Radio and TV broadcasting	
Includes: Commercial radio and TV revenues (advertising and non-advertising) Public radio and TV expenses *Excludes:* Commission revenues of commercial radio and TV (to avoid double counting)	Industry output measure *Less:* Advertising revenues of radio and TV broadcasting (included in I-O 73D)
68A Electric services (utilities)	
Includes: Private electric services revenues *Excludes:* Cost of resales Rental receipts (redefined to I-O 71B) Royalty receipts (redefined to I-O 71B)	Industry output measure *Plus:* Federal electric utility revenues, adjusted for resales (from I-O 78) State and local electric utility revenues, adjusted for resales (from I-O 79) *Less:* Sales of steam (included in I-O 68C)
68B Gas production and distribution (utilities)	
Includes: Private gas services revenues Revenues from transportation of gas *Excludes:* Revenues from imported gas Rental receipts (redefined to I-O 71B) Royalty receipts (redefined to I-O 71B)	Industry output measure *Plus:* Natural gas sold to final users for fuel or energy (from I-O 8) Coke oven gas (from I-O 37) Gas utility revenues (from I-O 79) *Less:* Natural gas liquids (included in I-O 8) Cyclic crudes and intermediates (included in I-O 27A) Gasoline and oil (included in I-O 31)
68C Water and sanitary services	
Includes: Private water supply services revenues Private sewerage system revenues Payments for refuse collection Other sanitary services revenues Steam and air-conditioning supply revenues Irrigation system revenues *Excludes:* Trash and garbage hauling (included in I-O 65B)	Industry output measure *Plus:* Trash and garbage hauling (from I-O 65B) Sales of steam (from I-O 68A) Water utilities revenues (from I-O 79) *Less:* Private sewerage system revenues (included in I-O 79)

* Imputation

I-O 69A–69B Wholesale and Retail Trade

Output

I-O generally measures the output of the trade industries as margin on goods bought and resold or as nonmargin output.[36] For wholesale trade, margin is measured as receipts less the cost of goods resold plus taxes collected, or, when receipts data are not available, as expenses plus taxes collected. Nonmargin output is measured by commissions on goods sold or by expenses for manufacturers' sales offices; it also includes customs duties on imports.

Margin output is included in the purchasers' prices of the goods that are purchased, but not in the producers' prices of those goods. Census information on the volume of various goods sold through wholesale establishments is used to distribute margin to the commodities sold through wholesalers and to the types of purchasers (e.g., households or business) of these commodities. Nonmargin output is assumed to be purchased by the producers of the goods being sold and is thus reflected in the producers' prices of the goods.

Revenues for service contracts and wholesaling activities for government enterprise liquor stores are excluded from wholesale trade because they are assumed to be included in the revenues of the appropriate industry. A number of activities are redefined out of wholesale trade; generally, they involve manufacturing and service activities that are redefined to their appropriate industries.

For retail trade, margin is measured as receipts less the cost of goods resold plus taxes collected. Nonmargin output, which is small, is generally measured as revenues for mailing and handling charges. Industry output includes trading stamps and nonmedical services of optometrists (medical services of optometrists are included in health services (I-O 77A)). An estimate of nonreported revenues for services provided to foreign affiliates is added. Revenues for service contracts are excluded from this industry because they are assumed to be included in the appropriate industry. Commodity output includes margins from a number of government

36. Margin and nonmargin output are discussed in detail in "Definitions and conventions for valuation" on page M-20.

Components of Industry and Commodity Output Measures for Wholesale and Retail Trade

Industry output measure	Commodity output measure
69A Wholesale trade	
Includes: Receipts of merchant wholesalers and agents and brokers on own-account Expenses of manufacturers' sales branches and offices Commissions of agents and brokers Sales taxes collected by wholesalers Excise taxes levied on wholesalers Estimate of undercoverage of source data Customs duties on imports Services provided to foreign affiliates Margin on resales occurring in manufacturing, mining, and service industries *Excludes:* Cost of resales for merchant wholesalers and agents and brokers on own-account Service contracts (to avoid double counting) Government enterprise liquor stores (to avoid double counting) Farm product preparation services (redefined to I-O 4) Food processed by wholesalers (redefined to I-O 14) Tobacco stemming and redrying by wholesalers (redefined to I-O 15) Commission finishing by wholesalers (redefined to I-O 16) Furs dressed by wholesalers (redefined to I-O 18) Millwork (redefined to I-O 20+21) Printing work by wholesalers (redefined to I-O 26B) Machine shop job work (redefined to I-O 50) Custom built parts (redefined to I-O's 58 and 59B) Lapidary work (redefined to I-O 64) Warehousing revenues of wholesalers (redefined to I-O 65B) Repair receipts (redefined to I-O 65D) Services provided by wholesalers (redefined to I-O 72B) Computer services performed by wholesalers (redefined to I-O 73A) Services (redefined to I-O 73C) Equipment rental receipts (redefined to I-O 73C) Rental and services provided by trade establishments (redefined to I-O 75)	Industry output measure

enterprise establishments; for example, margins generated at post exchanges, which are reclassified to this commodity from other Federal Government enterprises (I-O 78), and margins for government enterprise liquor stores, which are reclassified from other State and local government enterprises (I-O 79).

Information on the dollar volume of the various goods sold through retail establishments is used to distribute retail margin to the various commodities sold through retailers and to the types of purchasers of those commodities. Most of the retail margin is distributed to household consumers, although some business goods are sold through retailers. For example, some businesses buy computers through retail establishments, and many lumber yards are considered retail establishments but do a large amount of business with construction firms.

A number of activities are redefined out of this industry. Generally, these involve services performed by retail establishments, which are redefined to the appropriate service industry, and some construction activities, which are redefined to the construction industries. Eating and drinking places are excluded from the retail trade industry and included in the eating and drinking places industry (I-O 74).

Inputs

Inputs for the wholesale and retail trade industries were estimated primarily by extrapolating 1982 benchmark

Components of Industry and Commodity Output Measures for Wholesale and Retail Trade—Continued

Industry output measure	Commodity output measure
69B Retail trade	
Includes: Receipts of retailers Estimate of undercoverage of source data Services provided to foreign affiliates Sales taxes collected by retailers Excise taxes levied on retailers Margin on resales and vending machine sales by nonretail establishments (redefined from I-O's 4, 11+12, 65C, 66, 72A, 72B, 73C, 74, 75, 76, and 77B) *Excludes:* Cost of resales Service contracts (to avoid double counting) Grooming and boarding of pets at pet shops (redefined to I-O 4) Landscape services (redefined to I-O 4) Construction and installation receipts (redefined to I-O 11+12) Bakery products baked by retail establishments (redefined to I-O 14) Custom made garments (redefined to I-O 18) Jewelry engraving (redefined to I-O 42) Boat repair at boat dealers (redefined to I-O 61) Cutting and setting stones to order (redefined to I-O 64) Delivery charges of retailers (redefined to I-O 65B) Storage charges of retailers (redefined to I-O 65B) Cleaning and maintenance of boats at boat dealers (redefined to I-O 65C) Docking services at boat dealers (redefined to I-O 65C) Repair receipts (redefined to I-O 65D) Aircraft storage receipts (redefined to I-O 65D) Commissions for arrangement of auto financing (redefined to I-O 70A) Commissions for sale of life insurance (redefined to I-O 70B) Services provided by retailers (redefined to I-O 72B) Computer repair services performed by retailers (redefined to I-O 73A) Services (redefined to I-O 73C) Equipment rental receipts (redefined to I-O 73C) Photofinishing in retail establishments (redefined to I-O 73C) Meal and beverage receipts of retail establishments (redefined to I-O 74) Rental and services provided by trade establishments (redefined to I-O 75) Rental receipts at retail establishments (redefined to I-O 76) Coin-operated amusement devices at retailers (redefined to I-O 76) Sports instruction and rental of sports equipment (redefined to I-O 76) Medical services of optometrists (redefined to I-O 77A) Boat operation, flight, music, camera, and sewing instruction (redefined to I-O 77B)	Industry output measure *Plus:* Margin from government enterprise establishments (from I-O's 78 and 79)

estimates by the change in industry output from 1982 to 1987. These estimates were then adjusted during the process of balancing commodities to equal commodity output totals. Data on compensation, electricity, communication services, and some other expenses were used. (Goods that are purchased and then resold are not included as inputs in these industries.)

I-O 70A-71B Finance, Insurance, and Real Estate

Output

The output of the finance, insurance, and real estate industries is measured in a number of different ways. Finance industry output is generally measured as monetary income plus an imputation for service charges. Insurance industry output is generally measured as current operating expenses or as premiums collected less claims paid. Real estate industry output is generally measured as revenues plus an imputation for space rent.[37] A number of adjustments and redefinitions are made to clarify the boundaries for each industry and commodity in this group and to avoid double counting.

The measure of output for the finance industry excludes capital gains and interest income; this treatment is consistent with the NIPA's.[38] Adjustments are made to exclude foreign operations and to include noninsured banks. Various types of estimates were used to measure components of this industry for the 1987 benchmark. For example, for nondeposit trust companies, data for a sample of the companies were adjusted to the U.S. total; for some banking functions, 1982 estimates were extrapolated using unpublished BEA data on wages and salaries; and for mortgage loan brokers, unpublished BEA data on wages and salaries were adjusted for other expenses. Securities and Exchange Commission data were used to estimate output for security and commodity brokers, which includes some imputed charges. Output also includes merchant discounts and fees for credit, travel, and entertainment cards. Commodity output includes the North Dakota Bank, which is reclassified from State and local government enterprises (I-O 79).

The output of the insurance industry is measured by two different methodologies—one for life insurance and another for nonlife. For life insurance establishments, including private pension funds, output is based on current operating expenses adjusted to exclude foreign operations; the fraternal benefit societies and mutual savings banks component is measured by premiums collected less claims paid. For nonlife insurance establishments, output is generally measured as premiums collected less claims paid; however, nonprofit health insurance is measured by expenses. Commodity output is measured as industry output plus the reclassified output of Federal crop and flood insurance and Overseas Private Investment Corporation insurance (from I-O 78).

Industry and commodity output for owner-occupied dwellings are measured as imputations for space rent; they are thus treated as a business in a manner similar to tenant-occupied dwellings. This treatment is consistent with the NIPA's. The value is the amount the homeowner would have received had he or she chosen to rent his or her home; major kitchen appliances, furniture, and utilities are not included. The imputation covers owner-occupied mobile homes, owner-occupied farm and nonfarm dwellings, and farm dwellings provided to hired laborers.

The output of the real estate industry is measured based on revenue data. It includes rents, commissions, property management fees, and title abstract and escrow fees. An imputation is made for the rental value of buildings owned and occupied by nonprofit associations serving individuals. Commodity output also includes rental activity by government enterprises.

Industry and commodity output for royalties are measured based on receipts for individuals, partnerships, corporations, and governments, adjusted for misreporting. Royalty payments received by nonprofits serving individuals, and depletion claimed by tax-exempt farmers' co-ops, are included; oil bonus payments for oil rights are excluded.

Inputs

Inputs for the finance, insurance, and real estate industries were generally estimated by extrapolating 1982 benchmark estimates by the change in industry output from 1982 to 1987. These estimates were then adjusted during the process of balancing commodities to equal commodity output totals. The inputs to owner-occupied real estate were estimated using NIPA estimates on major expenses, as were parts of the inputs to the tenant-

37. Land subdividers and developers are included in the construction industry (I-O 11+12) and not in this group.

38. Monetary income consists of priced services (check collection, wire transfer, clearing houses, etc.) and reimbursements from the U.S. Treasury for services provided by Federal Reserve banks. Imputed service charges are an attempt to capture the value of services provided for which no explicit charges are made. An example of this would be "free" checking accounts, for which no regular fee is charged each month. A bank offsets its costs by lending or investing the money in the account and paying either a reduced interest rate or no interest on the account. Imputed service charges are estimated by deducting interest paid on depositors' accounts and interest paid on borrowed money from interest, dividends, and other property-type income earned by the bank.

Components of Industry and Commodity Output Measures for Finance, Insurance, and Real Estate

Industry output measure	Commodity output measure
70A Finance	
Includes: Monetary income of Federal Reserve banks Reimbursements by the U.S. Treasury to Federal Reserve banks Imputed service charges of Federal Reserve banks* Monetary income of Federal home loan banks Noninterest income of commercial banks, savings and loans, and credit unions Imputed service charges of commercial banks, savings and loans, and credit unions* Nondeposit trust company income Functions related to banking revenues Noninterest income of Federal and federally sponsored credit agencies Noninterest income of personal credit institutions Credit card fees Merchant discounts on credit card transactions Noninterest income of agricultural credit agencies Monetary income of mortgage companies Monetary income of mortgage loan brokers Imputed service charges of investment companies* Underwriting revenues Securities commissions Trading gains (excluding capital gains and interest income) Fees for investment advisory services Income from sale of investment company shares Other revenues of broker-dealers Commodity revenues Revenues of self-regulatory organizations Revenues from services allied with the exchange of securities Estimate of undercoverage of source data Commissions for arrangement of auto financing (redefined from I-O 69B) *Excludes:* Interest and capital gains on trading accounts Interest on repurchase agreements Royalty income of agricultural credit agencies (redefined to I-O 71B) Computer processing receipts of self-regulatory organizations (redefined to I-O 73A)	Industry output measure *Plus:* North Dakota Bank (from I-O 79) *Less:* Insurance services at banks, personal credit agencies, and mortgage bankers (included in I-O 70B) Real estate commissions and management fees of mortgage bankers (included in I-O 71B) Computer services at commercial banks (included in I-O 73A)
70B Insurance	
Includes: Operating expenses of legal reserve life insurance companies, including profits, for life insurance activity Expenses of foreign life insurance companies operating in the U.S. Expenses of private pension funds Life insurance premiums of fraternal benefit societies and mutual savings banks Nonlife insurance premiums paid Administrative expenses of self-insured and pre-paid health plans Administration costs of Medicare and Medicaid programs Income of insurance agents and brokers Estimate of undercoverage of source data Commissions for sale of life insurance (redefined from I-O's 69B and 70A) *Excludes:* Life insurance claims and dividends paid by fraternal benefit societies and mutual savings banks Nonlife insurance claims paid Expenses of foreign branches of U.S. companies Expenses related to real estate investment	Industry output measure *Plus:* Insurance services at banks, personal credit agencies, and mortgage bankers (from I-O 70A) Federal crop, flood, and OPIC insurance (from I-O 78)
71A Owner-occupied dwellings	
Includes: Rental value of owner-occupied dwellings and mobile homes* Rental value of farm dwellings provided to farm laborers*	Industry output measure

Components of Industry and Commodity Output Measures for Finance, Insurance, and Real Estate—Continued

Industry output measure	Commodity output measure
71B Real estate and royalties	
Includes: Revenues of real estate agents, operators, lessors, and managers Rental value of buildings owned and used by nonprofits serving individuals* Royalty receipts Depletion claimed by tax-exempt farmers' co-ops Estimate of undercoverage of source data Property management performed by construction establishments (redefined from I-O 11+12) Rental receipts (redefined from I-O's 65A, 65B, 65D, 65E, 66, 68A, 68B, and 77B) Royalty receipts (redefined from I-O's 68A, 68B, and 70A) Rental fees from concessionaires (redefined from I-O 76) *Excludes:* Oil bonus payments for oil rights Revenues of land subdividers and developers (included in I-O 11+12)	Industry output measure *Plus:* Real estate commissions and management fees of mortgage bankers (from I-O 70A) Residential guest room rentals (from I-O 72A) Rental receipts of government enterprises (from I-O's 78 and 79)

* Imputation
OPIC Overseas Private Investment Corporation

occupied rental industry. It is assumed that all of the insurance agents, brokers, and services commodity is an input to insurance carriers. Other value added was calculated as a residual.

I-O 72A-77B Services

Output

The output of the services industries is generally measured based on receipts, taxes collected, and employee tips. The output of nonprofit establishments is based on expenses; this treatment is consistent with the NIPA's. Some imputations are made for in-kind services provided. Establishments with and without payrolls are covered. Adjustments are made for misreporting and for nonreported services provided to foreign affiliates. Industry output also includes a large adjustment for automobile leasing not measured by major data sources.

In deriving the industry output measure, a number of redefinitions are made among the industries in the group and with industries outside the group. The most important of these is the redefinition of receipts from purchased meals and beverages in the hotels and lodging places industry (I-O 72A), and in other industries, to the eating and drinking places industry (I-O 74). Some of the other important redefinitions into the group are repairs, which includes auto repair (parts and labor), and medical services provided by optometrists (both from the trade industries, I-O's 69A and 69B). Some of the more important redefinitions out of the services group are merchandise sales, which are redefined to retail trade, and repair of central air conditioning equipment, which is redefined to construction.

The I-O measures of industry and commodity output for advertising are very different from each other. The industry measure is based on receipts of advertising agencies. It includes telephone directory advertising revenues, which are redefined from the communications, except radio and TV industry (I-O 66); it excludes public relations receipts of advertising agencies, which are redefined to the other business and professional services, except medical industry (I-O 73C). The commodity output measure includes many advertising products that have been reclassified into this commodity; for example, advertising revenues of periodicals (from I-O 26A, newspapers and periodicals); advertising revenues of newspapers (from I-O 26A and 26B, other printing and publishing); other advertising products, such as maps, catalogs, and signs (from I-O 26B and 64, miscellaneous manufacturing) and radio and TV broadcasting advertising revenues (from I-O 67, radio and TV broadcasting). Commodity output also includes cable and pay TV advertising revenues (from I-O 66, communications, except radio and TV), advertising products produced by commercial artists (from I-O 73C, other business and professional services, except medical), sign painting and direct mail advertising (from I-O 73C), advertising receipts of movie theaters (from I-O 76, amusements), and advertising receipts of business associations and professional membership organizations (from I-O 77B, educational and social services, and membership organizations).

Components of Industry and Commodity Output Measures for Services

Industry output measure	Commodity output measure
72A Hotels and lodging places	
Includes: Receipts of taxable establishments Expenses of tax-exempt establishments Taxes on services Employee tips Estimate of undercoverage of source data Services provided to foreign affiliates Lodging provided to employees* Room rentals (redefined from I-O 76) Private school room charges (redefined from I-O 77B) *Excludes:* Cost of resales Margin on resales (redefined to I-O 69B) Meal and beverage receipts of hotels and lodging places (redefined to I-O 74) Gambling and casino receipts of hotels (redefined to I-O 76)	Industry output measure *Less:* Residential guest room rentals (included in I-O 71B)
72B Personal and repair services (except auto)	
Includes: Receipts of taxable establishments Taxes on services Employee tips Estimate of undercoverage of source data Services provided by wholesalers (redefined from I-O 69A) Services provided by retailers (redefined from I-O 69B) *Excludes:* Cost of resales Cash advances made by funeral parlors Repair of central air-conditioning equipment (redefined to I-O 11+12) Margin on resales (redefined to I-O 69B)	Industry output measure *Plus:* Portrait photography (from I-O 73C) Beauty and barber shop receipts (from I-O 78) *Less:* Commercial photography and art and design in portrait studios (included in I-O 73C)
73A Computer and data processing services	
Includes: Receipts of taxable establishments Taxes on services Estimate of undercoverage of source data Services provided to foreign affiliates Computer services performed by wholesalers (redefined from I-O 69A) Computer repair services performed by retailers (redefined from I-O 69B) Computer processing receipts of self-regulatory organizations (redefined from I-O 70A) Computer services (redefined from I-O 73C) *Excludes:* Finance leasing	Industry output measure *Plus:* Computer-related services (from I-O's 51 and 62) Packaged computer software (from I-O 56) Computer services at commercial banks (from I-O 70A) Computer rental (from I-O 73C)
73B Legal, engineering, accounting, and related services	
Includes: Receipts of taxable establishments Expenses of tax-exempt establishments Taxes on services Estimate of undercoverage of source data Services provided to foreign affiliates Engineering and architectural services of construction establishments (redefined from I-O 11+12) Engineering and design services (redefined from I-O 73C)	Industry output measure *Plus:* Engineering services (from I-O 62)
73C Other business and professional services, except medical	
Includes: Receipts of taxable establishments Expenses of tax-exempt establishments Taxes on services Estimate of undercoverage of source data Services provided to foreign affiliates Repair services (redefined from I-O's 11+12, 69A, and 69B) Equipment rental receipts (redefined from I-O's 11+12, 69A, 69B, 76, and 77A) Photofinishing in retail establishments (redefined from I-O 69B) Interior decorating services in retail establishments (redefined from I-O 69B) Public relations receipts (redefined from I-O 73D) *Excludes:* Cost of resales Margin on resales (redefined to I-O's 69A and 69B) Trading stamp redemptions (included in I-O 69B) Computer services (redefined to I-O 73A) Engineering and design services (redefined to I-O 73B)	Industry output measure *Plus:* Equipment rental and leasing (from I-O's 44+45 and 75) Commercial photography and art and design in portrait studios (from I-O 72B) Receipts for commercial photography (from I-O 72B) Contract research performed by hospitals (from I-O 77A) *Less:* Portrait photography (included in I-O 72B) Computer rental (included in I-O 73A) Advertising products of commercial artists (included in I-O 73D) Advertising products of sign painters (included in I-O 73D) Direct mail advertising (included in I-O 73D) Auto rental (included in I-O 75) Video tape rental (included in I-O 76)

Components of Industry and Commodity Output Measures for Services—Continued

Industry output measure	Commodity output measure
73D Advertising	
Includes: Receipts of taxable establishments Taxes on services Estimate of undercoverage of source data Services provided to foreign affiliates Telephone directory advertising revenues (redefined from I-O 66) *Excludes:* Public relations receipts (redefined to I-O 73C)	Industry output measure *Plus:* Advertising revenues of newspapers and periodicals (from I-O's 26A and 26B) Telephone directory, shopping news, catalog, and directory printing and publishing (from I-O 26B) Other advertising products (from I-O 26B) Advertising displays and specialties (from I-O 64) Cable and pay TV advertising revenues (from I-O 66) Advertising revenues of radio and TV broadcasting (from I-O 67) Advertising products of commercial artists (from I-O 73C) Advertising products of sign painters (from I-O 73C) Direct mail advertising (from I-O 73C) Advertising receipts of movie theaters (from I-O 76) Advertising receipts of business associations and professional membership organizations (from I-O 77B)
74 Eating and drinking places	
Includes: Receipts of taxable establishments Taxes on services Employee tips Estimate of undercoverage of source data Services provided to foreign affiliates Meal and beverage receipts of retail establishments (redefined from I-O 69B) Meal and beverage receipts of hotels and lodging places (redefined from I-O 72A) Meal and beverage receipts of amusements (redefined from I-O 76) Meal and beverage receipts of schools (redefined from I-O 77B) Meal and beverage receipts of associations (redefined from I-O 77B) *Excludes:* Cost of resales Margin on resales (redefined to I-O 69B)	Industry output measure *Plus:* Meal and beverage receipts of Federal Government enterprises (from I-O 78) *Less:* Scrap grease (included in I-O 81)
75 Automotive repair and services	
Includes: Receipts of taxable establishments Taxes on services Employee tips Estimate of undercoverage of source data Services provided to foreign affiliates Rental and services provided by trade establishments (redefined from I-O's 69A and 69B) *Excludes:* Cost of resales Margin on resales (redefined to I-O 69B)	Industry output measure *Plus:* Automotive rental (from I-O 73C) Municipal parking receipts (from I-O 79) *Less:* Equipment rental (included in I-O 73C)
76 Amusements	
Includes: Receipts of taxable establishments Expenses of tax-exempt establishments Taxes on services Employee tips State and local government parimutuel tax Estimate of undercoverage of source data Services provided to foreign affiliates Rental receipts at retail establishments (redefined from I-O 69B) Coin-operated amusement devices at retailers (redefined from I-O 69B) Sports instruction and rental of sports equipment (redefined from I-O 69B) Gambling and casino receipts of hotels (redefined from I-O 72A) *Excludes:* Cost of resales Margin on resales (redefined to I-O 69B) Rental fees from concessionaires (redefined to I-O 71B) Room rentals (redefined to I-O 72A) Rental of equipment (redefined to I-O 73C) Meal and beverage receipts (redefined to I-O 74)	Industry output measure *Plus:* Recreational services of agricultural establishments (from I-O's 1 and 2) Receipts for prerecorded video tapes (from I-O 56) Video tape rental receipts (from I-O 73C) Motion picture theater receipts (from I-O 78) Off-track betting (from I-O 79) *Less:* Advertising receipts (included in I-O 73D)

Components of Industry and Commodity Output Measures for Services—Continued

Industry output measure	Commodity output measure
77A Health services	
Includes: Receipts of taxable establishments Expenses of tax-exempt establishments Taxes on services Estimate of undercoverage of source data Services provided to foreign affiliates Veterinary services Medical services of optometrists (redefined from I-O 69B) *Excludes:* Double counting of receipts in hospitals and doctors' offices Equipment rental receipts (redefined to I-O 73C)	Industry output measure *Less:* Contract research performed by hospitals (included in I-O 73C)
77B Educational and social services, and membership organizations	
Includes: In-kind compensation of educational establishments* Receipts of taxable establishments Expenses of tax-exempt establishments Taxes on services Estimate of undercoverage of source data Services provided to foreign affiliates Boat operation, flight, music, camera, and sewing instruction (redefined from I-O 69B) *Excludes:* Cost of resales Hospital expenses included in operating expenses of universities Scholarships included in operating expenses Capital expenditures included in expenses Margin on resales (redefined to I-O 69A) Margin on resales and vending machine sales (redefined to I-O 69B) Rental receipts (redefined to I-O 71B) Private school room charges (redefined to I-O 72A) Meal and beverage receipts of schools (redefined to I-O 74) Meal and beverage receipts of associations (redefined to I-O 74)	Industry output measure *Less:* Advertising receipts of business associations and professional membership organizations (included in I-O 73D)

* Imputation

Inputs

Inputs to the services industries were generally estimated by extrapolating 1982 benchmark estimates by the change in industry output from 1982 to 1987. These estimates were then adjusted during the process of balancing commodities to equal commodity output totals. For industries covered by the census, information on specific types of purchases was used to estimate purchases of electricity, communication services, and rents. Estimates of compensation by each industry were also used. Other value added was calculated as a residual.

I-O 78–79 Government Enterprises

Output

The government enterprises industries cover the current account activities of Federal Government enterprises and State and local government enterprises. Their capital account purchases are shown in the appropriate government final use category; this treatment is consistent with the NIPA's. Activities are classified as government enterprises if at least 50 percent of their costs are covered by their sales of goods and services, their sales are more than $10 million, and most of their capital stock is held by a government corporation or agency. Examples of Federal Government enterprises are the U.S. Postal Service, the Tennessee Valley Authority and other Federal electric utilities, and military Post Exchanges and restaurants. Examples of State and local government enterprises are local transit systems, gas and electric utilities, water and sanitary services, and municipal parking facilities.

The output of government enterprises is generally measured based on revenues, with adjustments for components such as the cost of resales or insurance claims paid, depending upon the particular industry involved; operating subsidies are not included in the measure.

Commodity output of government enterprises is generally measured as industry output less components such as rental receipts for subletting of space. In cases where the commodity output of government enterprises is identical to that of the private sector, output is reclassified to the private sector commodity, except in the case of sewerage systems, where commodity output of private

sector establishments is reclassified to the government enterprise commodity.

As discussed in the section "Definitions and conventions for classification," on page M-12, within Federal Government enterprises (I-O 78), the commodity output of the detailed commodity group Federal electric utilities is reclassified to electric services (utilities) (I-O 68A). Within State and local government enterprises (I-O 79), the commodity output of the detailed commodity group State and local government passenger transit is reclassified to railroads and related services, passenger ground transportation (I-O 65A), and the output of the group State and local government electric utilities is reclassified to electric services (utilities) (I-O 68A).

In effect, commodity output for most Federal Government and State and local government enterprise activities is reclassified to the appropriate private sector commodity. As a result, commodity output for Federal Government enterprises consists of Postal Service revenues and Federal Housing Administration mortgage and loan insurance, both of which are after deduction of rental receipts. Commodity output for State and local government enterprises consists of highway toll revenues, State and local and private sewerage revenues, and State and local lottery revenues.

Inputs

Inputs to the government enterprises industries were generally estimated by extrapolating 1982 benchmark estimates by the change in industry output from 1982 to 1987. These estimates were then adjusted during the process of balancing commodities to equal commodity output totals, while value added was held fixed. The

Components of Industry and Commodity Output Measures for Government Enterprises

Industry output measure	Commodity output measure
78 Federal Government enterprises	
Includes: Postal Service revenues Federal Government electric utility revenues Federal nonappropriated fund activity revenues and employee tips VA canteen service fund revenues GPO revenues Federal crop insurance fund revenues less claims paid National flood insurance revenues less claims paid OPIC revenues less claims paid FHA revenues less claims paid *Excludes:* Cost of resales Cost of electricity purchased and resold Rental receipts of electric utilities (redefined to I-O 71B)	Industry output measure *Less:* Electricity revenues adjusted for resales (included in I-O 68A) Margin on resales of Federal nonappropriated fund activities, VA canteen service, and GPO (included in I-O 69B) Federal crop, national flood, and OPIC insurance (included in I-O 70B) Rental receipts of Federal nonappropriated fund activities, VA canteen service, Postal Service, and FHA (included in I-O 71B) Beauty and barber shop receipts of VA canteen service (included in I-O 72B) Meal and beverage receipts of Federal nonappropriated fund activities and VA canteen service (included in I-O 74) Motion picture theaters of Federal nonappropriated fund activities (included in I-O 76)
79 State and local government enterprises	
Includes: Alaska Railroad revenues State and local government passenger transit revenues, including Long Island Railroad revenues State and local government electric utility revenues South Dakota Cement Plant revenues Alaska Ferry revenues State and local government waterport revenues State and local government airport revenues Highway toll revenues State and local government gas utility revenues State and local government water utility revenues State and local government sewerage revenues State and local government liquor store revenues North Dakota Bank revenues City market revenues Public housing revenues Municipal parking facility revenues State and local government lottery revenues Off-track betting revenues *Excludes:* Cost of resales Operating subsidies Cost of electricity purchased and resold	Industry output measure *Less:* South Dakota Cement Plant revenues (included in I-O 36) Alaska Railroad revenues (included in I-O 65A) State and local government passenger transit revenues, including Long Island Railroad revenues (included in I-O 65A) Alaska Ferry revenues (included in I-O 65C) Landing fees and other revenues of State and local government airports (included in I-O 65D) Electricity revenues adjusted for resales (included in I-O 68A) Gas utility revenues (included in I-O 68B) Water utility revenues (included in I-O 68C) Margin on liquor stores (included in I-O 69B) North Dakota Bank revenues (included in I-O 70A) Rental receipts of waterports and airports, city markets, and public housing (included in I-O 71B) Municipal parking facility revenues (included in I-O 75) Off-track betting revenues (included in I-O 76) *Plus:* Private sewer systems (from I-O 68C)

FHA Federal Housing Administration
GPO Government Printing Office
OPIC Overseas Private Investment Corporation
VA Veterans' Administration

value added component was estimated using NIPA information on compensation, government surplus, and government subsidies.

I-O 80–85 Special Industries

This group consists of seven specially designated I-O "industries": Noncomparable imports (I-O 80), scrap, used and secondhand goods (I-O 81), general government industry (I-O 82), rest of the world adjustment to final uses (I-O 83), household industry (I-O 84), and inventory valuation adjustment (I-O 85).

Only general government and household are industries in any sense of the word. Their output is measured based on the compensation received. For general government, the output measure consists of wages and salaries plus supplements of employees other than force-account construction workers or employees of government enterprises. For households, the measure covers household workers, such as maids, chauffeurs, and baby sitters. Commodity and industry output are the same for these two industries.

For noncomparable imports, used and secondhand goods, and rest of the world, there is no production in the United States, and thus no domestic commodity or industry output.[39] For scrap, there is domestic production, although that production is not by a "scrap" industry, but by other industries as a part of the production of their output.

Noncomparable imports are treated as commodities in the I-O accounts. Used and secondhand goods are treated as commodities bought and sold by various sectors of the economy. These purchases and sales, in producers' values, exactly offset each other unless there is a change in inventory. In purchasers' values, there appears to be output, but that output is the margin on the sale of the used and secondhand goods and not production of the goods.

The rest of the world adjustment to final uses is made to derive GDP, and the inventory valuation adjustment is used to convert inventory change from book value to replacement cost. Both adjustments are estimated as part of the NIPA's.

39. For more information on noncomparable imports, see the section "Definitions and conventions for valuation" on page M-20.

Components of Industry and Commodity Output Measures for Special Industries

Industry output measure	Commodity output measure
80 Noncomparable imports	
No domestic output (see text above)	No domestic output
81 Scrap, used and secondhand goods	
No domestic output (see text above)	Scrap produced in other industries
82 General government industry	
Includes: Compensation of general government *Excludes:* Force-account compensation of general government (included in I-O 11+12)	Industry output measure
83 Rest of the world adjustment to final uses	
No domestic output (see text above)	No domestic output
84 Household industry	
Compensation of household workers	Industry output measure
85 Inventory valuation adjustment	
NIPA estimate	Industry output measure

Appendix D
Mathematical Derivation of the Total Requirements Tables

This appendix discusses the matrix algebra underlying the derivation of the I-O total requirements tables.[40] The following definitions are used:

q is a column vector in which each entry shows the total amount of the output of a commodity.

U is a commodity-by-industry matrix in which the column shows for a given industry the amount of each commodity it uses, including noncomparable imports (I-O 80) and scrap and used and secondhand goods (I-O 81). (Hereafter, I-O 81 is designated as scrap.) This is the intermediate portion of the use table.

i is a unit, or summation, vector; all entries are 1's.

e is a column vector in which each entry shows the total sales to final users for a commodity (from the use table).

g is a column vector in which each entry shows the total amount of an industry's output, including its production of scrap.

V is an industry-by-commodity matrix in which each column shows for a given commodity the amount produced in each industry. V is the make table, adjusted to show only zero entries in the column for scrap. (Scrap is removed so that demand for it does not generate output in the industries where it originated.)

h is a column vector in which each entry shows the total amount of an industry's production of scrap. (The estimate of h is contained in column 81 of the make table.)

B is a commodity-by-industry matrix in which each entry in a column shows the amount of a commodity that an industry used per dollar of its output. Matrix B is derived from matrix U.

$\hat{}$ is a symbol that, when placed over a vector, indicates a square matrix in which the elements of the vector appear in the main diagonal cells and zeros appear in the other cells.

D is an industry-by-commodity matrix in which each entry in a column shows the share of total output of a given commodity produced in each industry. This matrix is the market share matrix and is derived from matrix V.

p is a column vector in which each entry shows the ratio of the value of scrap produced in an industry to that industry's total output.

I is the identity matrix, a square matrix in which 1's appear in the main diagonal cells and zeros appear in the other cells.

W is an industry-by-commodity matrix in which each entry in a column shows the share of total output of a given commodity produced in each industry, with each industry's commodity share adjusted for scrap produced by the industry. This matrix is the transformation matrix and is derived from matrix D and vector p.

The following are identities:

(1) $$q = Ui + e; \text{ and}$$

(2) $$g = Vi + h.$$

The following are assumptions:

First, inputs are required in proportion to output, and the proportions are the same for an industry's primary and secondary products. This is the industry technology assumption.

(3) $$U = B\hat{g}.$$

Second, each commodity (other than scrap) is produced by the various industries in fixed proportions.

(4) $$V = D\hat{q}.$$

40. The notation and derivation of the tables follow the System of National Accounts recommended by the United Nations. See *A System of National Accounts*, Studies in Methods, Series F, No. 2, Rev. 3 (New York: United Nations, 1968); also, R. Stone, M. Bacharach, and J. Bates, "Input-Output Relationships, 1951–1966," *A Programme for Growth*, Vol. 3 (London: Chapman and Hall, 1963).

Third, scrap output in each industry is proportional to total output of the industry.

$$h = \hat{p}g. \tag{5}$$

The model expressed in equations (1) through (5) thus involves three constants (B, D, and p) and six variables (U, V, h, e, q, and g). The model solution is derived as follows.

Substituting (3) into (1) gives

$$q = Bg + e. \tag{6}$$

Substituting (4) into (2) gives

$$g - h = Dq. \tag{7}$$

Substituting (5) into (7) and solving for g gives

$$\begin{aligned} g - \hat{p}g &= Dq, \\ (I - \hat{p})g &= Dq, \text{ and} \\ g &= (I - \hat{p})^{-1}Dq. \end{aligned} \tag{8}$$

Let $(I - \hat{p})^{-1}D = W$; then

$$g = Wq. \tag{9}$$

Substituting (9) into (6) and solving for q gives

$$\begin{aligned} q &= BWq + e, \\ (I - BW)q &= e, \text{ and} \\ q &= (I - BW)^{-1}e. \end{aligned} \tag{10}$$

Substituting (10) into (9) gives

$$g = W(I - BW)^{-1}e. \tag{11}$$

$(I - BW)^{-1}$ is the commodity-by-commodity total requirements matrix, which shows the commodity output required per dollar of each commodity delivered to final users.[41]

$W(I - BW)^{-1}$ is the industry-by-commodity total requirements matrix, which shows the industry output required per dollar of each commodity delivered to final users.[42]

41. Tables are prepared at detailed and summary levels. For the summary tables, the adjustments for secondary production were made at the detailed level and then aggregated before the total requirements tables were calculated.

42. See the previous footnote.