

Benchmark Input-Output Accounts for the U.S. Economy, 1987

THIS ARTICLE presents the 1987 benchmark input-output (I-O) accounts for the U.S. economy.¹ The first part of the article 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 part 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 here are in summary form; that is, they are aggregated to 95 I-O industries from 480-industry detail. The make (production) of commodities by industries is shown in table 1, the use (consumption) of commodities by industries in table 2.1, and the components of value added by industries in table 2.2. The following summary I-O tables will be presented in the May SURVEY OF CURRENT BUSINESS: Commodity-by-industry direct requirements per dollar of industry output; commodity-by-commodity total requirements, direct and indirect, per dollar of delivery to final use; and industry-by-commodity total requirements, direct and indirect, per dollar of delivery to final use. All of the summary tables, as well as the detailed tables, are available on diskette (see the box on page 90).

This article includes supplementary tables that relate the I-O accounts to the national income and product accounts (NIPA's); these tables permit more extensive analyses of the I-O estimates. The article also contains two appendixes: Appendix A provides a list of selected SURVEY articles about the I-O accounts; appendix B provides a concordance between the industry codes used in the I-O accounts and the 1987 Standard Industrial Classification (SIC) codes.

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.

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.

The 1987 Benchmark Accounts

In recognition of user needs—expressed, for example, by the interagency Working Group on the Quality of Economic Statistics—the Bureau of Economic Analysis (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 re-

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

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sources 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,

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

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

Value added components were prepared using the same procedures as in the past.³ Data

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.

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—personal consumption expenditures, 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 personal consumption expenditures 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

4. In the I-O accounts, change in business inventories covers commodities wherever held; capital purchases—producers' durable equipment 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.

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, Bureau of Labor Statistics tabulations of 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 <i>Monthly Treasury Statement</i> ; and for nontaxes (such as fines), receipts from the <i>Budget of the United States</i> , 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.

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 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 summary 1987 benchmark tables, which begin on page 98, cover 95 I-O industries instead of the 85 I-O industries used previously. For the new summary tables, 14 I-O industries were aggregated into 7,⁸ and 12 I-O industries were disaggregated into 30.⁹ With one exception, the aggregations involved small, declining industries; new construction and repair and maintenance construction were aggregated because of the abbreviated procedures used for the 1987 benchmark. The disaggregations involved large, growing industries. Appendix B shows the new aggregations and disaggregations of I-O industries. (The disaggregated industries

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 subsidy payments.

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.

are designated with an alphabetical suffix to the 1982 benchmark 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 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").

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-

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 box on page 90).

CHART 1**The U.S. Input-Output Accounts**

MAKE TABLE: INDUSTRIES PRODUCING COMMODITIES

	COMMODITIES									TOTAL INDUSTRY OUTPUT
	Agricultural products	Minerals	Construction	Manufactured products	Transportation	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
	Agriculture	Mining	Construction	Manufacturing	Transportation	Trade	Finance	Services	Other*	Total intermediate USE	Personal consumption expenditures	Gross private fixed investment	Change in business inventories	Exports of goods and services	Imports of goods and services	Government purchases
COMMODITIES	Agricultural products															
	Minerals															
	Construction															
	Manufactured products															
	Transportation															
	Trade															
	Finance															
	Services															
	Other*															
VALUE ADDED	Noncomparable imports															
	Total intermediate inputs															
	Compensation of employees															
	Indirect business tax and nontax liability															
	Other value added**															
	Total															
TOTAL INDUSTRY OUTPUT																

* See text and appendix B.

** See text.

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

by-commodity total requirements.¹¹ For the 1987 benchmark, details for the value added components of the use table and of the commodity-by-industry direct requirements table are contained in separate tables. Only the make and use tables are presented in this article. The remaining three tables and their descriptions will be published in the May SURVEY.

The make table

The make table (table 1), 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 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

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.

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

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 1-0 62) totaled \$86 billion, of which the scientific and controlling instruments industry (industry 1-0 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). 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."

The use table

The use table (table 2) 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 services

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.

(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 personal consumption expenditures (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 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 1-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 (1-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 (1-O 24), with \$81 billion of commodity output, were used by nearly all industries. The largest user was other printing and publishing (1-O 26B), which used \$15 billion, or 18 percent of total commodity output. In contrast, metal containers (1-O 39), with \$12 billion of commodity output, were used by only 20 industries. The largest user was food and kindred products (1-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 (1-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 (1-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 1-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 1-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 shows the principal methods and sources used for the 1987 benchmark.)

BEA estimates the final uses of commodities either by incorporating data into the 1-O accounts directly from other sources after minor adjustment, or—for personal consumption expenditures and producers' durable equipment—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 personal consumption expenditures for polishes and sanitation goods; in this case, approximately 40 percent of total output is allocated to personal consumption expenditures. An example of commodity flow using the residual method can be illustrated by examining its use in estimating personal consumption expenditures 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 personal consumption expenditures.

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, industry 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.

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 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 revision, the NIPA estimates of personal consumption expenditures and producers' durable equipment 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.¹⁵

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 producers' durable equipment to weight producer price indexes for calculating the constant-dollar NIPA estimates of producers' durable equipment.

Analytical uses.—The I-O accounts are an important analytical tool because they show the interdependence among various producers and

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

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

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 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.¹⁶

16. 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).

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.¹⁷ 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.¹⁸

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. The adjustments, which affect I-O-defined primary and secondary production, are called, in I-O terminology, redefinitions and reclassifications.¹⁹ 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 serv-

17. 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.

18. 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.

19. 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.

ice is primary; this assumption is called, in I-O terminology, the commodity-based technology assumption.²⁰

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 automobile and repair services (I-O 75), with \$131 billion of total industry output, of which \$40 billion has been redefined out to a number of other industries and \$1 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, \$34 billion out and \$1/2 billion in; wholesale trade (I-O 69A), with \$424 billion of total output, \$7 billion out and \$69 billion in; and retail trade (I-O 69B), with \$421 billion of total output, \$25 billion out and \$46 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 within the same I-O industry. 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 industries with large dollar amounts of reclassified sales receipts are the newspapers and periodicals industry (I-O 26A), for which \$20 billion of its \$36 billion total commodity output is moved to the advertising commodity (I-O 73D); and the crude petroleum and natural gas industry (I-O 8), for which \$12 billion of its \$80 billion total commodity output is moved 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 primary; this assumption, in I-O terminology, is called the industry-based technology assumption (see footnote 20).

20. The I-O commodity-based and I-O industry-based technology assumptions are important when estimating the total-requirements tables. The significance of the 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 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.

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 (I-O 85), which is a NIPA adjustment to derive GDP (see appendix B 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 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, not elsewhere classified (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 (rows 65A-E) of the use table.

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

Wholesale trade output is measured one way for merchant wholesalers, agents, and brokers and another way for manufacturers' sales branches. For merchant wholesalers, 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 (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

Text continues on page 90.

Text continues from page 83.

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 final 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 (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 (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 (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 (column 95).

Imports of goods *by commodity* (the entries in column 95) 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—both by commodity and as a total—are valued in U.S. producers' prices, which are considered to be equivalent to U.S. domestic port values. Exports 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

Data Availability

The estimates from the 1987 benchmark I-O accounts are available on diskette at two-digit (95 I-O industries) and six-digit (480 I-O industries) levels. They can be ordered for "transactions," for "total requirements," or for "all." "Transactions" includes the six-digit make table, use table, direct requirements coefficients table, and estimates by commodity of transportation costs and of wholesale and retail trade margins. "Total requirements" includes six-digit industry-by-commodity or commodity-by-commodity coefficients. Products specifying "all" contain all above data, but for the two-digit I-O industry level only. 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(s) being ordered. 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 inch HD)		
1987 benchmark six-digit, transactions (two diskettes).....	51-94-40-001	\$40
1987 benchmark six-digit, industry-by-commodity total requirements (two diskettes)	51-94-40-002	40
1987 benchmark six-digit, commodity-by-commodity total requirements (two 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 personal consumption expenditures and producers' durable equipment by NIPA category	51-94-40-006	20

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

original cost—in the use table. The inventory valuation adjustment, which converts inventory change from book value to replacement cost, is shown as a single entry for the total of all commodities (row 85, column 93).

Supplementary tables

Four supplementary tables, which can be used with the five basic sets of I-O tables, are provided with this article. Three tables (tables C–E) cover the I-O commodity composition of NIPA final demand, of NIPA personal consumption expenditures, and of NIPA producers' durable equipment; a fourth table (table F) reconciles I-O exports of goods and services and imports of goods and services with NIPA estimates.

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. Also, the definitions of I-O final use categories differ from those of the NIPA final demand categories. 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 personal consumption expenditures (NIPA table 2.4) in producers' and purchasers' prices. It provides a bridge between I-O commodities in producers' prices and NIPA personal consumption 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 producers' durable equipment purchases (NIPA table 5.8) in producers' and purchasers' prices. It provides a bridge between I-O commodities in producers' prices and NIPA producers' durable equipment 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.²¹ The NIPA's also exclude definitional and statistical revisions to the balance of payments accounts between NIPA comprehensive revisions.

Appendices A and B and tables 1 and 2 follow. 

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

21. 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.

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.

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	I-O industry number and title	Related 1987 SIC codes
	AGRICULTURE, FORESTRY, AND FISHERIES			
1	Livestock and livestock products:		14	Food and kindred products:
1.0100	Dairy farm products	024,*019, *0259, *029	14.0101	Meat packing plants
1.0200	Poultry and eggs	0251-3, *0259, *019, *0219, *029	14.0102	Sausages and other prepared meat products
1.0301	Meat animals	0211-4, *0219, *019, *0259, *029	14.0105	Poultry slaughtering and processing
1.0302	Miscellaneous livestock	0271-3, *0279, *019, *0219, *0259, *029	14.0200	Creamery butter
2	Other agricultural products:		14.0300	Natural, processed, and imitation cheese
2.0100	Cotton	0131, *019, *0219, *0259, *029	14.0400	Dry, condensed, and evaporated dairy products
2.0201	Food grains	*011, *019, *0219, *0259, *029	14.0500	Dry ice cream and frozen desserts
2.0202	Feed grains	*011, *019, *019, *0219, *0259, *029	14.0600	Fluid milk
2.0203	Grass seeds	*0139, *019, *0219, *0259, *029	14.0700	Canned and cured fish and seafoods
2.0300	Tobacco	0132, *019, *0219, *0259, *029	14.0800	Canned specialties
2.0401	Fruits	0171-2, *0174-5, *0179, *019, *0219, *0259, *029	14.0900	Canned fruits, vegetables, preserves, jams, and jellies
2.0402	Tree nuts	0173, *019, *019, *0219, *0259, *029	14.1000	Dehydrated fruits, vegetables, and soups
2.0501	Vegetables	0134, *0139, *016, *019, *0219, *0259, *029, *0119	14.1100	Pickles, sauces, and salad dressings
2.0502	Sugar crops	0133, *019, *0219, *0259, *029	14.1200	Prepared fresh or frozen fish and seafoods
2.0503	Miscellaneous crops	*0119, *0139, *019, *0219, *0259, *029	14.1301	Frozen fruits, fruit juices, and vegetables
2.0600	Oil bearing crops	0116, *019, *0139, *0219, *0259, *029	14.1302	Frozen specialties, n.e.c.
2.0701	Forest products	*018, *019, *0219, *0259, *029	14.1401	Flour and other grain mill products
2.0702	Greenhouse and nursery products	*018, *019, *0219, *0259, *029	14.1402	Cereal breakfast foods
3	Forestry and fishery products:		14.1403	Prepared flour mixes and doughs
3.0001	Forestry products	081, 083, 097	14.1501	Dog and cat food
3.0002	Commercial fishing	091	14.1502	Prepared feeds, n.e.c.
4	Agricultural, forestry, and fishery services:		14.1600	Rice milling
4.0001	Agricultural, forestry, and fishery services	0254, *0279, 071-2, 075-6, 085, 092	14.1700	Wet corn milling
4.0002	Landscape and horticultural services	078	14.1801	Bread, cake, and related products
	MINING		14.1802	Cookies and crackers
5+6	Metallic ores mining:		14.1803	Frozen bakery products, except bread
5.0000	Iron and ferroalloy ores	101, 106	14.1900	Sugar
6.0100	Copper ore	102	14.2001	Candy and other confectionery products
6.0200	Nonferrous metal ores, except copper	103-4, 109, *108	14.2002	Chocolate and cocoa products
7	Coal mining:		14.2003	Chewing gum
7.0000	Coal	122-3, *124	14.2004	Salted and roasted nuts and seeds
8	Crude petroleum and natural gas:		14.2101	Malt beverages
8.0000	Crude petroleum and natural gas	131-2, *138	14.2102	Malt
9+10	Nonmetallic minerals mining:		14.2103	Wines, brandy, and brandy spirits
9.0001	Dimension, crushed and broken stone	141-2	14.2104	Distilled and blended liquors
9.0002	Sand and gravel	144	14.2200	Bottled and canned soft drinks
9.0003	Clay, ceramic, and refractory minerals	145	14.2300	Flavoring extracts and flavoring syrups, n.e.c.
9.0004	Nonmetallic mineral services and miscellaneous minerals	*148, 149	14.2400	Cottonseed oil mills
10.0000	Chemical and fertilizer minerals	147	14.2500	Soybean oil mills
	CONSTRUCTION		14.2600	Vegetable oil mills, n.e.c.
11+12	Construction:		14.2700	Animal and marine fats and oils
11.0000	New and maintenance and repair	15-17, 6552	14.2800	Roasted coffee
11.0601	Petroleum and natural gas well drilling	*138	14.2900	Edible fats and oils, n.e.c.
11.0602	Petroleum, natural gas, and solid mineral exploration	*138, *108, *124, *148	14.3000	Manufactured ice
11.0603	Access structures for solid mineral development	*108, *124, *148	14.3100	Macaroni, spaghetti, vermicelli, and noodles
12.0215	Maintenance and repair of petroleum and natural gas wells.	*138	14.3201	Potato chips and similar snacks
	MANUFACTURING		14.3202	Food preparations, n.e.c.
13	Ordnance and accessories:		15	Tobacco products:
13.0100	Guided missiles and space vehicles	3761	15.0101	Cigarettes
13.0200	Ammunition, except for small arms, n.e.c.	3483	15.0102	Cigars
13.0300	Tanks and tank components	3795	15.0103	Chewing and smoking tobacco and snuff
13.0500	Small arms	3484	15.0200	Tobacco stemming and redrying
13.0600	Small arms ammunition	3482	16	Broad and narrow fabrics, yarn and thread mills:
13.0700	Ordnance and accessories, n.e.c.	3489	16.0100	Broadwoven fabric mills and fabric finishing plants
			16.0200	Narrow fabric mills
			16.0300	Yarn mills and finishing of textiles, n.e.c.
			16.0400	Thread mills
			17	Miscellaneous textile goods and floor coverings:
			17.0100	Carpets and rugs
			17.0600	Coated fabrics, not rubberized
			17.0700	Tire cord and fabrics
			17.0900	Cordage and twine
			17.1001	Nonwoven fabrics
			17.1100	Textile goods, n.e.c.
			18	Apparel:
			18.0101	Women's hosiery, except socks
			18.0102	Hosiery, n.e.c.
			18.0201	Knit outerwear mills
			18.0202	Knit underwear and nightwear mills
			18.0203	Knitting mills, n.e.c.
			18.0300	Knit fabric mills
			18.0400	Apparel made from purchased materials
				231-8, *399
			19	Miscellaneous fabricated textile products:
			19.0100	Curtains and draperies
			19.0200	Housefurnishings, n.e.c.
			19.0301	Textile bags
			19.0302	Canvas and related products
			19.0303	Pleating and stitching
			19.0304	Automotive and apparel trimmings
			19.0305	Schiffli machine embroideries
			19.0306	Fabricated textile products, n.e.c.
				2399

Appendix B.—Industry Classification of the 1987 Benchmark Input-Output Accounts—Continued

	I-O industry number and title	Related 1987 SIC codes		I-O industry number and title	Related 1987 SIC codes
20+21	Lumber and wood products: 20.0100 Logging 20.0200 Sawmills and planing mills, general 20.0300 Hardwood dimension and flooring mills 20.0400 Special product sawmills, n.e.c. 20.0501 Millwork 20.0502 Wood kitchen cabinets 20.0600 Veneer and plywood 20.0701 Structural wood members, n.e.c. 20.0702 Prefabricated wood buildings and components 20.0703 Mobile homes 20.0800 Wood preserving 20.0901 Wood pallets and skids 20.0903 Wood products, n.e.c. 20.0904 Reconstituted wood products 21.0000 Wood containers, n.e.c.	241 2421 2426 2429 2431 2434 2435-6 2439 2452 2451 2491 2448 2499 2493 2441, 2449	31	Petroleum refining and related products: 31.0101 Petroleum refining 31.0102 Lubricating oils and greases 31.0103 Products of petroleum and coal, n.e.c. 31.0200 Asphalt paving mixtures and blocks 31.0300 Asphalt felts and coatings	291 2992 2999 2951 2952
22+23	Furniture and fixtures: 22.0101 Wood household furniture, except upholstered 22.0102 Household furniture, n.e.c. 22.0103 Wood television and radio cabinets 22.0200 Upholstered household furniture 22.0300 Metal household furniture 22.0400 Mattressed and bedsprings 23.0100 Wood office furniture 23.0200 Office furniture, except wood 23.0300 Public building and related furniture 23.0400 Wood partitions and fixtures 23.0500 Partitions and fixtures, except wood 23.0600 Drapery hardware and window blinds and shades 23.0700 Furniture and fixtures, n.e.c.	2511 2519 2517 2512 2514 2515 2521 2522 253 2541 2542 2591 2599	32	Rubber and miscellaneous plastics products: 32.0100 Tires and inner tubes 32.0200 Rubber and plastics footwear 32.0300 Fabricated rubber products, n.e.c. 32.0400 Miscellaneous plastics products, n.e.c. 32.0500 Rubber and plastics hose and belting 32.0600 Gaskets, packing, and sealing devices	301 302 306 308 3052 3053
24	Paper and allied products, except containers: 24.0100 Pulp mills 24.0400 Envelopes 24.0500 Sanitary paper products 24.0701 Paper coating and glazing 24.0702 Bags, except textile 24.0703 Die-cut paper and paperboard and cardboard 24.0705 Stationery, tablets, and related products 24.0706 Converted paper products, n.e.c. 24.0800 Paper and paperboard mills	261 2677 2676 2671-2 2673-4 2675 2678 2679 262-3	33+34	Footwear, leather, and leather products: 33.0001 Leather tanning and finishing 34.0100 Boot and shoe cut stock and findings 34.0201 Shoes, except rubber 34.0202 House slippers 34.0301 Leather gloves and mittens 34.0302 Luggage 34.0303 Women's handbags and purses 34.0304 Personal leather goods, n.e.c. 34.0305 Leather goods, n.e.c.	311 313 3143-4, 3149 3142 315 316 3171 3172 319
25	Paperboard containers and boxes: 25.0000 Paperboard containers and boxes	265	35	Glass and glass products: 35.0100 Glass and glass products, except containers 35.0200 Glass containers	321, 3229, 323 3221
26A	Newspapers and periodicals: 26.0100 Newspapers 26.0200 Periodicals	271 272	36	Stone and clay products: 36.0100 Cement, hydraulic 36.0200 Brick and structural clay tile 36.0300 Ceramic wall and floor tile 36.0400 Clay refractories 36.0500 Structural clay products, n.e.c. 36.0600 Vitreous china plumbing fixtures 36.0701 Vitreous china table and kitchenware 36.0702 Fine earthenware table and kitchenware 36.0800 Porcelain electrical supplies 36.0900 Pottery products, n.e.c. 36.1000 Concrete block and brick 36.1100 Concrete products, except block and brick 36.1200 Ready-mixed concrete 36.1300 Lime 36.1400 Gypsum products 36.1500 Cut stone and stone products 36.1600 Abrasive products 36.1700 Asbestos products 36.1900 Minerals, ground or treated 36.2000 Mineral wool 36.2100 Nonclay refractories 36.2200 Nonmetallic mineral products, n.e.c.	324 3251 3253 3255 3259 3261 3262 3263 3264 3269 3271 3272 3273 3274 3275 328 3291 3292 3295 3296 3297 3299
26B	Other printing and publishing: 26.0301 Book publishing 26.0302 Book printing 26.0400 Miscellaneous publishing 26.0501 Commercial printing 26.0601 Manifold business forms 26.0602 Blankbooks, looseleaf binders and devices 26.0700 Greeting cards 26.0802 Bookbinding and related work 26.0803 Typesetting 26.0806 Platemaking and related services	2731 2732 274 275 276 2782 277 2789 2791 2796	37	Primary iron and steel manufacturing: 37.0101 Blast furnaces and steel mills 37.0102 Electrometallurgical products, except steel 37.0103 Steel wiredrawing and steel nails and spikes 37.0104 Cold-rolled steel sheet, strip, and bars 37.0105 Steel pipe and tubes 37.0200 Iron and steel foundries 37.0300 Iron and steel forgings 37.0401 Metal heat treating 37.0402 Primary metal products, n.e.c.	3312 3313 3315 3316 3317 332 3462 3398 3399
27A	Industrial and other chemicals: 27.0100 Industrial inorganic and organic chemicals 27.0401 Gum and wood chemicals 27.0402 Adhesives and sealants 27.0403 Explosives 27.0404 Printing ink 27.0405 Carbon black 27.0406 Chemicals and chemical preparations, n.e.c.	281 (excl. "2819), 2865, 2869	38	Primary nonferrous metals manufacturing: 38.0100 Primary smelting and refining of copper 38.0400 Primary aluminum 38.0501 Primary nonferrous metals, n.e.c.	3331 3334, *2819 3339
27B	Agricultural fertilizers and chemicals: 27.0201 Nitrogenous and phosphatic fertilizers 27.0202 Fertilizers, mixing only 27.0300 Pesticides and agricultural chemicals, n.e.c.	2873-4 2875 2879		38.0600 Secondary nonferrous metals 38.0700 Rolling, drawing, and extruding of copper 38.0800 Aluminum rolling and drawing 38.0900 Nonferrous rolling and drawing, n.e.c. 38.1000 Nonferrous wiredrawing and insulating 38.1100 Aluminum castings 38.1200 Copper foundries 38.1300 Nonferrous castings, n.e.c. 38.1400 Nonferrous forgings	334 3351 3353-5 3356 3357 3363, 3365 3366 3364, 3369 3463
28	Plastics and synthetic materials: 28.0100 Plastics materials and resins 28.0200 Synthetic rubber 28.0300 Cellulosic manmade fibers 28.0400 Manmade organic fibers, except cellulosic	2821 2822 2823 2824	39	Metal containers: 39.0100 Metal cans 39.0200 Metal shipping barrels, drums, kegs, and pails	3411 3412
29A	Drugs: 29.0100 Drugs	283	40	Heating, plumbing, and fabricated structural metal products: 40.0100 Enameling iron and metal sanitary ware 40.0200 Plumbing fixture fittings and trim 40.0300 Heating equipment, except electric and warm air furnaces 40.0400 Fabricated structural metal 40.0500 Metal doors, sash, frames, molding, and trim 40.0600 Fabricated plate work (boiler shops) 40.0700 Sheet metal work 40.0800 Architectural and ornamental metal work 40.0901 Prefabricated metal buildings and components 40.0902 Miscellaneous structural metal work	3431 3432 3433 3441 3442 3443 3444 3446 3448 3449
29B	Cleaning and toilet preparations: 29.0201 Soap and other detergents 29.0202 Polishes and sanitation goods 29.0203 Surface active agents 29.0300 Toilet preparations	2841 2842 2843 2844			
30	Paints and allied products: 30.0000 Paints and allied products	285			

Appendix B.—Industry Classification of the 1987 Benchmark Input-Output Accounts—Continued

	I-O industry number and title	Related 1987 SIC codes	I-O industry number and title	Related 1987 SIC codes
41	Screw machine products and stampings: 41.0100 Screw machine products, bolts, etc. 41.0201 Automotive stampings 41.0202 Crowns and closures 41.0203 Metal stampings, n.e.c.	3451-2 3465 3466 3469	54.0400 Electric housewares and fans 54.0500 Household vacuum cleaners 54.0700 Household appliances, n.e.c.	3634 3635 3639
42	Other fabricated metal products: 42.0100 Cutlery 42.0201 Hand and edge tools, except machine tools and handsaws. 42.0202 Saw blades and handsaws 42.0300 Hardware, n.e.c. 42.0401 Plating and polishing 42.0402 Coating, engraving, and allied services, n.e.c. 42.0500 Miscellaneous fabricated wire products 42.0700 Steel springs, except wire 42.0800 Pipe, valves, and pipe fittings 42.1000 Metal foil and leaf 42.1100 Fabricated metal products, n.e.c.	3421 3423 3425 3429 3471 3479 3495-6 3493 3491-2, 3494, 3498 3497 3499	55 Electric lighting and wiring equipment: 55.0100 Electric lamp bulbs and tubes 55.0200 Lighting fixtures and equipment 55.0300 Wiring devices 56 Audio, video, and communication equipment: 56.0100 Household audio and video equipment 56.0200 Prerecorded records and tapes 56.0300 Telephone and telegraph apparatus 56.0500 Communication equipment 57 Electronic components and accessories: 57.0100 Electron tubes 57.0200 Semiconductors and related devices 57.0300 Other electronic components 58 Miscellaneous electrical machinery and supplies: 58.0100 Storage batteries 58.0200 Primary batteries, dry and wet 58.0400 Electrical equipment for internal combustion engines 58.0600 Magnetic and optical recording media 58.0700 Electrical machinery, equipment, and supplies, n.e.c.	3641 3645-8 3643-4 3651 3652 3661 3663, 3669 3671 3674 3672, 3675-9 3691 3692 3694 3695 3699
43	Engines and turbines: 43.0100 Turbines and turbine generator sets 43.0200 Internal combustion engines, n.e.c.	3511 3519	59A Motor vehicles (passenger cars and trucks): 59.0301 Motor vehicles and passenger car bodies	3711
44+45	Farm, construction, and mining machinery: 44.0001 Farm machinery and equipment 44.0002 Lawn and garden equipment 45.0100 Construction machinery and equipment 45.0200 Mining machinery, except oil field 45.0300 Oil and gas field machinery and equipment	3523 3524 3531 3532 3533	59B Truck and bus bodies, trailers, and motor vehicles parts: 59.0100 Truck and bus bodies 59.0200 Truck trailers 59.0302 Motor vehicle parts and accessories	3713 3715 3714
46	Materials handling machinery and equipment: 46.0100 Elevators and moving stairways 46.0200 Conveyors and conveying equipment 46.0300 Hoists, cranes, and monorails 46.0400 Industrial trucks and tractors	3534 3535 3536 3537	60 Aircraft and parts: 60.0100 Aircraft 60.0200 Aircraft and missile engines and engine parts 60.0400 Aircraft and missile equipment, n.e.c.	3721 3724, 3764 3728, 3769
47	Metalworking machinery and equipment: 47.0100 Machine tools, metal cutting types 47.0200 Machine tools, metal forming types 47.0300 Special dies and tools and machine tool accessories 47.0401 Power-driven handtools 47.0402 Rolling mill machinery and equipment 47.0404 Electric and gas welding and soldering equipment 47.0405 Industrial patterns 47.0500 Metalworking machinery, n.e.c.	3541 3542 3544-5 3546 3547 3548 3543 3549	61 Other transportation equipment: 61.0100 Ship building and repairing 61.0200 Boat building and repairing 61.0300 Railroad equipment 61.0500 Motorcycles, bicycles, and parts 61.0601 Travel trailers and campers 61.0603 Motor homes 61.0700 Transportation equipment, n.e.c.	3731 3732 374 375 3792 3716 3799
48	Special industry machinery and equipment: 48.0100 Food products machinery 48.0200 Textile machinery 48.0300 Woodworking machinery 48.0400 Paper industries machinery 48.0500 Printing trades machinery and equipment 48.0600 Special industry machinery, n.e.c.	3556 3552 3553 3554 3555 3559	62 Scientific and controlling instruments: 62.0101 Search and navigation equipment 62.0102 Laboratory apparatus and furniture 62.0200 Mechanical measuring devices 62.0300 Environmental controls 62.0400 Surgical and medical instruments and apparatus 62.0500 Surgical appliances and supplies 62.0600 Dental equipment and supplies 62.0700 Watches, clocks, watchcases, and parts 62.0800 X-ray apparatus and tubes 62.0900 Electromedical and electrotherapeutic apparatus 62.1000 Laboratory and optical instruments 62.1100 Instruments to measure electricity	381 3821 3823-4, 3829 3822 3841 3842 3843 387 3844 3845 3826-7 3825
49	General industrial machinery and equipment: 49.0100 Pumps and compressors 49.0200 Ball and roller bearings 49.0300 Blowers and fans 49.0500 Mechanical power transmission equipment 49.0600 Industrial process furnaces and ovens 49.0700 General industrial machinery and equipment, n.e.c. 49.0800 Packaging machinery	3561, 3563 3562 3564 3566, 3568 3567 3569 3565	63 Ophthalmic and photographic equipment: 63.0200 Ophthalmic goods 63.0300 Photographic equipment and supplies	385 386
50	Miscellaneous machinery, except electrical: 50.0100 Carburetors, pistons, rings, and valves 50.0200 Fluid power equipment 50.0300 Scales and balances, except laboratory 50.0400 Industrial and commercial machinery and equipment, n.e.c.	3592 3593-4 3596 3599	64 Miscellaneous manufacturing: 64.0101 Jewelry, precious metal 64.0102 Jewelers' materials and lapidary work 64.0104 Silverware and plated ware 64.0105 Costume jewelry 64.0200 Musical instruments 64.0301 Games, toys, and children's vehicles 64.0302 Dolls and stuffed toys 64.0400 Sporting and athletic goods, n.e.c. 64.0501 Pens, mechanical pencils, and parts 64.0502 Lead pencils and art goods 64.0503 Marking devices 64.0504 Carbon paper and inked ribbons 64.0700 Fasteners, buttons, needles, and pins 64.0800 Brooms and brushes 64.0900 Hard surface floor coverings, n.e.c. 64.1000 Burial caskets 64.1100 Signs and advertising specialties 64.1200 Manufacturing industries, n.e.c.	3911 3915 3914 3961 393 3944 3942 3949 3951 3952 3953 3955 3965 3991 3996 3995 3993 3999
51	Computer and office equipment: 51.0102 Calculating and accounting machines 51.0103 Electronic computers 51.0104 Computer peripheral equipment 51.0400 Office machines, n.e.c.	3578 3571 3572, 3575, 3577 3579	TRANSPORTATION, COMMUNICATIONS, AND UTILITIES	
52	Service industry machinery: 52.0100 Automatic vending machines 52.0200 Commercial laundry equipment 52.0300 Refrigeration and heating equipment 52.0400 Measuring and dispensing pumps 52.0500 Service industry machinery, n.e.c.	3581 3582 3585 3586 3589	65A Railroads and related services; passenger ground transportation: 65.0100 Railroads and related services 65.0200 Local and suburban transit and interurban highway passenger transportation.	40, 474, *4789 41
53	Electrical industrial equipment and apparatus: 53.0200 Power, distribution, and specialty transformers 53.0300 Switchgear and switchboard apparatus 53.0400 Motors and generators 53.0500 Relays and industrial controls 53.0700 Carbon and graphite products 53.0800 Electrical industrial apparatus, n.e.c.	3612 3613 3621 3625 3624 3629	65B Motor freight transportation and warehousing: 65.0300 Motor freight transportation and warehousing	42, *4789
54	Household appliances: 54.0100 Household cooking equipment 54.0200 Household refrigerators and freezers 54.0300 Household laundry equipment	3631 3632 3633		

Appendix B.—Industry Classification of the 1987 Benchmark Input-Output Accounts—Continued

I-O industry number and title	Related 1987 SIC codes		I-O industry number and title	Related 1987 SIC codes
65C Water transportation: 65.0400 Water transportation	44		75 Automotive repair and services: 75.0001 Automotive rental and leasing, without drivers	751
65D Air transportation: 65.0500 Air transportation	45		75.0002 Automotive repair shops and services	753, 7549
65E Pipelines, freight forwarders, and related services: 65.0600 Pipelines, except natural gas	46		75.0003 Automobile parking and car washes	752, 7542
65.0701 Freight forwarders and other transportation services	473, 4783, 4785, *4789		76 Amusements: 76.0101 Motion picture services and theaters	781-3
65.0702 Arrangement of passenger transportation	472		76.0102 Video tape rental	784
66 Communications, except radio and TV: 66.0000 Communications, except radio and TV	481-2, 484, 489		76.0201 Theatrical producers (except motion picture), bands, orchestras and entertainers.	792
67 Radio and TV broadcasting: 67.0000 Radio and TV broadcasting	483		76.0202 Bowling centers	793
68A Electric services (utilities): 68.0100 Electric services (utilities)	491, *493		76.0203 Professional sports clubs and promoters	7941
68B Gas production and distribution (utilities): 68.0200 Gas production and distribution (utilities)	492, *493		76.0204 Racing, including track operation	7948
68C Water and sanitary services: 68.0301 Water supply and sewerage systems	494, 4952		76.0205 Physical fitness facilities and membership sports and recreation clubs.	7991, 7997
68.0302 Sanitary services, steam supply, and irrigation systems	4953, 4959, 496-7, *493		76.0206 Other amusement and recreation services	791, 7992-3, 7996, 7999
WHOLESALE AND RETAIL TRADE				
69A Wholesale trade: 69.0100 Wholesale trade	50, 51		77A Health services: 77.0100 Doctors and dentists	801-3, 8041
69B Retail trade: 69.0200 Retail trade, except eating and drinking	52-7 (excl. *546), 59, *7389, 8042		77.0200 Hospitals	806
FINANCE, INSURANCE, AND REAL ESTATE				
70A Finance: 70.0100 Banking	60		77.0301 Nursing and personal care facilities	805
70.0200 Credit agencies other than banks	61, 67 (excl. 6732)		77.0302 Other medical and health services, including veterinarians.	874, 8043, 8049, 807-9
70.0300 Security and commodity brokers	62		77B Educational and social services, and membership organizations: 77.0401 Elementary and secondary schools	821
70B Insurance: 70.0400 Insurance carriers	63		77.0402 Colleges, universities, and professional schools	822
70.0500 Insurance agents, brokers, and services	64		77.0403 Private libraries, vocational schools, and educational services, n.e.c.	823-4, 829
71A Owner-occupied dwellings: 71.0100 Owner-occupied dwellings			77.0501 Business associations and professional membership organizations.	861-2
71B Real estate and royalties: 71.0201 Real estate agents, managers, operators, and lessors ..	65 (excl. 6552)		77.0502 Labor organizations, civic, social, and fraternal associations.	863-4
71.0202 Royalties			77.0503 Religious organizations	866
SERVICES			77.0504 Other membership organizations	84, 865, 869, 8733, 6732
72A Hotels and lodging places: 72.0100 Hotels and lodging places	70		77.0600 Job training and related services	833
72B Personal and repair services (except auto): 72.0201 Laundry, cleaning, garment services, and shoe repair ..	721, 725		77.0700 Child day care services	835
72.0202 Funeral service and crematories	726		77.0800 Residential care	836
72.0203 Portrait photographic studios, and other miscellaneous personal services.	722, 729		77.0900 Social services, n.e.c.	832, 839
72.0204 Electrical repair shops	762		GOVERNMENT ENTERPRISES	
72.0205 Watch, clock, jewelry, and furniture repair	763-4		78 Federal Government enterprises: 78.0100 U.S. Postal Service	43
72.0300 Beauty and barber shops	723-4		78.0200 Federal electric utilities	(1)
73A Computer and data processing services: 73.0104 Computer and data processing services	737		78.0500 Other Federal Government enterprises	(1)
73B Legal, engineering, accounting, and related services: 73.0301 Legal services	81		79 State and local government enterprises: 79.0100 State and local government passenger transit	(1)
73.0302 Engineering, architectural, and surveying services	871		79.0200 State and local government electric utilities	(1)
73.0303 Accounting, auditing and bookkeeping, and miscellaneous services, n.e.c.	872, 89		79.0300 Other State and local government enterprises	(1)
73C Other business and professional services, except medical: 73.0101 Miscellaneous repair shops	769		SPECIAL INDUSTRIES	
73.0102 Services to dwellings and other buildings	734		80 Noncomparable imports: 80.0000 Noncomparable imports	(2)
73.0103 Personnel supply services	736		81 Scrap, used and secondhand goods: 81.0001 Scrap	(3)
73.0105 Management and consulting services, testing and research labs.	874, 8731-2, 8734		81.0002 Used and secondhand goods	(3)
73.0106 Detective and protective services	7381-2		82 General government industry: 82.0000 General government industry	(4)
73.0107 Miscellaneous equipment rental and leasing	735		83 Rest of the world adjustment to final uses: 83.0001 Rest of the world adjustment to final uses	(5)
73.0108 Photofinishing labs and commercial photography	7384, 7335-6		84 Household Industry: 84.0000 Household industry	(6)
73.0109 Other business services	732, 7383, *7389, 7331, 7334, 7338		85 Inventory valuation adjustment: 85.0000 Inventory valuation adjustment	(7)
73D Advertising: 73.0200 Advertising	731		VALUE ADDED	
74 Eating and drinking places: 74.0000 Eating and drinking places	58		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)

Appendix B.—Industry Classification of the 1987 Benchmark Input-Output Accounts—Continued

I-O industry number and title	Related 1987 SIC codes	I-O industry number and title	Related 1987 SIC codes
98.0003 State and local government purchases, other education and libraries.	(*)	11.0204 Garages and service stations
99.1001 State and local government purchases, hospitals and categorical health programs.	(*)	11.0205 Stores and restaurants
99.1002 State and local government purchases, public welfare institutions and activities.	(*)	11.0206 Religious buildings
99.1003 State and local government purchases, public sewerage systems, capital account only.	(*)	11.0231 Hospitals
99.1004 State and local government purchases, sanitation	(*)	11.0232 Residential institutions and other health-related facilities
99.2001 State and local government purchases, police	(*)	11.0241 Amusement and recreation buildings
99.2002 State and local government purchases, fire fighting organizations and auxiliary services.	(*)	11.0250 Other nonfarm buildings
99.2003 State and local government purchases, correctional institutions.	(*)	11.0301 Telephone and telegraph facilities
99.3001 State and local government purchases, public highways (excluding non-capital expenditures of toll roads).	(*)	11.0302 Railroads
99.3002 State and local government purchases, waterports and airports, capital account only.	(*)	11.0303 Electric utility facilities
99.3003 State and local government purchases, government-operated transit systems, capital account only.	(*)	11.0304 Gas utility facilities
99.3004 State and local government purchases, other commerce activities n.e.c., capital account only.	(*)	11.0305 Petroleum pipelines
99.3005 State and local government purchases, gas and electric utilities, capital account only.	(*)	11.0306 Water supply facilities
99.3006 State and local government purchases, government-operated water supply facilities, capital account only.	(*)	11.0307 Sewer system facilities
99.3007 State and local government purchases, redevelopment projects, capital account only.	(*)	11.0308 Local transit facilities
99.3008 State and local government purchases, natural and agricultural resources and recreation facilities.	(*)	11.0400 Highways and streets
99.3009 State and local government purchases, other general government activities, n.e.c.	(*)	11.0501 Farm housing units and additions and alterations
ADDENDUM: Special commodity groupings			
New construction:			
11.0101 Residential 1-unit structures, nonfarm		12.0100 Nonfarm residential structures
11.0102 Residential 2-4 unit structures, nonfarm		12.0201 Other nonfarm buildings
11.0103 Residential garden apartments		12.0202 Farm residential buildings
11.0104 Residential high-rise apartments		12.0203 Farm service facilities
11.0105 Residential additions and alterations, nonfarm		12.0204 Telephone and telegraph facilities
11.0106 Hotels and motels		12.0205 Railroads
11.0107 Dormitories and other group housing		12.0206 Electric utility facilities
11.0201 Industrial buildings		12.0207 Gas utility facilities
11.0202 Office buildings		12.0208 Petroleum pipelines
11.0203 Warehouses		12.0209 Water supply facilities
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 personal consumption expenditures 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.			

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 personal consumption expenditures 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.

Table 1.—The Make of Commodities
[Millions of dollars]

Industry number	For the distribution of industries producing a commodity, read the column for that commodity For the distribution of commodities produced by an industry, read the row for that industry	Commodity number	Livestock and livestock products	Other agricultural products	Forestry and fishery products	Agricultural, forestry, and fishery services	Metallic ores mining	Coal mining	Crude petroleum and natural gas	Non-metallic minerals mining	New construction	Maintenance and repair construction
			1	2	3	4	5+6	7	8	9+10	11	12
1	Livestock and livestock products	83,609			243	494						
2	Other agricultural products		82,183		1,788	974						
3	Forestry and fishery products				7,456		22,201					
4	Agricultural, forestry, and fishery services							6,800				
5+6	Metallic ores mining							(*)	25,447		6	
7	Coal mining									67,947	5	
8	Crude petroleum and natural gas										1	
9+10	Nonmetallic minerals mining							3	4		11,321	
11+12	Construction											445,347
13	Ordnance and accessories											173,466
14	Food and kindred products											
15	Tobacco products											
16	Broad and narrow fabrics, yarn and thread mills											
17	Miscellaneous textile goods and floor coverings											
18	Apparel											
19	Miscellaneous fabricated textile products											
20+21	Lumber and wood products											
22+23	Furniture and fixtures											
24	Paper and allied products, except containers											
25	Paperboard containers and boxes											
26A	Newspapers and periodicals											
26B	Other printing and publishing											
27A	Industrial and other chemicals										2	
27B	Agricultural fertilizers and chemicals										8	
28	Plastics and synthetic materials										1	
29A	Drugs											
29B	Cleaning and toilet preparations											
30	Paints and allied products											
31	Petroleum refining and related products										1	140
32	Rubber and miscellaneous plastics products											
33+34	Footwear, leather, and leather products											
35	Glass and glass products											
36	Stone and clay products										402	
37	Primary iron and steel manufacturing										1	
38	Primary nonferrous metals manufacturing											
39	Metal containers											
40	Heating, plumbing, and fabricated structural metal products											
41	Screw machine products and stampings											
42	Other fabricated metal products											
43	Engines and turbines											
44+45	Farm, construction, and mining machinery											
46	Materials handling machinery and equipment											
47	Metalworking machinery and equipment											
48	Special industry machinery and equipment											
49	General industrial machinery and equipment											
50	Miscellaneous machinery, except electrical											
51	Computer and office equipment											
52	Service industry machinery											
53	Electrical industrial equipment and apparatus											
54	Household appliances											
55	Electric lighting and wiring equipment											
56	Audio, video, and communication equipment											
57	Electronic components and accessories											
58	Miscellaneous electrical machinery and supplies											
59A	Motor vehicles (passenger cars and trucks)											
59B	Truck and bus bodies, trailers, and motor vehicles parts											
60	Aircraft and parts											
61	Other transportation equipment											
62	Scientific and controlling instruments											
63	Ophthalmic and photographic equipment											
64	Miscellaneous manufacturing											
65A	Railroads and related services; passenger ground transportation											
65B	Motor freight transportation and warehousing											
65C	Water transportation											
65D	Air transportation											
65E	Pipelines, freight forwarders, and related services											
66	Communications, except radio and TV											
67	Radio and TV broadcasting											
68A	Electric services (utilities)										59	
68B	Gas production and distribution (utilities)											
68C	Water and sanitary services											
69A	Wholesale trade											
69B	Retail trade											
70A	Finance											
70B	Insurance											
71A	Owner-occupied dwellings											
71B	Real estate and royalties											
72A	Hotels and lodging places											
72B	Personal and repair services (except auto)											
73A	Computer and data processing services											
73B	Legal, engineering, accounting, and related services											
73C	Other business and professional services, except medical											
73D	Advertising											
74	Eating and drinking places											
75	Automotive repair and services											
76	Amusements											
77A	Health services											
77B	Educational and social services, and membership organizations											
78	Federal Government enterprises											
79	State and local government enterprises											
82	General government industry											
84	Household industry											
85	Inventory valuation adjustment											
T	Total commodity output	83,609	82,183	9,488	23,688	6,802	25,451	68,008	11,884	445,347	173,466	

*Less than \$500,000.

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by Industries, 1987 Benchmark—Continued

[at producers' prices]

Primary nonferrous metals manufacturing	Metal containers	Heating, plumbing, and fabricated structural metal products	Screw machine products and stampings	Other fabricated metal products	Engines and turbines	Farm, construction, and mining machinery	Materials handling machinery and equipment	Metalworking machinery and equipment	Special industry machinery and equipment	General industrial machinery and equipment	Miscellaneous machinery, except electrical	Computer and office equipment	Service industry machinery	Industry number
38	39	40	41	42	43	44+45	46	47	48	49	50	51	52	
														1
														2
														3
														4
														5+6
														7
														8
														9+10
														11+12
														13
														14
														15
														16
														17
														18
														19
														20+21
														22+23
														24
														25
														26A
														26B
														27A
														27B
														28
														29A
														29B
														30
														31
														32
														33+34
														35
														36
														37
														38
														39
														40
														41
														42
														43
														44+45
														46
														47
														48
														49
														50
														51
														52
55,746	11,739	43,686	31,826	47,022	14,394	26,005	7,376	22,051	16,411	23,221	19,855	54,431	21,746	T

Table 1.—The Make of Commodities
[Millions of dollars]

Industry number	Commodity number	For the distribution of industries producing a commodity, read the column for that commodity For the distribution of commodities produced by an industry, read the row for that industry									
		Electrical industrial equipment and apparatus	Household appliances	Electric lighting and wiring equipment	Audio, video, and communication equipment	Electronic components and accessories	Miscellaneous electrical machinery and supplies	Motor vehicles (passenger cars and trucks)	Truck and bus bodies, trailers, and motor vehicles parts	Aircraft and parts	Other transportation equipment
		53	54	55	56	57	58	59A	59B	60	61
1	Livestock and livestock products										
2	Other agricultural products										
3	Forestry and fishery products										
4	Agricultural, forestry, and fishery services										
5+6	Metallic ores mining										
7	Coal mining										
8	Crude petroleum and natural gas										
9+10	Nonmetallic minerals mining										
11+12	Construction										
13	Ordnance and accessories		1		140	9	69		16	3,802	2
14	Food and kindred products		1								
15	Tobacco products			1							
16	Broad and narrow fabrics, yarn and thread mills		1								
17	Miscellaneous textile goods and floor coverings										
18	Apparel										
19	Miscellaneous fabricated textile products										
20+21	Lumber and wood products	(*)		(*)		1			1		6
22+23	Furniture and fixtures		7	42	14	2	21	(*)	1	2	3
24	Paper and allied products, except containers						331				
25	Paperboard containers and boxes										
26A	Newspapers and periodicals										
26B	Other printing and publishing										
27A	Industrial and other chemicals		1		3		1				1
27B	Agricultural fertilizers and chemicals		2		1		14				(*)
28	Plastics and synthetic materials					3					
29A	Drugs						1				
29B	Cleaning and toilet preparations			1		13					
30	Paints and allied products										
31	Petroleum refining and related products				5						
32	Rubber and miscellaneous plastics products		29	50	63	2	19	16	285	1	5
33+34	Footwear, leather, and leather products										
35	Glass and glass products					8		2			1
36	Stone and clay products		6		5	7	28	14	7	16	
37	Primary iron and steel manufacturing		3		83		42		44		1
38	Primary nonferrous metals manufacturing		1		36	76	62	18	14	9	1
39	Metal containers										
40	Heating, plumbing, and fabricated structural metal products										
41	Screw machine products and stampings		7	54	4	2	9	17	17	11	24
42	Other fabricated metal products		63	63	10	1	8	2	(*)	1	7
43	Engines and turbines			8	68	3	8	8	79	45	23
44+45	Farm, construction, and mining machinery		227	35	35			23	187	489	17
46	Materials handling machinery and equipment						1		53	4	210
47	Metalworking machinery and equipment								53		
48	Special industry machinery and equipment								15	(*)	8
49	General industrial machinery and equipment								27		
50	Miscellaneous machinery, except electrical								11		
51	Computer and office equipment								5		
52	Service industry machinery								23		
53	Electrical industrial equipment and apparatus								46		
54	Household appliances								14		
55	Electric lighting and wiring equipment								188		
56	Audio, video, and communication equipment								39		
57	Electronic components and accessories								22		
58	Miscellaneous electrical machinery and supplies								12		
59A	Motor vehicles (passenger cars and trucks)								12		
59B	Truck and bus bodies, trailers, and motor vehicles parts								609	1	1
60	Aircraft and parts								36	46	1
61	Other transportation equipment										
62	Scientific and controlling instruments										
63	Ophthalmic and photographic equipment										
64	Miscellaneous manufacturing										
65A	Railroads and related services; passenger ground transportation										
65B	Motor freight transportation and warehousing										
65C	Water transportation										
65D	Air transportation										
65E	Pipelines, freight forwarders, and related services										
66	Communications, except radio and TV										
67	Radio and TV broadcasting										
68A	Electric services (utilities)										
68B	Gas production and distribution (utilities)										
68C	Water and sanitary services										
69A	Wholesale trade										
69B	Retail trade										
70A	Finance										
70B	Insurance										
71A	Owner-occupied dwellings										3
71B	Real estate and royalties									55	52
72A	Hotels and lodging places								12	79,455	51
72B	Personal and repair services (except auto)								24		23,564
73A	Computer and data processing services								2	342	18
73B	Legal, engineering, accounting, and related services								1		
73C	Other business and professional services, except medical										
73D	Advertising										
74	Eating and drinking places										
75	Automotive repair and services										
76	Amusements										
77A	Health services										
77B	Educational and social services, and membership organizations										
78	Federal Government enterprises										
79	State and local government enterprises										
82	General government industry										
84	Household industry										
85	Inventory valuation adjustment										
T	Total commodity output	23,277	15,670	17,421	41,037	48,203	20,987	133,508	68,327	84,421	24,074

*Less than \$500,000.

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by Industries, 1987 Benchmark—Continued

at producers' prices]

Scientific and controlling instruments	Ophthalmic and photographic equipment	Miscellaneous manufacturing	Railroads and related services; passenger ground transportation	Motor freight transportation and warehousing	Water transportation	Air transportation	Pipelines, freight forwarders, and related services	Communications, except radio and TV	Radio and TV broadcasting	Electric services (utilities)	Gas production and distribution (utilities)	Water and sanitary services	Wholesale trade	Industry number
62	63	64	65A	65B	65C	65D	65E	66	67	68A	68B	68C	69A	
				807										1
														2
														3
														4
														5+6
														7
														8
														9+10
														11+12
														13
														14
														15
														16
														17
														18
														19
														20+21
														22+23
														24
														25
														26A
														26B
														27A
														27B
														28
														29A
														29B
														30
														31
														32
														33+34
														35
														36
														37
														38
														39
														40
														41
														42
														43
														44+45
														46
														47
														48
														49
														50
														51
														52
														53
														54
														55
														56
														57
														58
														59A
														59B
														60
														61
														62
														63
														64
														65A
														65B
														65C
														65D
														65E
														66
														67
														68A
														68B
														68C
														69A
														T
85,858	18,707	31,083	48,394	115,194	24,198	79,060	23,301	160,164	2,250	156,453	82,180	28,469	423,751	

SURVEY OF CURRENT BUSINESS

Table 1.—The Make of Commodities

[Millions of dollars]

Industry number	For the distribution of industries producing a commodity, read the column for that commodity For the distribution of commodities produced by an industry, read the row for that industry	Commodity number	Retail trade	Finance	Insurance	Owner-occupied dwellings	Real estate and royalties	Hotels and lodging places	Personal and repair services (except auto)	Computer and data processing services	Legal, engineering, accounting, and related services
			69B	70A	70B	71A	71B	72A	72B	73A	73B
1	Livestock and livestock products										
2	Other agricultural products										
3	Forestry and fishery products										
4	Agricultural, forestry, and fishery services										
5+6	Metallic ores mining										
7	Coal mining										
8	Crude petroleum and natural gas										
9+10	Nonmetallic mineral mining										
11+12	Construction										
13	Ordnance and accessories										
14	Food and kindred products										
15	Tobacco products										
16	Broad and narrow fabrics, yarn and thread mills										
17	Miscellaneous textile goods and floor coverings										
18	Apparel										
19	Miscellaneous fabricated textile products										
20+21	Lumber and wood products										
22+23	Furniture and fixtures										
24	Paper and allied products, except containers										
25	Paperboard containers and boxes										
26A	Newspapers and periodicals										
26B	Other printing and publishing										
27A	Industrial and other chemicals										
27B	Agricultural fertilizers and chemicals										
28	Plastics and synthetic materials										
29A	Drugs										
29B	Cleaning and toilet preparations										
30	Paints and allied products										
31	Petroleum refining and related products										
32	Rubber and miscellaneous plastics products										
33+34	Footwear, leather, and leather products										
35	Glass and glass products										
36	Stone and clay products										
37	Primary iron and steel manufacturing										
38	Primary nonferrous metals manufacturing										
39	Metal containers										
40	Heating, plumbing, and fabricated structural metal products										
41	Screw machine products and stampings										
42	Other fabricated metal products										
43	Engines and turbines										
44+45	Farm, construction, and mining machinery										
46	Materials handling machinery and equipment										
47	Metalworking machinery and equipment										
48	Special industry machinery and equipment										
49	General industrial machinery and equipment										
50	Miscellaneous machinery, except electrical										
51	Computer and office equipment										2,083
52	Service industry machinery										
53	Electrical industrial equipment and apparatus										
54	Household appliances										
55	Electric lighting and wiring equipment										13
56	Audio, video, and communication equipment										
57	Electronic components and accessories										
58	Miscellaneous electrical machinery and supplies										
59A	Motor vehicles (passenger cars and trucks)										
59B	Truck and bus bodies, trailers, and motor vehicles parts										
60	Aircraft and parts										
61	Other transportation equipment										
62	Scientific and controlling instruments										51
63	Ophthalmic and photographic equipment										51
64	Miscellaneous manufacturing										
65A	Railroads and related services; passenger ground transportation										
65B	Motor freight transportation and warehousing										
65C	Water transportation										
65D	Air transportation										
65E	Pipelines, freight forwarders, and related services										
66	Communications, except radio and TV										
67	Radio and TV broadcasting										
68A	Electric services (utilities)										
68B	Gas production and distribution (utilities)										
68C	Water and sanitary services										
69A	Wholesale trade										
69B	Retail trade	420,693		280,874	4,020		79				
70A	Finance					172,850					1,640
70B	Insurance						325,144				
71A	Owner-occupied dwellings							380,275			
71B	Real estate and royalties							934			
72A	Hotels and lodging places								40,064		
72B	Personal and repair services (except auto)									66,233	
73A	Computer and data processing services										60,821
73B	Legal, engineering, accounting, and related services										177,931
73C	Other business and professional services, except medical										35
73D	Advertising										79
74	Eating and drinking places										
75	Automotive repair and services										
76	Amusements										
77A	Health services										
77B	Educational and social services, and membership organizations										
78	Federal Government enterprises	1,301			751			737			3
79	State and local government enterprises	966		76				7,596			
82	General government industry										
84	Household industry										
85	Inventory valuation adjustment										
T	Total commodity output	422,980	280,950	177,821	325,144	389,820	40,064	66,271	64,687		177,982

*Less than \$500,000.

