Measuring the Nation's Economy: An Industry Perspective

A Primer on BEA's Industry Accounts

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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>.

This primer is a revised version of the primer published in August 2009. It is updated to reflect the 2009 comprehensive revision of the NIPAs and the 2010 comprehensive revision of the annual industry accounts. A shorter version of the original primer appeared in the June, 2009 SURVEY OF CURRENT BUSINESS.

Brian C. Moyer, Associate Director for Industry Economic Accounts at BEA, provided overall guidance.

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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.

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[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 1998–2008; 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 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

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

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 2008 annual I-O standard make table is shown in Table 1. The row for the computer and electronic products industry shows that in 2008 the industry produced not only $361.7 billion in computers (the industry's primary product in the shaded cell) but also secondary products, including $16.5 billion in other manufactured goods ($378.2 billion – $361.7 billion) and $14.4 billion in services. Total gross output for the industry was $392.6 billion.

The computer and electronic products column shows that while the computer and electronic products industry produced 96.6 percent of all computer and electronic products ($361.7 billion / $374.4 billion), it was not the only producer of these commodities. Nearly $13 billion were produced, as secondary products, by other manufacturing industries ($374.4 billion – $361.7 billion) and by service industries ($59 million). Together, all industries produced $374.4 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 2008 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 2008, total computer and electronic products commodity output was $374.4 billion, of which nearly 61 percent or $227.7 billion was used by industries as input to their production and $146.8 billion was consumed by final users. Personal consumption expenditures accounted for $67.1 billion in final use; private fixed investment accounted for $165.1 billion, change in private inventories was $3.1 billion, net exports were –$149.0 billion (the negative value indicates imports exceeded exports), and government expenditures and investment accounted for $60.5 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 products requires commodity inputs from all areas of the economy, including $62.9 billion in

computer and electronic products, $35.0 billion in other manufactured goods, $96.6 billion in services, $690 million in agriculture, mining, and construction goods, and $60 million in government goods and services. In total, $197.4 billion in intermediate inputs were required in 2008.

The computer and electronic products industry generated $195.2 billion in value added: $129.8 billion in compensation to labor, $5.7 billion in taxes on production and imports less subsidies to the government, and nearly $60 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 $14,441 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 2008 annual I-O accounts the amount of the redefined secondary output was $778.8 billion, or 2.9 percent of total output and 41.0 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

[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 >.

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. 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

[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.

produce $1 billion of computer and electronic products output in 2008, it directly required $511 million of intermediate inputs ($1 billion x 0.511). That included $166 million in computer and electronic products ($1 billion x 0.166) and $93 million in other manufactured goods (0.259 – 0.166 = 0.093 x $1 billion), which included such manufactured goods as $27 million in fabricated metals, $20 million in primary metals, and $12 million in chemical products. The industry also required $245 million in services inputs, including $60 million in wholesale trade services, $40 million in miscellaneous professional, scientific and technical services, and $4 million in legal services. The industry generated $489 million in value added for every $1 billion in industry output, 66 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.

Total Requirements Table	Use
Commodity-by-commodity	Final demand is shown for commodities; the objective is to derive the commodity output that is required.
Industry-by-commodity	Final demand is shown for commodities; the objective is to derive the industry output that is required.
Industry-by-industry	Final demand is shown for industries; the objective is to derive the industry output that is required.

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

[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.

per dollar of delivery to final use 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, $66 million in primary metals goods, $47 million in fabricated metal products, and $39 million in chemical products.[8] The total commodity requirements coefficient is 2.019, 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 $2.0 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 $1.2 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 $859 million of industry output. The total industry output requirement coefficient is 2.019, indicating the additional output of all industries that is required to deliver $1 billion of computer and electronic products to final users is $2.0 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 2008, 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

[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 2008 annual I-O Commodity-by-Commodity Total Requirements Table.
[9] Statistics are from the 2008 annual I-O Industry-by-Commodity Total Requirements Table.

industry to produce $58 million of output, and the fabricated metal products industry to produce $46 million of output, and so on.[10] The total industry output requirements coefficient is 2.003, 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 $2.0 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

[10] Statistics are from the 2008 annual I-O Industry-by-Industry Total Requirements Table.
[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.

for 2008 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 $635 million of industry output. The total industry output requirement coefficient is 1.690, indicating that the total additional output of all domestic industries required to deliver $1 billion of computer and electronic products to final users is $1.7 billion. This compares with the total (domestic and foreign output) requirements of 2.019 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 2008, 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 (367 workers), miscellaneous professional, scientific and technical services (296 workers), administrative and support services (290 workers), and management of companies and enterprises (234 workers). Across all

[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.

industries, roughly 6,233 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

[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.

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 three of the ten years 1999-2008, for the decade as a whole, it increased at an average annual rate of 3.2 percent. By contrast, value added for all industries rose each year, with an average annual rate of 5.1 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. For the industry, gross operating surplus, as a share of value added, fell from 10.6 percent in 1999 to a low of –8.8 percent in 2001 and a rapid recovery to 30.6 percent in 2008 (Table 5). The industry was hit hard in the recession of 2001. The share across all industries held up much better: The share fell from 36.0 percent in 1999 to 35.3 percent in 2001 before rising to 37.4 percent in 2008.

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 86.8 percent in 1999, while the national level share was just 57.3 percent. However, while the share across all industries fell 1.6 points to 55.7 percent in 2008, the computer and electronic products industry share decreased to 66.5 percent, a decline of 20.3 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 2.6 percent in 1999–2008 (Table 4). Real value added also increased for most industries during this period; however, the growth

rates varied considerably. The computer and electronic products industry grew at an average annual rate of 22.5 percent over this period, the highest growth rate of the 65 industries included in the GDP by industry accounts.

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 32.0 percent in 1999. Even though the computer and electronic products industry is relatively small (1.6 percent of current-dollar GDP in 1999), it contributed a larger share to growth: 0.49 percentage point of the 4.8 percent growth in real GDP. By 2008, the computer and electronic products industry accounted for 1.4 percent of current-dollar GDP; the industry's real value added increased 9.9 percent during 2008, 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 1999-2008, except 2001.

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 total intermediate inputs for the U.S. economy shows the broad move toward an increasingly services-oriented economy. Over all, 1999–2008, every dollar of gross output represented a higher percentage of purchased services and a lower percentage of materials. In 2008, purchased services accounted for 24.5 percent of the nation's output, compared to 23.7 percent in 1999 (Table 6). That means that every dollar of output in 2008 reflected 24.5 cents worth of purchased services. Materials accounted for 18.5 cents of every dollar of output in 2008, compared to 19.4 cents in 1999. In contrast, in 2008 the computer and electronic products industry required 33.4 cents worth of materials and 16.3 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 continued through 2000, the 2001-2002 slowdown, and the subsequent recovery through 2007. In 1999 and 2000, growth in the use of materials neared 20 percent each year (Table 7), and accounted for 0.98 percentage point of the economy-wide 2.8 percent growth in the use of materials in 1999 and 0.96 percentage point of the economy-wide 0.9 percent growth in 2000 (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 these two years. This growth was followed by steep declines: 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 did not increase until 2007.

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 3.5 percent in 1999-2008, outpacing the growth in output prices (3.0 percent) and dominating the 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: 10.4 percent, 4.2 percent, and 2.5 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 –6.9 percent and –15.8 percent, respectively. Over 1999-2008, value added prices for the computer and electronic products industry subtracted just under 3 tenths of a percentage point from the 2.4 percent average annual growth in the GDP price index (Table 10). Within intermediate inputs, the industry's growth in prices for material inputs was negative 7 of the 10 years. Overall, materials prices paid by the industry declined by 2.2 percent annually, subtracting 0.13 percentage point from the 4.3 percent average annual growth in economy wide materials prices.

For the computer and electronic products industry the growth in the price indexes for energy (4.7 percent) and purchased services (1.8 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 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 change 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 2013.

The most recent R&D satellite account, released in June 2010, provides data for 1998–2007 at the national level and R&D statistics for 14 R&D intensive for profit industries as well as non profit industries and governments.[14] The impact of R&D investment on GDP by state is available for 1998–2002. 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 1995–2004.

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

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

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 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 2011 budget. If funds are available, BEA anticipates releasing quarterly GDP by industry statistics on a regular basis in 2012. 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.

[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 OF CURRENT BUSINESS 90 (February 2010): 24-31.

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. Vojtech, "Chained-Dollar Indexes: Issues, Tips on Their Use, and Upcoming Changes," SURVEY 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 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 1998–2008. 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 1998-2008. 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 1998-2008:

- 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 1998–2008. 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 1998 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 Excel or 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.

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

VII. Future Directions for the Industry Accounts

In order to provide more relevant statistics on industry activity, BEA is proposing a number of improvements to the industry accounts. Proposals being considered include preparing quarterly GDP by industry statistics that would be released shortly after the quarterly GDP estimates from the NIPAs; integrating the benchmark I-O accounts with the already integrated annual I-O and annual GDP by industry accounts; 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 of CURRENT BUSINESS.

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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.[18] 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 intermediate 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.

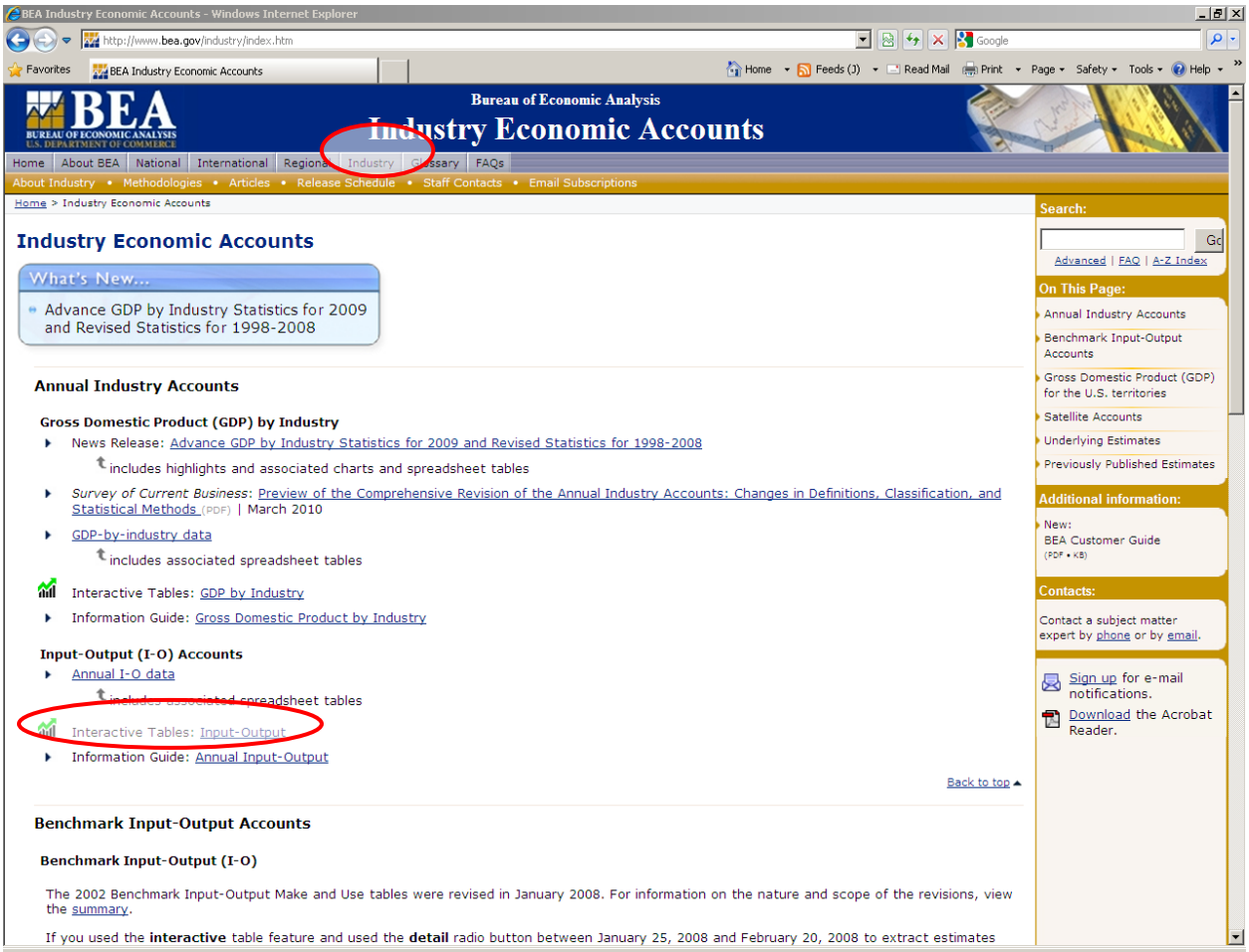
Change in private inventories. This component is measured by commodity at the LIFO-reserve-adjusted book value that is reported by industries in the economic censuses. Inventory values are adjusted to remove the effects of price changes while products are held in inventory. This inventory valuation adjustment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

[18] 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.

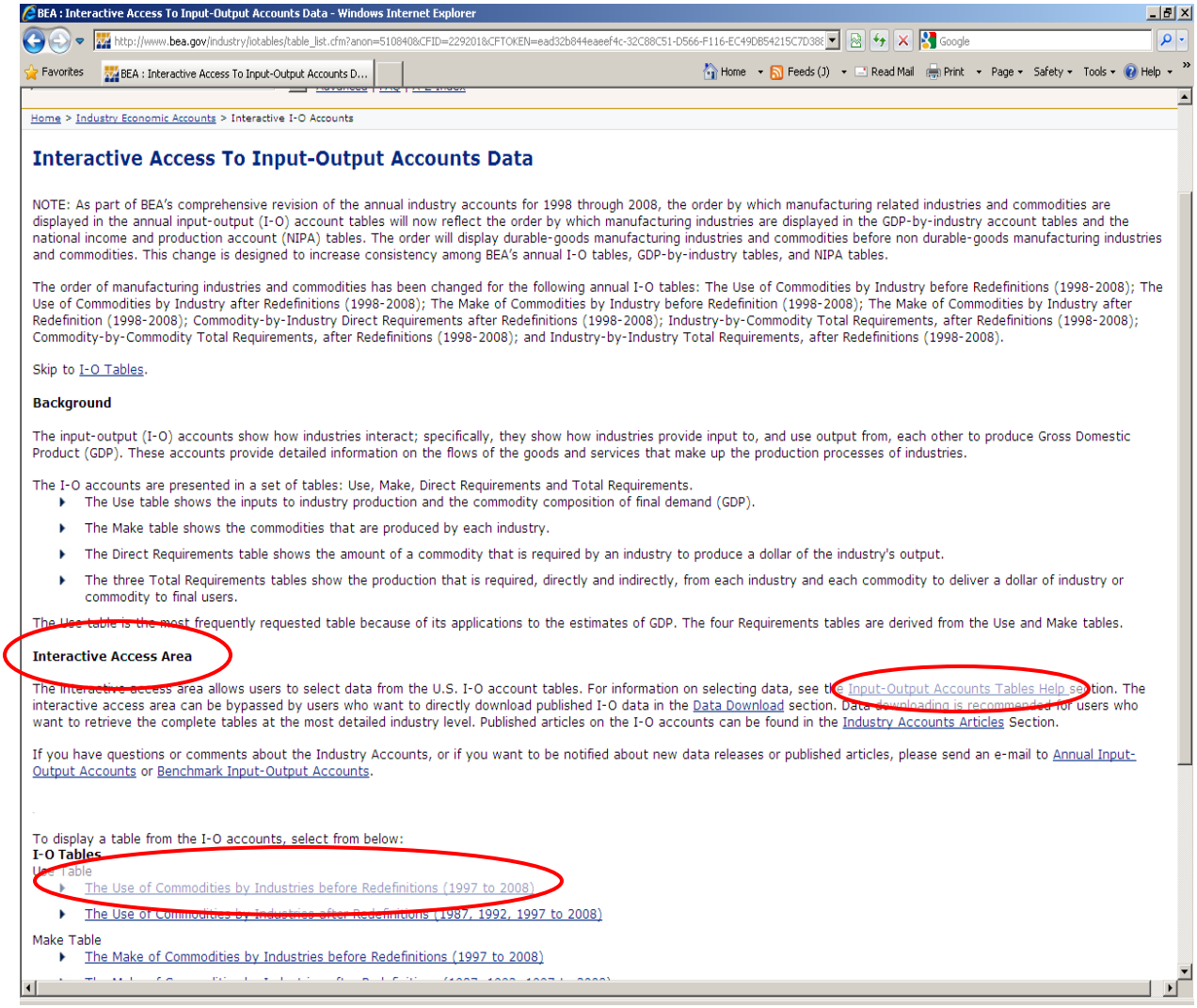
Appendix 2: Accessing the Industry Statistics Interactively

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

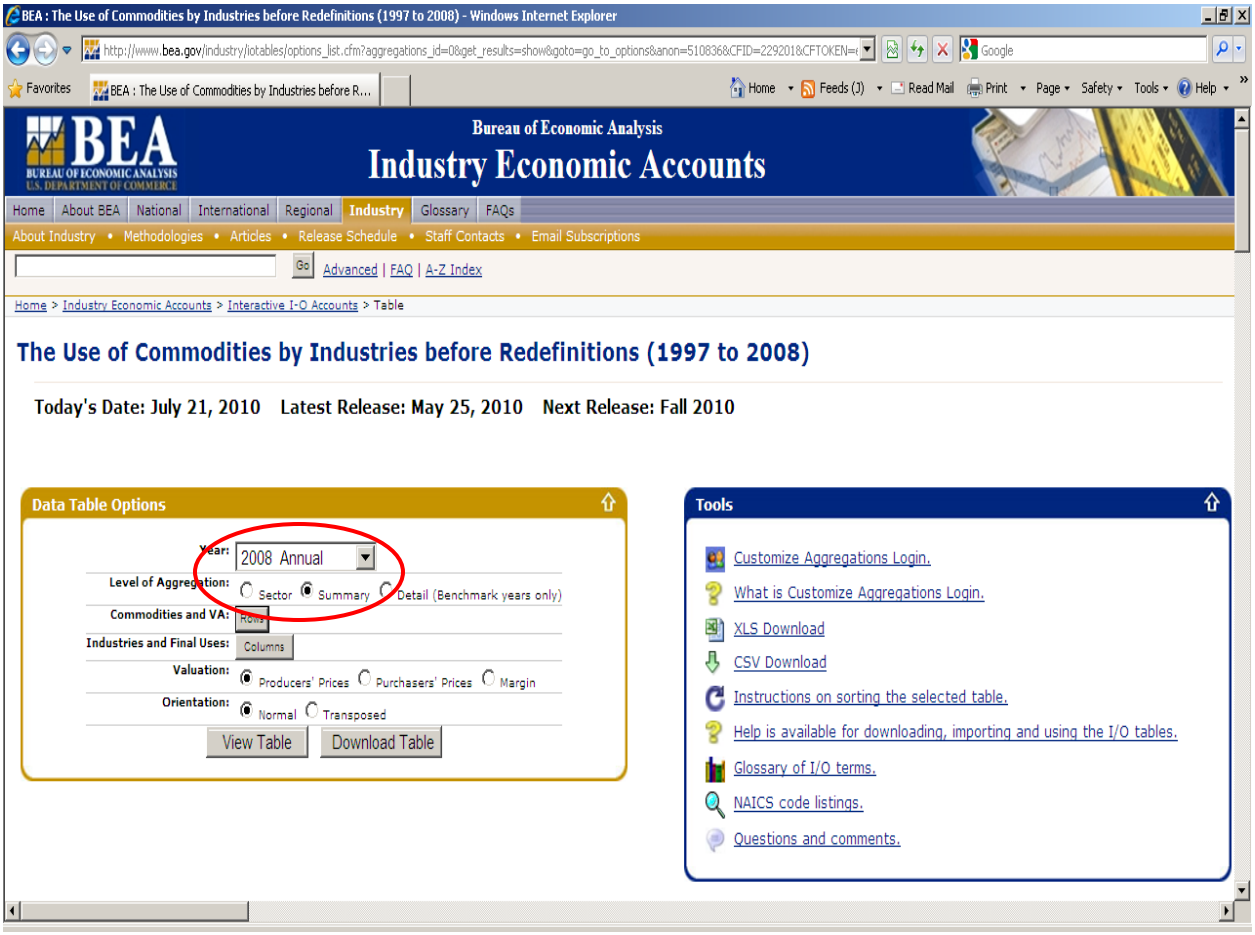


Step 2: Under the "Interactive Access Area" of the Web page, select a table by clicking on the title of the table. For example, the "Use of Commodities by Industries Before Redefinitions (1997 to 2007)." Note that information on selecting data can be found by clicking on the "Input-Output Accounts Tables Help" link.



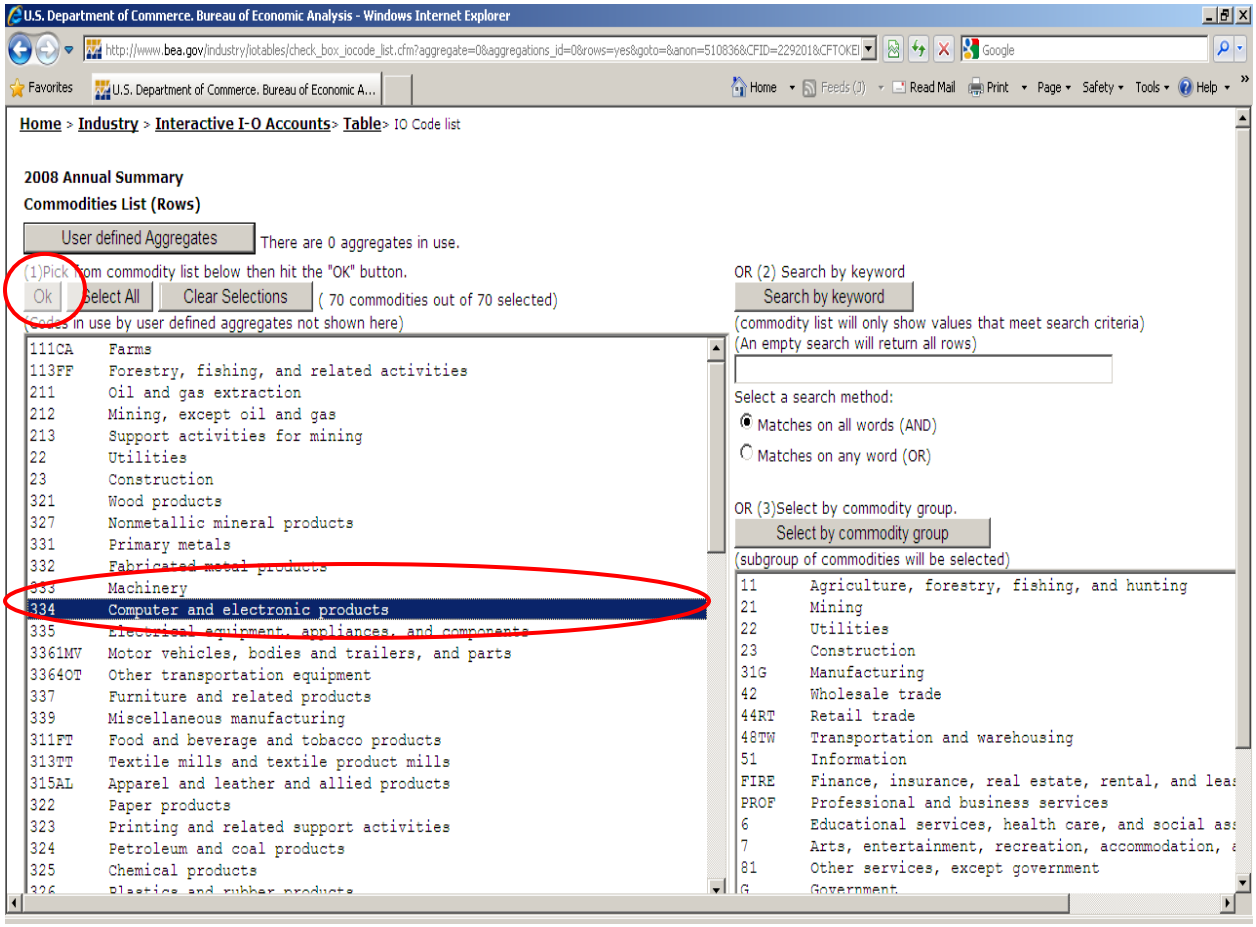
Step 3: In the "Data Table Options" box, select a year from the drop down menu, such as "2007 Annual"; then select a level of aggregation, such as "Summary." (Detail level statistics are available only for the benchmark I-O accounts.)

Select the rows for the table by clicking on the "Rows" button.[19] 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).



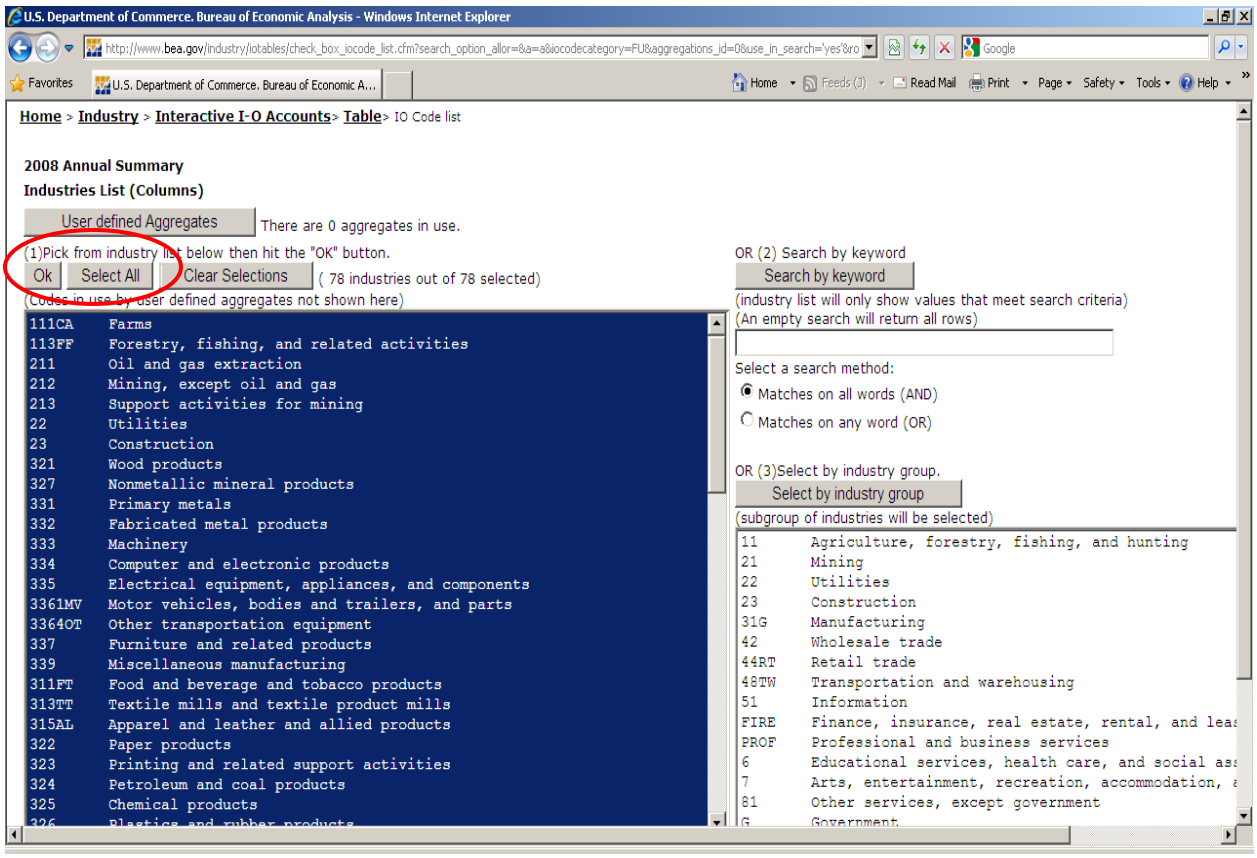
[19] Instructions for more complex data extracts from the I-O accounts, including creating custom aggregations, can be found on BEA's Web site at <www.bea.gov/industry/iotables/help_section.cfm>.

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.[20] Then click the "OK" button. When you click the "OK" button, it will return you to the previous screen.



[20] 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).

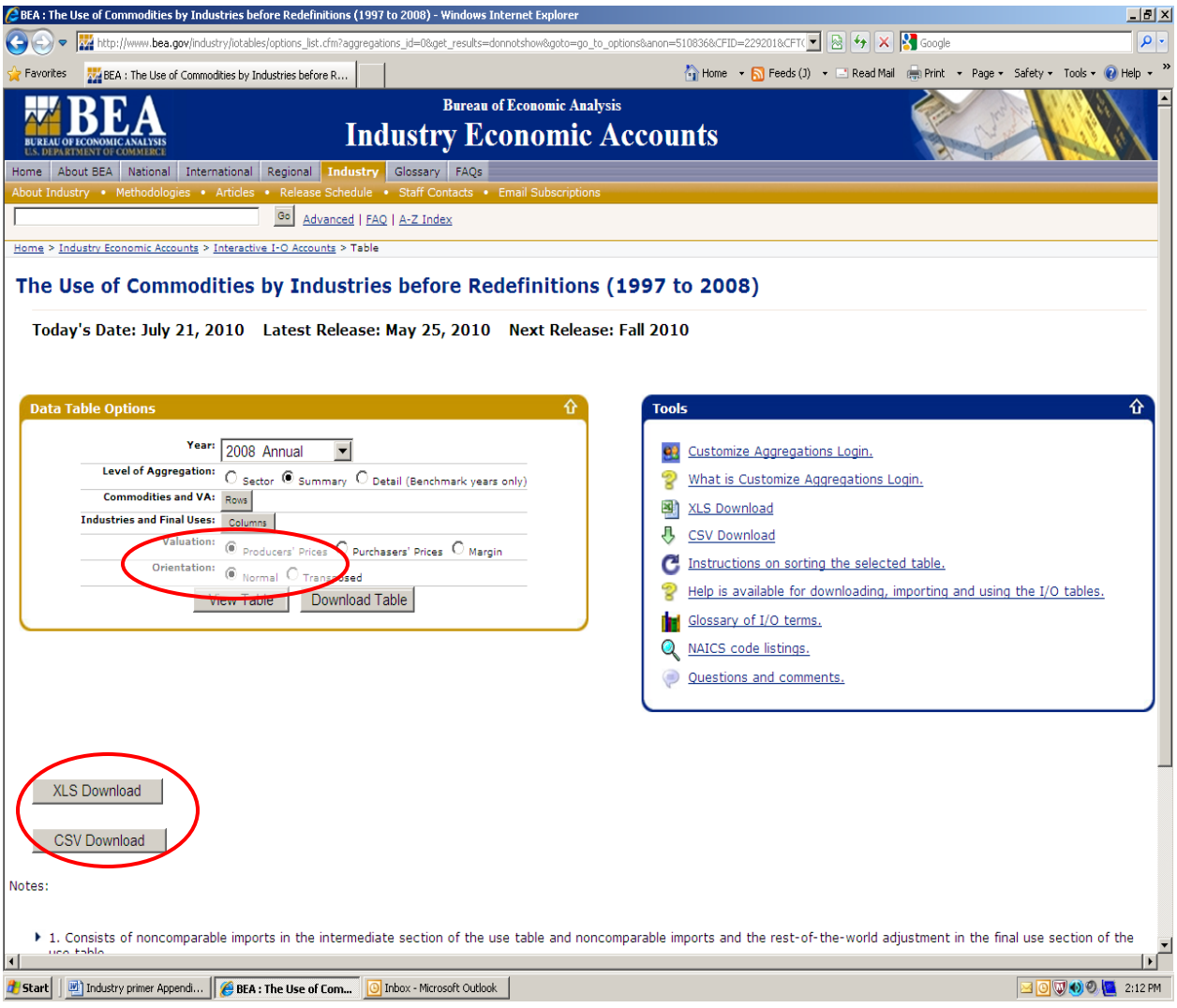
Step 5: The procedure for selecting the columns (industries) for the table are the same as for selecting the rows (commodities) for the table, except we begin by clicking on the "Columns" button. For this example, we want to see all the uses of the commodity computers and electronic products, both as 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.



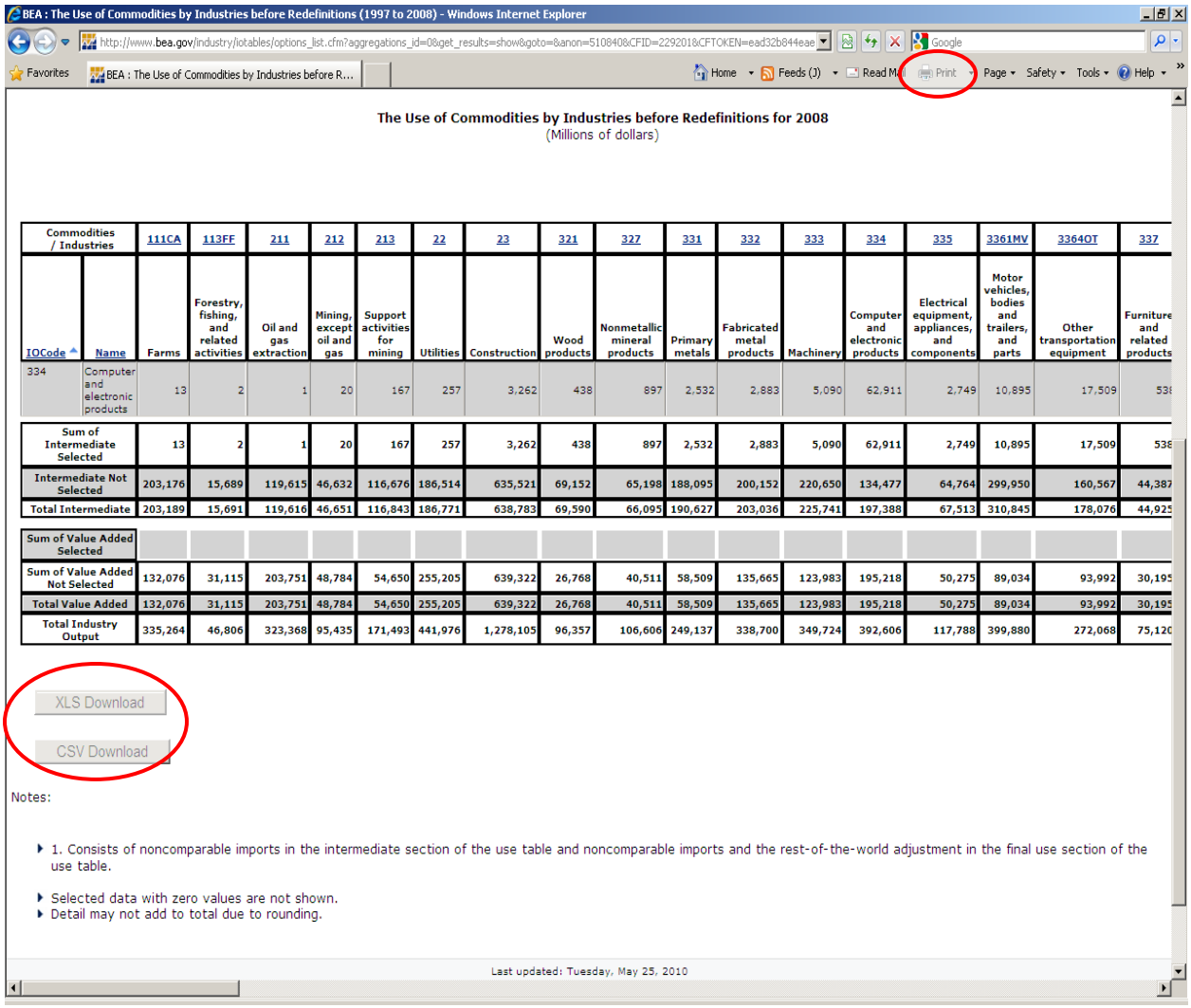
Step 6: Select the valuation—a feature available only for the use table in benchmark years. "Producers' Prices" is the default valuation.

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 MS Excel© spreadsheet (.xls) file by clicking on the "XLS Download" button.

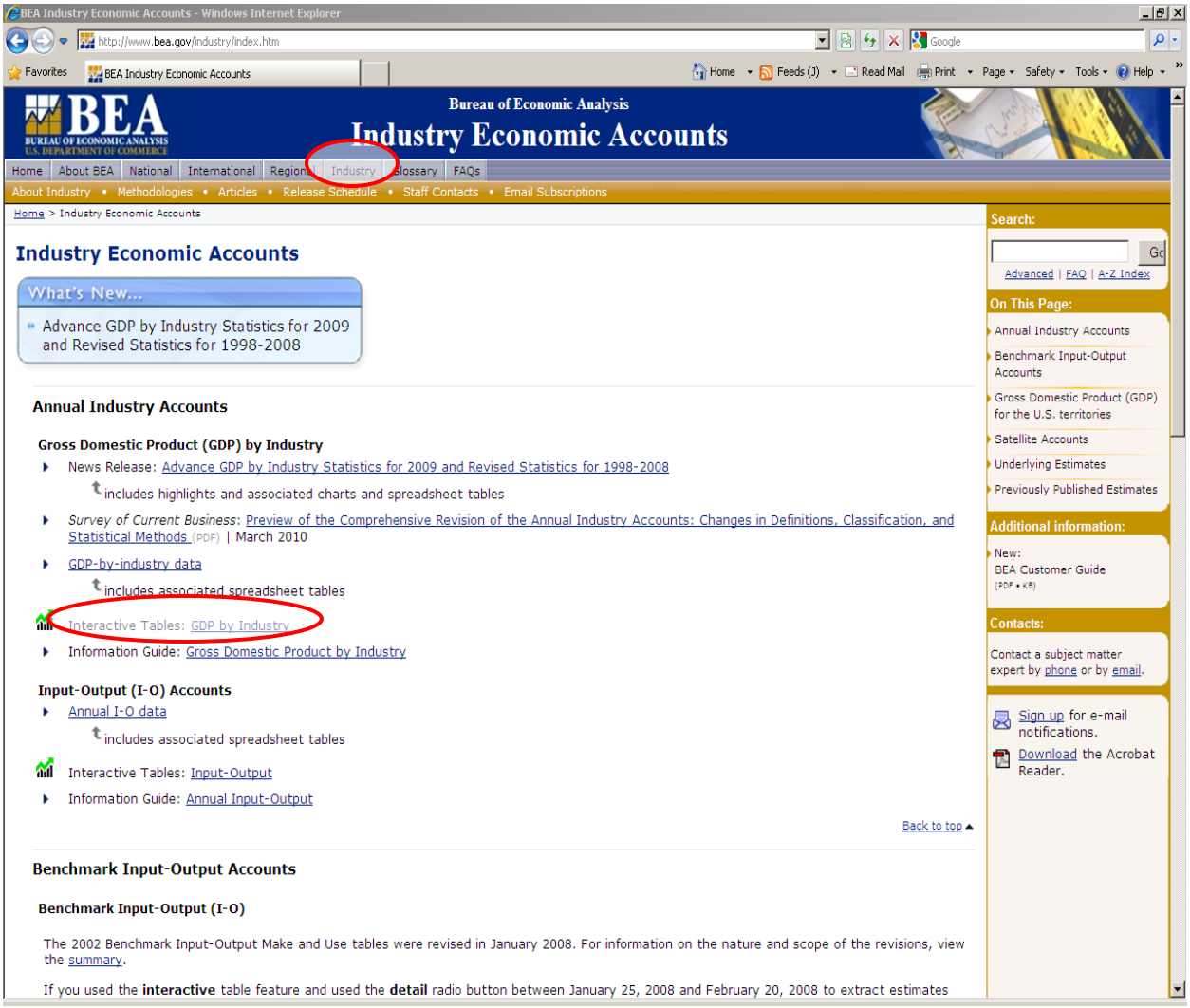


If you select “View Table,” you have the options to print the table and download and save the table after it is displayed.

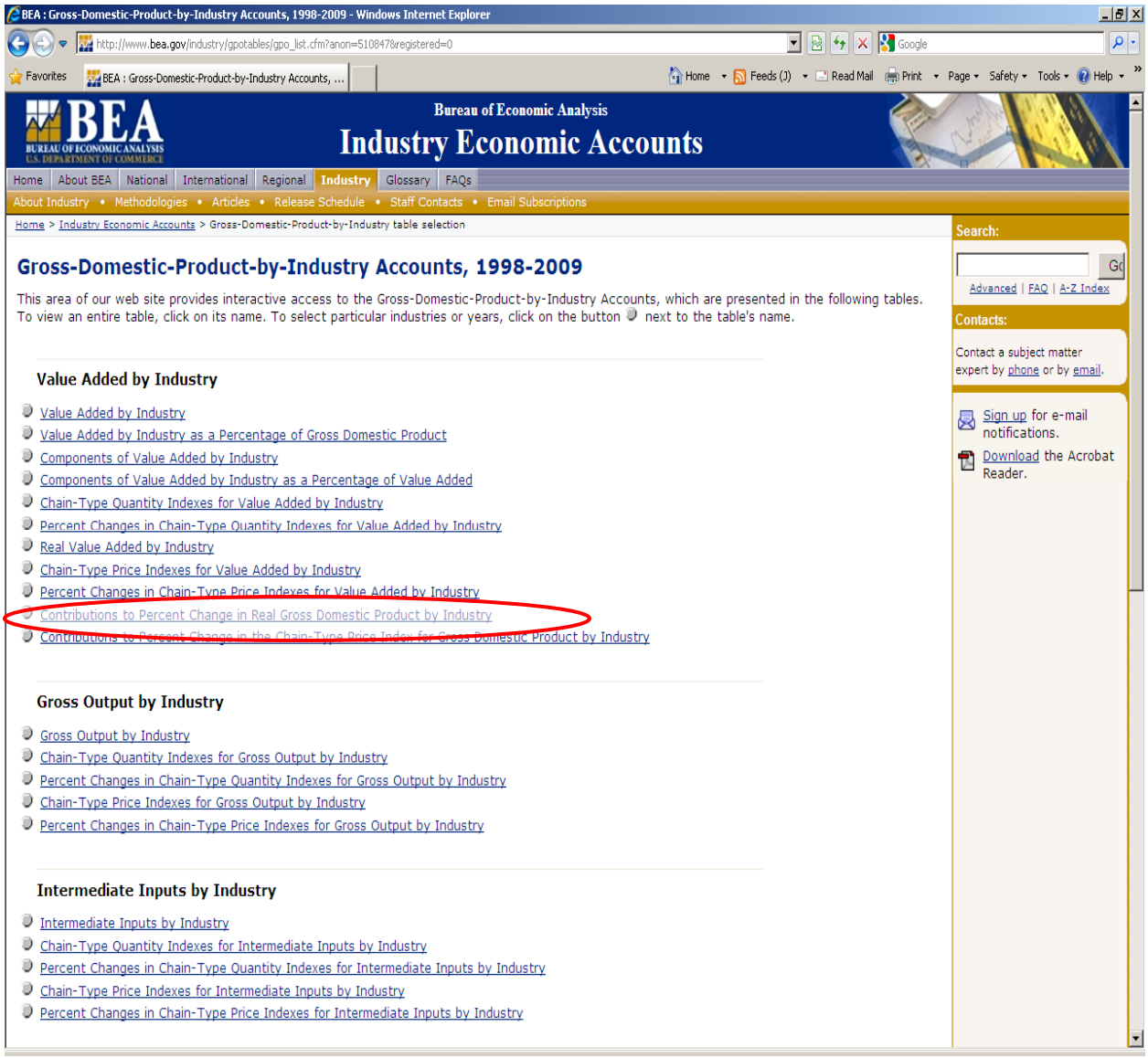


Commodities / Industries		111CA	113FF	211	212	213	22	23	321	327	331	332	333	334	335	3361MV	3364OT	337
IOCode	Name	Farms	Forestry, fishing, and related activities	Oil and gas extraction	Mining, except oil and gas	Support activities for mining	Utilities	Construction	Wood products	Nonmetallic mineral products	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
334	Computer and electronic products	13	2	1	20	167	257	3,262	438	897	2,532	2,883	5,090	62,911	2,749	10,895	17,509	53
Sum of Intermediate Selected		13	2	1	20	167	257	3,262	438	897	2,532	2,883	5,090	62,911	2,749	10,895	17,509	53
Intermediate Not Selected		203,176	15,689	119,615	46,632	116,676	186,514	635,521	69,152	65,198	188,095	200,152	220,650	134,477	64,764	299,950	160,567	44,38
Total Intermediate		203,189	15,691	119,616	46,651	116,843	186,771	638,783	69,590	66,095	190,627	203,036	225,741	197,388	67,513	310,845	178,076	44,92
Sum of Value Added Selected																		
Sum of Value Added Not Selected		132,076	31,115	203,751	48,784	54,650	255,205	639,322	26,768	40,511	58,509	135,665	123,983	195,218	50,275	89,034	93,992	30,19
Total Value Added		132,076	31,115	203,751	48,784	54,650	255,205	639,322	26,768	40,511	58,509	135,665	123,983	195,218	50,275	89,034	93,992	30,19
Total Industry Output		335,264	46,806	323,368	95,435	171,493	441,976	1,278,105	96,357	106,606	249,137	338,700	349,724	392,606	117,788	399,880	272,068	75,12

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."



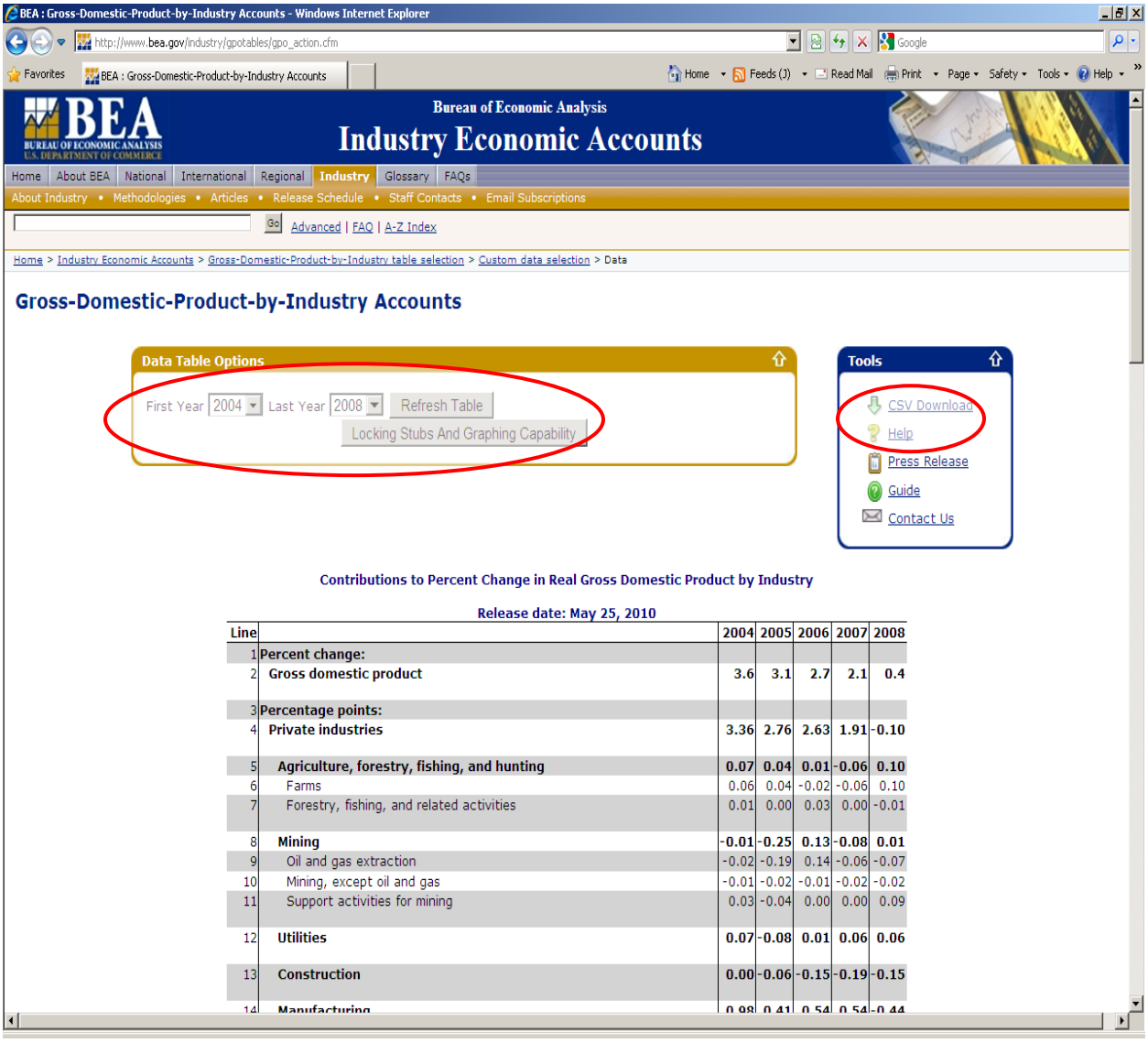
Step 2: Select a table by clicking on the title of the table. For this example, select the "Contributions to Percent Change in Real Gross Domestic Product by Industry."



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—2004 and 2008 for this example. Click on "Refresh Table" to view your selection.

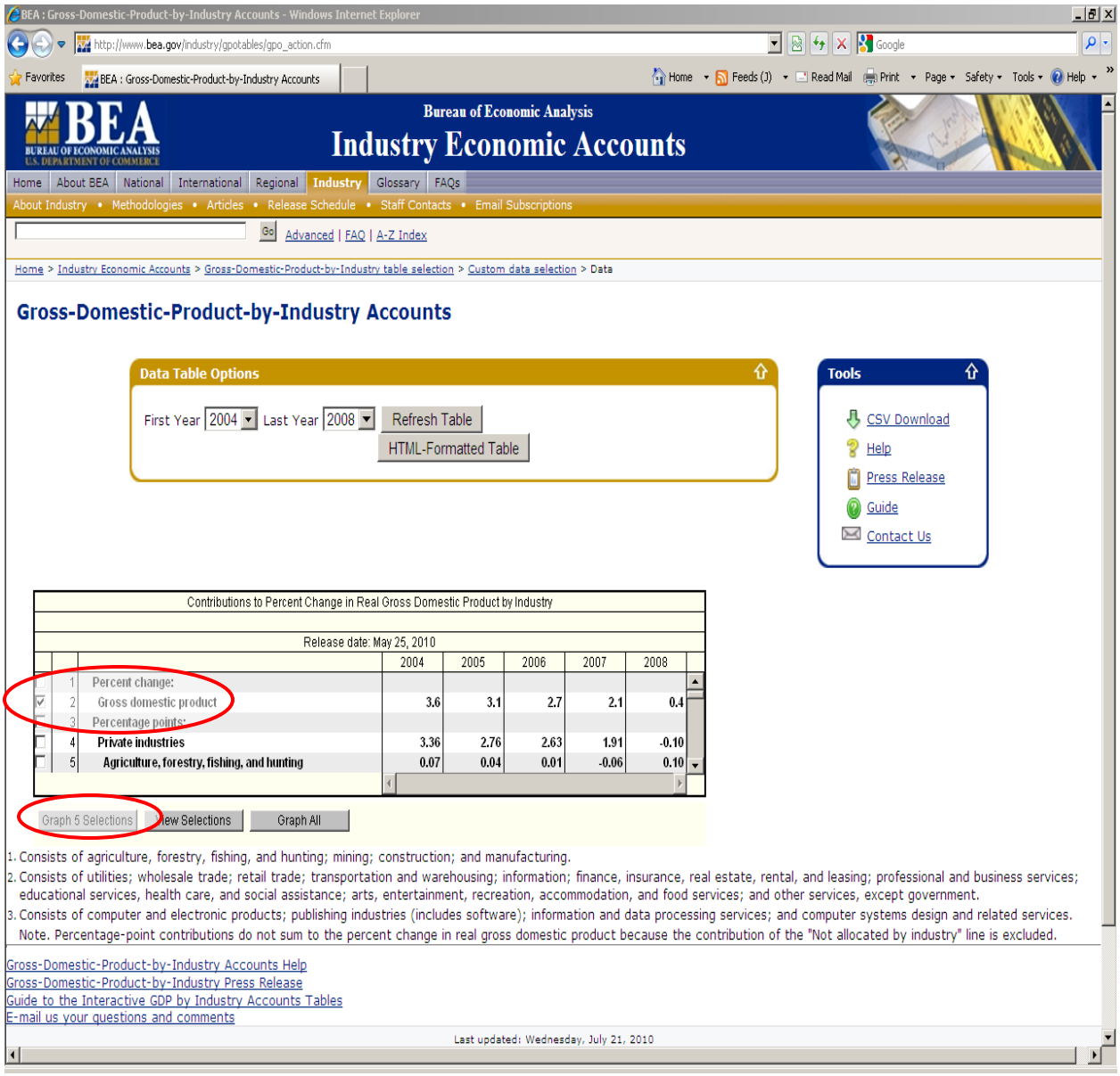
To download the table as a comma separated value (.csv) file, click on the "CSV Download" link in the "Tools" box. Information on custom selection and downloading of data can be found by clicking on the "Help" link in the "Tools" box.

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



Line		2004	2005	2006	2007	2008
1	Percent change:					
2	Gross domestic product	3.6	3.1	2.7	2.1	0.4
3	Percentage points:					
4	Private industries	3.36	2.76	2.63	1.91	-0.10
5	Agriculture, forestry, fishing, and hunting	0.07	0.04	0.01	-0.06	0.10
6	Farms	0.06	0.04	-0.02	-0.06	0.10
7	Forestry, fishing, and related activities	0.01	0.00	0.03	0.00	-0.01
8	Mining	-0.01	-0.25	0.13	-0.08	0.01
9	Oil and gas extraction	-0.02	-0.19	0.14	-0.06	-0.07
10	Mining, except oil and gas	-0.01	-0.02	-0.01	-0.02	-0.02
11	Support activities for mining	0.03	-0.04	0.00	0.00	0.09
12	Utilities	0.07	-0.08	0.01	0.06	0.06
13	Construction	0.00	-0.06	-0.15	-0.19	-0.15
14	Manufacturing	0.98	0.41	0.54	0.54	-0.44

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

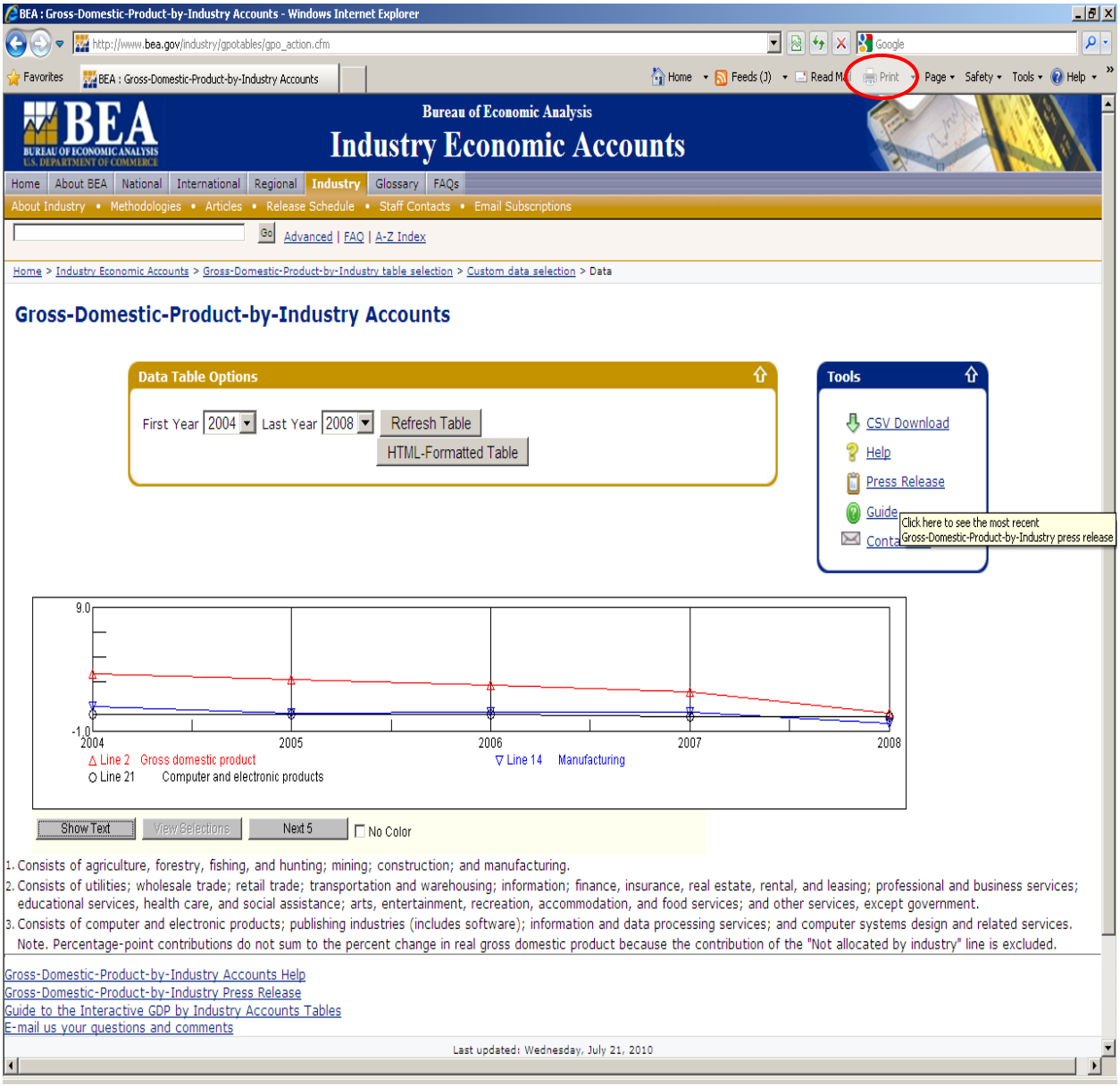


Table 1. The Make of Commodities by Industries, 2008
[Millions of dollars]

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]	2,224,144	23,384	……..	2,943	……..	**2,250,471**
Manufacturing	3,240	5,125,081	374,386	94,621	……..	**5,226,365**
Computer and electronic products	68	378,160	361,652	14,378	…….	**392,606**
Services[2]	48,551	18,589	59	15,921,528	1,376	**15,990,793**
Government[3]	26,026	5,986	…….	531,028	2,538,877	**3,106,736**
Total commodity output	**2,301,960**	**5,173,039**	**374,446**	**16,550,121**	**2,540,253**	**26,574,365**

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 of the NIPAs and the 2010 comprehensive revision of the annual industry accounts. They do not reflect the July 2010 annual revision of the NIPAs, which will be incorporated into the annual industry accounts in December 2010.

Table 2. The Use of Commodities by Industries, 2008
[Millions of dollars]

Commodities/ industries	Agriculture, mining, and construction[1]	Manufacturing		Services[2]	Government[3]	**Total intermediate use**	Personal consumption expenditures	Private fixed investment	Change in private inventories[4]	Net trade	Government consumption and gross investment[3]	**Total final uses (GDP)**	**Total commodity output**
		Total	Computer and electronic products										
Agriculture, mining, and construction[1]	153,354	797,028	690	258,530	85,033	**1,293,945**	72,571	1,008,112	-16,643	-368,107	312,081	**1,008,015**	**2,301,960**
Manufacturing	502,961	1,741,045	97,932	906,732	327,555	**3,478,292**	1,635,835	667,407	-12,747	-728,526	132,778	**1,694,747**	**5,173,039**
Computer and electronic products	3,464	117,576	62,911	69,739	36,871	**227,650**	67,075	165,091	3,134	-148,997	60,494	**146,796**	**374,446**
Services[2]	482,973	990,618	96,649	4,855,031	799,946	**7,128,566**	8,336,250	596,400	-5,410	436,962	57,353	**9,421,554**	**16,550,121**
Government[3]	131	2,598	60	73,915	10,937	**87,581**	65,497	…..	…..	299	2,386,877	**2,452,673**	**2,540,253**
Total intermediate inputs[5]	**1,140,773**	**3,556,729**	**197,388**	**6,182,108**	**1,253,341**	**12,132,950**	**10,129,919**	**2,170,805**	**-34,752**	**-707,765**	**2,883,208**		
Compensation of employees	551,606	939,084	129,802	4,984,190	1,569,870	**8,044,750**							
Taxes on production and imports less subsidies	47,747	61,339	5,667	905,127	-20,452	**993,761**							
Gross operating surplus	510,345	669,213	59,749	3,919,369	303,977	**5,402,904**							
Total value added	**1,109,698**	**1,669,636**	**195,218**	**9,808,686**	**1,853,395**							**14,441,415**	
Total industry output	**2,250,471**	**5,226,365**	**392,606**	**15,990,793**	**3,106,736**								**26,574,365**

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 of the NIPAs and the 2010 comprehensive revision of the annual industry accounts. They do not reflect the July 2010 annual revision of the NIPAs, which will be incorporated into the annual industry accounts in December 2010.

Table 3. The Direct Requirements by Industries, 2008
[Output requirement per dollar of delivery to final demand, in producers' prices]

Commodities/industries	Agriculture, mining, and construction[1]	Manufacturing		Services[2]	Government[3]
		Total	Computer and electronic products		
Agriculture, mining, and construction[1]	0.06626	0.15388	0.00182	0.01602	0.02838
Manufacturing	0.22377	0.33747	0.25871	0.05520	0.10760
Computer and electronic products	0.00161	0.02273	0.16620	0.00432	0.01226
Services[2]	0.21690	0.19086	0.24515	0.30265	0.25735
Government[3]	0.00006	0.00050	0.00016	0.00462	0.00351
Total intermediate inputs[4]	**0.50757**	**0.68761**	**0.51128**	**0.38397**	**0.40682**
Compensation of employees	0.24969	0.17555	0.32369	0.31493	0.49867
Taxes on production and imports less subsidies	0.02055	0.01190	0.01497	0.05628	-0.00684
Gross operating surplus	0.22219	0.12493	0.15006	0.24483	0.10135
Total value added	**0.49243**	**0.31239**	**0.48872**	**0.61603**	**0.59318**
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 of the NIPAs and the 2010 comprehensive revision of the annual industry accounts. They do not reflect the July 2010 annual revision of the NIPAs, which will be incorporated into the annual industry accounts in December 2010.

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, 1999-2008

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Average 1999-2008
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	6.4	3.4	3.5	4.7	6.5	6.5	6.0	5.1	2.6	5.1
Percent change in real GDP	4.8	4.1	1.1	1.8	2.5	3.6	3.1	2.7	2.1	0.4	2.6
Percentage point contribution to percent change in real GDP	4.8	4.1	1.1	1.8	2.5	3.6	3.1	2.7	2.1	0.4	2.6
Computer and electronic products											
Percentage of current-dollar GDP	1.6	1.7	1.2	1.2	1.2	1.3	1.5	1.5	1.4	1.4	1.4
Percentage of real GDP growth	0.1	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.1
Percent change in current-dollar value added	-4.6	17.3	-25.5	3.4	3.2	16.6	14.8	9.1	-1.2	-1.3	3.2
Percent change in real value added	32.0	59.5	-0.4	16.0	18.0	30.2	26.6	22.1	11.1	9.9	22.5
Percentage point contribution to percent change in real GDP	0.49	0.79	-0.01	0.19	0.21	0.34	0.33	0.3	0.16	0.13	0.3

NOTE. These statistics incorporate the 2009 comprehensive revision of the NIPAs and the 2010 comprehensive revision of the annual industry accounts. They do not reflect the July 2010 annual revision of the NIPAs, which will be incorporated into the annual industry accounts in December 2010.

NOTE. 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.

Table 5. Shares of Value Added, 1999-2008

[Percent]

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
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	57.3	58.2	58.2	57.5	57.3	56.5	56	55.9	55.9	55.7
Taxes on production and imports less subsidies	6.7	6.7	6.5	6.8	6.8	6.9	6.9	7	6.9	6.9
Gross operating surplus	36.0	35.1	35.3	35.7	35.9	36.7	37.2	37.2	37.2	37.4
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	86.8	86	105.3	91.2	84	74.5	67.8	64.7	67.3	66.5
Taxes on production and imports less subsidies	2.7	2.5	3.6	3.5	3.5	3	2.7	2.6	2.8	2.9
Gross operating surplus	10.6	11.5	-8.8	5.2	12.5	22.5	29.4	32.7	29.9	30.6

NOTE. These statistics incorporate the 2009 comprehensive revision of the NIPAs and the 2010 comprehensive revision of the annual industry accounts. They do not reflect the July 2010 annual revision of the NIPAs, which will be incorporated into the annual industry accounts in December 2010.

Table 6. Shares of Gross Output, 1999-2008

[Percent]

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
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	55.0	54.4	55.4	56.4	56.2	55.8	54.8	54.7	54.8	54.3
Intermediate inputs	45.0	45.6	44.6	43.6	43.8	44.2	45.2	45.3	45.2	45.7
Energy inputs	2.0	2.4	2.6	1.9	1.8	1.9	2.3	2.2	2.3	2.6
Materials inputs	19.4	19.0	17.6	17.3	17.4	17.8	18.2	18.3	17.9	18.5
Purchased-services inputs	23.7	24.3	24.4	24.4	24.6	24.5	24.7	24.8	24.9	24.5
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	32.2	34.2	30.8	37.5	38.3	43.0	48.4	51.0	50.2	49.7
Intermediate inputs	67.8	65.8	69.2	62.5	61.7	57.0	51.6	49.0	49.8	50.3
Energy inputs	1.3	1.3	1.7	0.9	0.9	0.7	0.6	0.5	0.6	0.6
Materials inputs	43.7	43.7	44.2	40.9	39.5	37.1	33.4	32.6	32.2	33.4
Purchased-services inputs	22.8	20.8	23.3	20.7	21.3	19.3	17.6	15.9	17.0	16.3

NOTE. These statistics incorporate the 2009 comprehensive revision of the NIPAs and the 2010 comprehensive revision of the annual industry accounts. They do not reflect the July 2010 annual revision of the NIPAs, which will be incorporated into the annual industry accounts in December 2010.

Table 7. Percent Change in Chain-Type Quantity Indexes, 1999-2008

[Percent]

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Average annual rate of change 1999-2008
All industries											
Gross output	5.1	4.5	0.2	0.6	2.0	3.3	3.8	2.2	1.4	-1.0	2.2
Gross domestic product	4.8	4.1	1.1	1.8	2.5	3.6	3.1	2.7	2.1	0.4	2.6
Intermediate inputs	5.4	4.7	-0.9	-0.8	1.8	3.0	5.0	1.7	0.7	-2.5	1.8
Energy inputs	23.0	7.3	7.5	-23.4	-10.8	-0.7	5.8	-7.2	5.0	-2.4	-0.3
Materials inputs	2.8	0.9	-4.5	1.2	0.8	2.6	2.8	0.6	-1.9	-3.7	0.1
Purchased-services inputs	6.3	7.6	1.0	0.2	3.5	3.5	6.5	3.3	2.2	-1.5	3.2
Computer and electronic products											
Gross output	21.7	24.3	-6.4	-10.6	6.9	8.3	5.7	8.4	6.4	4.6	6.4
Value added	32.2	59.4	-0.4	16.1	18.1	30.2	26.6	22.1	11.1	9.9	21.6
Intermediate inputs	16.5	10.1	-9.2	-21.9	0.6	-4.5	-9.1	-3.6	1.8	-0.4	-2.5
Energy inputs	42.8	6.8	-0.9	-53.1	-9.3	-23.5	-17.8	-20.9	20.0	-8.8	-10.0
Materials inputs	18.0	16.6	-10.5	-19.4	0.0	-1.8	-8.6	-1.0	0.4	2.9	-0.9
Purchased-services inputs	12.4	-1.6	-7.1	-24.5	2.1	-8.6	-9.6	-8.1	3.9	-6.3	-5.2

NOTE. These statistics incorporate the 2009 comprehensive revision of the NIPAs and the 2010 comprehensive revision of the annual industry accounts. They do not reflect the July 2010 annual revision of the NIPAs, which will be incorporated into the annual industry accounts in December 2010.

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, 1999-2008

	GDP		Energy inputs		Materials inputs		Purchased-services inputs	
	All industries	Computer and electronic products industry	All industries	Computer and electronic products industry	All industries	Computer and electronic products industry	All industries	Computer and electronic products industry
	Percent change	Percentage point contribution	Percent change	Percentage point contribution	Percent change	Percentage point contribution	Percent change	Percentage point contribution
1999	4.8	0.49	23.0	0.65	2.8	0.98	6.3	0.30
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	-0.17
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	2.1	0.16	5.0	0.07	-1.9	0.01	2.2	0.04
2008	0.4	0.13	-2.4	-0.03	-3.7	0.08	-1.5	-0.07
Average, 1999-2008	2.6	0.29	0.4	-0.05	0.2	-0.01	3.3	-0.08

NOTE. These statistics incorporate the 2009 comprehensive revision of the NIPAs and the 2010 comprehensive revision of the annual industry accounts. They do not reflect the July 2010 annual revision of the NIPAs, which will be incorporated into the annual industry accounts in December 2010.

Table 9. Percent Change in Chain-Type Price Indexes, 1999-2008

[Percent]

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Average annual rate of change 1999-2008
All industries											
Gross output	1.3	3.0	1.2	1.0	3.0	3.9	4.5	3.8	3.4	4.5	3.0
Gross domestic product	1.5	2.2	2.3	1.6	2.2	2.8	3.3	3.3	2.9	2.1	2.4
Intermediate inputs	1.1	4.1	0.2	0.1	3.7	5.0	5.8	4.5	4.1	7.1	3.5
Energy inputs	3.8	19.4	3.6	-6.0	15.8	13.7	22.1	9.0	7.1	18.8	10.4
Materials inputs	-0.2	4.4	-1.4	-1.1	4.4	7.2	7.8	5.8	5.0	10.8	4.2
Purchased-services inputs	1.9	2.6	1.0	1.5	2.3	2.9	3.0	3.1	3.1	3.4	2.5
Computer and electronic products industry											
Gross output	-12.9	-11.0	-11.7	-4.9	-5.4	-4.0	-3.6	-4.4	-5.7	-4.6	-6.9
Value added	-27.8	-26.4	-25.2	-10.9	-12.5	-10.5	-9.3	-10.6	-11.1	-10.1	-15.8
Intermediate inputs	-3.9	-2.4	-4.4	-1.7	-0.7	0.7	1.3	2.1	0.2	1.2	-0.8
Energy inputs	-0.8	6.0	8.2	-5.6	9.1	3.9	10.6	4.9	3.4	8.5	4.7
Materials inputs	-6.4	-5.0	-6.7	-2.5	-2.4	-0.4	0.4	2.0	-1.2	0.5	-2.2
Purchased-services inputs	1.0	2.5	-0.7	0.0	2.2	2.6	2.8	2.3	2.9	2.1	1.8

NOTE. These statistics incorporate the 2009 comprehensive revision of the NIPAs and the 2010 comprehensive revision of the annual industry accounts. They do not reflect the July 2010 annual revision of the NIPAs, which will be incorporated into the annual industry accounts in December 2010.

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, 1999-2008

	GDP		Energy inputs		Materials inputs		Purchased-services inputs	
	All industries	Computer and electronic products industry	All industries	Computer and electronic products industry	All industries	Computer and electronic products industry	All industries	Computer and electronic products industry
	Percent change	Percentage point contribution	Percent change	Percentage point contribution	Percent change	Percentage point contribution	Percent change	Percentage point contribution
1999	1.5	-0.56	3.8	-0.01	-0.2	-0.39	1.9	0.02
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	-0.01
2002	1.6	-0.14	-6	-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	0.04
2006	3.3	-0.17	9	0.02	5.8	0.06	3.1	0.03
2007	2.9	-0.17	7.1	0.01	5	-0.03	3.1	0.03
2008	2.1	-0.15	18.8	0.03	10.8	0.02	3.4	0.02
Average, 1999-2008	2.4	-0.26	10.7	0.04	4.3	-0.13	2.5	0.03

NOTE. These statistics incorporate the 2009 comprehensive revision of the NIPAs and the 2010 comprehensive revision of the annual industry accounts. They do not reflect the July 2010 annual revision of the NIPAs, which will be incorporated into the annual industry accounts in December 2010.