

MEASURING THE NATION'S ECONOMY: AN INDUSTRY PERSPECTIVE

A Primer on BEA's Industry Accounts



Measuring the Nation's Economy:

An Industry Perspective

A Primer on BEA's Industry Accounts



U.S. DEPARTMENT OF COMMERCE
Gary Locke
Secretary

ECONOMICS AND STATISTICS ADMINISTRATION
Rebecca M. Blank
Under Secretary for Economic Affairs

BUREAU OF ECONOMIC ANALYSIS
J. Steven Landefeld
Director
Brian C. Moyer
Deputy Director

Acknowledgments

Mary L. Streitwieser of the Industry Economic Accounts Directorate, Bureau of Economic Analysis (BEA), U.S. Department of Commerce, prepared this Primer.

Brian C. Moyer, Deputy Director for BEA, provided overall guidance.

Preface

This paper introduces new users to the basics of the U.S. industry economic accounts. It provides an overview of each of BEA's industry accounts and how they may be used to answer a variety of questions about the U.S. economy, industry activity, and the flow of goods and services throughout the economy.

Comments and questions about the Industry accounts primer, and the accounts themselves, are invited; contact BEA's Industry Economic Accounts Directorate at IndustryEconomicAccounts@bea.gov.

A shorter version of this primer appeared in the June 2009 SURVEY OF CURRENT BUSINESS.

Contents

Acknowledgments	<i>i</i>
Preface	<i>i</i>
A Primer on BEA's Industry Accounts	1
I. Input-Output Accounts	2
The make table.....	2
The use table.....	3
II. Impact Analysis	4
Redefinitions.....	4
Requirement tables	4
Other tables.....	6
III. GDP by Industry Accounts	7
Value added	7
Intermediate inputs.....	9
Price growth	10
IV. Satellite Accounts and Other Statistics	11
Other statistics.....	12
V. A Note on Assumptions.....	13
VI. Data Availability.....	13
VII. Future Directions for the Industry Accounts.....	14
References	15
Appendix 1: The Value of Input-Output Transactions	17
Appendix 2: Accessing the Industry Accounts Interactively	19
Input-Output accounts	19
GDP by industry accounts	26

Measuring the Nation's Economy: An Industry Perspective

A Primer on BEA's Industry Accounts

Is the economy growing? How fast—or slow? While the Bureau of Economic Analysis' (BEA) featured measure of economic output, gross domestic product (GDP), provides an answer, people are often also interested in the industry dynamics playing out within the economy. Which industries are expanding the fastest? Which are contributing the most to economic growth? How much income is generated from production? How much of an industry's growth is due to growth in real output and how much due to price inflation? Which industries are significant exporters?

BEA's industry accounts—which include the annual and benchmark input-output (I-O) accounts, the GDP by industry accounts, the KLEMS statistics, and satellite accounts—provide answers to such questions. Broadly speaking, the accounts facilitate the study of the internal workings of the U.S. economy. They provide a framework to measure and analyze the production of goods and services by industry. They show the flows of goods and services purchased by each industry, the incomes earned in each industry, and the distribution of sales for each commodity to industries and final users. The industry accounts also detail each industry's contribution to GDP and its counterpart gross domestic income (GDI). These accounts thus offer a valuable complementary tool to the national income and product accounts (NIPAs).

The industry accounts are widely used for a variety of purposes, such as estimating the effects of various policies, regulations, and tax proposals. The U.S. International Trade Commission, for example, uses the annual I-O accounts to measure the impact of various trade policies, and the U.S. Patent and Trade Office used the benchmark I-O accounts to measure the size of the domestic copyright-related industries. Macroeconomic and microeconomic forecasting models, private and public, also use information from the industry accounts.

In addition, academics use the data extensively. As just one example, Nobel Laureate Lawrence Klein and Professors Cynthia Saltzman and Vijaya Duggal used

annual and benchmark I-O time series data to examine the strategic importance of intermediate goods and services, particularly the role of information technology on productivity in the financial service industry.¹

Information from the benchmark I-O accounts is also used by BEA and other statistical agencies in preparing further economic statistics. Within BEA, for example, the benchmark I-O accounts are the building blocks for the NIPAs and the annual I-O accounts.

This article is intended for new users as an introduction to the industry accounts and how they can be used to examine intraindustry and interindustry relationships in the economy. The computer and electronic products industry is used throughout to demonstrate the scope and versatility of the industry accounts.²

The first section discusses the annual I-O accounts—the make and use tables. The second section discusses the four main requirements tables and how these accounts might be used for impact analysis. The next section discusses GDP by industry accounts and how they might be used for time series analysis. BEA's satellite accounts and other statistics are discussed in the fourth section. A note on underlying assumptions and data availability are covered in sections five and six, respectively. Future directions for the industry accounts are discussed in section seven. A list of references is provided for those who want more in-depth information. Appendix 1 provides information on the input-output valuation of transactions and Appendix 2 gives examples of accessing the industry statistics interactively from BEA's Web site.

1. See Lawrence R. Klein, Cynthia Saltzman, and Vijaya G. Duggal, "Information Technology and Productivity: The Case of the Financial Sector," *SURVEY OF CURRENT BUSINESS* 83 (August 2003): 32–37.

2. The industry accounts classify industries according to the North American Industry Classification System (NAICS). This classification facilitates using the BEA industry accounts with industry statistics from other sources such as the Census Bureau and the Bureau of Labor Statistics.

I. Input-Output Accounts

A basic understanding of an industry's current economic activity and how it relates to the total U.S. economy can be obtained from the two main tables in the I-O accounts—the standard make and use tables. These two tables provide consistent statistics on an industry's production and its relationship with other industries for a given year. They offer a wealth of information about the size of the U.S. economy, the relative size of specific industries, what and how much is produced by specific industries, the technology used by specific industries, the incomes generated by production, and the size and scope of an industry's market.

Two sets of I-O accounts are available. Annual I-O accounts, which are updated once a year, are available for 1998–2009; they include information on 65 industries. Benchmark I-O accounts include more detail, presenting information on more than 425 industries. The benchmark I-O table, for example, disaggregates the computer and electronic products industry into 25 separate industries. The benchmark I-O accounts are prepared less frequently, roughly once every 5 years, and are based on detailed data from the Economic Census conducted by the Census Bureau. The 2002 benchmark was released in October 2007.

The make table

The standard make table shows the value of each commodity produced by each industry in a given year ([Table 1](#)).³ Commodities are presented in columns and

3. These values are calculated at producers' prices. See Appendix 1 "The Input-Output Valuation of Transactions."

industries in rows. The entries across a row represent the dollar value of commodities produced by a specific industry. The diagonal cells in the table show the value of production of the commodity for which the industry has been designated the "primary" producer. Entries in the off-diagonal cells in the row show the value of production of "secondary" commodities. For example, a hotel may also provide restaurant services, but these services are not part of the hotel industry's primary product of accommodations. Therefore, the restaurant services are treated as a secondary product of the hotel industry. The sum of all the entries in the row is the total output of that industry.

The entries in a column represent the value of production by each industry of a specific commodity. The off-diagonal cells in each column represent the production of secondary producers of the commodity. The column total is total commodity output. The row totals of the make table equal the column totals of the use table.

The principal measure of output in the I-O accounts is gross output, which includes the value of intermediate products (which are used by others in their production processes) and final products (which count toward GDP). Because gross output reflects double-counting—both intermediate goods and final goods—it is often referred to as "gross duplicated output."

A highly aggregated version of the 2009 annual I-O standard make table is shown in Table 1. The row for the computer and electronic products industry shows that in 2009 the industry produced not only \$321.8 billion in computer and electronic products (the industry's primary product in the shaded cell) but also secondary products, including \$17.0 billion in other

Table 1. The Make of Commodities by Industries, 2009
[Millions of dollars]

Industries/commodities	Agriculture, mining, and construction ¹	Manufacturing		Services ²	Government ³	Total industry output ⁴
		Total	Computer and electronic products			
Agriculture, mining, and construction ¹	1,761,954	16,925	2,086	1,780,964
Manufacturing	4,292	4,418,259	331,611	95,976	4,522,360
Computer and electronic products	105	338,868	321,839	14,299	353,273
Services ²	40,176	18,669	56	15,280,753	1,429	15,341,784
Government ³	25,723	7,750	561,221	2,559,377	3,159,049
Total commodity output	1,832,144	4,461,601	331,666	15,940,037	2,560,806	24,804,156

1. Agriculture consists of agriculture, forestry, fishing, and hunting.

2. Consists of utilities; wholesale trade; retail trade; transportation and warehousing; information; finance, insurance, real estate, rental, and leasing; professional and business services; educational services, health care, and social assistance; arts, entertainment, recreation, accommodation, and food services; and other services, except government.

3. Consists of federal, state, and local governments.

4. Includes noncomparable imports; inventory valuation adjustment; rest-of-the-world adjustments; and scrap, used and secondhand goods.

NOTE. These statistics incorporate the 2009 comprehensive revision and the 2010 annual revision of the NIPAs as well as the 2010 comprehensive and annual revisions of the Industry Annual Accounts.

manufactured goods (\$338.9 billion – \$321.8 billion) and \$14.3 billion in services. Total gross output for the industry was \$353.3 billion.

The computer and electronic products column shows that while the computer and electronic products industry produced 97.0 percent of all computer and electronic products (\$321.8 billion / \$331.7 billion), it was not the only producer of these commodities. Nearly \$10 billion were produced, as secondary products, by other manufacturing industries (\$331.6 billion – \$321.8 billion) and by service industries (\$56 million). Together, all industries produced \$331.7 billion in computer and electronic products commodities.

The use table

The standard use table is a matrix that shows the uses of commodities by industries as intermediate inputs and by final users in a given year (Table 2). In contrast to the make table, the rows in the use table present the value of commodities (in producers' prices), and the columns display the industries and final users that utilize them. The sum of the entries in a row is the gross output of that commodity. The columns show the products consumed by each industry and the three components of value added, that is, the income generated by production. The components of value added include returns to labor (compensation of employees), capital (gross operating surplus), and government (taxes on production and imports less

subsidies). When aggregated across all industries, value added equals GDP for the nation. Value added is defined as the value of the industry's output to other industries and final users (gross output) less the value of its purchases from other industries (intermediate inputs). The sum of the entries in a column is that industry's total, or gross, output.

Table 2 shows the aggregate 2009 annual I-O standard use table corresponding to the make table. The row shows the value of computers and electronic products, as a commodity, used by each industry and final use category—that is, the commodity's market. In 2009, total computer and electronic products commodity output was \$331.7 billion, of which nearly 62 percent or \$205.4 billion was used by industries as input to their production and \$126.3 billion was consumed by final users. Personal consumption expenditures accounted for \$63.5 billion in final use; private fixed investment accounted for \$150.6 billion, change in private inventories was \$7.9 billion (the negative value indicates a decline in inventory), net exports were -\$139.5 billion (the negative value indicates imports exceeded exports), and government expenditures and investment accounted for \$59.6 billion.

The use table is sometimes referred to as a "recipe" matrix because it shows the components that are necessary for producing the output of each industry. The computer industry column of Table 2 shows that the production of the industry's primary and secondary

Table 2. The Use of Commodities by Industries, 2009
[Millions of dollars]

Commodities/Industries	Agriculture, mining, and construction ¹	Manufacturing		Services ²	Govern- ment ³	Total inter- mediate use	Personal con- sumption expendi- tures	Private fixed invest- ment	Change in private inven- tories ⁴	Net trade	Govern- ment con- sumption and gross invest- ment ³	Total final uses (GDP)	Total commodity output
		Total	Computer and electronic products										
Agriculture, mining, and construction ¹	105,797	532,973	597	180,295	88,929	907,993	71,169	735,947	10,616	-202,876	309,294	924,151	1,832,144
Manufacturing.....	379,757	1,475,459	71,023	684,401	307,105	2,846,722	1,549,643	549,640	-114,720	-511,932	142,248	1,614,879	4,461,601
Computer and electronic products...	3,442	103,829	43,825	62,661	35,430	205,363	63,460	150,553	-7,858	-139,455	59,604	126,304	331,666
Services ²	382,644	900,905	73,288	4,640,725	803,980	6,728,255	8,286,206	517,237	-18,893	369,193	58,038	9,211,781	15,940,037
Government ³	137	2,351	37	67,730	12,040	82,259	66,753	268	2,411,527	2,478,547	2,560,806
Total intermediate inputs⁵	869,524	2,937,526	146,845	5,641,525	1,236,542	10,685,116
Compensation of employees.....	486,889	858,645	120,852	4,840,778	1,633,206	7,819,518
Taxes on production and imports less subsidies	37,165	69,977	5,634	879,971	-22,754	964,359
Gross operating surplus	387,386	656,212	79,942	3,979,510	312,055	5,335,163
Total value added	911,440	1,584,834	206,428	9,700,259	1,922,507	14,119,040
Total industry output....	1,780,964	4,522,360	353,273	15,341,784	3,159,049	10,001,329	1,716,426	-127,222	-386,397	2,914,905	24,804,156

1. Agriculture consists of agriculture, forestry, fishing, and hunting.

2. Consists of utilities; wholesale trade; retail trade; transportation and warehousing; information; finance, insurance, real estate, rental, and leasing; professional and business services; educational services, health care, and social assistance; arts, entertainment, recreation, accommodation, and food services; and other services, except government.

3. Consists of federal, state, and local governments.

4. Includes inventory valuation adjustment.

5. Includes noncomparable imports; inventory valuation adjustment; rest-of-the-world adjustments; and scrap, used and secondhand goods.

Note. These statistics incorporate the 2009 comprehensive revision and the 2010 annual revision of the NIPAs as well as the 2010 comprehensive and annual revisions of the Industry Annual Accounts.

products requires commodity inputs from all areas of the economy, including \$43.8 billion in computer and electronic products, \$27.2 billion in other manufactured goods, \$73.3 billion in services, \$597 million in agriculture, mining, and construction goods, and \$37 million in government goods and services. In total, \$146.8 billion in intermediate inputs were required in 2009.

The computer and electronic products industry generated \$206.4 billion in value added: \$120.9 billion in compensation to labor, \$5.6 billion in taxes on production and imports less subsidies to the government, and nearly \$80 billion in gross operating surplus. Note that for each industry the (shaded) total industry output values in the make table column and use table row are the same. Similarly, for each commodity, the (shaded) total commodity output values reported in the two tables are the same.

In addition, the use table shows that the GDP of \$14,119 billion can be measured in three ways. First, as the sum of all final uses—the final goods and services purchased by persons, businesses, government, and foreigners—is known as the expenditures approach. The second approach, known as the income approach, measures GDP as the sum of all income payments incurred in production—compensation of employees, taxes on production and imports less subsidies, and gross operating surplus. Lastly, the production approach measures GDP as the sum of value added across industries. In the I-O accounts value added is defined as an industry's total gross output less its total intermediate inputs. The GDP value reported in the annual industry accounts is consistent with the GDP reported in the NIPAs.

II. Impact Analysis

While the make and use tables from the I-O accounts provide basic facts about an industry for a given year, researchers often want a more in-depth analysis. The main contribution of the I-O accounts to economic analysis is that they permit users to measure the full, economywide repercussions that changes in final uses (household, business, and governments spending) have on industry and commodity output, employment, and income. A number of tables are derived from the standard make and use tables; these tables can be used for additional analysis, such as an event study or impact analysis.

Redefinitions

The derivation of tables for this additional analysis starts with the standard make and use tables, in which

all products produced by an industry—primary and secondary—are assigned to that industry. For the supplementary make and use tables, however, some secondary products and their associated inputs are redefined; that is, they are reassigned to the industry in which they are the primary products. Redefinitions are made when the input structure of the industry's secondary product differs significantly from the input structure of its primary product. For example, the restaurant services in hotels are redefined from the accommodations industry to the food services industry. These supplementary tables are referred to as "after redefinition."

Redefinitions affect numerous industries in the I-O accounts, notably wholesale trade, retail trade, construction, publishing industries, and accommodations and food services. As a result of redefinitions, the total value of secondary products is decreased, and the total value of primary products is increased by the same amount.⁴ For the 2009 annual I-O accounts the amount of the redefined secondary output was \$760.2 billion, or 3.1 percent of total output and 41.4 percent of total secondary output. For most industries, the output shown in the standard make and use tables will differ from that shown in the supplementary make and use tables; however, commodity outputs are not affected.

Requirements tables

Four requirements tables are derived from the after redefinitions make and use table. These tables are the most useful for impact or event analysis, because they can be used to show the impact of a specified change in final demand throughout the economy.⁵ The values in these requirements tables are expressed as portions of industry output rather than in dollars.

4. See chapters 4 and 9 in Concepts and Methods of the U.S. Input-Output Accounts for details on the redefinition and reclassification process and underlying assumptions, available at www.bea.gov/papers/pdf/IOManual_092906.pdf.

5. BEA produces three additional supplementary tables that serve as bridges between the I-O statistics and statistics in the NIPAs. The bridge table for personal consumption expenditures (PCE) covers the I-O commodity composition of each PCE category in the NIPAs. The bridge table for private fixed investment in equipment and software (PES) covers the I-O commodity composition of each PES category in the NIPAs. The third bridge table reconciles the I-O statistics of exports and imports with those in the NIPAs. The commodity composition tables are necessary because the I-O accounts value the final use categories in producers' prices while the NIPAs final demand categories are expressed in purchasers' prices. In benchmark years, the I-O accounts also include a Concordance Between Input-Output Commodity Codes and Foreign Trade Harmonized Codes. This table links Census Bureau merchandise trade data by harmonized foreign trade codes to I-O commodity codes by weight. The weight indicates what portion of the harmonized code value was allocated to the I-O commodity.

The coefficients in the requirements tables represent interindustry linkages that, in turn, link output and final demand.

The commodity-by-industry direct requirements table. This table is sometimes referred to as “the direct coefficients table” (Table 3). The direct coefficients calculate only the direct effects, which are the amount of commodity inputs required by an industry to produce a dollar of the industry’s output, valued in producers’ prices. This table thus ignores the indirect effects, which are the production requirements of all other industries to meet the industry’s initial demand for a dollar of its output. For example, consider an increase in the final demand for motor vehicles. The direct requirements table shows the input production requirements—such as paint, steel, and plastic—of the motor vehicles, bodies and trailers, and parts industry to provide additional motor vehicle output. It does not include the “trickle down” effects, that is, the production requirements of all other industries necessary to support the additional demand for intermediate inputs from the motor vehicles industry, such as the additional requirement for tire cord and synthetic rubber by the plastics and rubber industry to provide the additional tires required by the motor vehicles industry.

The direct requirements table is calculated by dividing each row element (commodity value) of the use table after redefinitions by the column sum (total industry output) for each industry in the table. Table 3 shows that for the computer and electronic products industry to produce \$1 billion of computer and electronic products output in 2009, it directly required \$426 million of intermediate inputs ($\$1 \text{ billion} \times 0.426$). That included \$129 million in computer and electronic products ($\$1 \text{ billion} \times 0.129$) and \$80 million in other manufactured goods ($0.209 - 0.129 = 0.080 \times \1 billion), which included such manufactured goods as \$23 million in fabricated metals, \$16 million in primary metals, and \$12 million in chemical products. The industry also required \$209 million in services inputs, including \$48 million in wholesale trade services, \$38 million in miscellaneous professional, scientific and technical services, and \$4 million in legal services. The industry generated \$574 million in value added for every \$1 billion in industry output, 58 percent of which was for compensation to labor.

In many cases, researchers and policymakers are interested in the total impact—including the direct and indirect effects—of the specified change in final demand.⁶ BEA offers three total requirements tables, as shown in the following table.

Table 3. The Direct Requirements by Industries, 2009

[Output requirement per dollar of delivery to final demand, in producers’ prices]

Commodities/industries	Agri-culture, mining, and con- struction ¹	Manufacturing		Ser- vices ²	Govern- ment ³
		Total	Com- puter and electronic products		
Agriculture, mining, and construction ¹	0.05756	0.11912	0.00176	0.01163	0.02922
Manufacturing	0.21339	0.33131	0.20944	0.04327	0.09907
Computer and electronic products	0.00200	0.02321	0.12924	0.00406	0.01153
Services ²	0.21601	0.20137	0.20892	0.30134	0.25495
Government ³	0.00008	0.00053	0.00011	0.00441	0.00383
Total intermediate inputs⁴	0.48768	0.65810	0.42583	0.36508	0.39512
Compensation of employees	0.27997	0.18450	0.33338	0.31905	0.50996
Taxes on production and imports less subsidies	0.02012	0.01570	0.01661	0.05697	-0.00749
Gross operating surplus	0.21223	0.14170	0.22418	0.25890	0.10241
Total value added	0.51232	0.34190	0.57417	0.63492	0.60488
Total industry output	1.00000	1.00000	1.00000	1.00000	1.00000

1. Agriculture consists of agriculture, forestry, fishing, and hunting.

2. Consists of utilities; wholesale trade; retail trade; transportation and warehousing; information; finance, insurance, real estate, rental, and leasing; professional and business services; educational services, health care, and social assistance; arts, entertainment, recreation, accommodation, and food services; and other services, except government.

3. Consists of federal, state, and local governments.

4. Includes noncomparable imports; rest-of-the-world adjustment; and scrap, used and secondhand goods.

NOTE. These statistics incorporate the 2009 comprehensive revision and the 2010 annual revision of the NIPAs as well as the 2010 comprehensive and annual revisions of the Industry Annual Accounts.

The commodity-by-commodity total requirements table. This table shows the production required, both directly and indirectly, of the commodity at the beginning of each row per dollar of delivery to final use

6. The final use requirements coefficients presented in the total requirements tables identify the cumulative effects on total industry and commodity outputs that result from a change in final use. In contrast to conventional macroeconomic multipliers that measure the cumulative impact on final output of a policy change, such as the decline in GDP that results from a reduction in government spending, these final use coefficients measure the impact of a change in final demand (uses) on gross output (final and intermediate output). Indeed, shifts in the composition of final uses can have a “multiple” impact on industry and commodity output but can have no effect on the level of total GDP.

of the commodity at the top of the column.⁷ Providing \$1 billion of computer and electronic products to final users required, among other inputs, \$1.2 billion of computer and electronic products, \$45 million in primary metals goods, \$38 million in fabricated metal products, and \$34 million in chemical products.⁸ The total commodity requirements coefficient is 1.786, which is the sum of all the entries in the column. This means that the total value of all commodities required for an additional \$1 billion of computer and electronic products delivered to final users is \$1.8 billion.

The industry-by-commodity total requirements table. This table shows the production required, both directly and indirectly, from the industry at the beginning of the row per dollar of delivery to final use of the commodity at the top of the column. This table may be the most useful because most information on final uses is in terms of commodities and most other statistical data—for example, employment—is in terms of industries. In order to provide final users with \$1 billion of computer and electronic products goods, the computer and electronic products industry is required to produce \$1.1 billion of industry output.⁹ Recall that some of the industry's production will be used by other industries as intermediate inputs; not all reaches final users. Other industries must produce \$668 million of industry output. The total industry output requirement coefficient is 1.786, indicating the additional output of all industries that is required to deliver \$1 billion of computer and electronic products to final users is \$1.8 billion.

The industry-by-industry total requirements table. This table shows the production required, both directly and indirectly, from the industry at the beginning of the row per dollar of delivery to final use of the industry at the top of the column. For example, in 2009, providing final users with \$1 billion of computer and electronic products industry output required the computer and electronic products industry to produce \$1.2 billion of output, the primary metals industry to produce \$40 million of output, and the fabricated metal products industry to produce \$37 million of output, and so on.¹⁰ The total industry output require-

7. A coefficient greater than one (on the diagonal) indicates that for a specific commodity, the coefficient includes the increase in demand for that commodity plus other direct and indirect inputs of that commodity required to produce the commodity for final use.

8. Statistics are from the 2009 annual I-O Commodity-by-Commodity Total Requirements Table.

9. Statistics are from the 2009 annual I-O Industry-by-Commodity Total Requirements Table.

10. Statistics are from the 2009 annual I-O Industry-by-Industry Total Requirements Table.

ments coefficient is 1.770, indicating that the additional output of all industries to deliver \$1 billion of output to final users from the computer and electronic products industry is \$1.8 billion.

Other tables

Other tables, such as a domestic output requirements tables and an employment requirements table, can easily be constructed by users.

Domestic output requirements table. When using the total requirements tables, it is important to note that the amount of output required to deliver a dollar of commodity to final users includes both imported commodities and domestically produced commodities. However, both the total commodity output requirements coefficient and the total industry output requirements coefficient represent the output required as if all of the commodity were domestically supplied. Therefore, if a portion of the commodity is imported, the impact on domestic output will be lower than that implied by the requirements coefficient.

The coefficients in a domestic output requirements table are used to estimate the domestic output of goods and services required to meet final demand. Users can derive this table by subtracting the import matrix from the use table after redefinitions before calculating a total requirements matrix.¹¹ Thus a domestic output industry-by-commodity requirements table for 2009 is generated by subtracting the import matrix from the use table after redefinitions and then calculating the industry-by-commodity total requirements table.¹²

This table shows that in order to provide final users with \$1 billion of computer and electronic products goods, after taking into account imported computer and electronic products, the domestic computer and electronic products industry is required to produce \$1.1 billion of industry output. Other industries contribute \$537 million of industry output. The total

11. The import matrix is a supplemental table that shows for each commodity, the value of import of that same commodity used by each industry. The import matrix is derived from the use table. The imputed import values are based on the assumption that each industry uses imports of a commodity in the same proportion as imports-to-domestic supply of the same commodity. Therefore, all variability of import usage across industries reflects the assumption and is not based on industry-specific information. BEA prepares two import matrixes, corresponding to the standard use table and the use table after redefinitions.

12. BEA does not prepare domestic output requirements tables as part of the I-O accounts; however, it does provide the import matrix so that users can construct domestic output requirements tables.

industry output requirement coefficient is 1.590, indicating that the total additional output of all domestic industries required to deliver \$1 billion of computer and electronic products to final users is \$1.6 billion. This compares with the total (domestic and foreign output) requirements of 1.786 from the standard industry-by-commodity total requirements table described previously.

Employment requirements table. This table shows the direct and indirect impact of a change in final demand on industry employment. These tables are derived from one of the total requirements tables. The employment requirement coefficient can be calculated from the industry-by-commodity or the industry-by-industry total requirements tables (either the total or domestic requirements tables), depending on the assumptions used for the analysis. From the domestic industry-by-commodity employment requirements table, the direct and indirect impact of a \$1 billion change in final demand for computer and electronic products (commodity) on employment can be calculated.

As one would expect, the greatest impact occurs in the computer and electronics products industry, where in 2009, a \$1 billion dollar increase in final demand required an increase in the industry's employment of nearly 3,500 workers. Higher employment in other industries would also be required, including wholesale trade (329 workers), miscellaneous professional, scientific and technical services (265 workers), administrative and support services (246 workers), and management of companies and enterprises (221 workers). Across all industries, roughly 5,656 additional workers would have been required to meet a \$1 billion increase in final demand.

III. GDP by Industry Accounts

While the input-output accounts offer a wealth of information in current dollars, the GDP by industry accounts allow for easier time series analysis of industry output in current dollars and in inflation-adjusted dollars.¹³ These accounts provide an industry-by-industry breakout of GDP. They are ideally suited for studying industry shares of GDP, the composition of an industry's value added, an industry's returns to labor and capital, and its contribution to U.S. economic growth and inflation.

Changes over time in the current-dollar measures provided in the GDP by industry accounts may reflect a change in quantity, a change in price, or a combination of both. For some analyses, it is important to distinguish these effects: For example, to know how much of the change in an industry's value added is due to changes in prices, as compared to changes in quantities of goods and services.

The GDP by industry accounts therefore provide statistics of changes in quantities and prices, derived as indexes. These indexes provide information on the change over time from a reference year (2005). The GDP by industry accounts also provide measures of the industry level contributions of various components, such as contributions to national GDP growth and contributions to percent changes in the chain type price index for GDP.

Value added

One key feature of the GDP by industry accounts is the value added estimates for all industries. Value added is a measure of output after accounting for the intermediate inputs used in production. As such, it is also a measure of an industry's contribution to GDP. The main components of value added include the returns to labor (as measured by compensation of employees) and returns to capital (as measured by gross operating surplus) and the returns to government (as measured by taxes on productions and imports less subsidies).

Although current-dollar value added for the computer and electronic products industry declined in 2001 and 2007, for the decade as a whole, it increased at an average annual rate of 3.5 percent. By contrast, value added for all industries rose each year except 2009, with an average annual rate of 4.2 percent ([Table 4](#)).

Returns to capital. Gross operating surplus includes corporate profits and proprietors' income as well as depreciation, net interest, and business transfer payments. As a share of current-dollar value added, gross operating surplus was consistently lower in the computer and electronic products industry than for the economy as a whole, except for 2009. For the industry, gross operating surplus, as a share of value added, fell from 11.5 percent in 2000 to a low of -8.8 percent in 2001 and a rapid recovery to 38.7 percent in 2009 ([Table 5](#)). The industry was hit hard in the recession of 2001. The share across all industries held up much better: The share hit a low of 35.1 percent in 2000 before rising to 37.8 percent in 2009.

13. The GDP by industry accounts are an extension of the annual I-O accounts and therefore the current dollar value added and its components in the two sets of accounts are consistent.

Returns to labor. In contrast to the capital share, the compensation of employees share of current-dollar value added in the computer and electronic products industry was 86 percent in 2000, while the national level share was just 58.2 percent. However, while the share across all industries fell 2.8 points to 55.4 percent by 2009, the computer and electronic products industry share decreased to 58.5 percent, a decline of 27.5 points.

Real growth rates. A look at an industry's "real," or inflation-adjusted, value added growth rates in comparison to real GDP growth can suggest if the industry is adding to (or reducing) the national economy's growth.

Real GDP increased at an average annual rate of 1.8 percent in 2000–2009 (Table 4). Real value added also increased for most industries during this period; how-

ever, the growth rates varied considerably. The computer and electronic products industry grew at an average annual rate of 19.1 percent over this period, the highest growth rate of the 65 industries included in the GDP by industry accounts. The computer and electronic products industry was one of only three manufacturing industries experiencing real growth in the widespread economic decline of 2007–2009.

Contributions to economic growth. Differences in growth rates alone do not indicate the extent to which industries contribute to economic growth. An industry's contribution also depends on the industry's size. For example, real value added for the computer and electronic products industry increased by 59.5 percent in 2000. Even though the computer and electronic products industry is relatively small (1.7 percent of current-dollar GDP in 2000), it contributed a larger share to growth: 0.79 percentage point of the

Table 4. Industry Value Added as a Percentage of GDP, Percent Change in Value Added, and Contributions to Percent Change in Real Gross Domestic Product, 2000–2009

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average 2000–2009
All industries											
Percentage of current-dollar GDP	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Percentage of real GDP growth.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Percent change in current-dollar GDP	6.4	3.4	3.5	4.7	6.5	6.5	6.0	4.9	2.2	-1.7	4.2 ²
Percent change in real GDP.....	4.1	1.1	1.8	2.5	3.6	3.1	2.7	1.9	0.0	-2.6	1.8 ²
Percentage point contribution to percent change in real GDP.....	4.1	1.1	1.8	2.5	3.6	3.1	2.7	1.9	0.0	-2.6	1.8
Computer and electronic products											
Percentage of current-dollar GDP	1.7	1.2	1.2	1.2	1.3	1.5	1.5	1.4	1.4	1.5	1.4
Percentage of real GDP growth ¹	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1
Percent change in current-dollar value added....	17.3	-25.5	3.4	3.2	16.6	14.8	9.1	-1.8	3.9	1.1	3.5 ²
Percent change in real value added.....	59.5	-0.4	16.0	18.0	30.2	26.6	22.1	10.2	15.2	3.3	19.1 ²
Percentage point contribution to percent change in real GDP.....	0.79	-0.01	0.19	0.21	0.34	0.33	0.30	0.14	0.20	0.05	0.25

1. Industry percentage of real GDP growth is calculated as the ratio of the industry percentage point contribution to all industries percent change in real GDP to percent change in real GDP.

2. Average annual rate of growth.

NOTE. These statistics incorporate the 2009 comprehensive revision and the 2010 annual revision of the NIPAs as well as the 2010 comprehensive and annual revisions of the Industry Annual Accounts.

Table 5. Shares of Current-Dollar Value Added, 2000–2009
[Percent]

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
All Industries										
Gross domestic product	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Compensation of employees.....	58.2	58.2	57.5	57.3	56.5	56.0	55.9	55.9	56.1	55.4
Taxes on production and imports less subsidies	6.7	6.5	6.8	6.8	6.9	6.9	7.0	6.9	6.9	6.8
Gross operating surplus	35.1	35.3	35.7	35.9	36.7	37.2	37.2	37.2	36.9	37.8
Computer and electronic products										
Value added	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Compensation of employees.....	86.0	105.3	91.2	84.0	74.5	67.8	64.7	67.4	63.4	58.5
Taxes on production and imports less subsidies	2.5	3.6	3.5	3.5	3.0	2.7	2.6	2.8	2.7	2.7
Gross operating surplus	11.5	-8.8	5.2	12.5	22.5	29.4	32.7	29.8	33.9	38.7

NOTE. These statistics incorporate the 2009 comprehensive revision and the 2010 annual revision of the NIPAs as well as the 2010 comprehensive and annual revisions of the Industry Annual Accounts.

4.1 percent growth in real GDP. By 2009, the computer and electronic products industry accounted for 1.5 percent of current-dollar GDP; the industry's real value added increased 3.3 percent during 2009, helping to offset the wide spread deceleration in real GDP. The computer and electronic products industry outperformed the economy as a whole—with double-digit growth each year 2000–2009, except 2001 and 2009.

Intermediate inputs

For an industry to produce output, it needs capital and labor, its value added inputs, and also secondary inputs, which are also known as intermediate inputs to production. For example, a baker produces bread by mixing flour, water, eggs, and other material inputs before placing the dough into an oven. In addition to the material inputs, the baker also needs electricity, a kind of energy input, to power the operating equipment. Finally, the baker may have a fleet of vans to transport the bread to the local grocery store, or the baker may contract the delivery (purchased service input) to a local trucking service.

The KLEMS statistics provide detail on the types of intermediate inputs described above that are consumed by industries to produce goods and services. These statistics break out total intermediate inputs by industry into three cost categories: energy, materials, and purchased services. They also provide information on the contribution of price and quantity changes for the different types of intermediate inputs on the U.S. economy; for example, the impact of price changes for energy inputs on overall prices for the nation's output.

A look at the composition of current-dollar total intermediate inputs for the U.S. economy shows the broad move toward an increasingly services-oriented economy. Over all, for 2000–2009, every dollar of gross output represented a higher percentage of purchased services and a lower percentage of materials. In 2009, purchased services accounted for 25.4 percent of the nation's output, compared to 24.3 percent in 2000 ([Table 6](#)). That means that every dollar of output in 2009 reflected 25.4 cents worth of purchased services. Materials accounted for 15.7 cents of every dollar of output in 2009, compared to 19.0 cents in 2000. In contrast, in 2009 the computer and electronic products industry required 25.7 cents worth of materials and 15.2 cents worth of purchased services to produce a dollar of output.

The use of materials inputs, adjusted for inflation, for the computer and electronic products industry varied considerably, reflecting the IT boom which ended in 2000, the 2001–2002 slowdown, the subsequent recovery through 2007, and the economy-wide contraction in 2008–2009. In 2000, growth in the use of materials exceeded 15 percent ([Table 7](#)), and accounted for 0.96 percentage point of the economy-wide 0.9 percent growth in the use of materials ([Table 8](#))—indicating that the strong growth in materials in the computer and electronic products industry offset the decline in materials use experienced in other industries in 2000. This growth was followed by steep declines in materials usage in the computer and electronic products industry: 10.5 percent in 2001 and 19.4 percent in 2002. Even with the post 2002 recovery in output, the use of materials in the computer and electronic products industry declined every year except 2007.

Table 6. Shares of Current-Dollar Gross Output, 2000–2009
[Percent]

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
All Industries.....										
Gross output	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Gross domestic product.....	54.4	55.4	56.4	56.2	55.8	54.8	54.7	54.5	54.1	56.9
Intermediate inputs	45.6	44.6	43.6	43.8	44.2	45.2	45.3	45.5	45.9	43.1
Energy inputs.....	2.4	2.6	1.9	1.8	1.9	2.3	2.2	2.2	2.6	1.9
Materials inputs.....	19.0	17.6	17.3	17.4	17.8	18.2	18.3	18.4	18.9	15.7
Purchased-services inputs.....	24.3	24.4	24.4	24.6	24.5	24.7	24.8	24.8	24.4	25.4
Computer and electronic products										
Gross output	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Value added.....	34.2	30.8	37.5	38.3	43.0	48.4	51.0	48.7	50.9	58.4
Intermediate inputs	65.8	69.2	62.5	61.7	57.0	51.6	49.0	51.3	49.1	41.6
Energy inputs.....	1.3	1.7	0.9	0.9	0.7	0.6	0.5	0.8	0.8	0.7
Materials inputs.....	43.7	44.2	40.9	39.5	37.1	33.4	32.6	35.0	32.4	25.7
Purchased-services inputs.....	20.8	23.3	20.7	21.3	19.3	17.6	15.9	15.5	15.9	15.2

NOTE. These statistics incorporate the 2009 comprehensive revision and the 2010 annual revision of the NIPAs as well as the 2010 comprehensive and annual revisions of the Industry Annual Accounts.

Price growth

The price indexes for gross output, value added, and intermediate inputs represent the prices received by an industry for its output and the prices paid for its inputs. Growth rates for these indexes indicate whether prices for these inputs are growing faster or slower than output prices. Price growth for the nation's intermediate inputs averaged 2.8 percent in 2000–2009, outpacing the average growth in output prices (2.6 percent) and dominating the average growth in value added prices (2.4 percent) (Table 9). Within intermediate inputs, energy prices increased

significantly more than prices for materials and purchased services: 7.8 percent, 3.1 percent, and 2.1 percent, respectively. Indeed, energy prices saw double-digit price increases in 2000, 2003–2005, and 2008.

The pattern of changes in the price indexes for the computer and electronic products industry was quite different from the national pattern. Most striking is the large and continual decline in prices for gross output and value added in the industry: averaging –5.8 percent and –12.8 percent, respectively. Over 2000–2009, value added prices for the computer and electronic products industry subtracted just over 2

Table 7. Percent Change in Chain-Type Quantity Indexes, 2000–2009

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average annual growth rate 2000–2009
All industries											
Gross output.....	4.5	0.2	0.6	2.0	3.3	3.8	2.2	1.9	–1.5	–4.2	1.3
Gross domestic product	4.1	1.1	1.8	2.5	3.6	3.1	2.7	1.9	0.0	–2.6	1.8
Intermediate inputs.....	4.7	–0.9	–0.8	1.8	3.0	5.0	1.7	2.0	–2.9	–6.2	0.7
Energy inputs	7.3	7.5	–23.4	–10.8	–0.7	5.8	–7.2	2.9	–1.1	–6.0	–3.0
Materials inputs	0.9	–4.5	1.2	0.8	2.6	2.8	0.6	1.6	–4.9	–12.3	–1.2
Purchased-services inputs	7.6	1.0	0.2	3.5	3.5	6.5	3.3	2.1	–1.5	–1.8	2.4
Computer and electronic products											
Gross output.....	24.3	–6.4	–10.6	6.9	8.3	5.7	8.4	8.8	3.8	–9.2	3.5
Value added	59.4	–0.4	16.1	18.1	30.2	26.6	22.1	10.2	15.2	3.4	19.1
Intermediate inputs.....	10.1	–9.2	–21.9	0.6	–4.5	–9.1	–3.6	7.3	–6.5	–22.4	–6.5
Energy inputs	6.8	–0.9	–53.1	–9.3	–23.5	–17.8	–20.9	68.3	–10.4	–20.9	–12.4
Materials inputs	16.6	–10.5	–19.4	0.0	–1.8	–8.6	–1.0	11.8	–9.4	–26.4	–5.7
Purchased-services inputs	–1.6	–7.1	–24.5	2.1	–8.6	–9.6	–8.1	–3.5	0.5	–14.5	–7.8

NOTE. These statistics incorporate the 2009 comprehensive revision and the 2010 annual revision of the NIPAs as well as the 2010 comprehensive and annual revisions of the Industry Annual Accounts.

Table 8. Contributions of the Computer and Electronic Products Industry to Percent Change in Chain-Type Quantity Indexes for GDP, Energy, Materials, and Purchased Services, 2000–2009

	GDP		Energy inputs		Materials inputs		Purchased-services inputs	
	All industries	Computer and electronic products	All industries	Computer and electronic products	All industries	Computer and electronic products	All industries	Computer and electronic products
	Percent change	Percentage point contribution	Percent change	Percentage point contribution	Percent change	Percentage point contribution	Percent change	Percentage point contribution
2000	4.1	0.79	7.3	0.11	0.9	0.96	7.6	–0.04
2001	1.1	–0.01	7.5	–0.01	–4.5	–0.65	1.0	–0.17
2002	1.8	0.19	–23.4	–0.78	1.2	–1.08	0.2	–0.52
2003	2.5	0.21	–10.8	–0.08	0.8	0.00	3.5	0.03
2004	3.6	0.34	–0.7	–0.19	2.6	–0.07	3.5	–0.13
2005	3.1	0.33	5.8	–0.10	2.8	–0.30	6.5	–0.13
2006	2.7	0.30	–7.2	–0.09	0.6	–0.03	3.3	–0.09
2007	1.9	0.14	2.9	0.24	1.6	0.33	2.1	–0.04
2008	0.0	0.20	–1.1	–0.06	–4.9	–0.27	–1.5	0.00
2009	–2.6	0.05	–6.0	–0.11	–12.3	–0.71	–1.8	–0.14
Average	1.8 ¹	0.33	3.0 ¹	–0.12	–1.2 ¹	–0.16	2.4 ¹	–0.13

1. Average annual rate of growth.

NOTE. These statistics incorporate the 2009 comprehensive revision and the 2010 annual revision of the NIPAs as well as the 2010 comprehensive and annual revisions of the Industry Annual Accounts.

annual revision of the NIPAs as well as the 2010 comprehensive and annual revisions of the Industry Annual Accounts.

tenths of a percentage point from the 2.4 average percent change in the GDP price index ([Table 10](#)). Within intermediate inputs, the industry's growth in prices for material inputs was negative seven of the ten years. Overall, materials prices paid by the industry declined by 1.9 percent annually, subtracting 0.10 percentage point from the 3.1 percent average percent change in economy-wide materials prices.

For the computer and electronic products industry the average percent change in the price indexes for

energy (4.3 percent) and purchased services (1.5 percent) were offset by the drop in materials and value added prices. The decline in these price indexes at a time when real output was growing, reflects the significant productivity gains in the industry.

IV. Satellite Accounts and Other Statistics

Satellite accounts are supplemental accounts that expand the analytical capacity of the BEA's accounts by focusing on a particular aspect of economic activity. BEA currently produces two sets of satellite

Table 9. Percent Change in Chain-Type Price Indexes, 2000–2009

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average annual growth rate 2000–2009
All industries											
Gross output.....	3.0	1.2	1.0	3.0	3.9	4.5	3.8	3.4	4.6	-2.6	2.6
Gross domestic product	2.2	2.3	1.6	2.2	2.8	3.3	3.3	2.9	2.2	0.9	2.4
Intermediate inputs.....	4.1	0.2	0.1	3.7	5.0	5.8	4.5	3.8	7.0	-6.6	2.7
Energy inputs.....	19.4	3.6	-6.0	15.8	13.7	22.1	9.0	4.9	19.6	-24.5	6.8
Materials inputs	4.4	-1.4	-1.1	4.4	7.2	7.8	5.8	4.5	11.2	-11.8	2.9
Purchased-services inputs	2.6	1.0	1.5	2.3	2.9	3.0	3.1	3.2	2.8	-1.0	2.2
Computer and electronic products											
Gross output.....	-11.0	-11.7	-4.9	-5.4	-4.0	-3.6	-4.4	-5.4	-4.3	-2.8	-5.8
Value added.....	-26.4	-25.2	-10.9	-12.5	-10.5	-9.3	-10.6	-10.5	-9.8	-2.1	-13.1
Intermediate inputs.....	-2.4	-4.4	-1.7	-0.7	0.7	1.3	2.1	0.4	1.5	-3.7	-0.7
Energy inputs.....	6.0	8.2	-5.6	9.1	3.9	10.6	4.9	5.7	7.3	-7.2	4.1
Materials inputs	-5.0	-6.7	-2.5	-2.4	-0.4	0.4	2.0	-1.0	1.3	-4.7	-1.9
Purchased-services inputs	2.5	-0.7	0.0	2.2	2.6	2.8	2.3	3.3	1.7	-1.5	1.5

NOTE. These statistics incorporate the 2009 comprehensive revision and the 2010 annual revision of the NIPAs as well as the 2010 comprehensive and annual revisions of the Industry Annual Accounts.

Table 10. Contributions of the Computer and Electronic Products Industry to Percent Change in Chain-Type Price Indexes for GDP, Energy, Materials, and Purchased Services, 2000–2009

	GDP		Energy inputs		Materials inputs		Purchased-services inputs	
	All industries	Computer and electronic products	All industries	Computer and electronic products	All industries	Computer and electronic products	All industries	Computer and electronic products
	Percent change	Percentage point contribution	Percent change	Percentage point contribution	Percent change	Percentage point contribution	Percent change	Percentage point contribution
2000.....	2.2	-0.51	19.4	0.10	4.4	-0.33	2.6	0.06
2001.....	2.3	-0.43	3.6	0.12	-1.4	-0.41	1.0	-0.01
2002.....	1.6	-0.14	-6.0	-0.06	-1.1	-0.12	1.5	0.00
2003.....	2.2	-0.17	15.8	0.08	4.4	-0.11	2.3	0.04
2004.....	2.8	-0.14	13.7	0.03	7.2	-0.02	2.9	0.04
2005.....	3.3	-0.14	22.1	0.06	7.8	0.01	3.0	0.04
2006.....	3.3	-0.17	9.0	0.02	5.8	0.06	3.1	0.03
2007.....	2.9	-0.17	4.9	0.03	4.5	-0.03	3.2	0.03
2008.....	2.2	-0.15	19.6	0.04	11.2	0.04	2.8	0.02
2009.....	0.9	-0.03	-24.5	-0.03	-11.8	-0.11	-1.0	-0.01
Average.....	2.4 ¹	-0.21	6.8 ¹	0.04	2.9 ¹	-0.10	2.2 ¹	0.02

1. Average annual rate of growth.

NOTE. These statistics incorporate the 2009 comprehensive revision and the 2010

annual revision of the NIPAs as well as the 2010 comprehensive and annual revisions of the Industry Annual Accounts.

accounts—the travel and tourism satellite accounts and the research and development satellite account—and is developing satellite accounts for health, innovation, and energy.

Travel and tourism satellite accounts. Tourism is not treated as a separate industry in NAICS; rather, data for tourism are scattered among several industries—such as transportation services, accommodations, food and beverage services, and retail trade. As a result, comprehensive data on tourism are not identified specifically in the U.S. national accounts. The U.S. travel and tourism satellite accounts present a rearrangement of information from the NIPAs and the industry I-O accounts, augmented with information from other U.S. government agencies and from a private sector vendor of tourism information. In these accounts, the flows of commodities that are related to travel and tourism activities link tourism expenditures to the industries that produce tourism goods and services in the U.S. The tourism industries in the satellite accounts include industries whose output is purchased directly and indirectly by travelers.

These accounts present statistics on expenditures by tourists, or visitors, for 24 types of goods and services. The accounts also present statistics on the income generated by travel and tourism and statistics on output and employment generated by travel and tourism-related industries. Current-dollar and real dollar tourism output by commodity are reported along with the commodity chain-type price indexes. Both annual and quarterly satellite accounts are produced.

The travel and tourism satellite accounts can be used by government officials and policymakers and by researchers to determine the size and components of travel and tourism, to assess the contributions of the tourism industry to the U.S. economy, to assess the relationship among the travel and tourism industries, to determine the expenditures of tourists, and to compare travel and tourism industries to other manufacturing and services industries. Because the accounts are a time series, they can be used to analyze how travel and tourism expenditures have changed in recent years and examine who is traveling and how the mix of travelers is changing.

Research and development satellite account. The research and development (R&D) satellite account adjusts the accounting conventions of BEA's core accounts to test the impact of treating R&D as a capital investment rather than as a current-period expense. It provides statistics on R&D investment, capital stock,

and depreciation in the economy on a funder basis. In addition, it reports R&D-adjusted measures of GDP, gross domestic income, and national savings. Currently, the BEA accounts do not treat R&D and many other intangibles as investment and thus cannot separately identify their contribution to U.S. economic growth. This satellite account is part of a long-term effort to better account for intangible assets. BEA plans to incorporate R&D spending as investment into its core accounts in 2014.

The most recent R&D satellite account, released in December 2010, provides data for 1959–2007 at the national level and R&D statistics for 14 R&D industries for 1987–2007.¹⁴ The impact of R&D investment on GDP by state is available for 1998–2007. The R&D satellite account also includes an international component that shows the impact of treating R&D as investment on several dimensions of international transactions, including international transactions balances, the international investment position, and value added for multinational corporations for 1995–2007.

The R&D satellite account is a joint project by BEA and the National Science Foundation that aims to provide detailed statistics to facilitate research into the effects of R&D on the economy. The R&D satellite account can be used to determine the funding distribution of R&D investment and to assess the effects of R&D on the U.S. economy. Many state policymakers view R&D investment as an important part of their state's economic development strategy. For example, enhancing and encouraging R&D and knowledge-based industries within states and developing state-private partnerships with R&D industries are among the highest priorities among state governors.

Potential future satellite accounts. BEA is exploring the feasibility of creating additional satellite accounts—for innovation, including research and development and other intangible investments; health care; and energy.

Other Statistics

Quarterly GDP by industry statistics. BEA currently releases GDP by industry statistics only annually; however, BEA has been exploring the idea of producing GDP by industry on a more frequent basis. The economic downturn in the economy that began in December of 2007 emphasizes the importance of

14. Prior to the 2010 release the R&D satellite account covered 13 R&D intensive industries for 1987–2004.

providing timely, high quality statistical data about the U.S. economy.¹⁵ The recent expansion of improved source data from the Bureau of the Census makes it possible for BEA to begin producing GDP by industry statistics on a quarterly basis, as proposed in its 2012 budget. If funds are available, BEA anticipates releasing quarterly GDP by industry statistics on a regular basis in the near future. A set of proto-type statistics are planned for release in Summer 2011.¹⁶

V. A Note on Assumptions

When using the industry accounts, the underlying assumptions are worth keeping in mind. The assumptions follow directly from the fundamental economic principles that provide structure to I-O accounts.

First, inspection of the I-O use and the requirements tables shows that each industry is defined so that it has a unique production function, that is, a unique set of inputs.

Second, there are no economies of scale in production; the ratio of each input to one unit of output remains constant over a wide range of output levels. This means if the demand for a given product increases 50 percent, all of the inputs required for the product will also increase by 50 percent. This principle is necessary to calculate the effect of a change in final uses on the output of all industries.

Third, the production relationships embodied in the I-O represent aggregate relationships at a given level of production in a given year. Thus, it is important to use the requirements tables to estimate impacts for a year close to the reference year of the accounts. This is particularly important in using the detailed benchmark I-O accounts, which are produced once every 5 years. Interindustry relationships change over time because of changes in market conditions, technology, and productivity. The farther the event year is from the reference year, the less reliable the results.

Fourth, the 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.

Fifth, BEA's industry accounts, following BEA conventions, use Fisher indexes to create price and quantity indexes. Two characteristics of the indexes are worth noting. First, the level of an index in any single year is not in itself meaningful. It is the change in the index over time that is important. Second, because the chained-dollar measures of components are not additive, accurate measures of a component's contribution to change cannot be derived from the chained-dollar measures. For this reason, BEA provides measures of the contributions of real components to the percent change in real aggregates. For more information, see J. Steven Landefeld, Brent R. Moulton, and Cindy M. Wojtech, "Chained-Dollar Indexes: Issues, Tips on Their Use, and Upcoming Changes," *SURVEY OF CURRENT BUSINESS* 83 (November 2003): 8–16.

VI. Data Availability

The industry accounts are available to the public without charge on BEA's Web site at www.bea.gov. Users have two options for downloading the industry data: downloading complete tables or creating user specified extracts via an interactive data retrieval tool. Users who want to directly download published I-O data will find all the data files accessible in the Industry portion of BEA's Web site. Data downloading is recommended for users who want to retrieve the complete tables at the most detailed industry level. All data are in MS Excel© format except for the very large detail level benchmark tables, which are in .txt format.

The benchmark I-O tables for 1997 and 2002 are available on a NAICS basis. Tables for 1947, 1958, 1963, 1967, 1972, 1977, 1982, 1987, and 1992 are available on the Standard Industrial Classification (SIC) basis. The import matrix and the concordance between the I-O commodity codes and the foreign trade harmonized codes are available only for 1997 and 2002. The bridge tables are available for 1987 forward.

The benchmark I-O accounts are available at three levels of industry and commodity aggregation:

- The sector level—15 industries, 16 commodities, and 6 final use categories—that corresponds approximately to the two-digit level NAICS
- The summary level—133 industries, 136 commodities, and 13 final use categories—that corresponds

15. The National Bureau of Economic Research (NBER) identifies December 2007 as the end of the last economic expansion and the beginning of the recent recession. NBER defines a recession as a significant decline in economic activity spread across the economy, lasting more than a few months. Real GDP, as measured by BEA did not show a decline in growth until the first quarter of 2008.

16. For a fuller discussion of BEA's planned quarterly GDP by industry statistics see Carol A. Robbins, Thomas F. Howells, and Wendy Li, "Experimental Quarterly U.S. Gross Domestic Product by Industry Statistics," *SURVEY* 90 (February 2010): 24–31.

approximately to the three- and four-digit level NAICS

- The detailed level—over 425 industries and commodities and 13 final use categories

The NAICS-based annual I-O tables are available for 1998–2009. These tables are consistent with the 2010 comprehensive revision of the integrated annual industry accounts. The import matrix and the bridge tables are available for 1998–2009. Historic SIC-based tables are available for 1996–1999.

The annual I-O accounts are available at two levels of industry and commodity aggregation for 1998–2009:

- The sector level—15 industries, 16 commodities, and 6 final use categories—that corresponds approximately to the two-digit level NAICS
- The summary level—65 industries, 68 commodities, and 13 final use categories—that corresponds approximately to the three-digit level NAICS

The NAICS-based GDP by industry accounts, including statistics for gross output, intermediate inputs, and value added and the KLEMS statistics, are available for 1998–2009. These accounts are integrated with the annual I-O accounts. Historical NAICS-based GDP by industry accounts, including statistics for value added (1947–1997), gross output and intermediate inputs (1987–1997), and SIC-based GDP by industry accounts statistics for gross output (1977–1997) and value-added and its components (1947–1997), are also available.

The annual accounts, both annual I-O and GDP by industry, are available approximately 11 months after the end of the reference year. The “advance” GDP by industry statistics are aggregated to 22 broad industry groups, including government—roughly corresponding to the two-digit NAICS—rather than to the 65 industries in the revised accounts. The advance statistics are published approximately four months after the end of the reference year.

The core tables for the benchmark I-O accounts for 1997 forward and the annual I-O and GDP by industry accounts and the KLEMS statistics for 1947 forward also are available on an interactive basis on BEA's Web site.¹⁷ The interactive access area allows users to customize a selection of data from the U.S. I-O account tables. Data can be extracted in MS Excel or comma separated value (csv) format. In addition, users are able to graph selected information from the GDP by industry accounts and the KLEMS statistics to view trends over time. Select tables allow for four different types of graphs: actual values, normalized values, changes from one period to the next, and percentage changes from one period to the next.

Published articles on the I-O accounts can be found on BEA's Web site. See www.bea.gov/industry/an2.htm for a list of articles.

VII. Future Directions for the Industry Accounts

In order to provide more relevant statistics on industry activity, BEA is undertaking a number of improvements to the industry accounts and proposing additional future improvements. Beginning with the 2007 accounts, the benchmark I-O accounts will be integrated with the annual I-O and annual GDP by industry accounts.¹⁸ Proposals being considered include preparing quarterly GDP by industry statistics that would be released shortly after the quarterly GDP estimates from the NIPAs; preparing an I-O based energy satellite account; and improving the measurement of intangibles and innovation in BEA's core and satellite accounts.

In addition, longer run research on the source data and methodologies used to prepare major portions of the annual I-O accounts and the NIPAs is being considered in order to improve the consistency and quality of both sets of accounts. For more information, see “BEA Briefing: Future Directions for the Industry Accounts” by Brian C. Moyer in the March 2009 SURVEY.

17. See Appendix 2: Accessing the Industry Statistics Interactively for step-by-step examples.

18. The 2007 benchmark I-O accounts are scheduled for release in 2014.

References

This article provides a first step in understanding BEA's industry accounts. For readers interested in continuing their education, this section offers references, organized by subject area and industry account.

Concepts, framework, and history

Chevalier, Michel. "Chain Fisher Volume Index Methodology." *Income and Expenditure Accounts technical series*, No. 42. Ottawa, Canada: Statistics Canada, November 2003.

Horowitz, Karen J. and Mark A. Planting. *Concepts and Methods of the U.S. Input-Output Accounts*. Working Paper WP2006-06. Washington, DC: BEA, September 2006.

Landefeld, J. Steven, Brent R. Moulton, and Cindy M. Vojtech, "Chained-Dollar Indexes: Issues, Tips on Their Use, and Upcoming Changes." *SURVEY OF CURRENT BUSINESS* 83 (November 2003): 8–16.

Leontief, Wassily W. *Input-Output Economics*, 2nd edition. New York: Oxford University Press, 1986.

Mayerhauser, Nicole M. and Erich H. Strassner. "Preview of the Comprehensive Revision of the Annual Industry Accounts: Changes in Definitions, Classification, and Statistical Methods." *SURVEY OF CURRENT BUSINESS* 90 (March 2010): 21–34.

Miernyk, William H. *The Elements of Input-Output Analysis*. New York, NY: Random House, 1965.

Miller, Ronald E. and Peter D. Blair. *Input-Output Analysis: Foundations and Extensions*. Englewood Cliffs, NJ: Prentice Hall, December 1984.

Moyer, Brian C. "BEA Briefing: Future Directions for the Industry Accounts." *SURVEY OF CURRENT BUSINESS* 89 (March 2009): 29–32.

Moyer, Brian C., Mark A. Planting, Paul V. Kern, and Abigail M. Kish. "Improved Annual Industry Accounts for 1998–2002: Integrated Annual Input-Output Accounts and Gross-Domestic-Product-by-Industry Ac-

counts." *SURVEY OF CURRENT BUSINESS* 84 (June 2004): 21–57.

Moyer, Brian C., Mark A. Planting, Mahnaz Fahim-Nader, and Sherlene K. S. Lum. "Preview of the Comprehensive Revision of the Annual Industry Accounts: Integrating the Annual Input-Output Accounts and Gross-Domestic-Products-by-Industry Accounts." *SURVEY OF CURRENT BUSINESS* 84 (March 2004): 38–51.

Rassier, Dylan G., Thomas F. Howells III, Edward T. Morgan, Nicholas R. Empey, and Conrad F. Roesch. "BEA Briefing: Integrating the 2002 Benchmark Input-Output Accounts and the 2002 Annual Industry Accounts." *SURVEY OF CURRENT BUSINESS* 87 (December 2007): 14–22.

United Nations. *Handbook of Input-Output Table Compilation and Analysis*. Studies in Methods: Handbook of National Accounting Series F, no.74. New York, NY: United Nations, 1999.

Benchmark input-output accounts

Kunze, Kurt, and Stephanie H. McCulla. "Preview of Revised NIPA Estimates for 2002: Effects of Incorporating the 2002 Benchmark I-O Accounts and Proposed Definition and Statistical Changes." *SURVEY OF CURRENT BUSINESS* 88 (March 2008): 10–17.

Stewart, Ricky L., Jessica Brede Stone, and Mary L. Streitwieser. "U.S. Benchmark Input-Output Accounts, 2002." *SURVEY OF CURRENT BUSINESS* 87 (October 2007): 19–48.

Annual industry accounts

Harris, Tameka R.L., William A. Jolliff, Amanda S. Lyndaker, and Matthew B. Schroeder. "Annual Industry Accounts: Revised Statistics for 2007–2009." *SURVEY OF CURRENT BUSINESS* 91 (January 2011): 9–29.

Strassner, Erich H., Gabriel W. Medeiros, and George M. Smith. "Annual Industry Accounts: Introducing KLEMS Input Estimates for 1997–2003." *SURVEY OF CURRENT BUSINESS* 85 (September 2005): 31–39.

Satellite accounts and other statistics

Aizcorbe, Ana M., Carol E. Moylan, and Carol A. Robbins. "BEA Briefing: Toward Better Measurement of Innovation and Intangibles." *SURVEY OF CURRENT BUSINESS* 89 (January 2009): 10–23.

Lee, Jennifer, and Andrew G. Schmidt. "Research and Development Satellite Account Update: Estimates for 1959–2007." *SURVEY OF CURRENT BUSINESS* 90 (December 2010): 16–56.

Robins, Carol A., Mary L. Streitwieser, and William A. Jolliff. "R&D and Other Intangible Assets in an

Input-Output Framework: Experimental Estimates with U.S. Data." BEA Working Paper WP2010–07 (July 2010).

Robins, Carol A., Thomas F. Howells, and Wendy Li. "BEA Briefing: Experimental Quarterly U.S. Gross Domestic Product by Industry Statistics." *SURVEY OF CURRENT BUSINESS* 90 (February 2010): 24–31.

Zemanek, Steven L. and Stanislaw J. Rzeznik. "U.S. Travel and Tourism Satellite Accounts for 2004–2009." *SURVEY OF CURRENT BUSINESS* 90 (November 2010): 31–44.

Appendix 1: The Input-Output Valuation of Transactions

Transactions in commodities are valued at producers' prices in the industry accounts. Producers' prices exclude wholesale and retail trade margins and transportation costs, but they include excise and sales taxes collected and remitted 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.

In order 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. The flows of commodities for resale to and from wholesale trade and retail trade are not shown. If trade were shown as buying and reselling commodities, industrial and final users would make most of their purchases from a single source—trade.

Wholesale and retail trade margins on commodities are shown as purchases by users and are included in the trade commodity rows of the use table. Transportation costs are the freight charges paid to move the commodity from the producer to the intermediate user or the final user. All transportation costs are shown as purchases by users and are included in the transportation commodity rows of the use table.

Wholesale trade. This sector comprises establishments engaged in wholesaling merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. Wholesalers sell merchandise to other businesses and normally operate from a warehouse or office. Wholesale trade output consists of trade margin output and nonmargin output; both exclude the cost of goods purchased for resale. Both the margin and nonmargin outputs are included in the wholesale trade commodity row of the use table.

The trade margin output occurs when an establishment buys and resells a good. It is included in the purchasers' prices of the goods that are purchased but

not in the producers' prices of those goods, and it is measured in two parts. The trade margin is calculated as wholesale sales less the cost of goods sold plus taxes collected by the distributor.

Nonmargin output occurs when a wholesale trade service is purchased separately from the commodity, such as when a wholesaler acts as a broker between buyer and seller. Nonmargin output is assumed to be purchased by the producer of the goods being sold and is thus reflected in the producers' prices of the goods. It is measured as the sum of expenses, excluding the cost of the goods, on goods sold by manufacturers' sales offices, the commissions on goods sold by agents and brokers and by merchant wholesalers acting as commission merchants, the taxes collected, and the customs duties, which are considered as taxes collected by wholesale trade establishments.

Retail trade. This sector has one primary product—distributive services for the sale of goods. Its output consists primarily of retail trade margins, which are measured as retail sales less the cost of goods sold plus the taxes collected by retail trade establishments. All retail trade margin and nonmargin output are included in the retail trade commodity row of the use table.

Retail trade margins apply primarily to purchases by persons, but they are also applied to purchases by business and government, such as some purchases of personal computers by business. Retail trade margins are also applied to some intermediate purchases by business, such as office supplies, gasoline, and construction materials.

Final use components

Imports of goods and services. This component is measured by individual commodity at domestic port values. The domestic port value of an imported commodity, which includes customs duties, is considered equivalent to the producers' price of a domestically produced commodity. The imports of transportation

and wholesale trade include adjustments to convert the sum of all commodity imports of goods to foreign port value. Imports of services are valued at producers' prices. No margins or transportation costs are associated with services.

All imports except "noncomparable imports" are assumed either to be consumed within the U.S. boundaries or to have domestic equivalents. Noncomparable imports consist of goods purchased by U.S. residents abroad and of services imports that have no domestic counterparts.¹ These services include travel by U.S. residents abroad—both foreign travel by U.S. residents, which is included in final demand as a part of personal consumption expenditures, and foreign travel by U.S. business people, which is included as in-

1. Most imported goods now have domestic counterparts. Before the 1992 benchmark I-O accounts, noncomparable imports also included domestically consumed imported goods, such as bananas and coffee, that had no significant domestic counterparts.

termediate purchases. Noncomparable commodity imports are distributed directly to industries and final users and are shown in a separate row in the use table.

Exports of goods and services. This component is measured by commodity at producers' prices—the same as other domestically produced commodities. Transportation costs and trade margins, which are required to move exports from the producer to the port of exit, are included in the transportation and trade commodity rows of the use table.

Change in private inventories. This component is measured by commodity at the LIFO-reserve-adjusted book value that is reported by industries in the economic censuses. Inventory values are adjusted to remove the effects of price changes while products are held in inventory. This inventory valuation adjustment is made by holding industry, commodity, and inventory type.

Appendix 2: Accessing the Industry Statistics Interactively

BEA provides the industry accounts without charge on its Web site. Users can download the published statistics as a Microsoft Excel spreadsheet file (.xls) or as a text file (.txt), or they can create custom data extracts via the interactive access feature. The interac-

tive service is capable of providing a high degree of customization, including some graphic capabilities. This appendix provides two examples on how to use the interactive feature—one for the input-output accounts and one for the GDP by industry accounts.

Input-output accounts. Step 1: To retrieve data from the annual or benchmark input-output accounts from BEA's Web site, www.bea.gov, begin by clicking on the "Industry" tab at the top of the page, then on "Interactive Tables: Input-Output."

The screenshot shows the Bureau of Economic Analysis (BEA) website for Industry Economic Accounts. The URL in the address bar is <http://www.bea.gov/industry/index.htm>. The main navigation menu includes Home, About BEA, National, International, Regional, Industry (which is circled in red), Glossary, and FAQs. Below the menu, there are links for About Industry, Methodologies, Articles, Releases, Staff Contacts, and Email Subscriptions. The breadcrumb trail indicates the user is at Home > Industry Economic Accounts. The main content area is titled 'Industry Economic Accounts'. It features a 'What's New...' section with a link to 'Revised Statistics of Gross Domestic Product by Industry, 2007-2009'. Under 'Annual Industry Accounts', there are links for 'Gross Domestic Product (GDP) by Industry', 'Survey of Current Business: Annual Industry Accounts: Revised Statistics for 2007–2009 (PDF)', 'GDP-by-industry data', and 'Interactive Tables: GDP by Industry'. Under 'Input-Output (I-O) Accounts', there are links for 'Annual I-O Data' (which includes associated spreadsheet tables) and 'Interactive Tables: Input-Output' (which is circled in red). A sidebar on the right contains links for 'On This Page', 'Additional Information', and 'Contacts'. The sidebar also includes a search bar and links for 'Sign up for e-mail notifications' and 'Download the Acrobat Reader'.

Step 2: Under the “Interactive Access Area” of the Web page, select a table by clicking on the title of the table. For example, the “Use of Commodities by Industries Before Redefinitions (1997 to 2009).” Note that information on selecting data can be found by clicking on the “Input-Output Accounts Tables Help” link.

BEA : Interactive Access To Input-Output Accounts Data - Windows Internet Explorer
 http://www.bea.gov/industry/iotables/table_list.cfm?anon=866973&CFID=229201&CFTOKEN=ead32b844eaeeff4c-32C88C51-D566-F116-EC49D854215C7D38E

File Edit View Favorites Tools Help
 Favorites BEA : Interactive Access To Input-Output Accounts D... Advanced | FAQ | A-Z Index

Home > Industry Economic Accounts > Interactive I-O Accounts

Interactive Access To Input-Output Accounts Data

Skip to I-O Tables.

Background

The input-output (I-O) accounts show how industries interact; specifically, they show how industries provide input to, and use output from, each other to produce Gross Domestic Product (GDP). These accounts provide detailed information on the flows of the goods and services that make up the production processes of industries.

The I-O accounts are presented in a set of tables: Use, Make, Direct Requirements and Total Requirements.

- ▶ The Use table shows the inputs to industry production and the commodity composition of final demand (GDP).
- ▶ The Make table shows the commodities that are produced by each industry.
- ▶ The Direct Requirements table shows the amount of a commodity that is required by an industry to produce a dollar of the industry's output.
- ▶ The three Total Requirements tables show the production that is required, directly and indirectly, from each industry and each commodity to deliver a dollar of industry or commodity to final users.

The Use table is the most frequently requested table because of its applications to the estimates of GDP. The four Requirements tables are derived from the Use and Make tables.

Interactive Access Area

The interactive access area allows users to select data from the U.S. I-O account tables. For information on selecting data, see the [Input-Output Accounts Tables Help](#) section. The interactive access area can be bypassed by users who want to directly download published I-O data in the [Data Download](#) section. Data download is recommended for users who want to retrieve the complete tables at the most detailed industry level. Published articles on the I-O accounts can be found in the [Industry Accounts Articles Section](#).

If you have questions or comments about the Industry Accounts, or if you want to be notified about new data releases or published articles, please send an e-mail to [Annual Input-Output Accounts](#) or [Benchmark Input-Output Accounts](#).

To display a table from the I-O accounts, select from below:

I-O Tables

Use Table

- ▶ [The Use of Commodities by Industries before Redefinitions \(1997 to 2009\)](#)
- ▶ [The Use of Commodities by Industries after Redefinitions \(1987, 1992, 1997 to 2009\)](#)

Make Table

- ▶ [The Make of Commodities by Industries before Redefinitions \(1997 to 2009\)](#)

Step 3: In the “Data Table Options” box, select a year from the drop down menu, such as “2009 Annual”; then select a level of aggregation, such as “Summary.” (Detail level statistics are available only for the benchmark I-O accounts.)

Select the rows for the table by clicking on the “Rows” button.¹ Depending on the table selected, the rows can be either industries (the make, industry-by-commodity requirements, and industry-by-industry requirements tables) or commodities (all other tables).

1. Instructions for more complex data extracts from the I-O accounts, including creating custom aggregations, can be found on BEA's Web site at www.bea.gov/industry/iotables/help_section.cfm.

The screenshot shows a Windows Internet Explorer window displaying the Bureau of Economic Analysis (BEA) website. The main title bar reads "BEA : The Use of Commodities by Industries before Redefinitions (1997 to 2009) - Windows Internet Explorer". The URL in the address bar is http://www.bea.gov/industry/iotables/options_list.cfm?aggregations_id=0&get_results=show&goto=go_to_options&anon=866973&CFTOKEN=229201&CFTOKEN=229201&CFTOKEN=229201. The page header includes the BEA logo and the title "Industry Economic Accounts".

The navigation menu at the top includes links for Home, About BEA, International, Regional, Industry, Glossary, FAQs, About Industry, Methodologies, Articles, Release Schedule, Staff Contacts, and Email Subscriptions. Below the menu, there is a search bar and links for Advanced, FAQ, and A-Z Index.

The main content area displays the title "The Use of Commodities by Industries before Redefinitions (1997 to 2009)". Below it, it says "Today's Date: March 10, 2011 Latest Release: December 14, 2010 Next Release: Fall 2011".

A prominent feature is a "Data Table Options" dialog box with a red circle around its border. Inside the dialog box, the "Year" dropdown is set to "2009 Annual". The "Level of Aggregation" section has three radio buttons: "Sector" (unchecked), "Summary" (checked), and "Detail" (unchecked). The "Commodities and VA" section has a dropdown menu set to "Rows". The "Industries and Final Uses" section has a dropdown menu set to "None". The "Valuation" section has three radio buttons: "Producers' Prices" (checked), "Purchasers' Prices" (unchecked), and "Margin" (unchecked). The "Orientation" section has two radio buttons: "Normal" (checked) and "Transposed". At the bottom of the dialog box are "View Table" and "Download Table" buttons.

To the right of the dialog box is a "Tools" sidebar with a blue border. It contains several links: "Customize Aggregations Login", "What is Customize Aggregations Login?", "XLS Download", "CSV Download", "Instructions on sorting the selected table", "Help is available for downloading, importing and using the I/O tables.", "Glossary of I/O terms", "NAICS code listings", and "Questions and comments".

At the bottom center of the page, it says "The Use of Commodities by Industries before Redefinitions for 2009 (Millions of dollars)".

Step 4: To select a specific row (commodity), for example, “334 Computer and electronic products,” click on the desired commodity description in the scroll down screen to highlight it as the commodity of choice.² Then click the “OK” button. When you click the “OK” button, it will return you to the previous screen.

2. To select more than one commodity, hold the “Ctrl” key down on your key board, and click and highlight as many commodities as desired. You also have the option to select all commodities or commodity group with the “Select All” and “Select by commodity group” buttons, clear your selections with the “Clear Selections” button, or to search by keyword (“Search by keyword” button on the right of the screen).

User defined Aggregates There are 0 aggregates in use.

(1) Pick from commodity list below then hit the "OK" button.

Ok | Select All | Clear Selections (70 commodities out of 70 selected)

Codes in use by user defined aggregates not shown here)

111CA	Farms
113FF	Forestry, fishing, and related activities
211	Oil and gas extraction
212	Mining, except oil and gas
213	Support activities for mining
22	Utilities
23	Construction
321	Wood products
327	Nonmetallic mineral products
331	Primary metals
332	Fabricated metal products
333	Machinery
334	Computer and electronic products
335	Electrical equipment, appliances, and components
3361MV	Motor vehicles, bodies and trailers, and parts
3364OT	Other transportation equipment
337	Furniture and related products
339	Miscellaneous manufacturing
311FT	Food and beverage and tobacco products
313TT	Textile mills and textile product mills
315AL	Apparel and leather and allied products
322	Paper products
323	Printing and related support activities
324	Petroleum and coal products
325	Chemical products
326	Plastics and rubber products

OR (2) Search by keyword

Search by keyword

(commodity list will only show values that meet search criteria)
(An empty search will return all rows)

Select a search method:

Matches on all words (AND)
 Matches on any word (OR)

OR (3) Select by commodity group

Select by commodity group

(subgroup of commodities will be selected)

11	Agriculture, forestry, fishing, and hunting
21	Mining
22	Utilities
23	Construction
31G	Manufacturing
42	Wholesale trade
44RT	Retail trade
48TW	Transportation and warehousing
51	Information
FIRE	Finance, insurance, real estate, rental, and leasing
PROF	Professional and business services
6	Educational services, health care, and social assistance
7	Arts, entertainment, recreation, accommodation, and food services
81	Other services, except government
G	Government
Used	Scrap, used and secondhand goods
Other	Noncomparable imports and rest-of-the-world adjustment
V001	Compensation of employees

Step 5: The procedure for selecting the columns (industries) for the table are the same as for selecting the rows (commodities) for the table, except we begin by clicking on the “Columns” button. For this example, we want to see all the uses of the commodity computers and electronic products, both as intermediate inputs to industries and final uses. To do this, click the “Select All” button; you will see that all industries and final use categories in the scroll down screen are highlighted. Now click the “OK” button to be returned to the previous screen.

The screenshot shows a Windows Internet Explorer window with the following details:

- Title Bar:** U.S. Department of Commerce, Bureau of Economic Analysis - Windows Internet Explorer
- Address Bar:** http://www.bea.gov/industry/itable/check_box_iocode_list.cfm?search_option_allor=&a=a&iocodecategory=VA&aggregations_id=0&use_in_search=yes&r=
- Menu Bar:** File, Edit, View, Favorites, Tools, Help
- Toolbar:** Home, Feeds, Read Mail, Print, Page, Safety, Tools, Help
- Content Area:**
 - Section:** Home > Industry > Interactive I-O Accounts > Table > IO Code list
 - Text:** 2009 Annual Summary
Commodities List (Rows)
 - Form:** User defined Aggregates (There are 0 aggregates in use.)
(1) Pick from commodity list below then hit the "OK" button.
Buttons: OK, Select All (highlighted with a red circle), Clear Selections (disabled)
(70 commodities out of 70 selected)
(Codes in use by user defined aggregates not shown here)
 - Table:** A list of commodity codes and descriptions, including:
111CA Farms
113FF Forestry, fishing, and related activities
211 Oil and gas extraction
212 Mining, except oil and gas
213 Support activities for mining
22 Utilities
23 Construction
321 Wood products
327 Nonmetallic mineral products
331 Primary metals
332 Fabricated metal products
333 Machinery
334 Computer and electronic products
335 Electrical equipment, appliances, and components
3361MV Motor vehicles, bodies and trailers, and parts
3364OT Other transportation equipment
337 Furniture and related products
339 Miscellaneous manufacturing
311FT Food and beverage and tobacco products
313TT Textile mills and textile product mills
315AL Apparel and leather and allied products
322 Paper products
323 Printing and related support activities
324 Petroleum and coal products
325 Chemical products
326 Plastics and rubber products
 - Search Options:**
 - OR (2) Search by keyword
Search by keyword
(commodity list will only show values that meet search criteria)
(An empty search will return all rows)
 - Select a search method:
 Matches on all words (AND)
 Matches on any word (OR)
 - OR (3) Select by commodity group
Select by commodity group
(subgroup of commodities will be selected)
 - A list of commodity groups:
11 Agriculture, forestry, fishing, and hunting
21 Mining
22 Utilities
23 Construction
31G Manufacturing
42 Wholesale trade
44RT Retail trade
48TW Transportation and warehousing
51 Information
FIRE Finance, insurance, real estate, rental, and leasing
PROF Professional and business services
6 Educational services, health care, and social assistance
7 Arts, entertainment, recreation, accommodation, and food services
81 Other services, except government
G Government
Used Scrap, used and secondhand goods
Other Noncomparable imports and rest-of-the-world adjustment
V001 Compensation of employees

Step 6: Select the valuation—a feature available only for the use table in benchmark years. “Producers’ Prices” is the default valuation.

Select the orientation for the table, either normal, in its published format, or transposed to reverse the rows and columns.

At this point, you have three choices: (1) View the table on-line by clicking the "View Table" button; (2) download the selected data as a comma separated value (.csv) file by clicking on the "Download Table" button or the "CSV Download" button; or (3) download the table as a formatted Microsoft Excel spreadsheet (.xls) file by clicking on the "XLS Download" button.

The Use of Commodities by Industries before Redefinitions (1997 to 2009) - Windows Internet Explorer

File Edit View Favorites Tools Help

Favorites BEA : The Use of Commodities by Industries before R...

Home About BEA National International Regional Industry Glossary FAQs

About Industry Methodologies Articles Release Schedule Staff Contacts Email Subscriptions

Advanced | FAQ | A-Z Index

Home > Indstry Economic Accounts > Interactive I-O Accounts > Table

The Use of Commodities by Industries before Redefinitions (1997 to 2009)

Today's Date: March 10, 2011 Latest Release: December 14, 2010 Next Release: Fall 2011

Data Table Options

Year: 2009 Annual

Level of Aggregation: Sector Summary Detail (Benchmark years only)

Commodities and VA: Rows

Industries and Final Uses: Columns

Valuation: Producers' Prices Purchasers' Prices Margin

Orientation: Normal Transposed

Tools

Customize Aggregations Login.
What is Customize Aggregations Login.
XLS Download
CSV Download
Instructions on sorting the selected table.
Help is available for downloading, importing and using the I/O tables.
Glossary of I/O terms.
NAICS code listings.
Questions and comments.

XLS Download

CSV Download

Notes:

If you select “View Table,” you have the options to print the table and download and save the table after it is displayed.

The Use of Commodities by Industries before Redefinitions for 2009
(Millions of dollars)

Commodities / Industries	111CA	113FF	211	212	213	22	23	321	327	331	332	333	334	335	3361MV	3364OT	337	339	311FT
334 Computer and electronic products	Farms	Forestry, fishing, and related activities	Oil and gas extraction	Mining, except oil and gas	Support activities for mining	Utilities	Construction	Wood products	Nonmetallic mineral products	Primary metals	Fabricated metal products	Machinery	Computer and electronic products	Electrical equipment, appliances, and components	Motor vehicles, bodies and trailers, and parts	Other transportation equipment	Furniture and related products	Miscellaneous manufacturing	Food and beverage and tobacco products
Sum of Intermediate Selected	18	2	0	14	63	285	3,345	501	950	2,752	3,413	4,403	43,825	2,862	8,954	22,720	586	1,600	1,878
Intermediate Not Selected	195,067	12,501	43,094	27,167	38,052	124,069	550,200	57,816	53,353	133,678	178,563	144,847	103,020	49,051	261,690	136,248	36,187	67,108	558,758
Total Intermediate	195,085	12,503	43,094	27,182	38,115	124,354	553,545	58,317	54,303	136,429	181,977	149,250	146,845	51,913	270,644	158,968	36,774	68,708	560,635
Sum of Value Added Selected																			
Sum of Value Added Not Selected	103,964	29,174	141,671	48,941	50,230	268,107	537,460	20,866	38,160	43,410	121,900	112,658	206,428	51,678	78,160	90,705	24,218	79,018	206,098
Total Value Added	103,964	29,174	141,671	48,941	50,230	268,107	537,460	20,866	38,160	43,410	121,900	112,658	206,428	51,678	78,160	90,705	24,218	79,018	206,098
Total Industry Output	299,049	41,677	184,765	76,123	88,345	392,461	1,091,005	79,183	92,463	179,839	303,877	261,908	353,273	103,591	348,804	249,672	60,991	147,726	766,733

XLS Download
CSV Download

Notes:

GDP by industry accounts. Step 1: To retrieve data from the GDP by industry accounts and KLEMS statistics from BEA's Web site, www.bea.gov, begin by clicking on the "Industry" tab at the top of the Web page, then on "Interactive Tables: GDP by Industry."

The screenshot shows the BEA Industry Economic Accounts page. At the top, there is a navigation bar with links for Home, About BEA, National, International, Regional, Industry, Glossary, and FAQs. The 'Industry' link is circled in red. Below the navigation bar, the main content area has a title 'Industry Economic Accounts'. On the left, there is a sidebar with a 'What's New...' section and a 'Annual Industry Accounts' section. The 'Annual Industry Accounts' section contains links for 'Gross Domestic Product (GDP) by Industry', 'Input-Output (I-O) Accounts', and 'Interactive Tables: GDP by Industry'. The 'Interactive Tables: GDP by Industry' link is also circled in red. On the right side, there is a search bar and a sidebar with various links related to industry accounts and contacts.

Step 2: Select a table by clicking on the title of the table. For this example, select the “Contributions to Percent Change in Real Gross Domestic Product by Industry.”

The screenshot shows a Microsoft Internet Explorer window displaying the Bureau of Economic Analysis (BEA) website. The main title is "Industry Economic Accounts". The left sidebar lists various tables under "Value Added by Industry" and "Gross Output by Industry". A specific link, "Contributions to Percent Change in Real Gross Domestic Product by Industry", is highlighted with a red oval.

Bureau of Economic Analysis
Industry Economic Accounts

Value Added by Industry

- [Value Added by Industry](#)
- [Value Added by Industry as a Percentage of Gross Domestic Product](#)
- [Components of Value Added by Industry](#)
- [Components of Value Added by Industry as a Percentage of Value Added](#)
- [Chain-Type Quantity Indexes for Value Added by Industry](#)
- [Percent Changes in Chain-Type Quantity Indexes for Value Added by Industry](#)
- [Real Value Added by Industry](#)
- [Chain-Type Price Indexes for Value Added by Industry](#)
- [Percent Changes in Chain-Type Price Indexes for Value Added by Industry](#)
- [Contributions to Percent Change in Real Gross Domestic Product by Industry](#)**
- [Contributions to Percent Change in the Chain-Type Price Index for Gross Domestic Product by Industry](#)

Gross Output by Industry

- [Gross Output by Industry](#)
- [Chain-Type Quantity Indexes for Gross Output by Industry](#)
- [Percent Changes in Chain-Type Quantity Indexes for Gross Output by Industry](#)
- [Chain-Type Price Indexes for Gross Output by Industry](#)
- [Percent Changes in Chain-Type Price Indexes for Gross Output by Industry](#)

Step 3: In the “Data Table Options” box, select the first and last years to be included in the table from the drop down menus—2000 and 2009 for this example. Click on “Refresh Table” to view your selection.

To download the table as a comma separated value (.csv) file, click on the “CSV Download” link in the “Tools” box. Information on custom selection and downloading of data can be found by clicking on the “Help” link in the “Tools” box.

To view the table as a Java Applet with locking stubs and graphing capability, click on the “Locking Stubs And Graphing Capability” button.

The screenshot shows a web browser window for the Bureau of Economic Analysis (BEA) Gross-Domestic-Product-by-Industry Accounts. The URL is http://www.bea.gov/industry/gpobtable/gpo_action.cfm. The page title is "Bureau of Economic Analysis Industry Economic Accounts". The main content area displays a table titled "Contributions to Percent Change in Real Gross Domestic Product by Industry" with data for December 14, 2010. The table includes columns for Line Number, Description, and years from 2000 to 2009. The "Data Table Options" and "Tools" boxes are highlighted with red circles. The "Data Table Options" box contains dropdown menus for "First Year" (set to 2000) and "Last Year" (set to 2009), and a "Refresh Table" button. The "Tools" box contains links for "CSV Download", "Help", "Press Release", "Guide", and "Contact Us".

Line	Description	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
1	Percent change:										
2	Gross domestic product	4.1	1.1	1.8	2.5	3.6	3.1	2.7	1.9	0.0	-2.6
3	Percentage points:										
4	Private industries	4.03	1.13	1.48	2.05	3.36	2.76	2.63	1.83	-0.58	-2.63
5	Agriculture, forestry, fishing, and hunting	0.11	-0.03	0.04	0.10	0.07	0.04	0.01	-0.07	0.09	0.05
6	Farms	0.10	-0.05	0.03	0.09	0.06	0.04	-0.02	-0.07	0.11	0.05
7	Forestry, fishing, and related activities	0.00	0.02	0.01	0.01	0.00	0.03	-0.01	-0.01	0.00	
8	Mining	-0.13	0.14	0.01	-0.16	-0.01	-0.25	0.13	0.05	-0.07	0.45

Step 4: The graphic capabilities allow two options: You can select rows using a checkbox and graph up to 5 rows (industries) at a time, or you can graph more than 5 rows, 5 at a time. For this example, to graph the contributions to percent change in real GDP for the manufacturing sector and the computer and electronic products industry, click on the left hand side check box beside their respective rows (rows 2, 14, and 21). Click the "Graph 5 Selections" button at the bottom of the screen to see the selected industry values in a line graph.

The screenshot shows a Microsoft Internet Explorer window displaying the Bureau of Economic Analysis (BEA) Industry Economic Accounts. The URL is http://www.bea.gov/industry/gpotables/gpo_action.cfm. The page title is "Gross-Domestic-Product-by-Industry Accounts". A data table titled "Contributions to Percent Change in Real Gross Domestic Product by Industry" is displayed, showing data from 2000 to 2009. The table includes columns for industry code, industry name, and percentage contribution for each year. Rows 2, 14, and 21 are circled in red, corresponding to "Gross domestic product", "Manufacturing", and "Computer and electronic products" respectively. A "Data Table Options" panel on the left allows selecting first and last years and choosing between an HTML-formatted table or a CSV download. A "Tools" panel on the right provides links for CSV download, help, press release, guide, and contact us. At the bottom, buttons for "Graph 5 Selections!", "View All", and "Graph All" are visible.

Contributions to Percent Change in Real Gross Domestic Product by Industry												
Release date: December 14, 2010												
			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
<input checked="" type="checkbox"/>	2	Gross domestic product	4.1	1.1	1.8	2.5	3.6	3.1	2.7	1.9	0.0	-2.6
<input checked="" type="checkbox"/>	14	Manufacturing	0.92	-0.65	0.32	0.36	0.98	0.41	0.54	0.40	-0.58	-1.02
<input checked="" type="checkbox"/>	21	Computer and electronic products	0.79	-0.01	0.19	0.21	0.34	0.33	0.30	0.14	0.20	0.05

Graph 5 Selections! View All Graph All

1. Consists of agriculture, forestry, fishing, and hunting; mining; construction; and manufacturing.
2. Consists of utilities; wholesale trade; retail trade; transportation and warehousing; information; finance; insurance; real estate; rental, and leasing; professional and business services; educational

The graph will be displayed on the screen and can be printed.

