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Appendices



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METHODOLOGY, DATA SOURCES AND APPENDIX TABLES

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METHODOLOGY, DATA SOURCES AND APPENDIX TABLES

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APPENDIX TO CHAPTER III

Information Technology Producing Industries in the New Economy

This portion of the Appendix describes the sources of data and methods used to assess the economic impacts of Information Technology (IT) producing industries that were presented in Chapter III of the *Digital Economy 2002* (DE 2002) report.

DEFINING INFORMATION TECHNOLOGY PRODUCING INDUSTRIES

The IT-producing industries selected for the DE 2002 report are those industries that produce, process, or transmit information goods and services as either intermediate demand (inputs to production of other industries) or as final products (goods and services bought by consumers, business investors, government or for exports). The selected IT-producing industries also include those that supply the goods and services necessary for the Internet and electronic commerce (e-commerce) to operate—i.e., provide the products and services for the Internet infrastructure. IT-producing industries include manufacturers of some general and specialized electronic components, computers and peripheral equipment, specialized measuring and testing instruments, telecommunications equipment, and prepackaged software. IT-producing industries also include computer, software, and telecommunications service providers. (Table A-3.1)

In *Digital Economy 2000*¹ (DE 2000) and prior *Emerging Digital Economy*²(EDE) reports, radio and TV broadcasting industries were included as IT-producing industries, but in the DE 2002 report, these industries were not. After reevaluation, these industries were considered to be more oriented toward content, rather than products or processes that meet the criteria for IT-producing, and, therefore, were removed from the IT-producing list of industries. Content industries such as radio and TV broadcasting and printing and publishing provide the information, not the infrastructure, needed for the digital economy. Radio and TV broadcasting industries made up almost 5 percent of the total output, as measured by Gross Product Originating (GPO), of the IT-producing sector in the prior digital economy reports, mentioned above.

In DE 2002, the criteria for including the instruments industries as IT-producing were also re-evaluated, based on their importance to other IT-producing industries. The result was that these industries were retained since a majority of their production was purchased primarily by other IT-producing industries. For example, over 50 percent of all products produced within the Instruments for measuring electricity industry were purchased by other IT-producing industries—radio and TV communications industry, electronics industries, semiconductor industries, the other instrument industries, and the communications services industry. The same relationship held, to varying degrees for the Industrial instruments for measurement and the Laboratory analytical instruments industries.

Table A-3.1
Information Technology Producing Industries
NAICS to SIC Concordance*

Hardware Industries	<u>1997 NAICS</u>	<u>1987 SIC</u>
Computers and computer equipment and calculating and office machines	334111, 2, 3, 9, 334418pt 333311pt, 3pt	3571, 2, 5, 7pt 3578, 9pt
Wholesale trade of computers	421430pt, 3pt	5045pt
Retail trade of computers	443120pt	5734pt
Electron tubes	334411	3671
Printed circuit boards	334412	3672
Semiconductors	334413	3674
Passive electronic components	334414, 5, 6, 8pt, 9	3675, 6, 7, 8, 9pt, 3661pt
Industrial instruments for measurement	334513	3823
Instruments for measuring electricity	334514pt, 334515	3825pt
Laboratory analytical instruments	334516	3826
 Software/Service Industries		
Computer programming services	541511	7371
Prepackaged software	511210, 334611	7372
Wholesale trade of software	421430pt	5045pt
Retail trade of software	443120pt	5734pt
Computer integrated system design	541512	7373
Computer processing, data preparation	514210	7374
Information retrieval services	514191, 9	7375
Computer services management	541513	7376
Computer renting and leasing	532420	7377
Computer maintenance and repair	811212	7378
Computer related services, nec	541519	7379
 Communications Services Industries		
Telephone and telegraph communications	513310, 21, 22, 30, 40, 90	481, 4822, 4899
Cable and other pay TV services	513210, 20	4841
 Communications Equipment Industries		
Household audio and video equipment	334310	3651, 3679pt
Telephone and telegraph equipment	334210, 334418pt	3661pt, 3577pt, 3679pt
Radio and TV communications equipment	334220, 334290	3663, 3679pt, 3699
Magnetic and optical recording media	334613	3695, 3577pt

*1997 North American Industry Classification to 1987 Standard Industrial Classification concordance.

The IT-producing industries in this report are classified according to the Office of Management and Budget's (OMB's) 1997 *North American Industry Classification System* (NAICS). They are also cross-referenced to OMB's 1987 *Standard Industrial Classification* (SIC) manual since the data for the time-period considered in this report are published according to each industry classification system, depending on the year of the estimates. Annual estimates of GPO for the IT-producing sector by NAICS/SIC industries and portions of SIC industries were developed for the 1990 through 2000 period.

Although both industry classification systems were used in this report, the estimates of GPO by industry, reported here, are made consistent with the NAICS classification as shown in Table A-3.1. The development of the GPO time series for 1990 through 2000 meant taking all years for which only SIC data are available and translating these to GPO by NAICS industries. For example, data for estimating GPO of IT-producing manufacturing industries (hardware and communication equipment industries) are available by NAICS industries for 1992, 1997 (from the 1992 and 1997 *Economic Census* data), 1998, and 1999 (from the *Census' Annual Survey of Manufactures* data). However, data for 1990-91, 1993-96, and 2000 were published only in 1987 SIC codes. The estimates of GPO by industry for those years were converted to NAICS to be consistent with the latest industry classification system.

The differences in the classification of products between NAICS and SIC did raise some difficulties. For example, while 1997 industry shipments³ for Other computer peripheral equipment manufacturing (NAICS 334119) includes shipments data for its counterpart industry under the SIC system (SIC 3577), it also includes shipments of products such as point of sales terminals and fund transfer devices, products produced under the Calculating and accounting equipment industry (SIC 3578). Thus, for the years that only SIC shipment data are available for these industries, estimates of product shipments for point of sales terminals and fund transfer devices were made and added to the shipments of the Other computer equipment industry, under the NAICS description of the industry, and subtracted from production in the Calculating and office equipment industry. There are other products under the SIC 3577 that are now part of the production of the Telephone and telegraph equipment industry and the Magnetic and optical recording equipment industry. These types of industry classification adjustments, from SIC to NAICS, were necessary to construct a consistent time series for the entire 1990 through 2000 period.

Table A-3.1 provides the complete listing of IT-producing industries according to the NAICS. A concordance of the NAICS to SIC industries is also provided. Six of the 27 IT-producing industries listed in the table had some reassignment of shipments as a result of SIC to NAICS classification changes. All of the industry reassignments of shipments resulting from the differences of NAICS and SIC occurred between IT-producing industries only that affected the composition, not the total, of GPO for IT-producing industries.

Finally, while the industries presented as IT-producing industries in the DE 2002 report do not reflect any official U.S. government list of such industries, the industries selected in Table A-3.1 meet the criteria, listed above, for IT-producing and, therefore, are considered to be IT-producing industries in this report.

MEASURING INFORMATION TECHNOLOGY PRODUCING INDUSTRIES

As stated previously, the output of IT-producing industries was measured in terms of its Gross Product Originating. This is often referred to as an industry's "value added." GPO is defined as being equal to an industry's total revenue (measured by total shipments or receipts plus inventory change) less the cost of purchased goods and services used in production.⁴ GPO and value added can be thought of more directly as the sum of the costs incurred by an industry including compensation of employees, net interest, indirect business taxes, capital investments, and profits earned in production.

GPO by industry is the contribution of each private industry and government to Gross Domestic Income (GDI). Theoretically, the nominal dollar value of GDI, the income associated with the output of industries, should equal total final demand on the economy, or Gross Domestic Product (GDP). In practice, however, GDI and GDP do not match precisely due to statistical differences.

The analysis of IT-producing industries used here is consistent with the definitions and conventions used in the Gross Product by Industry series published by the Bureau of Economic Analysis (BEA). Although the concept of GPO and value added are considered to be the same, value added data for manufacturing industries published by the Bureau of the Census do not match the GPO published by BEA. The difference between the two measures results from BEA subtracting industries' purchases of "Other services" (NAICS 71151, 51221, 54169, 51223, 541612, 514199, and 54162) from total revenue along with all other purchased goods and services. The Census does not subtract these other services to determine value added. The reason is that the Census collects manufacturing data on an establishment basis and most purchases of other services are at the corporate level. The BEA makes an adjustment for corporate to establishment estimates. The Census does not.⁵

The GPO estimates for the IT-producing industries are derived from revenue, receipts, and shipments, whether or not all of the industry's production was used as an IT good or service. For example, not all semiconductors are used by the computer industry or other industries considered to be IT-producing. Semiconductors are also used in automobiles, home appliances, and a variety of other consumer and industrial goods. However, to differentiate production into IT-producing and non IT-producing would be difficult, if not impossible. For this reason, the GPO of the semiconductor industry is based on its total annual shipments and costs of production.

By using GPO as the measure of industry performance for the IT-producing industries, double counting of the value of production is avoided when adding production across IT-producing industries. For example, the value of shipments of the computer industry includes the cost to the computer industry of their expenditures on semiconductors. The value of the semiconductor industry shipments includes its sales to the computer industry, as well as all other industry sales. Adding shipments of the semiconductor industry to the shipments of the computer industry double-counts the value of shipments of the semiconductor industry, i.e., once as the value of shipments of the semiconductor industry and once again as a cost of production of the computer industry. Other industries provide goods and services used in production in the computer industry as well. Adding the shipments of these industries to the shipments of the computer industry would similarly result in double counting due to mixing industry inputs and outputs.

For this reason, the costs of production of both for goods and services are subtracted from the industry shipments of all of the IT-producing industries.

Developing GPO Estimates For IT-Producing Industries

The following is a description of the data and the methods used to derive GPO for IT-producing industries for 1990 through 2000. (Table A-3.2)

GPO for Hardware and Communications equipment IT-producing industries, all in manufacturing, were derived beginning with Census data on value of shipments for 1990 through 1999 and BEA estimates of shipments for 2000. GPO for 1990 through 1999 was derived by deducting the cost of materials and the value of purchased services used in production from the value of shipments and then adjusting

Table A-3.2
Information Technology Producing Industries
Gross Product Originating

Industries*	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Total Gross Domestic Income	5,772,700.0	5,966,600.0	6,275,200.0	6,578,600.0	6,995,600.0	7,374,000.0	7,780,300.0	8,288,600.0	8,812,500.0	9,341,300.0	10,003,400.0
Year-to-Year GDI Change (%)	3.4%	5.2%	5.2%	4.8%	6.3%	5.4%	5.5%	6.5%	6.3%	6.0%	7.1%
<i>(Millions of \$, except as noted)</i>											
Hardware Industries											
Computers and equipment, calc. machines	27,091.0	23,144.8	24,101.7	23,495.0	26,330.1	31,036.0	32,927.6	36,139.0	39,210.8	38,583.4	46,222.9
Computers and equipment wholesale sales	33,835.9	35,999.0	39,743.2	42,573.0	43,553.9	51,113.8	61,559.9	70,270.7	75,084.2	81,015.8	87,675.5
Computer and equipment retail sales	1,870.3	1,887.8	1,914.9	2,293.3	2,720.8	2,860.5	2,797.0	3,188.8	3,407.3	3,676.4	3,985.3
Electron tubes	1,169.4	1,038.5	1,053.3	1,019.3	1,186.5	1,205.6	1,255.8	1,258.6	1,316.5	1,349.4	1,524.8
Printed circuit boards	4,407.7	3,143.3	3,555.7	3,710.8	4,380.9	4,406.2	5,056.3	5,070.3	5,526.7	5,908.0	5,984.8
Semiconductors	15,812.0	18,486.7	19,308.2	23,702.6	31,639.5	40,836.2	43,553.0	54,131.5	57,054.6	64,072.3	72,292.8
Passive electronic components	11,565.7	12,720.7	13,493.6	14,350.9	16,034.9	15,310.2	13,347.4	11,313.7	12,071.7	12,880.5	14,503.4
Industrial instruments for measurement	2,331.8	2,386.1	2,551.5	2,343.8	2,436.4	2,526.2	2,943.3	4,597.9	4,873.8	5,010.3	5,155.6
Instruments for measuring electricity	3,318.6	3,460.4	3,493.3	3,096.9	3,551.6	3,980.7	4,907.2	7,761.8	8,382.7	8,659.3	9,212.3
Laboratory analytical instruments	1,871.6	1,987.9	1,834.8	1,858.3	1,933.4	2,133.8	2,770.4	3,746.0	3,985.7	4,212.9	5,097.5
Total Hardware	103,273.9	104,235.1	110,050.3	118,443.7	133,768.2	155,409.6	171,117.9	197,478.3	210,913.8	225,368.4	251,655.0
Software and Services											
Computer programming services	15,896.5	17,442.5	18,624.4	20,399.0	23,162.9	26,119.5	31,370.1	37,295.3	47,796.1	55,013.3	62,715.2
Prepackaged software	11,322.9	12,552.9	14,554.5	17,263.4	19,775.9	22,768.3	26,926.5	29,511.7	34,496.8	40,016.2	46,418.8
Prepackaged software wholesale sales	1,810.1	1,927.7	2,127.2	2,278.0	2,330.2	2,733.0	3,291.7	3,607.7	4,217.1	4,891.9	5,674.6
Prepackaged software retail sales	99.8	100.9	102.3	122.5	145.3	152.6	149.2	163.6	191.2	221.8	257.3
Computer integrated system design	10,052.6	10,709.5	11,813.9	12,619.8	13,257.3	13,598.8	15,736.9	20,314.2	24,691.5	28,419.9	32,597.6
Computer processing, data preparation	10,939.9	11,563.8	12,554.2	14,561.7	17,908.4	21,843.6	25,181.1	26,592.1	28,062.2	32,299.5	37,047.6
Information retrieval services	2,597.6	2,704.8	2,879.2	3,132.7	3,338.0	3,910.0	5,058.5	6,637.4	8,977.4	10,333.0	11,852.0
Computer services management	1,460.3	1,616.6	1,910.2	1,872.9	1,941.8	2,090.0	2,134.1	2,478.6	2,942.1	3,386.3	3,884.1
Computer rental and leasing	1,693.8	1,535.9	1,528.0	1,590.2	1,702.4	1,880.1	2,125.4	2,463.0	2,944.3	3,388.9	3,887.1
Computer maintenance and repair	4,558.9	4,509.0	4,989.3	5,400.5	6,040.5	6,949.2	7,871.8	8,786.9	10,029.4	11,543.8	13,240.8
Computer related services, nec	3,206.5	3,461.0	4,406.4	5,545.2	7,267.3	9,305.2	11,644.3	16,023.4	21,261.1	24,471.5	28,081.2
Total Software and Services	63,638.8	68,124.6	75,489.6	84,786.6	96,869.9	111,350.2	131,489.6	153,863.8	185,609.1	213,986.2	245,656.2
Communications Equipment											
Household audio and video equipment	1,631.9	1,784.4	1,871.6	2,024.0	2,034.4	1,944.7	1,617.6	2,217.1	2,286.0	2,480.2	3,214.3
Telephone equipment, exc. ext. modems	8,313.5	8,005.2	10,250.9	10,734.9	10,949.7	12,138.7	15,034.4	21,069.1	21,806.5	24,968.4	29,712.4
Radio & TV communications equipment	9,806.1	8,763.0	10,134.2	9,480.7	13,020.2	14,309.8	13,839.4	18,646.4	20,641.6	22,251.6	26,524.3
Magnetic and optical and recording media	1,442.3	1,644.5	1,713.4	1,878.8	2,014.4	2,381.6	1,953.4	1,951.8	1,973.3	1,730.6	2,012.7
Total Communications Hardware	21,193.8	20,197.2	23,970.1	24,118.3	28,018.6	30,774.8	32,444.7	43,884.5	46,709.5	51,430.8	61,463.7
Communications Services											
Telephone and telegraph communications	119,400.0	124,000.0	128,700.0	139,000.0	148,000.0	151,600.0	163,900.0	166,700.0	173,900.0	195,100.0	204,074.6
Cable and other pay TV services	10,524.7	13,661.9	14,992.3	19,822.5	19,331.9	21,778.0	23,008.1	26,486.9	29,797.8	32,265.9	33,717.9
Total Communications Services	129,924.7	137,661.9	143,692.3	158,822.5	167,331.9	173,378.0	186,908.1	193,186.9	203,697.8	227,365.9	237,792.5
Total IT-Producing Industries	318,031.2	330,218.8	353,202.3	386,171.2	429,888.6	470,912.7	521,960.3	588,413.5	646,930.2	718,151.4	796,567.3
Share of the Economy**	5.5%	5.5%	5.6%	5.9%	6.1%	6.4%	6.7%	7.1%	7.3%	7.7%	8.0%

* See industry classification in Table A-3.1

**Share of the economy as measured by share of Gross Domestic Income

Source: ESA estimates derived from BEA and Census data

for inventory change. Cost of material and value of purchased services data for 2000 were not available so that GPO for 2000 is more generally estimated. GPO for 2000 was derived by using the average annual ratio, 1997 to 1999, of GPO to value of shipments for each of the IT producing industries and applying that ratio to the BEA estimates of shipments for 2000 to derive an estimate of GPO for 2000.

Beginning with BEA's Fall 1999 comprehensive revision of the national accounts, industry purchases of software and software services were considered as an investment, rather than as an expense of production.⁶ Thus, industry spending on software and software services become a part of GPO, i.e., software is no longer considered as a cost of production. Therefore, the estimates of GPO for the IT-producing industries in Tables A-3.2 and A-3.3 include the purchase of software as a capital good and the value of the capital good purchases are included in its GPO.

In general, data used to estimate GPO for IT-producing industries in the manufacturing sector are from the *Annual Survey of Manufactures* for 1990-91, 1993-96, and 1998-99 and from the more detailed 1992 and 1997 *Economic Census of Manufactures*. The Economic Census reports contain more detailed data, particularly on the cost of materials and purchased services used in production, so that data for these two years are used to adjust the shipments data for the Annual Survey years where data are less detailed. Thus, for 1990-91, 1993-96, and 1998-99 GPO was estimated from the published shipments data in the Annual Surveys and then adjusted for inventory change and costs of materials and purchased services estimated from the average relationship of inventory change and materials costs to production in the 1992 and 1997 Economic Census years.

The more detailed data available in the Economic Census years (1992 and 1997) include costs of materials, beginning and end of year inventories, and costs of selected purchased services. Data on selected purchased services include software services, repair of buildings, repair of machinery, communications, legal services, accounting and bookkeeping, advertising, and refuse removal. Since IT-producing industry spending for these services only represent a portion of its purchased services, industry spending for all other services was estimated using the distribution of spending on services from BEA's 1992 Benchmark Input-Output (I-O) table. The distribution and the portion of the industry's output that was purchased services, from the I-O table, were then adjusted to accommodate the selected purchased services published in the 1992 and 1997 *Economic Census of Manufactures*. The "adjusted" ratio was applied to total annual industry shipments for the remaining years in the time period to estimate the cost of purchased services, not including software.

GPO for wholesale trade of computer equipment (part of NAICS 421430) was added to the category called IT-producing hardware industries since over half of wholesale trade of computers comes directly from computer manufacturers' branch offices. This was established based on the detailed data from the 1992 and 1997 Economic Census. Although counted by the Census as a wholesale sale and not a manufacturer's shipment, the actual sale is in practical terms a direct manufacturer's sale and, therefore, does not double-count the manufacturers sales. The nominal value of computer sales from branch offices of manufacturers has been twice that of computer sales directly from manufacturing facilities throughout the 1990s. If these wholesale sales were left out of GPO estimates for IT-producing industries, the overall value of GPO for the computer industry would be significantly under-represented.

Annual source data for 1990-91, 1993-96, and 1998-99 for wholesale trade of computers and equipment were available at the 3-digit SIC industry level in the Census Current Business Report called the *Annual Benchmark Report for Wholesale Trade*. In this report, the Census Bureau maintained time series of merchant wholesalers based on the SIC system through March 2001. In subsequent reports, data on merchant wholesalers will be on a NAICS basis. In the Annual Benchmark report for wholesale trade, gross margins (sales less costs of goods sold) by wholesale industries were reported under SIC

504, Wholesale sales of professional and commercial equipment and supplies.

Data for wholesale trade of computers and computer equipment in 1992 and 1997, at the 4-digit SIC industry level, are available from the Census *Economic Census of Wholesale Trade* and were used to derive the GPO for SIC 5045pt (NAICS 42143pt), Wholesale sales of computer equipment (and software). In the 1992 and 1997 reports, data for SIC 5045pt include sales and purchased operating expenses from merchant wholesalers, manufacturers' sales from branch offices, and sales from agents, brokers, and commission merchants. This Census report also separates sales and purchased operating expenses for computers, into both equipment and software.

The ratios of manufacturer's branch office sales to total wholesale sales of computer equipment (part of SIC 5045 for 1992 and 1997) and to the corresponding purchased operating expenses were used to distribute the gross margin data of the annual reports (SIC 504 for 1990-91, 1993-96, and 1998-99).

GPO for the retail trade of computer equipment and software (part of NAICS 443120) was derived in much the same way as the wholesale estimates described above. The Census *Annual Benchmark Report for Retail Trade* contains total sales and gross margins for the 3-digit SIC sector (SIC 573). Data on purchased operating expenses, as well as the distribution between equipment and software from the *1992 and 1997 Census of Retail Trade*, were then used to disaggregate the 3-digit SIC sector to the 4-digit SIC 5734 for 1990-91, 1993-96, and 1998-99.

GPO for the computer software and computer services IT-producing industries for 1990-91, 1993-96, and 1998-00 was derived using the Census Current Business Reports and the *Service Annual Survey* and the *1992 and 1997 Census of Service Industries* for 1992 and 1997. Similar to the derivation of GPO for the wholesale and retail trade of computer equipment and software, 4-digit SIC data on revenue and operating expenses from the 1992 and 1997 *Census of Service Industries* were used as a pattern to derive annual estimates from 3-digit SIC "controls" for 1990-91, 1993-96, and 1998. In 1997, the *Census of Service Industries* reported the industries on a NAICS basis. For 2000, the Census reported the service data on the NAICS basis and included data for 1998 and 1999.

The 1992 and 1997 *Census of Service Industries* includes a Subject Series report called *Sources of Receipts and Revenue* and were used to determine whether these industries sold only services, i.e., were used to determine whether these industries also sold goods where the cost of production of goods would have to be deducted from revenue to determine GPO. For most of the computer service industries, the cost of goods sold was less than 2 percent of total receipts so that the cost of production of goods sold for these industries were considered to be zero.

However, three of the computer service industries derived a significant portion of their revenue from the sale of goods. The Computer rental and leasing industry (NAICS 532420) derived almost 9 percent of its total revenue in 1997 from sales of goods. Computer maintenance and repair (NAICS 8112212) derived almost 8 percent of revenue from sales of goods and Computer services, not elsewhere classified (NAICS 541519), 2.4 percent. For these three computer services industries, therefore, it was necessary to account for the production of goods in its GPO estimate. The costs of these goods (computers and equipment sold from these industries) were deducted from the industry's total receipts to arrive at a gross margin (GPO) estimate.

The 1992 and 1997 *Census of Service Industry* reports also provide a Subject Series report called *Capital Expenditures, Depreciable Assets, and Operating Expenses*. This report lists operating expenses for these industries that were deducted from the remaining revenue to arrive at GPO estimates.

The distribution of goods sold and operating expenses for 1992 and 1997 is then applied to 4-digit SIC receipts data from the annual reports for these industries to obtain GPO estimates for 1990-91, 1993-96, and 1998-2000. GPO for Software wholesale sales (part of SIC 5045) and Retail sales (part of 5734) were derived using data from the *Census Annual Benchmark Reports for Wholesale Trade and for Retail Trade* for 1990-91, 1993-96, and 1998-2000 and the *Census 1992 Economic Census of Wholesale Trade and Census of Retail Trade*.

GPO for the Communications Services IT-producing industries was the BEA's published gross product by industry for communications services (NAICS 513310, 21, 22, 30, 40, and 90). This is the only IT-producing industry, listed in Table A-3.1, that is classified identically to the BEA published gross product by industry series⁷. BEA's estimates of GPO for Communications services were verified by using the same methods to estimate GPO of the rest of the IT-producing industries. In this case, the *1992 and 1997 Census of Transportation, Communications, and Utilities* and the 1990-91 and the 1993-98 *Annual Survey of Communications Services* reports were used. Revenue and cost of purchased services data from these reports, and the value and distribution of the costs of purchased services from BEA's 1992 Benchmark Input-Output table, were used to derive estimates of GPO adjusted for consistency with the new treatment for software purchases.

Real Dollar GPO of IT-Producing Industries

GPO, in nominal dollars, for IT-producing goods industries was converted to real (chained 1996) dollars by using the industry price indexes associated with the industry sector from BEA's Gross Product by Industry series⁸ in most cases. (Table A-3.2) A price index for the IT-producing industries was developed using an implicit⁹ price index from an aggregate industry that included the IT-producing industries. For example, the price indexes used for the three IT-producing instruments industries were derived from the BEA aggregate industry implicit price index for all of instruments.

Price indexes for the computer and the semiconductor industries were handled differently. For the computer, computer equipment and calculating and office machine industry a composite price index was developed using BEA's quality-adjusted "hedonic" deflators for computers and computer equipment and an average product industry price index for calculating and office machines. The quality-adjusted deflators for computers relate prices of these products to their performance characteristics and their cost of production. The 1990 through 2000 composite price indexes used in this analysis of IT-producing industries for Computers and computer parts and Calculating and Office Machines were:

Computers and computer parts, Calculating and office machines

NAICS 334111, 2, 3, 334418pt., 9,
333311pt, and 3pt

Year	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>
Deflator	3.077	2.791	2.364	1.944	1.696	1.385	1.000	0.773	0.570	0.435	0.376

Total nominal dollar shipments of these sectors were divided by an aggregate real chain-weighted dollar value of shipments to produce the implicit deflator shown. The aggregation of the real chain-weighted dollar values of shipments was estimated by using a Fisher-Ideal quantity index formula.¹⁰ These price indexes were also applied to wholesale sales of computers since these were mostly manufactures' sales.

Table A-3.3
Information Technology Producing Industries
Real Gross Product Originating

Industry*	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
	(Millions of 1996\$, except as noted)										
Total Gross Domestic Income	6,672,300	6,659,600	6,832,700	6,994,800	7,286,800	7,516,700	7,780,300	8,130,200	8,538,900	8,926,000	9,345,700
Year-to-Year GDI Change (%)		-0.2%	2.6%	2.4%	4.2%	3.2%	3.5%	4.5%	5.0%	4.5%	4.7%
Hardware Industries											
Computers and equipment, calculating machines	8,804.4	8,292.7	10,195.3	12,085.9	15,524.8	22,408.7	32,927.6	46,751.6	68,790.8	88,291.5	122,933.2
Computers and equipment wholesale sales	10,996.4	12,898.2	16,811.8	21,899.7	25,680.4	36,905.3	61,559.9	90,906.5	131,726.6	186,243.3	233,179.6
Computer and equipment retail sales	607.8	676.4	810.0	1,179.7	1,604.3	2,065.4	2,797.0	4,125.3	5,977.6	8,451.5	10,599.3
Electron tubes	1,170.9	1,027.2	1,067.2	1,043.3	1,196.1	1,211.7	1,255.8	1,251.1	2,140.6	2,565.4	3,457.6
Printed circuit boards	3,812.9	2,750.0	3,166.2	3,420.1	4,156.4	4,286.2	5,056.3	5,080.5	9,075.0	11,296.4	13,695.0
Semiconductors	3,794.6	4,997.7	5,967.5	8,801.6	13,828.5	27,133.7	43,553.0	71,413.6	120,115.0	162,620.1	212,625.9
Passive electronic components	10,495.2	11,564.3	12,189.3	12,975.5	14,657.2	14,416.4	13,347.4	11,336.4	19,822.2	24,628.1	33,188.6
Industrial instruments for measurement	3,256.7	3,123.2	3,146.2	2,770.4	2,800.4	2,816.3	2,943.3	4,575.0	4,938.0	5,076.3	5,109.6
Instruments for measuring electricity	4,634.9	4,529.4	4,307.4	3,660.6	4,082.3	4,437.8	4,907.2	7,677.3	8,441.8	8,729.1	9,085.1
Laboratory analytical instruments	2,614.0	2,601.9	2,262.3	2,196.6	2,222.3	2,123.2	2,770.4	3,731.1	4,042.3	4,772.7	5,062.1
Total Hardware**	39,848.6	43,297.6	51,832.9	63,980.3	80,852.3	116,522.8	171,117.8	245,373.0	368,982.6	488,710.0	625,915.2
Software and Services***											
Total Software and Services	75,312.1	78,214.3	83,784.3	92,360.1	104,611.1	115,736.7	131,489.6	139,495.8	173,304.5	194,179.9	220,319.5
Communications Equipment											
Household audio and video equipment	2,065.7	2,139.6	1,997.5	2,026.0	1,846.1	1,511.1	1,617.6	2,109.5	2,636.0	3,035.7	4,179.8
Telephone equipment, exc. ext. modems	6,546.1	6,394.0	8,499.9	9,089.7	9,638.8	8,609.0	15,034.4	21,132.5	25,386.0	31,685.8	40,701.9
Radio & TV communications equipment	10,376.8	9,147.2	10,309.4	9,509.2	12,942.5	14,338.5	13,839.4	18,721.3	24,057.8	28,274.0	36,384.5
Magnetic and optical and recording media	2,236.2	2,243.5	2,306.0	2,366.2	2,156.7	2,334.9	1,953.4	1,938.3	2,042.8	1,860.9	2,274.2
Total Communications Equipment**	20,590.5	19,339.7	22,806.7	22,793.0	26,278.5	26,162.7	32,444.7	43,896.0	54,092.4	64,729.2	83,365.0
Communication Services											
Telephone and telegraph communications	117,100.0	120,800.0	125,500.0	135,800.0	142,200.0	147,600.0	163,900.0	167,900.0	180,900.0	215,100.0	243,708.3
Cable and other pay TV services	13,916.6	18,008.9	19,130.1	23,507.0	22,527.4	24,143.1	23,008.1	27,166.1	30,190.3	32,395.5	33,516.8
Total Communications Services**	136,829.0	144,536.8	148,582.0	162,445.7	167,262.6	170,858.9	186,908.1	191,775.0	209,762.0	247,583.0	277,052.0
Total IT- Producing Industries**	247,736.8	261,195.9	286,657.6	324,114.5	365,972.8	425,258.8	521,960.3	626,289.0	780,945.0	942,981.7	1,117,792.3

*See industry classification in Table A-3.1

**Real chain weighted 1996 dollars are not directly additive.

***Detailed software and services price indexes are not available so that only aggregate real dollar value of software and services are provided.

Source: ESA estimates derived from BEA and Census data.

A hedonic deflator was also used to deflate semiconductors. The hedonic price indexes for semiconductors for 1990 through 2000 that were used to deflate nominal dollar GPO of the semiconductor industry were:

Semiconductors

NAICS 334413

Year	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>
Deflator	4.167	3.695	3.068	2.693	2.288	1.505	1.000	0.758	0.475	0.394	0.340

Real dollar estimates for telecommunications services were taken directly from BEA's gross product by industry series. Finally, chain-weighted dollars cannot be added directly. Instead, a Fisher-ideal quantity index formula (See footnote 5) was used.

IT-Producing Industries: Contribution to Real Economic Growth

The contribution of IT-producing industries to overall real economic growth was calculated using the contributions formula published by the BEA.¹¹ The formula based contribution estimates take into account the chain weighting of the GPO estimates. It is also important to use a Fishers based residual formula when including the rest of the economy (real dollars) into the contribution calculation.

Industry Income Versus Product Demand: Alternative Measures of the Performance of IT-Producing Industries

Up until Table 3.4 in Chapter III, the estimates of performance of IT-producing industries are based on income (production) side data and estimates, as measured by their GPO. As stated previously, GPO is used instead of an industry's shipments, revenues, or output to avoid double counting of the value of the industries. Estimates of GPO for each of these IT-producing industries for the 1990 through 2000 period were made. The sum of the individual industries GPO in current dollars is measured as a share of aggregate GPO for all industries. Aggregate GPO equates to the Gross Domestic Income of the U.S. Thus, IT-producing industries' relative size to the economy as a whole can be measured. In addition, the importance of these industries to the overall real, or inflation-adjusted, growth of the economy is calculated. The advantage of using income side (the income side of the national income and product accounts) is that all industries considered to be IT-producing can be incorporated into a performance measure.

On the other hand, one distinct disadvantage of using income side estimates is the lack of current data. In the DE 2002 report, the most recent estimates of the GPO for IT-producing industries that in "good conscience" could be made were for 2000. More current data for IT-producing industries are on the "product side." Product side data refer to final demands on the economy/industries. The sum of these demands for products is equal to the gross domestic product. Sources of final demand are from personal consumption expenditures, gross private fixed investments, government expenditures, and net international trade. These are all sources of demand (spending) for IT goods and services that have the distinct advantage of being more current, in most cases, than the production estimates.

We reported on demand for IT goods and services through the fourth quarter of 2001, as opposed to GPO (income or production side) estimates that stopped in 2000. Unfortunately, the product (demand or spending) side data are incomplete. Investment spending for IT goods and services provide the most complete and broadest measure of spending for IT goods and services, although this does not incorporate all final demand for these products.

While a significant portion of demand is generated by business investments, demand for IT goods and services should also include industry spending on currently expensed items and services such as spending on telecommunications and on IT goods used in their own production. In addition, personal consumption of IT goods and services, such as purchases of computers and communications, are significant. So are spending by the governments. Imports of IT goods and services exceed exports so that the demand placed on the domestic IT-producing industry from international trade is negative.

The net result is that a complete picture of business investments is available while data on demand on IT-industries from other sources is spotty and incomplete. While these other sources of demand are more difficult to gather, the data that are available and the estimates made show that sources of demand other than investments are significant.

Industry investments, in current and constant (chained 1996 dollars) dollars, in IT equipment and software are from BEA's published series on Private Fixed Investment by Type—Tables 5.4 and 5.5, respectively, in the *Survey of Current Business*. Four types of equipment and software are identified in these tables: (1) Information processing equipment and software, (2) Industrial equipment, (3) Transportation equipment, and (4) Other. Information equipment and software is further broken down into Computers and peripheral equipment, Software, and Other.

The contribution of IT equipment (Information processing and related equipment) to the growth in capital expenditures (investments) was derived from BEA's Table 8.2, Contributions to Percent Change in Real Gross Domestic Product.

Demand for IT from other than industry investments in capital IT goods and software were then estimated using (1) an interindustry (input-output) model¹² to estimate business spending on IT goods and services that is not considered capital (or investment) spending such as business spending on communication services, (2) BEA data for personal consumption of computers and communications services, and (3) BEA data for government spending on computers and estimates of government spending on communications services using BEA data on broad categories of government spending weighted by spending categories in BEA's methodology paper on government transactions¹³.

Comprehensive estimates of all spending (final demand) for all IT goods and services are not readily available. Published data are available for business spending on investments in information processing equipment and software and data are available for personal and government consumption of computers. Estimates, rather than published data, were made for business spending on IT goods and services that are not considered to be investments and for governments (communication spending). Other data or estimates need to be made. For example, some electronic products that are final demand goods, not intermediate products, such as communication equipment are purchased directly by consumers either from imports or from domestic production. These were not included in Table 3.9, Spending for IT Goods and Services, 2000, since the data were not available.

The unavailability of complete data for IT-producing industries on the demand side requires that the income (production) side approach continue in the measurement of performance of this important industry. On the other hand, reporting the current business spending on information processing equipment and software are a good indicator of how the IT-producing sector is doing.

Endnotes

¹ Digital Economy 2000, *Economics and Statistics Administration, U.S. Department of Commerce, June 2000.*

² The Emerging Digital Economy, The Emerging Digital Economy II, *Economics and Statistics Administration, U.S. Department of Commerce, April 1998 and June 1999, respectively.*

³Shipments are the basis from which gross product originating is determined. See the next section called *Measuring Information Technology Producing Industries.*

⁴ See page 133 of Yuskavage, "Improved Estimates of Gross Product by Industry, 1959-94," *Survey of Current Business, August 1996* for a more detailed description of GPO and its relationship to Gross Domestic Product and Gross Domestic Income.

⁵See page XI of the 1992 Census of Manufactures MC92-S-1, Subject Series General Summary, for a description of the difference between gross product originating and value added.

⁶See Seskin, "Improved Estimates of the National Income and Product Accounts for 1959-98, Results of the Comprehensive Revision," *Survey of Current Business, December 1999.*

⁷ The remainder of the industries in Table A-3.1 are below the level of aggregation in the BEA published series.

⁸BEA's gross product by industry series are published on BEA's web site, <http://www.bea.doc.gov> . The series are included with their industry and wealth data.

⁹ The implicit deflator equaled the current dollar price over the constant dollar price.

¹⁰See page 142 of Yuskavage, "Improved Estimates of Gross Product by Industry, 1959-94," *Survey of Current Business, August 1996* for a description of the Fisher-Ideal quantity index formula.

¹¹See Moulton and Seskin, "A Preview of the 1999 Comprehensive Revision of the National Income and Product Accounts, Statistical Changes," *Survey of Current Business, October 1999.* The formula to calculate component contributions to economic growth is on page 16.

¹² INFORUM's (Interindustry Forecasting at the University of Maryland) LIFT (for Long-term Interindustry Forecasting Tool) model, (<http://inforumweb.umd.edu/>).

¹³ U.S. Department of Commerce, Bureau of Economic Analysis. Government Transactions. Paper Series MP-5. Washington, DC, November 1988.

APPENDIX TO CHAPTER IV

Industry-Level Effects of Information Technology Use on Productivity and Inflation

The appendices to this chapter are in two parts. Appendix A provides the tables of results supporting the figures in the text. To facilitate the correspondence between them, the numbering system and titles are kept the same. For brevity, only the figure titles are typed out in the list below and the numbers of the supporting tables are listed after the title. In some cases, there are three tables supporting the specific figure. In the latter cases, the letters “a,” “b,” and “c” are added to the table number where “a” is the table for *all* industries, “b” for *top-half* industries, and “c” for *bottom-half* industries.

Appendix B is a mathematical presentation of this chapter’s methodology for decomposing aggregate productivity growth and overall inflation into industry-level contributions.

APPENDIX A

- Figure 4.1 GDP Growth in Top-Half and Bottom-Half Industries and in All Industries of the U.S. Nonfarm Business Sector, 1989-2000
Table A-4.1a, Table A-4.1b, and Table A-4.1c
- Figure 4.2 FTE Growth in Top-Half and Bottom-Half Industries and in All Industries of the U.S. Nonfarm Business Sector, 1989-2000
Table A-4.2a, Table A-4.2b, and Table A-4.2c
- Figure 4.3 GDP per FTE Growth in Top-Half and Bottom-Half Industries and in All Industries of the U.S. Nonfarm Business Sector, 1989-2000
Table A-4.3a, Table A-4.3b, and Table A-4.3c
- Figure 4.4 Contributions to Overall GDP per FTE Growth by Top-Half and Bottom-Half Industries of the U.S. Nonfarm Business Sector, 1989-2000
Table A-4.4
- Figure 4.5 GDP per FTE Growth in Top-Half and Bottom-Half Industries and in All Industries of the U.S. Nonfarm Business Sector, 1989-1995 and 1995-2000
Table A-4.5
- Figure 4.6 Contributions to Overall GDP per FTE Growth Acceleration by Top-Half and Bottom-Half Industries of the U.S. Nonfarm Business Sector, 1995-2000 over 1989-1995
Table A-4.6
- Figure 4.7 GDP per FTE Growth in U.S. Nonfarm Business Sector by Major Industry Groups, 1989-2000
Table A-4.7
- Figure 4.8 Contributions to GDP per FTE Growth in U.S. Nonfarm Business Sector by Major Industry Groups, 1989-2000
Table A-4.8
- Figure 4.9 GDP per FTE Growth in U.S. Nonfarm Business Sector by Major Industry Groups, 1989-1995 and 1995-2000
Table A-4.9
- Figure 4.10 Contributions to GDP per FTE Growth Acceleration in U.S. Nonfarm Business Sector by Major Industry Groups, 1995-2000 over 1989-1995
Table A-4.10
- Figure 4.11 Price Growth in Top-Half and Bottom-Half Industries and in All Industries of the U.S. Nonfarm Business Sector, 1989-2000
Table A-4.11a, Table A-4.11b, and Table A-4.11c
- Figure 4.12 Contributions to Overall Price Growth by Top-Half and Bottom-Half Industries in the U.S. Nonfarm Business Sector, 1989-2000
Table A-4.12

Table A-4.1a: GDP GROWTH IN ALL INDUSTRIES OF THE U.S. NONFARM BUSINESS SECTOR, 1989-2000

INDUSTRY	SIC	TEQ/TFE Rank (Percentage Point)											Average (Pct. Pt.) 1989-90
		1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1987-98	1998-99	1999-00	
1 Metal mining	2,96	0.0184	0.0312	0.0078	-0.0017	-0.0038	-0.0027	0.0062	0.0069	0.0185	0.0045	-0.0664	0.0072
2 Coal mining	8,81	0.0198	0.0032	0.0264	0.0002	0.0304	0.0006	0.0207	0.0001	0.0112	0.0045	-0.0004	0.0072
3 Oil and gas extraction	4,02	0.0482	-0.1354	-0.1563	0.1113	0.0691	0.0728	0.0028	0.0001	0.0112	0.0045	-0.0004	0.0072
4 Nonmetallic minerals, except fuels	13	-0.0034	-0.0102	0.0059	-0.0048	0.0284	0.0068	-0.0412	0.0526	0.0039	-0.1283	-0.2900	0.0037
5 Construction	0,11	-0.1163	-0.4435	0.0889	0.1419	0.3387	0.0433	0.3028	0.1438	0.4184	-0.0001	0.0219	0.0063
6 Lumber and wood products	2,20	-0.0401	-0.0652	-0.0306	-0.0509	0.0403	0.0538	-0.0307	-0.0069	0.0095	0.0368	0.1554	0.0063
7 Furniture and fixtures	24	-0.0234	-0.0222	0.0295	0.0322	0.0007	0.0105	-0.0006	-0.0099	0.0131	0.0157	0.0083	0.0081
8 Stone, clay, and glass products	0,42	0.0020	-0.0531	0.0559	-0.0096	0.0552	0.0159	0.0063	0.0604	-0.0006	0.0210	0.0165	0.0081
9 Primary metal industries	33	-0.0008	-0.0184	0.0174	0.0944	0.0374	-0.0168	0.0232	0.0312	0.0291	0.0386	0.0020	0.0216
10 Fabricated metal products	0,32	-0.0610	-0.1244	0.0322	0.0748	0.2122	0.0809	0.0426	0.0526	0.0566	0.0308	0.0189	0.0339
11 Industrial machinery and equipment	0,76	0.0290	-0.2273	0.1852	0.1150	0.2374	0.3825	0.2182	0.3626	0.5186	0.2164	0.2199	0.2055
12 Electronic and other electric equipment	1,27	0.0871	0.1477	0.0207	0.3668	0.5240	0.6139	0.4790	0.4782	0.4762	0.4762	0.6086	0.3807
13 Motor vehicles and other transport equipment	0,74	0.0338	-0.0426	0.1827	-0.1187	0.2716	-0.1180	0.0745	0.0931	0.2342	0.0713	-0.0924	-0.0371
14 Other transport equipment	37	0.0038	-0.0265	-0.0612	-0.1221	-0.0611	-0.0210	0.0205	-0.0714	-0.0132	-0.0161	-0.0004	-0.0304
15 Instruments and related products	1,59	-0.0041	-0.0259	-0.0216	0.0164	0.0257	0.0131	0.0078	0.0198	0.0004	0.0321	0.0123	0.0068
16 Miscellaneous manufacturing industries	0,59	0.0284	0.0466	-0.0058	0.0652	-0.0392	0.3777	-0.2552	-0.0105	-0.1034	0.0386	0.0134	0.0185
17 Food and kindred products	2,44	-0.0523	-0.0675	-0.0862	-0.0090	0.1075	0.0344	-0.0152	-0.0168	-0.0404	-0.1874	-0.0667	-0.0282
18 Tobacco products	0,26	0.0176	0.0002	0.0028	0.0076	0.0194	-0.0171	-0.0113	-0.0067	-0.0139	-0.0066	0.0078	0.0083
19 Textile mill products	0,13	-0.0164	-0.0069	0.0170	-0.0037	0.0178	-0.0078	-0.0086	-0.0086	-0.0202	-0.0424	-0.0018	-0.0084
20 Apparel and other textile products	2,23	0.0122	0.0238	0.0285	0.0961	0.0110	-0.1716	0.0718	0.0396	-0.0327	0.0079	-0.1150	-0.0017
21 Paper and allied products	2,6	-0.0785	-0.0866	-0.0235	-0.1117	0.0785	-0.0610	-0.0329	-0.0329	-0.0144	0.0300	-0.0238	-0.0332
22 Printing and publishing	0,84	0.1641	-0.0404	0.0730	-0.0135	0.2609	0.0488	0.1039	0.1831	-0.1503	0.2141	0.2263	0.0973
23 Chemicals and allied products	3,72	0.1646	-0.0952	0.0318	0.0153	0.1223	0.1135	0.0882	0.1669	-0.1503	0.2141	-0.1450	-0.0102
24 Petroleum and coal products	7,57	-0.0118	0.0261	0.0670	0.0713	0.0767	0.0449	0.0484	0.0604	0.0392	0.0393	0.0234	0.0437
25 Rubber and miscellaneous plastics products	0,26	-0.0025	0.0005	-0.0005	-0.0070	0.0025	0.0034	-0.0201	0.0008	-0.0066	-0.0026	0.0029	-0.0024
26 Leather and leather products	31	0.0227	0.0691	-0.0023	0.0042	0.0254	0.0118	0.0138	-0.0111	-0.0001	-0.0041	0.0094	0.0126
27 Railroad transportation	1,73	-0.0077	-0.0052	-0.0008	0.0024	0.0027	0.0067	0.0041	0.0226	0.0133	0.0179	0.0238	0.0075
28 Local and interurban passenger transit	0,28	0.0238	0.0084	-0.0045	0.0424	0.0718	0.1292	0.0621	0.0270	0.1013	0.0884	0.0903	0.0687
29 Trucking and warehousing	0,36	0.0238	0.0084	-0.0045	0.0424	0.0718	0.1292	0.0621	0.0270	0.1013	0.0884	0.0903	0.0687
30 Water transportation	0,42	0.0238	0.0084	-0.0045	0.0424	0.0718	0.1292	0.0621	0.0270	0.1013	0.0884	0.0903	0.0687
31 Transportation by air	1,45	-0.0176	-0.0460	0.0097	0.0056	0.0021	-0.0101	-0.0102	0.0687	0.1496	0.0884	0.0636	0.0803
32 Pipelines, except natural gas	4,6	0.0143	0.0049	-0.0028	0.0179	0.0352	0.0262	0.0429	0.0119	0.0223	0.0310	0.0114	0.0195
33 Transportation services	2,38	0.1744	0.0888	0.1110	0.2303	0.1364	0.1075	0.3030	0.0684	0.2148	0.3899	0.3177	0.1947
34 Telephone and telegraph	22,98	0.0386	0.0668	0.0477	0.0410	0.0494	0.1153	-0.0780	-0.0153	0.0078	-0.0011	0.0689	0.0303
35 Radio and television	10,07	0.1603	0.1231	-0.0669	0.0410	0.0494	0.1153	-0.0780	-0.0153	0.0078	-0.0011	0.0689	0.0303
36 Electric, gas, and sanitary services	1,50	-0.0953	0.4817	0.6095	0.1533	0.5988	0.2036	0.1919	-0.1085	-0.1387	0.2998	0.0729	0.0588
37 Wholesale trade	50,51	-0.0653	-0.1079	0.3320	0.2584	0.7317	0.4713	0.8389	1.0016	0.8738	0.3541	0.2584	0.4889
38 Retail trade	52,59	0.2235	0.0437	-0.2236	-0.0155	-0.1081	0.2551	-0.0245	0.0927	0.1910	0.2097	0.3519	0.0905
39 Depository institutions	2,07	-0.0255	-0.0760	0.0886	0.1040	-0.0913	0.0686	0.1077	0.2394	0.0559	0.0445	0.0769	0.0585
40 Nondepository institutions	12,39	0.2235	0.0437	-0.2236	-0.0155	-0.1081	0.2551	-0.0245	0.0927	0.1910	0.2097	0.3519	0.0905
41 Security and commodity brokers	2,10	-0.0760	-0.0482	0.2591	0.2852	0.2781	0.0113	0.5823	0.3406	0.5118	-0.0083	0.0019	0.0218
42 Insurance carriers	1,94	-0.0340	0.3432	-0.2005	0.1305	-0.0619	0.0371	-0.1149	0.2181	-0.0083	0.0019	-0.0712	0.0218
43 Insurance agents, brokers, and service	0,41	-0.0024	0.0057	-0.0785	-0.0927	0.0113	-0.0289	-0.0868	0.0241	0.0501	0.1171	-0.0850	0.0007
44 Holding and other investment offices	1,65	0.0494	-0.0315	0.0375	0.0792	0.1042	0.0206	0.0643	-0.0275	-0.0265	0.0280	-0.0452	0.0221
45 Hotels and other lodging places	0,16	0.0137	-0.0263	0.0238	0.0221	0.0434	0.0829	0.0643	0.0829	0.0772	-0.0180	0.0139	0.0036
46 Personal services	0,43	0.3115	-0.1116	0.3842	0.2989	0.4800	0.3466	0.5097	0.7308	0.4516	0.6879	0.6139	0.0036
47 Business services	0,64	0.0176	-0.0387	-0.0313	0.0112	0.0725	0.0571	0.0466	0.0232	0.0904	0.0907	0.0492	0.0380
48 Auto repair, services, and parking	0,20	0.0017	-0.0345	-0.0254	-0.0015	-0.0044	0.0184	-0.0102	-0.0129	0.0082	-0.0364	-0.0102	-0.0081
49 Miscellaneous repair services	7,6	-0.0289	-0.0176	0.0013	0.0367	-0.0394	0.0355	0.0179	0.0194	0.0412	0.0156	0.0120	0.0111
50 Motion pictures	0,10	0.0688	0.0225	0.1084	-0.0256	0.0437	0.0546	0.0607	0.0607	0.0367	0.0539	0.0190	0.0463
51 Amusement and recreation services	0,42	0.2625	0.1757	0.1823	-0.0980	0.0156	0.1118	0.2678	0.0065	0.0236	0.1583	0.2325	0.1217
52 Health services	0,49	0.0061	-0.0527	0.0455	-0.0899	-0.0373	0.0644	-0.1286	0.1113	0.0527	0.0504	0.0833	0.0096
53 Legal services	0,06	0.0081	0.0425	0.0159	0.0315	0.0312	0.0644	-0.0076	0.0116	0.0421	0.0215	0.0388	0.0240
54 Educational services	0,82	0.0081	0.0425	0.0159	0.0315	0.0312	0.0644	-0.0076	0.0116	0.0421	0.0215	0.0388	0.0240
55 Other services, n.e.c.	0,34	83,84,86,87,89	2,42,03	-0.0395	0.0200	0.2654	0.1510	0.1481	0.1737	0.2268	0.3149	0.3470	0.1830
Sum of Contributions (Pct.)		1,1807	-0,4706	2,2088	2,9258	4,8230	4,0155	4,5708	5,5100	5,8009	5,4942	4,8854	3,7222

Source: ESA estimates derived from BEA data.

Table A-4.1b: GDP GROWTH IN TOP-HALF INDUSTRIES OF THE U.S. NONFARM BUSINESS SECTOR, 1989-2000

INDUSTRY	ITEQ/ITE	Rank	SIC	(Percentage Point)																	Average (Pct. Pt.) 1989-00
				1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1987-98	1988-99	1999-00							
34 Telephone and telegraph	22.98		481	482,489	0.3592	0.1826	0.2272	0.4759	0.2822	0.2222	0.6240	0.1393	0.4357	0.7939	0.6430	0.3987					
32 Pipelines, except natural gas	14.25	46			-0.0362	0.0200	-0.0115	0.0044	-0.0209	-0.0210	0.0273	0.0164	0.0050	0.0009	0.0018	-0.0013					
40 Nondepository institutions	12.39	61			-0.0526	-0.0522	0.1814	0.2150	-0.1889	0.1418	0.2219	0.4873	0.1134	0.0906	0.1557	0.1194					
35 Radio and television	10.07	483	484		0.0753	0.1374	0.0977	0.0848	0.0897	0.2382	-0.1606	-0.0311	0.0159	-0.0022	0.1393	0.0622					
24 Petroleum and coal products	7.57	29			-0.3392	-0.1958	0.0652	0.0317	0.0254	0.2346	0.1308	-0.1797	0.0342	0.2604	-0.2932	-0.0205					
36 Electric, gas, and sanitary services	6.40	49			0.3301	0.2532	-0.1164	0.0050	0.1431	0.4207	0.0393	-0.2210	-0.2814	0.6106	0.1475	0.1210					
3 Oil and gas extraction	4.02	13			0.0992	-0.2784	-0.3198	0.2300	0.1430	0.1505	-0.0848	0.1071	0.0079	-0.2615	-0.5865	-0.0721					
23 Chemicals and allied products	3.72	28			0.3379	-0.0891	0.1495	-0.0278	0.5399	0.1009	0.2141	0.3727	-0.3049	0.4361	0.4580	0.1894					
1 Metal mining	2.86	10			0.0380	0.0641	0.0161	-0.0035	-0.0078	-0.0055	0.0128	0.0140	0.0375	0.0092	-0.0130	0.0147					
18 Tobacco products	2.44	21			-0.1076	-0.1390	-0.1152	-0.0187	0.2223	0.0711	-0.0313	-0.0342	-0.0821	-0.3830	-0.0136	-0.0574					
33 Transportation services	2.38	47			0.0295	0.0101	-0.0054	0.0370	0.0729	0.0521	0.0885	0.0242	0.0453	0.0631	0.0230	0.0400					
50 Motion pictures	2.28	78			-0.0616	-0.0362	0.0026	0.1172	-0.0628	0.0734	0.0368	0.0396	0.0836	0.0318	0.0242	0.0226					
41 Security and commodity brokers	2.10	62			-0.1607	-0.0991	0.5304	0.5895	0.5753	0.0234	1.1994	0.6934	1.0379	1.1107	1.3351	0.6214					
39 Depository institutions	2.07	60			0.4603	0.0899	-0.4578	-0.0319	-0.2237	0.5271	-0.0505	0.1887	0.3875	0.4271	0.7120	0.1844					
42 Insurance carriers	1.94	63			-0.0701	0.7060	-0.4104	0.2699	-0.1282	0.0767	-0.2368	0.4440	-0.0168	0.0039	-0.1440	0.0449					
27 Railroad transportation	1.73	40			0.0467	0.1421	-0.0047	0.0086	0.0525	0.0243	0.0284	-0.0225	-0.0001	-0.0083	0.0190	0.0260					
44 Holding and other investment offices	1.65	67			0.1018	-0.0647	0.0767	0.1637	-0.2155	0.0426	-0.1788	0.0491	0.4453	-0.2348	-0.1720	0.0012					
15 Instruments and related products	1.59	38			0.0788	-0.0545	-0.1252	-0.2524	-0.1263	-0.0434	0.0422	-0.1453	-0.0267	-0.0327	-0.0007	-0.0624					
37 Wholesale trade	1.50	50,51			-0.1993	0.9906	1.2475	0.3168	1.2182	0.0593	1.7853	1.8881	2.4443	0.7213	0.5229	0.9996					
31 Transportation by air	1.45	45			0.2916	-0.0947	0.2039	0.1293	0.3515	0.1419	0.3080	0.1567	0.0576	0.1411	0.1288	0.1650					
12 Electronic and other electric equipment	1.27	36			0.1793	0.3038	0.0423	0.7580	1.0838	1.2688	0.9863	0.9733	0.7811	0.9683	1.2318	0.7798					
21 Paper and allied products	1.00	26			0.0251	0.0490	0.0583	0.1985	0.0228	-0.3546	0.1478	0.0806	-0.0663	0.0365	-0.2327	-0.0032					
22 Printing and publishing	0.84	27			-0.1617	-0.1781	-0.0481	-0.2309	0.0822	-0.1260	-0.0328	-0.0670	-0.0293	0.0876	-0.0482	-0.0684					
2 Coal mining	0.81	12			0.0223	0.0067	0.0541	0.0005	0.0628	0.0196	0.0427	0.0001	0.0227	0.0413	-0.0008	0.0247					
11 Industrial machinery and equipment	0.76	35			0.0598	-0.4616	0.3791	0.2377	0.4912	0.7905	0.4493	0.7380	1.0514	0.4407	0.4451	0.4201					
14 Other transportation equipment	0.74	37 exc 371			0.0079	-0.0877	-0.3781	-0.2453	-0.2441	-0.1067	0.0741	0.1191	0.0621	0.1452	-0.1869	-0.0764					
4 Nonmetallic minerals, except fuels	0.64	14			-0.0069	-0.0210	0.0120	-0.0098	0.0588	-0.0012	0.0309	0.0179	0.0159	-0.0003	0.0444	0.0128					
47 Business services	0.64	73			0.6416	-0.2286	0.7864	0.6177	0.9930	0.7162	1.0500	1.4879	0.9163	1.4013	1.2484	0.8754					
49 Miscellaneous repair services	0.63	76			0.0036	-0.0782	-0.0520	-0.0032	-0.0091	0.0379	-0.0210	-0.0263	0.0188	-0.0538	-0.0207	-0.0186					
Sum of Contributions (Pct.)					1.9930	0.8007	2.0857	3.6666	5.2831	4.7752	6.7432	7.3103	7.2118	6.8461	5.5679	4.7531					

Source: ESA estimates derived from BEA data.

Table A-4.1c: GDP GROWTH IN BOTTOM-HALF INDUSTRIES OF THE U.S. NONFARM BUSINESS SECTOR, 1989-2000

INDUSTRY	SIC	Rank 1996	ITEQIFTE (Percentage Point)																		Average (Pct. Pt.) 1989-00
			1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1987-98	1998-99	1999-00								
17 Food and kindred products	20	0.59	0.0513	0.0888	-0.0113	0.1264	-0.0768	0.7318	-0.4959	-0.0206	-0.2039	0.1740	0.0264	0.0356							
9 Primary metal industries	33	0.57	-0.0017	-0.0358	0.0340	0.1828	0.0724	-0.0326	0.0451	0.0613	0.0575	0.0759	0.0039	0.0421							
13 Motor vehicles and equipment	371	0.56	-0.2778	-0.3280	0.3571	0.6147	0.5258	0.1444	-0.3793	0.1633	0.4620	0.0941	0.0614	0.1307							
53 Legal services	81	0.49	0.0119	-0.1026	0.0889	-0.1743	-0.0722	0.1247	-0.2499	0.2187	0.039	0.0991	0.1647	0.0194							
46 Personal services	72	0.43	-0.0390	-0.0514	0.0385	0.0748	-0.0083	0.1066	-0.0194	0.0573	0.1523	-0.0354	0.0275	0.0189							
52 Health services	80	0.42	0.0502	0.3419	0.3564	-0.1899	0.0302	0.2167	0.5205	0.0128	0.0466	0.3110	0.4596	0.2378							
8 Stone, clay, and glass products	32	0.42	0.0038	-0.1034	0.1093	-0.0186	0.1069	0.3007	0.0122	0.1188	-0.0012	0.0565	0.0415	0.0324							
30 Water transportation	44	0.42	0.0462	0.0163	-0.0087	0.0081	0.0324	-0.0018	0.0327	0.0347	-0.0016	-0.0436	-0.0025	0.0102							
43 Insurance agents, brokers, and service	64	0.41	-0.0046	0.0111	-0.1535	-0.1796	0.0218	-0.0960	-0.0368	0.0013	0.0988	0.2301	0.0384	-0.0026							
29 Trucking and warehousing	42	0.36	0.0386	0.1608	0.1807	0.1391	0.2501	0.0524	0.1969	-0.0561	0.1816	0.1736	0.1786	0.1360							
55 Other services, n.e.c.	34	0.34	-0.1185	-0.1858	0.0391	0.5142	0.2924	0.2570	0.3375	0.4456	0.6212	0.4342	0.6859	0.3580							
10 Fabricated metal products	34	0.32	-0.0079	-0.2282	0.0629	0.1449	0.4108	0.1968	0.0828	0.1034	0.0111	0.0604	0.0374	0.0858							
16 Miscellaneous manufacturing industries	39	0.29	-0.0150	-0.0504	-0.0423	0.0318	0.0488	0.0253	0.0152	0.0370	0.0008	0.0631	0.0242	0.0133							
28 Local and interurban passenger transit	41	0.28	-0.0100	-0.0100	-0.0015	0.0091	0.0052	0.0130	0.0080	0.0443	0.0263	0.0352	0.0470	0.0147							
19 Textile mill products	22	0.26	0.0342	0.0004	0.1228	0.0147	0.0375	-0.0331	-0.0220	-0.0132	-0.0275	-0.0170	0.0155	0.0102							
25 Rubber and miscellaneous plastics products	30	0.26	-0.0229	0.0508	0.1310	0.1382	0.1484	0.0794	0.0941	0.1186	0.0774	0.0772	0.0463	0.0853							
48 Auto repair, services, and parking	75	0.20	0.0829	-0.0676	-0.0612	0.0218	0.1404	0.1106	0.0906	0.0455	0.1783	0.1781	0.0972	0.0742							
6 Lumber and wood products	24	0.17	-0.0779	-0.1270	-0.0599	-0.0986	0.0779	0.1042	-0.0598	0.0779	0.187	0.0905	0.0337	-0.0101							
38 Retail trade	52-59	0.17	-0.1270	-0.2101	0.6491	0.5007	1.4164	0.9132	1.6307	1.9686	1.7238	1.2832	1.7078	1.0415							
45 Hotels and other lodging places	70	0.16	0.0266	-0.0513	0.0465	0.0428	0.0840	0.1606	0.1249	-0.0541	-0.0523	0.0550	0.0894	0.0429							
26 Leather and leather products	31	0.16	-0.0048	0.0009	-0.0010	-0.0136	0.0095	0.0066	-0.0390	0.0016	-0.0130	-0.0051	0.0057	-0.0048							
7 Furniture and fixtures	25	0.16	-0.0455	-0.0432	0.0578	0.0624	0.0013	0.0203	-0.0011	0.0491	0.0259	0.0308	0.0164	0.0158							
20 Apparel and other textile products	23	0.13	-0.0320	-0.0134	0.0333	-0.0072	0.0345	-0.0152	-0.0372	-0.0169	-0.0397	-0.0832	-0.0036	-0.0164							
5 Construction	15,16,17	0.11	-0.2260	-0.8632	0.1152	0.2750	0.6557	0.0588	0.5884	0.2825	0.0252	0.7008	0.3073	0.2497							
51 Amusement and recreation services	79	0.10	0.1298	0.0437	0.2119	-0.0495	0.0846	0.1057	0.0958	0.1586	0.0723	0.1058	0.0375	0.0906							
54 Educational services	82	0.06	0.0119	0.0828	0.0311	0.0611	0.0604	0.0621	-0.0147	0.0227	0.0831	0.0421	0.0728	0.0468							
Sum of Contributions (Pct.)			0.4138	-1.6737	2.3261	2.2312	4.3922	3.3033	2.5202	3.7715	4.4275	4.1865	4.2200	2.7381							

Source: ESA estimates derived from BEA data.

Table A-4.2a: FTE GROWTH IN ALL INDUSTRIES OF THE U.S. NONFARM BUSINESS SECTOR, 1989-2000

Industry	Rank	TEQ/FTE	SIC	Average (Pct. Pt.)											
				1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	1989-00
1 Metal mining	2.96		10	0.0024	-0.0036	-0.0025	-0.0037	-0.0024	0.0035	0.0022	0.0000	-0.0053	-0.0052	-0.0044	-0.0017
2 Coal mining	0.81		12	0.0012	-0.0133	-0.0111	-0.0171	0.0000	-0.0081	-0.0067	-0.0022	-0.0042	-0.0062	-0.0080	-0.0069
3 Oil and gas extraction	4.02		13	0.0170	0.0000	-0.0491	-0.1110	-0.0084	-0.0197	0.0000	0.0197	0.0000	-0.0443	0.0121	-0.0076
4 Nonmetallic minerals, except fuels	0.64		14	0.0000	-0.0084	-0.0037	0.0012	0.0000	0.0035	0.0000	0.0000	0.0000	0.0010	0.0010	0.0000
5 Construction	15,16,17		15	0.0045	-0.5565	-0.2124	0.1934	0.3830	0.3437	0.2957	0.3377	0.3394	0.4071	0.3106	0.1616
6 Lumber and wood products	0.20		24	-0.0256	-0.0638	0.0074	0.0380	0.0586	0.0162	0.0112	0.0131	0.0244	0.0268	-0.0161	0.0082
7 Furniture and fixtures	0.16		25	-0.0219	-0.0434	0.0025	0.0171	0.0239	0.0104	-0.0056	0.0065	0.0212	0.0175	0.0080	0.0032
8 Stone, clay, and glass products	0.42		25	-0.0146	-0.0446	-0.0147	0.0098	0.0215	0.0059	0.0022	0.0131	0.0148	0.0041	0.0101	0.0005
9 Primary metal industries	0.57		33	-0.0183	-0.0398	-0.0430	-0.1110	0.0227	0.0069	0.0067	0.0022	0.0053	-0.0186	0.0020	-0.0077
10 Fabricated metal products	0.32		34	-0.0195	-0.0855	-0.0233	0.0110	0.0646	0.0579	0.0056	0.0383	0.0339	0.0155	0.0151	0.0103
11 Industrial machinery and equipment	0.76		35	-0.0463	-0.0903	-0.1007	0.0706	0.0706	0.1007	0.0258	0.0678	0.0424	-0.0210	-0.0131	-0.0013
12 Electronic and other electric equipment	1.27		36	-0.0803	-0.1000	-0.0774	-0.0073	0.0622	0.0498	0.0426	0.0328	0.0159	-0.0443	0.0523	-0.0049
13 Motor vehicles and other equipment	0.56		371	-0.0341	-0.0482	0.0454	0.0208	0.0742	0.0798	-0.0022	0.0164	0.0148	0.0289	-0.0020	0.0176
14 Other transportation equipment	0.74		372	-0.0207	-0.0988	-0.0882	-0.1237	-0.0766	-0.0405	0.0067	0.0372	0.0458	-0.0268	-0.0382	-0.0395
15 Instruments and related products	1.59		38	-0.0353	-0.0337	-0.0516	-0.0404	-0.0311	-0.0220	0.0168	0.0088	0.0085	-0.0027	-0.0030	-0.0187
16 Miscellaneous manufacturing industries	0.28		39	-0.0243	-0.0048	0.0000	0.0110	0.0150	-0.0220	0.0056	-0.0022	0.0021	0.0021	-0.0010	0.0005
17 Food and kindred products	0.39		20	0.0231	0.0096	-0.0135	0.0208	0.0275	-0.0072	-0.0011	-0.0033	-0.0021	0.0062	0.0030	0.0068
18 Tobacco products	2.44		21	-0.0012	-0.0024	-0.0012	-0.0037	-0.0024	-0.0012	-0.0011	0.0000	-0.0011	-0.0031	-0.0020	-0.0018
19 Textile mill products	0.26		22	-0.0280	-0.0361	0.0061	0.0086	0.0072	-0.0195	-0.0336	-0.0142	-0.0212	-0.0402	-0.0251	-0.0177
20 Apparel and other textile products	0.13		23	-0.0511	-0.0398	-0.0074	-0.1110	0.0084	-0.0474	-0.0818	-0.0771	-0.0636	-0.0711	-0.0774	-0.0444
21 Paper and allied products	1.00		26	0.0037	-0.0084	-0.0025	0.0061	0.0024	0.0000	-0.0090	-0.0022	-0.0042	-0.0103	-0.0131	-0.0034
22 Printing and publishing	0.84		27	0.0061	-0.0398	-0.0454	0.0086	0.0455	0.0012	-0.0067	0.0230	0.0127	-0.0124	-0.0020	-0.0008
23 Chemicals and allied products	3.72		28	0.0158	-0.0600	-0.0049	-0.0661	-0.0239	-0.0116	-0.0067	-0.0011	0.0021	0.0020	0.0020	-0.0036
24 Petroleum and coal products	7.57		29	0.0024	0.0012	-0.0025	-0.0025	-0.0048	-0.0035	-0.0045	-0.0031	-0.0021	-0.0031	0.0020	-0.0028
25 Rubber and miscellaneous plastics products	0.26		30	0.0037	-0.0241	0.0184	0.0367	0.0527	0.0255	0.0022	0.0208	0.0159	-0.0041	0.0070	0.0141
26 Leather and leather products	0.16		31	-0.0097	-0.0120	-0.0049	-0.0012	-0.0048	-0.0081	-0.0123	-0.0066	-0.0053	-0.0082	-0.0050	-0.0071
27 Railroad transportation	1.73		40	-0.0195	-0.0084	-0.0098	-0.0037	-0.0072	0.0000	-0.0101	-0.0033	0.0032	0.0000	-0.0090	-0.0064
28 Local and interurban passenger transit	0.28		41	0.0037	0.0084	0.0061	0.0220	0.0215	0.0150	0.0202	0.0175	0.0148	0.0155	0.0101	0.0141
29 Trucking and warehousing	0.36		42	-0.0065	0.0024	-0.0024	0.0012	0.0906	0.0671	0.0403	0.0503	0.0668	0.0800	0.0342	0.0434
30 Water transportation	0.42		44	0.0024	0.0072	-0.0098	-0.0012	0.0048	0.0000	-0.0011	0.0044	0.0032	0.0031	0.0050	0.0016
31 Transportation by air	1.45		45	0.0584	-0.0025	-0.0025	0.0416	0.0393	0.0486	0.0538	0.0208	0.0583	0.0433	0.0472	0.0360
32 Pipelines, except natural gas	14.25		46	0.0000	0.0012	0.0000	0.0000	-0.0024	-0.0023	-0.0011	0.0000	-0.0011	0.0000	0.0000	-0.0005
33 Transportation services	2.38		47	0.0037	-0.0024	0.0025	0.0220	0.0311	0.0197	0.0090	0.0219	0.0170	0.0052	0.0111	0.0128
34 Telephone and telegraph	22.98		481,482,489	0.0300	-0.0181	-0.0344	-0.0024	0.0108	0.0090	0.0179	0.0645	0.0392	0.0546	0.0794	0.0228
35 Radio and television	10.07		483,484	0.0158	-0.0072	0.0000	0.0073	0.0120	0.0174	0.0179	0.0044	0.0127	0.0124	0.0221	0.0104
36 Electric, gas, and sanitary services	6.40		49	0.0256	0.0084	-0.0025	-0.0135	-0.0156	-0.0255	-0.0269	-0.0142	-0.0127	0.0021	-0.0060	-0.0073
37 Wholesale trade	1.50		5051	-0.0021	-0.1951	0.0061	-0.0845	0.2202	0.2661	0.0865	0.1899	0.1697	0.1092	0.0895	0.0742
38 Retail trade	0.17		52-59	0.0071	-0.5252	0.1645	0.3314	0.7373	0.6354	0.3954	0.4109	0.3118	0.5730	0.9350	0.3759
39 Depository institutions	2.07		60	-0.0049	-0.1024	-0.0786	-0.0184	-0.0192	-0.0428	-0.0168	0.0066	0.0032	-0.0072	-0.0191	-0.0272
40 Nondepository institutions	12.39		61	0.0097	0.0048	0.0344	0.0637	0.0287	0.0243	0.0504	0.0001	0.0659	0.0412	-0.0231	0.0301
41 Security and commodity brokers	2.10		62	-0.0037	-0.0060	0.0021	0.0404	0.0563	0.0127	0.0280	0.0481	0.0477	0.0423	0.0623	0.0318
42 Insurance carriers	1.94		63	0.0548	0.0265	-0.0209	0.0049	0.0024	-0.0197	-0.0022	0.0142	0.0414	0.0258	-0.0261	0.0092
43 Insurance agents, brokers, and service	0.41		64	0.0146	0.0108	-0.0098	0.0147	0.0251	0.0116	0.0112	0.0186	0.0170	0.0031	0.0030	0.0100
44 Holding and other investment offices	1.65		67	0.0061	0.0120	-0.0098	0.0135	0.0455	-0.0081	0.0000	-0.0033	0.0021	0.0072	0.0040	0.0023
45 Hotel and other lodging places	0.16		70	0.0385	-0.0590	-0.0209	0.0318	0.0318	0.0287	0.0255	0.0437	0.0424	0.0680	0.0482	0.0288
46 Personal services	0.43		72	0.0377	-0.0120	0.0021	0.0318	0.0287	0.0255	0.0258	-0.0022	0.0148	0.0239	0.0241	0.0206
47 Business services	0.64		73	0.2909	-0.1686	0.3586	0.4946	0.5458	0.6688	0.5645	0.7093	0.6819	0.6369	0.6433	0.4933
48 Auto repair, services, and parking	0.20		75	0.0402	-0.0554	0.0025	0.0624	0.0515	0.0648	0.0840	0.0503	0.0318	0.0537	0.0462	0.0397
49 Miscellaneous repair services	0.63		76	0.0183	-0.0578	0.0049	0.0196	-0.0239	0.0168	0.0022	0.0022	-0.0020	-0.0021	-0.0070	0.0005
48 Auto repair, services, and parking	0.20		75	0.0402	-0.0554	0.0025	0.0624	0.0515	0.0648	0.0840	0.0503	0.0318	0.0537	0.0462	0.0397
50 Motion pictures	2.28		78	0.0170	-0.0024	0.0000	0.0122	0.0371	0.0440	0.0302	0.0284	0.0212	0.0186	0.0000	0.0188
51 Amusement and recreation services	0.10		79	0.0633	0.0133	0.0516	0.0698	0.1077	0.0984	0.0739	0.0721	0.0361	0.0567	0.0834	0.0660
52 Health services	0.42		80	0.3659	0.3734	0.4593	0.3110	0.2968	0.2407	0.3158	0.2306	0.1464	0.1309	0.1357	0.2751
53 Legal services	0.49		81	-0.0195	-0.0012	0.0111	0.0147	0.0012	-0.0035	0.0090	0.0197	0.0297	0.0258	0.0201	0.0051
54 Educational services	0.06		82	0.0292	0.0530	0.1044	0.5688	0.9551	0.6692	0.0504	0.0623	0.0955	0.0794	0.0844	0.6666
55 Other services, n.e.c.	0.34		83,84,86,87,89	0.3348	0.2325	-0.0553	0.3195	0.9527	0.3827	0.3214	0.3541	0.4317	0.3102	0.3880	0.2945
Sum of Contributions (Pct.)				1.0567	-1.9009	0.2972	2.2919	2.4375	3.3160	2.4763	3.0515	2.9113	2.5280	2.5551	2.0017

Source: ESA estimates derived from BEA data.

Table A-4.2b: FTE GROWTH IN TOP-HALF INDUSTRIES OF THE U.S. NONFARM BUSINESS SECTOR, 1989-2000

Industry	Rank 1996	SIC	(Percentage Point)																	Average (Pct Pt.) 1989-00
			1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00							
34 Telephone and telegraph	22.98	481482489	0.1085	-0.0504	-0.0967	-0.0069	0.0309	0.0000	0.0519	0.1866	0.1126	0.1556	0.2271	0.0654						
32 Pipelines, except natural gas	14.25	46	0.0000	0.0034	0.0000	0.0000	-0.0069	-0.0032	0.0000	-0.0030	0.0000	0.0000	0.0000	-0.0015						
40 Nondepository institutions	12.39	61	0.0271	0.0134	0.0967	0.1804	0.0623	-0.0701	0.1459	0.1739	0.2466	0.1174	-0.0661	0.0861						
35 Radio and television	10.07	483484	0.0441	-0.0202	0.0000	0.0208	0.0343	0.0501	0.0519	0.0126	0.0365	0.0352	0.0632	0.0289						
24 Petroleum and coal products	7.57	29	0.0068	0.0034	-0.0069	-0.0173	-0.0137	-0.0100	-0.0130	-0.0095	-0.0061	-0.0088	-0.0144	-0.0081						
36 Electric, gas, and sanitary services	6.40	49	0.0712	0.0235	-0.0069	-0.0382	-0.0446	-0.0735	-0.0778	-0.0411	-0.0365	0.0059	-0.0172	-0.0214						
3 Oil and gas extraction	4.02	13	0.0475	0.0000	-0.1381	-0.0312	-0.0240	-0.0568	0.0000	0.0569	0.0000	-0.1262	0.0345	-0.0216						
23 Chemicals and allied products	3.72	28	0.0441	-0.0168	-0.0138	-0.0173	-0.0686	-0.0334	-0.0195	-0.0032	0.0030	0.0059	0.0057	-0.0103						
1 Metal mining	2.96	10	0.0068	-0.0101	-0.0069	-0.0104	-0.0069	0.0100	0.0065	0.0000	-0.0152	-0.0147	-0.0115	-0.0048						
18 Tobacco products	2.44	21	-0.0034	-0.0067	-0.0035	-0.0104	-0.0069	-0.0033	-0.0032	0.0000	-0.0030	-0.0038	-0.0057	-0.0050						
33 Transportation services	2.38	47	0.0102	-0.0067	0.0069	0.0625	0.0892	0.0568	0.0259	0.0632	0.0487	0.0147	0.0316	0.0366						
50 Motion pictures	2.28	78	0.0475	-0.0067	0.0000	0.0347	0.1063	0.1269	0.0876	0.0822	0.0609	0.0528	0.0000	0.0538						
41 Security and commodity brokers	2.10	62	-0.0102	-0.0168	0.0621	0.1145	0.1612	0.0367	0.0811	0.1391	0.1370	0.1204	0.1782	0.0912						
39 Depository institutions	2.07	60	-0.0136	-0.2558	-0.2209	-0.0520	-0.0549	-0.1236	-0.0466	0.0190	0.0091	-0.0205	-0.0546	-0.0770						
42 Insurance carriers	1.94	63	0.1526	0.0740	-0.0587	0.0139	0.0069	-0.0568	-0.0065	0.0411	0.1187	0.0734	-0.0747	0.0258						
27 Railroad transportation	1.73	40	-0.0543	-0.0303	-0.0276	-0.0104	-0.0206	0.0000	-0.0252	-0.0095	0.0091	0.0000	-0.0259	-0.0180						
44 Holding and other investment offices	1.65	67	0.0170	0.0336	-0.0276	0.0382	0.0034	-0.0234	0.0000	-0.0095	0.0061	0.0205	0.0115	0.0063						
15 Instruments and related products	1.59	38	-0.0984	-0.0941	-0.1450	-0.1145	-0.0892	-0.0634	0.0466	0.0285	0.0244	-0.0675	-0.0086	-0.0527						
37 Wholesale trade	1.50	50,51	-0.1730	-0.5446	0.0173	-0.2394	0.6312	0.7681	0.2562	0.5755	0.4870	0.3112	0.2846	0.2158						
31 Transportation by air	1.45	45	0.1628	-0.0336	-0.0069	0.1190	0.1088	0.1403	0.1557	0.0601	0.1674	0.1233	0.1351	0.1029						
12 Electronic and other electric equipment	1.27	36	-0.2238	-0.2790	-0.2175	-0.0208	0.1784	0.1436	0.1232	0.0949	0.0457	-0.1282	0.1495	-0.0120						
21 Paper and allied products	1.00	26	0.0102	-0.0235	-0.0069	0.0173	0.0069	0.0000	-0.0259	-0.0063	-0.0122	-0.0284	-0.0374	-0.0097						
22 Printing and publishing	0.84	27	0.0170	-0.1109	-0.1277	0.0243	0.1303	0.0033	-0.0195	0.0664	0.0365	-0.0352	-0.0057	-0.0019						
2 Coal mining	0.81	12	0.0034	-0.0370	-0.0311	-0.0486	0.0000	-0.0234	-0.0195	-0.0063	-0.0122	-0.0176	-0.0230	-0.0196						
11 Industrial machinery and equipment	0.76	35	-0.1289	-0.2522	-0.2831	0.0312	0.2024	0.2905	0.0746	0.1961	0.1218	-0.2143	-0.0575	-0.0018						
14 Other transportation equipment	0.74	37exc371	-0.0577	-0.2757	-0.2762	-0.3504	-0.2195	-0.1169	0.0195	0.1075	0.1309	-0.0763	-0.1082	-0.1113						
4 Nonmetallic minerals, except fuels	0.64	14	0.0000	-0.0235	-0.0104	0.0035	0.0034	0.0100	0.0000	0.0063	0.0061	0.0029	0.0029	0.0001						
47 Business services	0.64	73	0.8106	-0.4707	1.0080	1.4017	1.5642	1.9302	1.6343	2.0523	1.9573	1.8141	1.8400	1.4129						
49 Miscellaneous repair services	0.63	76	0.0509	-0.1614	0.0138	0.0555	-0.0686	0.0768	0.0466	0.0063	0.0244	-0.0059	-0.0201	0.0018						
Sum of Contributions (Pct)			0.8730	-2.6056	-0.5074	1.1484	2.7167	2.9821	2.5456	3.8832	3.7016	2.1017	2.4322	1.7521						

Source: ESA estimates derived from BEA data.

Table A-4.2c: FTE GROWTH IN BOTTOM-HALF INDUSTRIES OF THE U.S. NONFARM BUSINESS SECTOR, 1989-2000
(Percentage Point)

Industry	Rank	SIC	ITOE/FTE																Average (Pct. Pt.) 1989-00	
			1996	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00						
17 Food and kindred products	0.59	20	0.0361	0.0150	-0.0210	0.0322	0.0423	0.0159	0.0205	-0.0050	-0.0033	0.0127	0.0046	0.0136						
9 Primary metal industries	0.57	33	-0.0285	-0.0619	-0.0867	-0.0170	0.0349	0.0106	0.0103	0.0033	0.0081	-0.0266	0.0031	-0.0120						
13 Motor vehicles and equipment	0.56	371	-0.0532	-0.0751	0.0705	0.0322	0.1140	0.1222	-0.0034	0.0251	0.0228	0.0445	-0.0031	0.0269						
53 Legal services	0.49	81	-0.0304	-0.0019	0.0172	0.0227	0.0018	-0.0053	0.0137	0.0301	0.0456	0.0397	0.0309	0.0149						
46 Personal services	0.43	72	0.0589	-0.0188	0.0343	0.0492	0.0441	0.0390	0.0394	-0.0033	0.0228	0.0461	0.0371	0.0317						
52 Health services	0.42	80	0.6020	0.5819	0.7128	0.4806	0.4559	0.3683	0.4825	0.3524	0.2446	0.2017	0.2086	0.4247						
8 Stone, clay, and glass products	0.42	32	-0.0228	-0.0695	-0.0229	0.0151	0.0331	0.0053	0.0034	0.0200	0.0228	0.0064	0.0155	0.0006						
30 Water transportation	0.42	44	0.0038	0.0113	-0.0152	-0.0019	0.0074	0.0000	-0.0017	0.0067	0.0049	0.0048	0.0077	0.0025						
43 Insurance agents, brokers, and service	0.41	64	0.0228	0.0169	-0.0305	0.0227	0.0386	0.0177	0.0171	0.0284	0.0260	0.0048	0.0046	0.0154						
29 Trucking and warehousing	0.36	42	-0.0133	-0.0375	0.0019	0.1400	0.1397	0.1027	0.0616	0.0768	0.0225	0.1048	0.0525	0.0665						
55 Other services, n.e.c.	0.34	83,84,86,87,89	0.5222	-0.3623	-0.0858	0.4938	0.4081	0.5153	0.4910	0.5411	0.8225	0.4780	0.5986	0.4532						
10 Fabricated metal products	0.32	34	-0.0304	-0.1333	-0.0362	0.0170	0.0983	0.0885	0.0086	0.0685	0.0521	0.0238	0.0232	0.0155						
16 Miscellaneous manufacturing industries	0.29	39	-0.0380	-0.0075	0.0000	0.0170	0.0276	-0.0018	0.0086	-0.0033	0.0032	0.0032	-0.0015	0.0007						
28 Local and interurban passenger transit	0.28	41	0.0057	0.0131	0.0095	0.0341	0.0331	0.0230	0.0308	0.0267	0.0228	0.0238	0.0155	0.0216						
19 Textile mill products	0.26	22	-0.0437	-0.0563	0.0095	0.0132	0.0110	-0.0283	-0.0513	-0.0217	-0.0326	-0.0619	-0.0386	-0.0273						
25 Rubber and miscellaneous plastics products	0.26	30	0.0057	-0.0375	0.0286	0.0568	0.0809	0.0390	0.0034	0.0317	0.0244	-0.0064	0.0108	0.0216						
48 Auto repair, services, and parking	0.20	75	0.0627	-0.0864	0.0038	0.0985	0.0790	0.0992	0.1283	0.0768	0.4488	0.0905	0.0711	0.0609						
6 Lumber and wood products	0.20	24	-0.0389	-0.0995	0.0114	0.0586	0.0901	0.0248	0.0171	0.0200	0.0374	0.0413	-0.0247	0.0124						
38 Retail trade	0.17	52-59	0.1671	-0.8185	0.2554	0.8211	1.1324	1.2784	0.6040	0.6280	0.785	0.830	0.9118	0.5765						
45 Hotels and other lodging places	0.16	70	0.0570	-0.0920	-0.0324	0.0285	0.0699	0.0761	0.0667	0.0701	0.0651	0.1048	0.0742	0.0442						
26 Leather and leather products	0.16	31	-0.0152	-0.0188	-0.0076	-0.0019	-0.0074	-0.0124	-0.0188	-0.0100	-0.0081	-0.0127	-0.0077	-0.0110						
7 Furniture and fixtures	0.16	25	-0.0342	-0.0676	0.0038	0.0265	0.0368	0.0159	-0.0086	0.0084	0.0326	0.0270	0.0124	0.0048						
20 Apparel and other textile products	0.13	23	-0.0798	-0.0619	-0.0114	-0.0170	0.0129	-0.0726	-0.1249	-0.0701	-0.0977	-0.1096	-0.1190	-0.0683						
5 Construction	0.11	15,16,17	-0.1006	-0.8673	-0.3297	0.2989	0.3683	0.5259	0.4517	0.5161	0.2019	0.6273	0.4776	0.2463						
51 Amusement and recreation services	0.10	79	0.0987	0.0206	0.0801	0.1078	0.1655	0.1505	0.1129	0.1102	0.0553	0.0873	0.1283	0.1016						
54 Educational services	0.06	82	0.0456	0.0326	0.1620	0.0908	0.0846	0.0921	0.0770	0.0952	0.1465	0.1223	0.1298	0.1026						
Sum of Contributions (Pct.)			1.1384	-1.5074	0.7414	2.9155	3.8237	3.4899	2.4398	2.6722	2.4887	2.7586	2.6272	2.1402						

Source: ESA estimates derived from BEA data.

Table A-4.3a: GDP PER FTE GROWTH IN ALL INDUSTRIES OF THE U.S. NON-FARM BUSINESS SECTOR, 1989-2000
(Percentage Point)

Industry	ITC/FTE Rank 1996	SIC	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	Average Contrib. (Pct. Pt.) 1989-95	Average Contrib. (Pct. Pt.) 1995-2000
1 Metal mining	2.96	10	0.0158	0.0355	0.0103	0.0019	-0.0013	-0.0059	0.0039	0.0067	0.0232	0.0094	-0.0023	0.0088	0.0094
2 Coal mining	0.81	12	0.0085	0.0168	0.0374	0.0170	0.0293	0.0170	0.0268	0.0222	0.0150	0.0258	0.0075	0.0186	0.0154
3 Oil and gas extraction	4.02	13	0.0306	-0.1380	-0.1068	0.1196	0.0749	0.0895	-0.0402	0.0320	0.0038	-0.0819	-0.2945	-0.2823	0.0117
4 Nonmetallic minerals, except fuels	0.64	14	-0.0033	-0.0018	0.0095	-0.0058	0.0263	-0.0309	0.0046	0.0064	0.0055	-0.0011	0.0204	0.0061	0.0035
5 Construction	0.11	15,16,17	-0.0512	0.1152	0.2706	-0.0503	-0.0428	-0.2938	-0.0689	-0.1882	0.0768	-0.0010	-0.1513	-0.0321	-0.0080
6 Lumber and wood products	0.20	24	-0.0144	-0.0144	-0.0379	-0.0868	-0.0178	-0.0364	-0.0409	-0.1984	-0.0145	0.188	0.0323	-0.0132	-0.0010
7 Furniture and fixtures	0.16	25	-0.0015	0.0216	0.0270	0.0147	-0.0225	0.0001	0.0049	0.0190	-0.0078	-0.0018	0.0002	0.0049	0.0066
8 Stone, clay, and glass products	0.42	32	0.0164	-0.0087	0.0704	-0.0189	0.0326	0.0230	0.0039	0.0459	-0.0150	0.0241	0.0107	0.0157	0.0173
9 Primary metal industries	0.57	33	0.0172	0.0218	0.0602	0.1030	0.142	-0.0230	0.0161	0.0281	0.0231	0.0558	0.0000	0.0288	0.0322
10 Fabricated metal products	0.32	34	-0.0411	0.0371	0.0553	0.0623	0.1427	0.0223	0.0361	0.0139	0.0275	0.0149	0.0037	0.0228	0.0349
11 Industrial machinery and equipment	0.76	35	0.0745	-0.1367	0.2851	0.1017	0.1613	0.2728	0.1878	0.2861	0.4627	0.2845	0.2340	0.2012	0.1264
12 Electric and other electric equipment	1.27	36	0.1657	0.2325	0.0977	0.3858	0.4464	0.5461	0.4249	0.4322	0.3590	0.5077	0.5424	0.3765	0.3124
13 Motor vehicles and other equipment	0.56	37	-0.1077	-0.1227	0.1368	0.2899	0.1909	-0.0051	-0.1883	0.0647	0.0216	0.0186	0.0323	0.0475	0.0637
14 Other transportation equipment	0.74	37exc371	0.0243	0.0572	-0.0862	0.0049	-0.0400	-0.0108	0.0285	0.0207	-0.0146	0.0987	-0.0528	0.0024	0.0084
15 Instruments and related products	1.59	38	0.0728	0.0073	-0.0096	-0.0799	-0.0290	0.0009	0.0036	-0.0768	0.0210	0.0075	0.026	-0.0112	-0.0062
16 Miscellaneous manufacturing industries	0.29	39	0.0201	-0.0215	0.0216	0.0053	0.0338	0.0075	0.0338	0.0224	-0.0017	0.0283	0.0061	0.0061	0.0026
17 Food and kindred products	0.59	20	0.0032	0.0367	0.0077	0.0434	-0.0645	0.3555	-0.2821	-0.0070	-0.0984	0.0784	0.0101	0.0094	0.0037
18 Tobacco products	2.44	21	-0.0505	-0.0684	-0.0549	-0.0052	0.1062	0.0344	-0.0137	-0.0163	-0.0382	-0.1738	-0.046	-0.0263	-0.0505
19 Textile mill products	0.26	22	0.0451	0.0371	0.0565	-0.0009	0.0118	0.0014	0.0217	0.0073	0.0071	0.0308	0.0227	0.0251	0.0198
20 Apparel and other textile products	0.13	23	0.0343	0.0335	0.0243	0.0071	0.0091	0.0083	0.0611	0.0362	0.0423	0.0280	0.0737	0.0353	0.0245
21 Paper and allied products	1.00	26	0.0085	0.0329	0.0308	0.0879	0.0083	-0.1661	0.0788	0.0405	-0.0276	0.0275	-0.0894	0.0020	0.0004
22 Printing and publishing	0.84	27	-0.0837	0.0219	0.0717	-0.1176	-0.0066	-0.0602	-0.0090	-0.0542	-0.0264	0.0540	-0.0213	-0.0318	-0.0488
23 Chemicals and allied products	3.72	28	0.1487	-0.0350	0.0072	0.0684	0.0772	0.2754	0.1080	0.1787	-0.1470	0.2068	0.2187	0.0983	0.0860
24 Petroleum and coal products	0.26	29	-0.1653	-0.0883	0.0342	0.0210	0.165	0.1133	0.0683	-0.0824	0.0185	-0.1279	-0.1365	-0.0077	-0.0131
25 Rubber and miscellaneous plastics products	0.57	30	0.0072	0.0128	0.044	0.0338	0.0232	0.0450	0.0451	0.0384	0.0227	0.0423	0.0160	0.0292	0.0029
26 Leather and leather products	1.16	31	0.0072	0.0128	0.044	-0.0057	0.0084	0.0114	-0.0076	0.0072	-0.0013	0.0065	0.0077	0.0046	0.0065
27 Railroad transportation	1.73	40	0.0417	0.0815	0.0075	0.0077	0.0315	0.0114	0.0233	-0.0076	0.0031	-0.0040	0.0180	-0.0189	0.0032
28 Local and interurban passenger transit	0.28	41	-0.0112	-0.1038	-0.0069	-0.0170	-0.183	0.0114	-0.157	0.0049	0.0045	0.0024	0.0034	-0.0065	-0.0125
29 Trucking and warehousing	0.36	42	0.0281	0.1088	0.0009	-0.0184	0.0370	-0.0388	0.0595	-0.0765	0.0245	0.199	0.1548	0.0263	0.0346
30 Water transportation	0.42	44	0.0211	0.0012	0.0054	0.0053	0.0115	-0.0009	0.0175	0.0129	-0.0039	-0.0247	-0.0061	0.0036	0.0073
31 Transportation by air	1.45	45	0.0823	-0.0346	0.1018	0.0200	0.1272	0.0194	0.0335	0.0545	-0.0291	0.0254	0.0160	0.0433	0.0321
32 Pipelines, except natural gas	14.25	46	-0.0349	-0.0308	0.0541	0.0095	-0.1161	0.0900	0.0599	0.1740	-0.0291	0.0032	0.0976	0.0276	0.0003
33 Transportation services	2.38	47	0.0106	0.0087	-0.0056	0.0021	-0.0075	-0.0076	0.0140	0.0078	0.0034	0.0004	0.0009	-0.0001	-0.0045
34 Telephone and telegraph	22.98	48,1482,489	0.1340	0.1089	0.1450	-0.0041	0.0040	0.0054	0.0332	-0.0097	0.0052	0.0252	0.0003	0.0066	0.0030
35 Radio and television	10.07	483,484	0.0205	0.0755	0.0476	0.0329	0.0303	0.0948	-0.0536	-0.0191	0.1706	0.3270	0.2324	0.1685	0.1402
36 Electric, gas, and sanitary services	6.40	49	0.3333	0.1169	-0.0542	0.0155	0.0819	0.0217	0.0449	-0.0915	-0.1224	0.2904	0.0456	0.0197	0.0503
37 Wholesale trade	1.50	50,51	-0.0339	0.6899	0.6016	0.2325	0.3564	-0.298	0.7596	0.7070	1.0063	0.7389	0.1549	0.0649	0.0859
38 Retail trade	0.17	52-59	-0.1706	0.4253	0.1669	-0.2668	-0.0054	-0.5524	0.4329	0.5731	0.5461	0.782	0.2641	0.1538	-0.0338
39 Depository institutions	2.07	60	0.2260	0.1488	-0.1446	0.0028	-0.0860	0.2883	-0.0075	0.0836	0.1825	0.2115	0.3617	0.1152	0.1864
40 Nondepository institutions	12.39	61	-0.0349	-0.0308	0.0541	0.0095	-0.1161	0.0900	0.0599	0.1740	-0.0291	0.0032	0.0976	0.0276	0.0003
41 Security and commodity brokers	2.10	62	-0.0736	-0.0430	0.2363	0.2393	0.2145	-0.0013	0.5409	0.2839	0.4510	0.4914	0.3823	0.2656	0.0954
42 Insurance carriers	1.94	63	-0.0879	0.3229	-0.1790	0.1228	-0.0622	0.0549	-0.1100	0.1978	-0.0482	-0.0233	-0.0439	0.0131	0.0286
43 Insurance agents, brokers, and service	0.41	64	-0.0168	-0.052	-0.0587	-0.1050	-0.134	-0.0392	-0.0284	-0.0774	0.0322	0.1112	0.1610	-0.0114	-0.0397
44 Holding and other investment offices	1.65	67	0.0429	-0.0444	0.0471	0.0642	-0.1019	0.0278	-0.0847	0.0265	0.2111	-0.1184	-0.0668	-0.0016	0.0025
45 Hotels and other lodging places	0.16	70	-0.0226	0.0333	0.0445	0.0048	-0.0020	0.0321	0.0201	-0.0713	-0.0670	-0.0391	-0.0030	-0.0064	-0.0106
46 Personal services	0.43	72	-0.0572	-0.0447	0.0254	0.0066	-0.0319	-0.0349	-0.0349	0.0304	0.0606	-0.0467	-0.0109	-0.0109	-0.0001
47 Business services	0.64	73	0.0204	0.0581	-0.0025	-0.1914	-0.0636	-0.3119	-0.0534	0.0209	-0.2238	0.0467	-0.0257	-0.0632	-0.0771
48 Auto repair, services, and parking	0.20	75	0.0024	0.0211	-0.0337	0.0801	0.0203	-0.0075	-0.0365	-0.0253	0.0669	0.0311	0.0038	-0.0017	0.0058
49 Miscellaneous repair services	0.63	76	-0.0163	0.0097	-0.0302	-0.0207	0.0189	-0.0080	-0.0284	-0.0147	0.0007	-0.0237	-0.0031	-0.0094	-0.0034
50 Motion pictures	2.28	78	-0.0464	-0.0155	0.0013	0.0435	-0.0652	-0.0082	-0.0071	-0.0087	0.0194	-0.0029	-0.0076	-0.0076	0.0015
51 Amusement and recreation services	0.10	79	0.0034	0.0094	0.0566	-0.0932	-0.0619	-0.0424	-0.0040	0.0063	0.0006	-0.0027	-0.0629	-0.0190	-0.0162
52 Health services	0.42	80	-0.1221	-0.2016	-0.2761	-0.3998	-0.2719	-0.1247	-0.0469	-0.2175	0.0288	0.0844	-0.1508	-0.1508	-0.0525
53 Legal services	0.48	81	0.0253	-0.0245	0.0343	-0.1023	-0.0372	0.0657	-0.1342	0.0889	0.0024	0.0241	0.0616	-0.0004	-0.0111
54 Educational services	0.06	82	-0.0229	-0.1007	-0.0882	-0.0266	-0.0231	-0.0272	-0.0566	-0.0492	-0.0518	-0.0565	-0.0471	-0.0471	-0.0521
55 Other services, n.e.c.	0.34	83,84,86,87,89	-0.0935	-0.3343	0.0750	-0.0530	-0.1108	-0.1825	-0.1442	-0.1236	-0.1134	-0.0870	-0.0400	-0.1098	-0.1165
Sum of Contributions (Pct.)			0.228	1.480	1.900	0.6195	1.3395	0.6790	2.0439	2.3857	2.8079	2.8931	2.772	1.6844	1.9208

Source: ESA estimates derived from BEA data.

Table A-4.3b: GDP PER FTE GROWTH IN TOP-HALF INDUSTRIES OF THE U.S. NONFARM BUSINESS SECTOR, 1989-2000

Industry	TREQIFTE Rank 1996	SIC	(Percentage Point)																
			1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	1989-00	1989-95	1995-2000	Contribution (Pct. Pt.)		
34 Telephone and telegraph	22.98	481,482,489	0.2485	0.2393	0.3255	0.4774	0.2447	0.2158	0.5579	-0.0455	0.3116	0.6532	0.4080	0.3279	0.2919	0.3710			
32 Pipelines except natural gas	14.25	46	-0.0359	0.0171	-0.0116	0.0044	-0.0137	-0.0139	0.0298	0.158	0.0078	-0.008	0.0018	0.0002	-0.0089	0.0112			
40 Nondepository institutions	12.39	61	-0.0790	-0.0674	0.0852	0.0342	-0.2641	0.2058	0.0741	0.3016	-0.1284	-0.0263	0.2166	0.0320	-0.0142	0.0875			
35 Radio and television	10.07	483,484	0.0310	0.1618	0.0982	0.0633	0.0539	0.1827	-0.2072	-0.0421	-0.0199	-0.0366	0.0743	0.0327	0.0985	-0.0463			
24 Petroleum and coal products	7.57	29	-0.3430	-0.2045	0.0724	0.0485	0.0381	0.2376	0.1402	-0.1639	0.0389	0.2837	-0.2722	-0.0151	-0.0251	0.0013			
36 Electric, gas, and sanitary services	6.40	49	0.2586	0.2358	-0.1100	0.0427	0.1828	0.4798	0.1143	-0.1731	-0.2381	0.5922	0.1608	0.1405	0.1813	0.0916			
3 Oil and gas extraction	4.02	13	0.0513	-0.2658	-0.1826	0.2583	0.1626	0.2012	-0.0827	0.4683	0.0076	-0.1325	-0.6062	-0.0510	0.0342	-0.1531			
23 Chemicals and allied products	3.72	28	0.2912	-0.0681	0.1641	-0.0104	0.5924	0.1304	0.2277	0.3618	-0.2969	0.4214	0.4416	0.2050	0.1833	0.2311			
1 Metal mining	2.96	10	0.0309	0.0762	0.0231	0.0068	-0.0009	-0.0151	0.0061	0.0135	0.0509	0.0234	-0.0015	0.0194	0.0202	0.0185			
18 Tobacco products	2.44	21	-0.1034	-0.1388	-0.1123	-0.0082	0.2231	0.0723	-0.0274	-0.0329	-0.0762	-0.3664	-0.0077	-0.0523	-0.0107	-0.1021			
33 Transportation services	2.38	47	0.0191	0.0173	-0.0124	-0.0252	-0.0159	-0.0045	0.0610	-0.0375	-0.0033	0.0474	-0.0084	0.0034	-0.0036	0.0118			
50 Motion pictures	2.28	78	-0.1081	-0.0302	0.0026	0.0915	-0.1647	-0.0495	-0.0411	0.0219	-0.0206	0.0237	-0.0306	-0.0306	-0.0451	-0.0131			
41 Security and commodity brokers	2.10	62	-0.1492	-0.0845	0.4706	0.4696	0.4032	-0.0129	1.0905	0.5395	0.8688	0.9700	1.1294	0.5172	0.1828	0.9184			
39 Depository institutions	2.07	60	0.4697	0.3857	-0.2381	0.0199	-0.1643	0.6318	-0.0018	0.1634	0.3649	0.4385	0.7485	0.2562	0.1841	0.3427			
42 Insurance carriers	1.94	63	-0.2208	0.6489	-0.3535	0.2531	-0.1314	0.1296	-0.2246	0.3678	-0.1307	-0.0681	-0.0676	0.0202	0.0543	-0.0206			
27 Railroad transportation	1.73	40	0.1001	0.1770	0.0230	0.0188	0.0711	0.0236	0.0562	-0.0126	-0.0089	-0.0082	0.0438	0.0440	0.0689	0.0118			
44 Holding and other investment offices	1.65	67	0.0641	-0.1010	0.1049	0.1241	-0.2132	0.0640	-0.1744	0.0563	0.4235	-0.2501	-0.1791	-0.0055	0.1005	-0.0247			
15 Instruments and related products	1.59	38	0.1757	0.0406	0.0198	-0.1364	-0.0862	0.0195	-0.0063	-0.1673	-0.0492	0.0341	0.0077	-0.0089	0.0138	-0.0362			
37 Wholesale trade	1.50	5051	-0.0252	1.5764	1.2365	0.5499	0.5716	-0.6883	1.4912	1.2635	1.8873	0.4017	0.2326	0.7725	0.5366	1.0653			
31 Transportation by air	1.45	45	0.1277	-0.0627	0.2119	0.1002	0.2353	0.0016	0.1486	0.0930	-0.1059	0.0715	-0.0062	0.0610	0.0873	0.0294			
12 Electronic and other electric equipment	1.27	36	0.3996	0.5965	0.2611	0.7700	0.8815	1.0926	0.8416	0.8456	0.7092	1.0729	1.0586	0.7754	0.6672	0.9052			
21 Paper and allied products	1.00	26	0.0148	0.0745	0.0655	0.1791	0.0155	-0.3443	0.1694	0.0836	-0.0522	0.0645	-0.1907	0.0073	0.0009	0.0149			
22 Printing and publishing	0.84	27	-0.1771	-0.0690	0.0800	-0.2523	-0.0489	-0.1256	-0.0130	-0.1284	-0.0634	0.1203	-0.0444	-0.0682	-0.0985	-0.0252			
2 Coal mining	0.81	12	0.0187	0.0448	0.0856	0.0485	0.0417	0.0417	0.0066	0.0062	0.0336	0.0577	0.0217	0.0437	0.0501	0.0360			
11 Industrial machinery and equipment	0.76	35	0.1870	-0.2150	0.6655	0.2041	0.2811	0.4855	0.3655	0.5217	0.8965	0.6415	0.4907	0.4113	0.2681	0.5831			
14 Other transportation equipment	0.74	37exc371	0.0650	0.1930	-0.1024	0.1039	-0.0239	0.0099	0.0533	0.0111	0.0664	0.2170	-0.0758	0.0350	0.0409	0.0278			
4 Nonmetallic minerals, except fuels	0.64	14	-0.0068	0.0026	0.0225	-0.0131	0.0539	-0.0109	0.0301	0.0112	0.0094	-0.0031	0.0406	0.0124	0.0080	0.0176			
47 Business services	0.64	73	-0.1675	0.2476	-0.2227	-0.7751	-0.5561	-1.1789	-0.5898	-0.5453	-1.0039	-0.4043	-0.5775	-0.5229	-0.4421	-0.6196			
49 Miscellaneous repair services	0.63	76	-0.0469	0.0844	-0.0662	-0.0580	0.0560	-0.0377	-0.0879	-0.0314	-0.0054	-0.0469	-0.0006	-0.0199	-0.0111	-0.0305			
Sum of Contributions (Pct.)			1.1083	3.4974	2.0064	2.4896	2.4986	1.7411	4.0534	3.2993	3.3849	4.6467	3.0612	2.3479	2.3236	3.6971			

Source: ESA estimates derived from BEA data.

Table A-4.3c: GDP PER FTE GROWTH IN BOTTOM-HALF INDUSTRIES OF THE U.S. NONFARM BUSINESS SECTOR, 1989-2000

Industry	FTE Rank 1996	SIC	(Percentage Point)													Average Contribution (Pct. Pt.) 1989-95	Average Contribution (Pct. Pt.) 1995-2000
			1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00				
17 Food and kindred products	0.59	20	0.0150	0.0749	0.0096	0.0915	-0.1137	0.6917	-0.5041	-0.0152	-0.1957	0.1570	0.0212	0.0211	0.1282	-0.1074	
9 Primary metal industries	0.57	33	0.0265	0.0266	0.0999	0.1942	0.0361	-0.0418	0.0340	0.0565	0.0481	0.1070	0.0008	0.0530	0.0569	0.0462	
13 Motor vehicles and equipment	0.56	371	-0.2220	-0.2568	0.2845	0.5861	0.3966	0.0215	-0.3669	0.1347	0.4286	0.0483	0.0629	0.0998	0.1316	0.0615	
53 Legal services	0.49	81	0.0416	-0.1023	0.0713	-0.1914	-0.0713	0.1256	-0.2573	0.1638	0.0569	0.0578	0.1304	0.0041	-0.0210	0.0343	
46 Personal services	0.43	72	-0.0967	-0.0332	0.0042	0.0248	-0.0505	-0.0274	-0.0573	0.0591	0.1264	-0.0793	-0.0093	-0.0126	-0.0298	0.0079	
52 Health services	0.42	80	-0.0907	-0.2437	-0.3538	-0.6514	-0.4100	-0.1465	0.0371	-0.3310	-0.1737	0.1064	0.2445	-0.1830	-0.3160	-0.0233	
8 Stone, clay, and glass products	0.42	32	0.0263	-0.0345	0.1312	-0.0328	0.0711	0.0246	0.0086	0.0962	-0.0234	0.0488	0.0254	0.0310	0.0310	0.0311	
30 Water transportation	0.42	44	0.0420	0.0051	0.0065	0.0097	0.0241	-0.0018	0.0336	0.0273	-0.0063	-0.0471	-0.0099	0.0076	0.0143	-0.0005	
43 Insurance agents, brokers, and service	0.41	64	-0.0271	-0.0059	-0.1221	-0.1965	-0.0161	-0.0712	-0.0526	-0.0265	0.0710	0.2193	0.0329	-0.0177	-0.0732	0.0488	
29 Trucking and warehousing	0.36	42	0.0513	0.2014	0.1775	-0.0009	0.1064	-0.0486	0.1321	-0.1296	0.0771	0.0670	0.1228	0.0688	0.0612	0.0539	
83,84,86.																	
55 Other services, n.e.c.	0.34	87,89	-0.0545	-0.5565	0.1239	0.0198	-0.1115	-0.2206	-0.1498	-0.0931	-0.0403	-0.0427	0.0870	-0.0944	-0.1332	-0.0478	
10 Fabricated metal products	0.32	34	-0.0871	-0.0964	0.0984	0.1242	0.3000	0.0650	0.0725	0.0438	-0.0400	0.0356	0.1139	0.0483	0.0675	0.0252	
16 Miscellaneous manufacturing industries	0.29	39	0.0297	-0.0436	-0.0420	0.0144	0.0214	0.0262	0.0065	0.0393	-0.0024	0.0563	0.0251	0.0121	0.0010	0.0254	
28 Local and interurban passenger transit	0.28	41	-0.0204	-0.0235	-0.0110	-0.0242	-0.0269	-0.0087	-0.0223	0.0172	0.0034	0.0111	0.0307	-0.0069	-0.0193	0.0080	
19 Textile mill products	0.26	22	0.0770	0.0576	0.1124	0.0014	0.0255	-0.0046	0.0286	0.0083	0.0049	0.0438	0.0527	0.0371	0.0449	0.0277	
25 Rubber and miscellaneous plastics products	0.26	30	-0.0283	0.0897	0.1016	0.0791	0.0650	0.0391	0.0885	0.0847	0.0517	0.0813	0.0346	0.0625	0.0577	0.0682	
48 Auto repair, services, and parking	0.20	75	0.0200	0.0911	-0.0645	-0.0726	0.0591	0.0111	-0.0368	-0.0305	0.1264	0.0852	0.0254	0.0129	-0.0047	0.0339	
6 Lumber and wood products	0.20	24	-0.0376	-0.0279	-0.0708	-0.1528	-0.0117	0.0757	-0.0750	-0.0327	-0.0163	0.0479	0.0570	-0.0223	-0.0373	-0.0042	
38 Retail trade	0.17	52-59	-0.2907	0.6177	0.3908	-0.3113	0.2735	-0.3529	1.0023	1.3065	1.2150	0.3895	0.7756	0.4560	0.0545	0.3978	
45 Hotels and other lodging places	0.16	70	-0.0301	0.0414	0.0783	0.0158	0.0137	0.0816	0.0568	-0.1211	-0.1146	-0.0485	0.0148	-0.0011	0.0334	-0.0425	
26 Leather and leather products	0.16	31	0.0102	0.0200	0.0066	-0.0114	0.0162	0.0183	-0.0197	0.0113	-0.0048	0.0074	0.0131	0.0061	0.0100	0.0015	
7 Furniture and fixtures	0.16	25	-0.0112	0.0248	0.0535	0.0349	-0.0341	0.0042	0.0072	0.0397	-0.0065	0.0037	0.0039	0.0109	0.0120	0.0086	
20 Apparel and other textile products	0.13	23	0.0473	0.0483	0.0444	0.0095	0.0208	0.0555	0.0856	0.0519	0.0565	0.0257	0.1124	0.0508	0.0378	0.0664	
5 Construction	0.11	15,16,17	-0.1239	0.0042	0.4417	-0.0232	0.0649	-0.4252	0.1335	-0.2276	0.2970	0.0715	-0.1659	0.0043	-0.0103	0.0217	
51 Amusement and recreation services	0.10	79	0.0307	0.0234	0.1309	-0.1529	-0.0779	-0.0433	-0.0167	0.0471	0.0166	0.0180	-0.0885	-0.0102	-0.0148	-0.0047	
54 Educational services	0.06	82	-0.0333	0.0002	-0.1289	-0.0289	-0.0233	-0.0280	-0.0895	-0.0706	-0.0619	-0.0780	-0.0556	-0.0545	-0.0407	-0.0711	
Sum of Contributions (Pct.)			-0.7261	-0.1689	1.5731	-0.6649	0.5475	-0.1803	0.0786	1.1299	1.8917	1.3896	1.5580	0.5835	0.0618	1.2085	

Source: ESA estimates derived from BEA data.

Table A-4.4: CONTRIBUTIONS TO OVERALL GDP PER FTE GROWTH BY TOP-HALF AND BOTTOM-HALF INDUSTRIES OF THE U.S. NONFARM BUSINESS SECTOR, 1989-2000
(Percentage Point)

Industry	IT/EGFTE Rank 1996	SIC	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	Average (Pct Pt) 1989-00
34 Telephone and telegraph	22.98		0.1340	0.1089	0.1450	0.2275	0.1215	0.1041	0.2782	0.0038	0.1706	0.3270	0.2324	0.1685
32 Pile mills, except nuclear gas	14.25	481,482,489	-0.0077	-0.0087	-0.0056	0.0021	-0.1161	-0.0900	0.0140	0.0078	0.0034	0.0004	0.0009	-0.0001
40 Nondepository institutions	11.78	61	-0.0349	-0.0308	0.0541	0.0395	-0.1161	0.0900	0.0559	0.1740	0.0032	0.0032	0.0076	0.0276
35 Radio and television	10.07	483,484	0.0205	-0.0755	0.0476	0.0329	0.0303	0.0948	-0.0936	-0.0048	-0.0048	-0.0131	0.0456	0.0197
24 Petroleum and coal products	7.57	29	-0.1653	-0.0983	0.0342	0.0210	0.0165	0.1133	0.0663	-0.0824	0.0185	0.1279	-0.1365	-0.0077
49 Electric, gas, and sanitary services	6.40		0.1353	0.1168	-0.0542	0.0195	0.0819	0.2267	0.0449	-0.0915	-0.1254	0.2894	0.0769	0.0649
23 Chemical and allied products	3.92	28	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875
22 Food and kindred products	3.72	20	0.1487	0.0369	0.0775	-0.0072	0.2754	0.0584	0.1082	0.1767	-0.1470	0.2068	0.2187	0.0983
13 Metal mining	2.96	10	0.0158	0.0365	0.0103	0.0019	-0.0013	0.0069	0.0039	0.0667	0.0232	0.0084	-0.0023	0.0088
18 Tobacco products	2.44	21	-0.0505	-0.0684	-0.0549	-0.0052	0.1062	0.0344	-0.0137	-0.1163	-0.0382	-0.1798	-0.0046	-0.0263
33 Transportation services	2.38	47	0.0106	0.0075	-0.0041	0.0041	0.0040	0.0075	0.0332	-0.0097	0.0092	0.0003	0.0066	0.0066
50 Motion pictures	2.17	78	-0.0464	-0.0155	0.0051	0.0435	-0.0652	-0.0082	-0.0121	-0.0087	0.0194	-0.0029	0.0117	-0.0076
41 Security and commodity brokers	1.99	62	-0.0736	-0.0430	0.2363	0.2393	0.2145	-0.0013	0.5409	0.2839	0.4510	0.4914	0.5823	0.2856
39 Depository institutions	1.97	60	0.2260	0.1489	-0.1446	0.0028	-0.0860	0.2883	-0.0075	0.0836	0.1825	0.2115	0.3817	0.1152
42 Insurance carriers	1.84	63	-0.0879	0.3229	0.1790	0.1228	-0.0622	0.0549	-0.1100	0.1978	-0.0482	-0.0233	-0.0439	0.0131
27 Railroad transportation	1.73	40	0.0417	0.0815	0.0075	0.0077	0.0315	0.0114	0.0233	-0.0076	-0.0031	-0.0040	0.0180	0.0189
15 Instruments and related products	1.59	38	0.0728	0.0073	-0.0096	-0.0799	-0.0290	0.0009	0.0036	-0.0788	-0.0210	0.0075	0.0026	-0.0112
44 Holding and other investment offices	1.57	67	0.0429	-0.0444	0.0471	0.0642	-0.1019	0.0278	-0.0847	0.0265	0.2111	-0.1194	-0.0868	-0.0016
31 Transportation by air	1.45	45	0.0823	-0.0346	0.1018	0.0200	0.1272	0.0194	0.0935	0.0545	-0.0291	0.0254	0.0160	0.0433
37 Wholesale trade	1.43	50,51	-0.0339	0.6999	0.6016	0.2325	0.3564	-0.2298	0.7596	0.7070	1.0063	0.2389	0.1549	0.4076
12 Electronic and other electric equipment	1.27	36	0.1657	0.2525	0.0977	0.3658	0.4464	0.5461	0.4259	0.4322	0.3590	0.5077	0.5424	0.3765
21 Paper and allied products	1.00	26	0.0085	0.0329	0.0306	0.0879	0.0083	-0.1661	0.0788	0.0405	-0.0276	0.0275	-0.0994	0.0020
22 Printing and publishing	0.84	27	-0.0837	-0.0497	0.0219	-0.1176	-0.0056	-0.0022	-0.0090	0.0025	-0.0264	0.0540	-0.0213	-0.0318
11 Coal mining	0.76	10	0.0768	0.1368	0.0768	0.1017	0.1613	0.2728	0.1878	0.3662	0.4637	0.2945	0.1918	0.1918
14 Other transportation equipment	0.74	37,8,46,87,89	0.0243	0.0572	-0.0862	0.0049	0.0400	-0.0108	0.0285	0.0207	0.0146	0.0957	-0.0528	0.0024
14 Nonmetallic minerals, except fuels	0.64	14	-0.0033	0.0018	0.0095	-0.0058	0.0263	-0.0039	0.0146	0.0064	0.0055	-0.0011	0.0204	0.0061
49 Business services	0.61	73	0.0294	0.0581	-0.0025	-0.1914	-0.0636	-0.3119	-0.0534	0.0209	-0.2238	0.0497	-0.0257	-0.0632
47 Miscellaneous repair services	0.60	76	-0.0163	0.0197	0.0302	-0.0207	0.0169	-0.0080	-0.0264	-0.0147	0.0007	-0.0237	-0.0031	-0.0094
Contributions of Top-Half Industries			0.6469	1.3488	1.1961	1.3383	1.5526	1.2364	2.3371	2.1824	2.2025	2.5606	1.8530	1.6777
17 Food and kindred products	0.59	20	0.0032	0.0367	0.0077	0.0434	-0.0645	0.3555	-0.2621	-0.0070	-0.0984	0.0784	0.0101	0.0084
9 Primary metal industries	0.57	33	0.0172	0.0218	0.0602	0.1030	0.0142	-0.0230	0.0161	0.0281	0.0231	0.0558	0.0000	0.0288
13 Motor vehicles and equipment	0.56	371	-0.1077	-0.1227	0.1368	0.2899	0.1909	-0.1883	0.2897	0.0647	0.2132	0.0186	0.0323	0.0475
53 Legal services	0.47	81	0.0253	-0.0525	0.0343	-0.1023	-0.0372	0.0657	-0.1342	0.0889	0.0224	0.0616	0.0616	-0.0004
8 Stone, clay, and glass products	0.42	32	0.0164	-0.0087	0.0704	-0.0189	0.0326	0.0120	0.0039	0.0459	-0.0150	0.0241	0.0107	0.0157
30 Water transportation	0.42	44	0.0211	0.0012	0.0054	0.0053	0.0115	-0.0009	0.0175	0.0129	-0.0039	-0.0247	-0.0061	0.0036
46 Personal services	0.41	72	-0.0572	-0.0147	-0.0024	0.0066	-0.0319	-0.0193	-0.0349	0.0304	0.0606	-0.0247	-0.0000	-0.0109
52 Health services	0.40	80	-0.1221	-0.2016	-0.2761	-0.3998	-0.2719	-0.1247	-0.0469	0.0275	-0.1193	0.0268	0.0944	-0.1508
43 Insurance agents, brokers, and service	0.39	64	-0.0166	-0.0052	-0.0067	-0.1050	-0.0134	-0.0382	-0.0294	-0.0744	-0.0322	0.1112	0.0160	-0.0114
63 Lumber and wood products	0.38	24	0.0095	-0.0343	0.0759	0.0759	0.0759	0.0759	0.0759	0.0759	0.0759	0.0759	0.0759	0.0759
55 Other nonmetallic mineral products	0.32	83,84,86,87,89	-0.0935	-0.0339	0.0630	-0.0630	-0.1108	-0.1826	-0.1443	-0.1736	-0.1134	-0.0770	-0.0400	-0.1088
10 Fabricated metal products	0.32	34	-0.0411	-0.0323	0.0553	0.0623	0.1427	0.0223	0.0364	0.1339	-0.0275	0.0149	0.0037	0.0228
16 Miscellaneous manufacturing industries	0.29	39	0.0201	-0.0215	0.0216	0.0953	0.0075	0.0138	0.0022	0.0204	-0.0017	0.0293	0.0129	0.0061
28 Local and interurban passenger transit	0.28	41	-0.0112	-0.0139	-0.0069	-0.0170	-0.0183	-0.0081	-0.0157	0.0049	-0.0015	0.0024	0.0134	-0.0065
19 Textile mill products	0.26	41	0.0451	0.0371	0.0565	-0.0009	0.0118	0.0014	0.0217	0.0073	0.0073	0.0038	0.0321	0.0227
25 Rubber and miscellaneous plastics products	0.26	30	-0.0153	0.0512	0.0484	0.0338	0.0232	0.0150	0.0451	0.0384	0.0227	0.0423	0.0160	0.0292
6 Lumber and wood products	0.20	24	-0.0144	-0.0014	-0.0379	-0.0868	-0.0178	0.0364	-0.0409	-0.0194	-0.0145	0.0188	0.0323	-0.0132
48 Auto repair, services, and parking	0.17	75	0.0024	0.0211	-0.0337	-0.0501	0.0203	-0.0075	-0.0365	0.0569	0.0311	0.0028	-0.0017	0.0017
38 Retail trade	0.17	52-59	-0.1706	0.4253	0.1669	-0.2668	-0.0054	-0.3524	0.4329	0.5731	0.2841	0.0782	0.2841	0.1538
26 Leather and leather products	0.16	31	0.0072	0.0128	0.0044	-0.0057	0.0094	0.0111	-0.0076	0.0072	-0.0013	0.0055	0.0077	0.0046
7 Furniture and fixtures	0.16	25	-0.0015	0.0216	0.0270	0.0147	-0.0225	0.0001	0.0049	0.0049	-0.0018	0.0002	0.0000	0.0000
45 Hotels and other lodging places	0.15	70	-0.0226	0.0333	0.0445	0.0048	-0.0020	0.0321	0.0201	-0.0713	-0.0670	-0.0391	-0.0030	-0.0064
20 Apparel and other textile products	0.13	23	0.0343	0.0335	0.0071	0.0071	0.0091	0.0383	0.0061	0.0362	0.0423	0.0280	0.0737	0.0353
5 Construction	0.11	15,16,17	-0.0512	0.1152	0.2706	-0.0503	-0.0428	-0.2898	0.0069	0.0669	0.0768	-0.0490	-0.1513	-0.0321
51 Amusement and recreation services	0.10	79	0.0034	0.0084	0.0566	-0.0032	-0.0619	-0.0424	-0.0240	0.0083	0.0006	-0.0027	-0.0629	-0.0190
54 Educational services	0.05	82	-0.0229	-0.0107	-0.0862	0.0266	-0.0272	-0.0566	-0.0272	-0.0566	-0.0516	-0.0368	-0.0464	-0.0417
Contributions of Bottom-Half Industries			-0.3242	0.1094	0.7099	-0.1787	-0.2151	-0.3573	-0.2933	0.2034	0.6094	0.3326	0.4193	0.0067
Sum of Contributions			0.1228	1.4580	1.9060	0.5196	1.3395	0.6790	2.0439	2.9857	2.8079	2.8331	2.2722	1.6844

Note: The results in this table are the same as those in Table A-4.3a.

Source: ESA estimates derived from BEA data.

Table A-4.5: GDP PER FTE GROWTH IN TOP-HALF AND BOTTOM-HALF INDUSTRIES AND IN ALL INDUSTRIES OF THE U.S. NONFARM BUSINESS SECTOR, 1989-1995 AND 1995-2000

	Average Contrib. (Pct.) 1989-1995	Average Contrib. (Pct.) 1995-2000
Top-Half Industries (see Table A-4.3b)	2.3236	3.6971
Bottom-Half Industries (see Table A-4.3c)	0.0618	1.2096
All Industries (see Table A-4.3a)	1.0208	2.4806

Source: ESA estimates derived from BEA data.

Table A-4.6: CONTRIBUTIONS TO OVERALL GDP PER FTE GROWTH ACCELERATION BY TOP-HALF AND BOTTOM-HALF INDUSTRIES OF THE U.S. NONFARM BUSINESS SECTOR, 1995-2000 OVER 1989-1995

Industry	ITOE/FTE Rank 1996	SIC	(Percentage Point)																Growth Acceleration 1995-00 over 1989-95
			1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	1999-95	2000-00	1995-00 over 1989-95			
34 Telephones and telegraph	22.98	481,482,489	0.1340	0.1089	0.1460	0.2375	0.1215	0.1041	0.2792	0.0038	0.1706	0.3270	0.3234	0.1402	0.2024	0.6822			
37 Airlines, except intrastate	14.95	40	-0.0174	-0.0037	-0.0066	0.0623	-0.0076	-0.0075	0.1440	0.0078	0.0034	0.0004	0.0009	-0.0045	0.0068	0.0068			
40 Nondepository institutions	12.53	6	-0.0349	0.0308	0.0541	0.0885	-0.1161	0.0075	0.0559	0.1740	0.0291	0.0932	0.0976	0.0003	0.0603	0.6800			
35 Petroleum and coal products	10.97	483,484	0.0205	0.0755	0.0476	0.0329	0.0303	0.0848	0.0936	0.0948	-0.0048	-0.0131	0.0456	0.0503	-0.0170	0.0800			
24 Petroleum and coal products	7.57	29	-0.1653	-0.0983	0.0342	0.0210	0.1165	0.1133	0.0683	-0.0824	-0.0018	-0.1385	-0.1385	-0.0131	-0.0012	0.0119			
36 Electric, gas, and sanitary services	6.40	49	0.1333	0.1169	-0.0542	0.1555	0.0819	0.2217	0.0449	-0.0915	0.1224	0.2904	0.0789	0.0859	0.0397	0.0462			
3 Oil and gas extraction	4.02	13	0.0308	-0.1380	-0.1068	0.1196	0.0749	0.0895	-0.0402	0.0320	0.0038	-0.0819	-0.2845	0.1117	-0.0762	-0.0878			
23 Chemicals and allied products	3.72	28	0.1467	-0.0350	0.0777	-0.0072	0.2764	0.0584	0.1080	0.1787	0.2094	0.187	0.0860	0.1130	0.0082	0.0012			
11 Metal mining	2.96	10	0.1558	0.0355	0.1003	0.0919	-0.0013	-0.0559	0.0039	0.0867	0.0232	0.0094	-0.0046	-0.0061	-0.0505	-0.0012			
18 Tobacco products	2.44	21	-0.0505	-0.0664	-0.0549	-0.0552	0.1082	0.0344	-0.137	0.0332	0.0352	-0.1798	-0.0046	-0.0061	-0.0505	-0.0012			
33 Transportation services	2.38	47	0.0106	0.0075	0.0013	-0.0041	0.0040	0.0054	0.0332	0.0097	0.0052	0.0003	0.0030	0.0030	0.0030	0.0078			
50 Motion pictures	2.28	78	-0.0464	-0.0155	0.0013	0.2435	-0.0652	-0.0012	0.0121	-0.0087	0.0194	-0.0029	0.0117	-0.0151	0.0015	0.1666			
41 Security and commodity brokers	2.10	62	-0.0736	-0.0430	0.2363	0.0393	0.2145	-0.0013	0.5409	0.2839	0.4510	0.4814	0.5823	0.0954	0.4699	0.3745			
39 Depository institutions	2.07	60	0.2260	0.1489	0.1489	0.0028	-0.0860	0.2883	-0.0075	0.0836	0.1825	0.2115	0.3617	0.0726	0.1864	0.0938			
42 Insurance carriers	1.94	63	-0.0879	0.3229	-0.1790	0.1228	-0.0622	0.0549	-0.1100	0.1978	0.1482	-0.0233	-0.0439	0.0286	-0.0055	-0.0341			
27 Railroad transportation	1.73	40	0.0417	0.0815	0.0075	0.0677	0.0315	0.1114	0.0233	-0.0076	-0.0031	-0.0040	0.0180	0.0302	-0.0055	-0.0249			
44 Holding and other investment offices	1.65	67	0.0429	-0.0444	0.0471	0.0642	-0.1019	0.0278	0.1114	0.0233	-0.0076	-0.0031	-0.0040	0.0180	0.0302	-0.0055			
15 Wholesale and related products	1.59	38	0.0728	0.0073	-0.0096	-0.0799	-0.0290	0.0009	0.0036	-0.0402	-0.0210	0.0075	0.0026	-0.0062	-0.0106	-0.1666			
37 Wholesale trade	1.50	50.51	-0.0339	0.8899	0.6016	0.2325	0.3564	-0.2298	0.7596	0.7070	1.0063	0.2389	0.1549	0.2694	0.5733	0.3039			
31 Transportation by air	1.45	45	0.0823	-0.0346	0.1018	0.2020	0.1272	0.194	0.0935	0.545	-0.0291	0.0254	0.160	0.0527	0.0321	-0.0206			
12 Electronic and other electric equipment	1.27	36	0.1657	0.2525	0.0977	-0.1176	-0.0056	-0.0602	-0.1661	0.0788	0.0405	0.0276	0.0542	0.3124	0.4534	0.1411			
21 Paper and allied products	1.00	26	0.0085	0.0329	0.0308	0.0879	0.0083	0.0879	0.0083	0.4259	0.4322	0.3590	0.5077	0.0527	0.0040	0.0036			
22 Printing and publishing	0.84	27	-0.0037	-0.0477	0.0219	-0.1176	-0.0056	-0.0602	-0.1661	0.0788	0.0405	-0.0276	-0.0994	-0.0488	-0.0114	-0.067			
2 Coal mining	0.81	12	0.0095	0.1688	0.0374	0.0170	0.0293	0.0170	0.2688	0.2862	0.1050	0.0258	0.0075	0.0212	0.0154	-0.0114			
11 Industrial machinery and equipment	0.76	35	0.0745	-0.1367	0.2851	0.017	0.1613	0.2728	0.1778	0.1878	0.2862	0.2340	0.2340	0.1264	0.2910	0.1646			
14 Other transportation equipment	0.74	37 exc 37.1	-0.0043	0.0572	-0.0682	0.0409	-0.0400	-0.0108	0.0285	0.2027	0.0146	-0.0528	-0.0084	-0.0035	0.0155	0.0029			
4 Nonmetallic minerals, except fuels	0.64	14	-0.0233	-0.0018	-0.0695	-0.0558	0.0283	-0.0039	0.146	0.0064	0.0055	-0.0011	0.0204	0.0035	0.0092	0.0057			
47 Business services	0.64	73	0.0204	0.0581	0.0255	-0.1914	-0.0636	-0.3119	-0.0534	0.2029	-0.2238	-0.0497	-0.0257	-0.0771	-0.0465	0.0307			
49 Miscellaneous repair services	0.63	76	-0.0163	0.0197	-0.0302	-0.0207	0.189	-0.0080	-0.0284	-0.0147	0.0007	-0.0031	-0.0071	-0.0134	-0.0073	-0.0073			
Contributions of Top-Half Industries			0.6469	1.3486	1.1961	1.3383	1.5526	1.2364	2.3371	2.1824	2.2025	2.5606	1.8530	1.2198	2.2271	1.0073			
17 Food and kindred products	0.59	20	0.0032	0.0367	0.0077	0.0434	-0.0645	0.3555	-0.2621	-0.0070	-0.0984	0.0784	0.0101	0.0637	-0.0558	-0.1195			
9 Primary metal industries	0.57	33	0.0172	0.0218	0.0602	0.1030	0.142	-0.230	0.161	0.0231	0.0142	0.0558	0.0000	0.0322	0.0246	-0.0076			
13 Motor vehicles and equipment	0.56	371	-0.1077	-0.1227	0.1368	0.2899	0.1909	-0.0051	-0.1883	0.0647	0.132	0.0186	0.0323	0.0637	0.0281	-0.0356			
53 Legal services	0.49	81	0.0553	-0.0525	0.0343	-0.1023	-0.0372	0.0657	-0.1342	0.0889	0.0224	0.0241	0.0616	-0.0111	0.0125	0.0237			
46 Personal services	0.43	72	-0.0572	-0.0147	-0.0024	0.0066	-0.0319	-0.1947	-0.0349	0.0304	0.0606	-0.0467	-0.0100	-0.0198	-0.0001	0.197			
52 Health services	0.42	80	-0.1221	-0.2016	-0.2761	-0.3998	-0.2719	-0.1247	-0.0469	-0.2175	-0.1193	0.0268	0.0944	-0.2327	-0.0525	0.1802			
8 Stone, clay, and glass products	0.42	32	0.0164	-0.0087	0.0704	-0.0189	0.0326	0.0120	0.0039	0.0459	-0.0510	0.0241	0.107	0.0173	0.0139	-0.0034			
30 Water transportation	0.42	44	0.0211	0.0012	0.054	0.0553	-0.00134	-0.0009	0.0175	0.0129	-0.0039	-0.0247	-0.0061	0.0073	-0.0009	-0.0081			
43 Insurance agents, brokers, and service	0.41	64	-0.0168	-0.0052	-0.0587	-0.1050	-0.0134	-0.0392	-0.0294	-0.0174	0.0322	0.1112	0.160	-0.0387	0.0225	0.0622			
29 Trucking and warehousing	0.36	42	0.0281	0.1088	0.0909	-0.184	0.0370	-0.388	0.0595	-0.1442	-0.1134	-0.0870	-0.0400	-0.1165	0.0164	-0.182			
55 Other services, n.e.c.	0.34	83,84,86,87,89	-0.0935	-0.3343	0.0750	-0.0530	-0.1108	-0.1825	-0.1442	-0.1396	-0.1134	-0.0870	-0.0400	-0.1165	0.0164	-0.182			
10 Fabricated metal products	0.32	34	-0.0411	-0.0323	0.0553	0.0523	0.1427	0.223	0.0361	0.0139	-0.0275	0.0149	0.0037	0.0349	0.0082	-0.0266			
16 Miscellaneous manufacturing industries	0.29	39	0.0201	-0.0215	-0.0216	0.0503	0.0075	0.0138	0.0022	0.0204	-0.0017	0.0293	0.0129	0.0006	0.0126	0.0120			
28 Local and interurban passenger transit	0.28	41	-0.0112	-0.0139	-0.0069	-0.0170	-0.0183	-0.0081	-0.157	0.0049	-0.0015	0.0024	-0.0125	0.0007	0.0077	-0.0053			
19 Textile mill products	0.26	22	0.0451	0.0371	0.0565	-0.0009	0.0118	0.0014	0.0217	0.0073	0.0071	0.0308	0.0321	0.0251	0.0198	0.0068			
25 Rubber and miscellaneous plastics products	0.26	30	-0.0153	0.0512	0.0484	0.0338	0.0232	0.0150	0.0451	0.0384	0.0227	0.0423	0.160	0.0261	0.0329	0.0088			
48 Auto repair, services, and parking	0.20	75	-0.0024	0.0211	-0.0337	-0.0501	0.0203	-0.0075	-0.0385	-0.0263	0.0569	0.0311	0.0028	-0.0079	0.0056	0.0135			
46 Auto repair, services, and parking	0.20	75	-0.0024	0.0211	-0.0337	-0.0501	0.0203	-0.0075	-0.0385	-0.0263	0.0569	0.0311	0.0028	-0.0079	0.0056	0.0135			
38 Retail trade	0.17	52-59	-0.1706	0.4233	0.1669	-0.2668	-0.0054	-0.3524	0.4329	0.5461	0.0782	0.2641	0.0338	-0.0047	-0.0047	0.127			
45 Hotels and other lodging places	0.16	70	-0.0228	0.0333	0.0445	0.0448	-0.0020	0.0321	0.0201	-0.0713	-0.0670	-0.0391	-0.0030	-0.0338	-0.0047	-0.0471			
28 Leather and leather products	0.16	31	0.0072	0.0128	0.0044	-0.0057	0.0084	0.0111	-0.0076	0.0072	-0.0013	0.0055	0.0077	0.0065	0.0023	-0.0042			
7 Furniture and fixtures	0.16	25	-0.0015	0.0216	0.0270	0.0147	-0.0225	0.0001	0.0049	0.0072	-0.0013	0.0055	0.0077	0.0065	0.0023	-0.0042			
29 Apparel and other textile products	0.13	23	0.0343	0.0335	0.0243	0.0071	0.0081	0.0383	0.0611	0.0362	0.0280	0.0377	0.0245	0.0066	0.0029	-0.0037			
5 Construction	0.11	15,16,17	-0.0512	0.1152	0.1152	0.2706	-0.0428	-0.2898	0.0689	-0.1882	0.0768	-0.0900	-0.1513	-0.0080	0.0238	0.0238			
51 Amusement and recreation services	0.10	79	0.0034	0.0094	0.0566	-0.0932	-0.0619	-0.0424	-0.0240	0.0083	0.0006	-0.0027	-0.0629	-0.0213	-0.0162	-0.0529			
54 Educational services	0.06	82	-0.0229	-0.0107	-0.0882	-0.0286	-0.0231	-0.0272	-0.0586	-0.0482	-0.0518	-0.0065	-0.0464	-0.0331	-0.0621	-0.190			
Contributions of Bottom-Half Industries			-0.5442	0.1094	0.7099	-0.7187	-0.2131	-0.5573	-0.2933	0.2034	0.6054	0.3326	0.4193	-0.1990	0.2535	0.4524			
Sum of Contributions			0.1228	1.4580															

Table A-4.7: GDP PER FTE GROWTH IN U.S. NONFARM BUSINESS SECTOR BY MAJOR INDUSTRY GROUPS, 1989-2000
(Percent)

Industry Group	Growth (Pct.)										GPO/FTE Growth (Pct.) 1989-00	
	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99		1999-00
Mining	0.4289	-1.4863	2.8025	10.0291	8.3880	7.7683	0.7680	0.3126	3.6042	2.8966	-15.2979	1.8376
Construction	-0.8570	1.7682	5.0801	-0.8231	-0.5233	-4.9669	0.4895	-2.9302	1.8252	-0.4380	-2.1608	-0.3197
Manufacturing, Durable Goods	1.7602	0.5601	4.5907	6.0454	6.6110	6.4019	3.5698	6.4189	7.5469	8.8874	6.9374	5.3936
Manufacturing, Nondurable Goods	-0.5869	-0.1361	2.4251	0.4606	3.6913	4.1094	1.1824	1.6183	-2.4737	5.1129	1.4383	1.5311
Transportation and Public Utilities	3.0124	4.2343	3.0906	1.2016	2.3096	2.4897	3.1018	-2.1663	-0.9854	4.5937	2.9059	2.1625
Wholesale trade	-0.2097	8.3755	6.7070	2.8882	3.1699	-3.4170	8.2531	7.1947	10.8067	2.2119	1.3533	4.3031
Retail trade	-1.0568	1.7932	1.8904	-0.5321	2.3069	-0.2394	5.0619	6.3008	5.6761	2.4734	4.2146	2.5354
Finance and Insurance	0.4167	4.3124	-0.1505	3.3693	-2.2605	5.1231	3.3806	6.5162	6.0366	5.3642	8.8545	3.7257
Services	-0.4857	-1.6535	-0.1442	-2.3792	-1.3960	-1.2109	-0.9161	-0.1774	-0.3761	0.5707	0.9788	-0.6536
All Industries	0.1228	1.4580	1.9060	0.6196	1.3395	0.6790	2.0439	2.3857	2.8079	2.8931	2.2722	1.6844

Source: ESA estimates derived from BEA data.

Table A-4.8: CONTRIBUTIONS TO GDP PER FTE GROWTH IN U.S. NONFARM BUSINESS SECTOR BY MAJOR INDUSTRY GROUPS, 1989-2000

Industry	ITEQ/FTE Rank 1996	SIC	(Percentage Point)										Average Pct. Pt. 1989-00	
			1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99		1999-00
1 Metal mining	2.96	10	0.0158	0.0355	0.0103	0.0019	-0.0013	-0.0059	0.0039	0.0067	0.0232	0.0094	-0.0023	0.0088
2 Coal mining	0.81	12	0.0095	0.0168	0.0374	0.0170	0.0293	0.0170	0.0268	0.0022	0.0150	0.0258	0.0075	0.0186
3 Oil and gas extraction	4.02	13	0.0308	-0.1380	-0.1068	0.1196	0.0749	0.0895	-0.0402	0.0320	0.0038	-0.0819	-0.2945	-0.0283
4 Nonmetallic minerals, except fuels	0.64	14	-0.0033	-0.0018	0.0095	-0.0058	0.0263	-0.0039	0.0146	0.0064	0.0055	-0.0011	0.0204	0.0061
Mining			0.0528	-0.0875	-0.0496	0.1327	0.1293	0.0967	0.0051	0.0472	0.0475	-0.0478	-0.2690	0.0052
5 Construction	0.11	15,16,17	-0.0512	0.1152	0.2706	-0.0503	-0.0428	-0.2898	0.0069	-0.1882	0.0768	-0.0490	-0.1513	-0.0321
6 Lumber and wood products	0.20	24	-0.0144	-0.0014	-0.0379	-0.0868	-0.0178	0.0364	-0.0409	-0.0194	-0.0145	0.0188	0.0323	-0.0132
7 Furniture and fixtures	0.16	25	-0.0015	0.0216	0.0270	0.0147	-0.0225	0.0001	0.0049	0.0190	-0.0078	-0.0018	0.0002	0.0049
8 Stone, clay, and glass products	0.42	32	0.0164	-0.0087	0.0704	-0.0189	0.0326	0.0120	0.0039	0.0459	-0.0150	0.0241	0.0107	0.0157
9 Primary metal industries	0.57	33	0.0172	0.0218	0.0602	0.1030	0.0142	-0.0230	0.0161	0.0281	0.0231	0.0558	0.0000	0.0288
10 Fabricated metal products	0.32	34	-0.0411	-0.0323	0.0553	0.0623	0.1427	0.0223	0.0361	0.0139	-0.0278	0.0149	0.0037	0.0228
11 Industrial machinery and equipment	0.76	35	0.0745	-0.1367	0.2851	0.1017	0.1613	0.2728	0.1878	0.2861	0.4627	0.2845	0.2340	0.2012
12 Electronic and other electric equipment	1.27	36	0.1657	0.2525	0.0977	0.3658	0.4464	0.5461	0.4259	0.4322	0.3590	0.5077	0.5424	0.3765
13 Motor vehicles and equipment	0.56	371	-0.1077	-0.1227	0.1368	0.2899	0.1909	-0.0051	-0.1883	0.0647	0.2132	0.0186	0.0323	0.0475
14 Other transportation equipment	0.74	37exc371	0.0243	0.0572	-0.0862	0.0049	-0.0400	-0.0108	0.0285	0.0207	-0.0146	0.0957	-0.0528	0.0024
15 Instruments and related products	1.59	38	0.0728	0.0073	-0.0096	-0.0799	-0.0290	0.0009	0.0036	-0.0788	-0.0210	0.0075	0.0026	-0.0112
16 Miscellaneous manufacturing industries	0.29	39	0.0201	-0.0215	-0.0216	0.0053	0.0075	0.0138	0.0022	0.0204	-0.0017	0.0293	0.0129	0.0061
Manufacturing, Durable Goods			0.2263	0.0371	0.5773	0.7618	0.8863	0.8654	0.4797	0.8329	0.9559	1.0549	0.8184	0.6814
17 Food and kindred products	0.59	20	0.0032	0.0367	0.0077	0.0434	-0.0645	0.3555	-0.2621	-0.0070	-0.0984	0.0784	0.0101	0.0094
18 Tobacco products	2.44	21	-0.0505	-0.0664	-0.0549	-0.0052	0.1062	0.0344	-0.0137	-0.0163	-0.0382	-0.1798	-0.0046	-0.0263
19 Textile mill products	0.26	22	0.0451	0.0371	0.0565	-0.0009	0.0118	0.0014	0.0217	0.0073	0.0071	0.0308	0.0321	0.0227
20 Apparel and other textile products	0.13	23	0.0343	0.0335	0.0243	0.0071	0.0091	0.0383	0.0611	0.0362	0.0423	0.0280	0.0737	0.0353
21 Paper and allied products	1.00	26	0.0085	0.0329	0.0308	0.0879	0.0083	-0.1661	0.0788	0.0405	-0.0276	0.0275	-0.0994	0.0020
22 Printing and publishing	0.84	27	-0.0837	-0.0477	0.0219	-0.1176	-0.0056	-0.0602	-0.0090	-0.0542	-0.0264	0.0540	-0.0213	-0.0318
23 Chemicals and allied products	3.72	28	0.1467	-0.0350	0.0777	-0.0072	0.2754	0.0584	0.1080	0.1787	-0.1470	0.2068	0.1807	0.0983
24 Petroleum and coal products	7.57	29	-0.1653	-0.0983	0.0342	0.0210	0.0165	0.1133	0.0663	-0.0824	0.0185	0.1279	-0.1365	-0.0077
25 Rubber and miscellaneous plastics products	0.26	30	-0.0153	0.0512	0.0484	0.0338	0.0232	0.0150	0.0451	0.0384	0.0227	0.0423	0.0160	0.0292
26 Leather and leather products	0.16	31	0.0072	0.0128	0.0044	-0.0057	0.0094	0.0111	-0.0076	0.0072	-0.0013	0.0055	0.0077	0.0046
Manufacturing, Nondurables Goods			-0.0699	-0.0433	0.2511	0.0566	0.3899	0.4012	0.0886	0.1484	-0.2485	0.4215	0.0967	0.1357
27 Railroad transportation	1.73	40	0.0417	0.0815	0.0075	0.0077	0.0315	0.0114	0.0233	-0.0076	-0.0031	-0.0040	0.0180	0.0189
28 Local and interurban passenger transit	0.28	41	-0.0112	-0.0139	-0.0069	-0.0170	-0.0183	-0.0081	-0.0157	0.0049	-0.0015	0.0024	0.0134	-0.0065
29 Trucking and warehousing	0.36	42	0.0281	0.0088	0.0909	-0.0184	0.0370	-0.0388	0.0595	-0.0765	0.0245	0.0199	0.0548	0.0263
30 Water transportation	0.42	44	0.0211	0.0012	0.0054	0.0053	0.0115	-0.0009	0.0175	0.0129	-0.0039	-0.0247	-0.0061	0.0036
31 Transportation by air	1.45	45	0.0823	-0.0346	0.1018	0.0200	0.1272	0.0194	0.0935	0.0545	-0.0291	0.0254	0.0160	0.0433
32 Pipelines, except natural gas	14.25	46	-0.0174	0.0087	-0.0056	0.0021	-0.0075	-0.0076	0.0140	0.0078	0.0034	0.0004	0.0009	-0.0001
33 Transportation services	2.38	47	0.0106	0.0075	-0.0051	-0.0041	0.0040	0.0054	0.0332	-0.0097	0.0052	0.0252	0.0003	0.0066
34 Telephone and telegraph	22.98	481,482,489	0.1340	0.1089	0.1450	0.2275	0.1215	0.1041	0.2782	0.0038	0.1706	0.3270	0.2324	0.1685
35 Radio and television	10.07	483,484	0.0205	0.0755	0.0476	0.0329	0.0303	0.0948	-0.0936	-0.0191	-0.0048	-0.0131	0.0456	0.0197
36 Electric, gas, and sanitary services	6.40	49	0.1333	0.1169	-0.0542	0.0155	0.0819	0.2217	0.0449	-0.0915	-0.1224	0.2904	0.0769	0.0649
Transportation and Public Utilities			0.4431	0.4604	0.3263	0.2717	0.4192	0.4013	0.4548	-0.1204	0.0390	0.6488	0.4521	0.3451
37 Wholesale trade	1.50	50,51	-0.0339	0.6899	0.6016	0.2325	0.3564	-0.2298	0.7596	0.7070	1.0063	0.2389	0.1549	0.4076
38 Retail trade	0.17	52-59	-0.1706	0.4253	0.1669	-0.2668	-0.0054	-0.3524	0.4329	0.5731	0.5461	0.0782	0.2641	0.1538
39 Depository institutions	2.07	60	0.2260	0.1489	-0.1446	0.0028	-0.0660	0.2883	-0.0075	0.0836	0.1825	0.2115	0.3617	0.1152
40 Nondepository institutions	12.39	61	-0.0349	-0.0308	0.0541	0.0395	-0.1161	0.0900	0.0559	0.1740	-0.0291	0.0032	0.0976	0.0276
41 Security and commodity brokers	2.10	62	-0.0736	-0.0430	0.2363	0.2393	0.2145	-0.0013	0.5409	0.2839	0.4510	0.4914	0.5823	0.2656
42 Insurance carriers	1.94	63	-0.0879	0.3229	-0.1790	0.1228	-0.0622	0.0549	-0.1100	0.1978	-0.0482	-0.0233	-0.0439	0.0131
43 Insurance agents, brokers, and service	0.41	64	-0.0168	-0.0052	-0.0587	-0.1050	-0.0134	-0.0392	-0.0294	-0.0174	0.0322	0.1112	0.0160	-0.0114
44 Holding and other investment offices	1.65	67	0.0429	-0.0444	0.0471	0.0642	-0.1019	0.0278	-0.0847	0.0265	0.2111	-0.1194	-0.0868	-0.0016
Finance and Insurance			0.0557	0.3484	-0.0448	0.3637	-0.1650	0.4205	0.3653	0.7484	0.7994	0.6746	0.9269	0.4085
45 Hotels and other lodging places	0.16	70	-0.0226	0.0333	0.0445	0.0048	-0.0020	0.0321	0.0201	-0.0713	-0.0670	-0.0391	-0.0030	-0.0064
46 Personal services	0.43	72	-0.0572	-0.0147	-0.0024	0.0066	-0.0319	-0.0193	-0.0349	0.0304	0.0606	-0.0467	-0.0100	-0.0109
47 Business services	0.64	73	0.0204	0.0581	0.0255	-0.1914	-0.0636	-0.3119	-0.0534	0.0209	-0.2238	0.0497	-0.0257	-0.0632
48 Auto repair, services, and parking	0.20	75	0.0024	0.0211	-0.0337	-0.0501	0.0203	-0.0075	-0.0365	-0.0263	0.0569	0.0311	0.0028	-0.0017
49 Miscellaneous repair services	0.63	76	-0.0163	0.0197	-0.0302	-0.0207	0.0189	-0.0080	-0.0264	-0.0147	0.0007	-0.0237	-0.0031	-0.0094
50 Motion pictures	2.28	78	-0.0464	-0.0155	0.0013	0.0435	-0.0652	-0.0082	-0.0121	-0.0087	0.0194	-0.0029	0.0117	-0.0076
51 Amusement and recreation services	0.10	79	0.0034	0.0094	0.0566	-0.0932	-0.0619	-0.0424	-0.0240	0.0083	0.0006	-0.0027	-0.0629	-0.0190
52 Health services	0.42	80	-0.1221	-0.2016	-0.2761	-0.3998	-0.2719	-0.1247	-0.0469	-0.2175	-0.1193	0.0268	0.0944	-0.1508
53 Legal services	0.49	81	0.0253	-0.0525	0.0343	-0.1023	-0.0372	0.0657	-0.1342	0.0889	0.0224	0.0241	0.0616	-0.0004
54 Educational services	0.06	82	-0.0229	-0.0107	-0.0882	-0.0266	-0.0231	-0.0272	-0.0566	-0.0492	-0.0518	-0.0565	-0.0464	-0.0417
55 Other services	0.34	83,84,86,87,89	-0.0935	-0.3343	0.0750	-0.0530	-0.1108	-0.1825	-0.1442	-0.1236	-0.1134	-0.0870	-0.0400	-0.1098
Services			-0.3296	-0.4876	-0.1933	-0.8283	-0.6340	-0.5490	-0.3627	-0.4146	-0.1269	-0.0205	-0.4208	
Sum of Contributions			0.1228	1.4580	1.9060	0.6196	1.3395	0.6790	2.0439	2.3857	2.8079	2.8931	2.2722	1.6844

Source: ESA estimates derived from BEA data.

**Table A-4.9: GDP PER FTE GROWTH IN U.S. NONFARM BUSINESS SECTOR BY MAJOR INDUSTRY GROUPS
1989-1995 AND 1995-2000
(Percent)**

Industry Group	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	GPO/FTE Growth (Pct.) 1989-95	GPO/FTE Growth (Pct.) 1995-00
Mining	0.4289	-1.4863	2.8025	10.0291	8.3880	7.7683	0.7680	0.3126	3.6042	2.8966	-15.2979	4.6551	-1.5433
Construction	-0.8570	1.7882	5.0801	-0.8231	-0.5233	-4.9669	0.4895	-2.9302	1.8252	-0.4380	-2.1608	-0.0504	-0.6429
Manufacturing, Durable	1.7602	0.5601	4.5907	6.0454	6.6110	6.4019	3.5698	6.4189	7.5469	8.8874	6.9374	4.3282	6.6721
Manufacturing, Nondurables Goods	-0.5869	-0.1361	2.4251	0.4606	3.6913	4.1094	1.1824	1.6183	-2.4737	5.1129	1.4383	1.6606	1.3756
Transportation and Public Utilities	3.0124	4.2343	3.0906	1.2016	2.3096	2.4897	3.1018	-2.1663	-0.9854	4.5937	2.9059	2.7230	1.4899
Wholesale trade	-0.2097	8.3755	6.7070	2.8882	3.1699	-3.4170	8.2531	7.1947	10.8067	2.2119	1.3533	2.9190	5.9639
Retail trade	-1.0568	1.7932	1.8904	-0.5321	2.3069	-0.2394	5.0619	6.3008	5.6761	2.4734	4.2146	0.6937	4.7454
Finance and Insurance	0.4167	4.3124	-0.1505	3.3893	-2.2605	5.1231	3.3806	6.5162	6.0366	5.3642	8.8545	1.8051	6.0304
Services	-0.4857	-1.6535	-0.1442	-2.3792	-1.3960	-1.2109	-0.9161	-0.1774	-0.3761	0.5707	0.9788	-1.2116	0.0160
All Industries	0.1228	1.4580	1.9060	0.6196	1.3395	0.6790	2.0439	2.3857	2.8079	2.8931	2.2722	1.0208	2.4806

Source: ESA estimates derived from BEA data.

Table A-4.10: CONTRIBUTIONS TO GDP PER FTE GROWTH ACCELERATION IN U.S. NONFARM BUSINESS SECTOR BY MAJOR INDUSTRY GROUPS
1995-2000 OVER 1989-1995

Industry	ITEQ/ FTE Rank	SIC	(Percentage Point)												Average Contrib. (Pct. Pt.) 1989-95	Average Contrib. (Pct. Pt.) 1995-00	Growth Acceleration 1995-00 over 1989-95
			1989- 90	1990- 91	1991- 92	1992- 93	1993- 94	1994- 95	1995- 96	1996- 97	1997- 98	1998- 99	1999- 00				
1 Metal mining	2.96	10	0.02	0.04	0.01	0.00	0.00	-0.01	0.00	0.01	0.02	0.01	0.00	0.01	0.01	0.01	0.00
2 Coal mining	0.81	12	0.01	0.02	0.04	0.02	0.03	0.02	0.03	0.00	0.01	0.03	0.01	0.02	0.02	0.02	-0.01
3 Oil and gas extraction	4.02	13	0.03	-0.14	-0.11	0.12	0.07	0.09	-0.04	0.03	0.00	-0.08	-0.29	0.01	-0.08	-0.09	-0.09
4 Nonmetallic minerals, except fuels	0.64	14	0.00	0.00	0.01	-0.01	0.03	0.00	0.01	0.01	0.01	0.00	0.02	0.00	0.01	0.01	0.01
Mining			0.05	-0.09	-0.05	0.13	0.13	0.10	0.01	0.05	0.08	-0.05	-0.27	0.05	-0.04	-0.09	-0.09
5 Construction	0.11	15,16,17	-0.05	0.12	0.27	-0.05	-0.04	-0.29	0.01	-0.19	0.08	-0.05	-0.15	-0.01	-0.06	-0.06	-0.05
6 Lumber and wood products	0.20	24	-0.01	0.00	-0.04	-0.09	-0.02	0.04	-0.04	-0.02	-0.01	0.02	0.03	-0.02	0.00	0.00	0.02
7 Furniture and fixtures	0.16	25	0.00	0.02	0.03	0.01	-0.02	0.00	0.00	0.02	-0.01	0.00	0.00	0.01	0.00	0.00	0.00
8 Stone, clay, and glass products	0.42	32	0.02	-0.01	0.07	-0.02	0.03	0.01	0.00	0.05	-0.02	0.02	0.01	0.02	0.01	0.02	0.00
9 Primary metal industries	0.57	33	0.02	0.02	0.06	0.10	0.01	-0.02	0.02	0.03	0.02	0.06	0.00	0.03	0.02	0.02	-0.01
10 Fabricated metal products	0.32	34	-0.04	-0.03	0.06	0.06	0.14	0.02	0.04	0.01	-0.03	0.01	0.00	0.03	0.01	0.01	-0.03
11 Industrial machinery and equipment	0.76	35	0.07	-0.14	0.29	0.10	0.16	0.27	0.19	0.29	0.46	0.28	0.23	0.13	0.29	0.16	0.16
12 Electronic and other electric equipment	1.27	36	0.17	0.25	0.10	0.37	0.45	0.55	0.43	0.43	0.36	0.51	0.54	0.31	0.45	0.14	0.14
13 Motor vehicles and equipment	0.56	371	-0.11	-0.12	0.14	0.29	0.19	-0.01	-0.19	0.06	0.21	0.02	0.03	0.06	0.03	0.03	-0.04
14 Other transportation equipment	0.74	37exc371	0.02	0.06	-0.09	0.00	-0.04	-0.01	0.03	0.02	-0.01	0.10	-0.05	-0.01	0.02	0.02	0.02
15 Instruments and related products	1.59	38	0.07	0.01	-0.01	-0.08	-0.03	0.00	0.00	-0.08	-0.02	0.01	0.00	-0.01	-0.02	-0.01	-0.01
16 Miscellaneous manufacturing industries	0.29	39	0.02	-0.02	-0.02	0.01	0.01	0.01	0.00	0.02	0.00	0.03	0.01	0.00	0.01	0.01	0.01
Manufacturing, Durable Goods			0.23	0.04	0.58	0.76	0.89	0.87	0.48	0.83	0.96	1.05	0.82	0.56	0.83	0.83	0.27
17 Food and kindred products	0.59	20	0.00	0.04	0.01	0.04	-0.06	0.36	-0.26	-0.01	-0.10	0.08	0.01	0.06	-0.06	-0.12	-0.12
18 Tobacco products	2.44	21	-0.05	-0.07	-0.05	-0.01	0.11	0.03	-0.01	-0.02	-0.04	-0.18	0.00	-0.01	-0.05	-0.04	-0.04
19 Textile mill products	0.26	22	0.05	0.04	0.06	0.00	0.01	0.00	0.02	0.01	0.01	0.03	0.03	0.03	0.02	0.02	-0.01
20 Apparel and other textile products	0.13	23	0.03	0.03	0.02	0.01	0.01	0.04	0.06	0.04	0.04	0.03	0.07	0.02	0.05	0.02	0.02
21 Paper and allied products	1.00	26	0.01	0.03	0.03	0.09	0.01	-0.17	0.08	0.04	-0.03	0.03	-0.10	0.00	0.00	0.00	0.00
22 Printing and publishing	0.84	27	-0.08	-0.05	0.02	-0.12	-0.01	-0.06	-0.01	-0.05	-0.03	0.05	-0.02	-0.05	-0.01	0.04	0.04
23 Chemicals and allied products	3.72	28	0.15	-0.04	0.08	-0.01	0.28	0.06	0.11	0.18	-0.15	0.21	0.22	0.09	0.11	0.03	0.03
24 Petroleum and coal products	7.57	29	-0.17	-0.10	0.03	0.02	0.02	0.11	0.07	-0.08	0.02	0.13	-0.14	-0.01	0.00	0.01	0.01
Rubber and miscellaneous plastics																	
25 products	0.26	30	-0.02	0.05	0.05	0.03	0.02	0.02	0.05	0.04	0.02	0.04	0.02	0.03	0.03	0.01	0.01
26 Leather and leather products	0.16	31	0.01	0.01	0.00	-0.01	0.01	0.01	-0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.00
Manufacturing, Nondurables Goods			-0.07	-0.04	0.25	0.06	0.39	0.40	0.09	0.15	-0.25	0.42	0.10	0.16	0.10	-0.06	-0.06
27 Railroad transportation	1.73	40	0.04	0.08	0.01	0.01	0.03	0.01	0.02	-0.01	0.00	0.00	0.02	0.03	0.01	0.01	-0.02
28 Local and interurban passenger transit	0.28	41	-0.01	-0.01	-0.01	-0.02	-0.02	-0.01	-0.02	0.00	0.00	0.00	0.01	-0.01	0.00	0.01	0.01
29 Trucking and warehousing	0.36	42	0.03	0.11	0.09	-0.02	0.04	-0.04	0.06	-0.08	0.02	0.02	0.05	0.03	0.02	0.02	-0.02
30 Water transportation	0.42	44	0.02	0.00	0.01	0.01	0.01	0.00	0.02	0.01	0.00	-0.02	-0.01	0.01	0.00	0.01	-0.01
31 Transportation by air	1.45	45	0.08	-0.03	0.10	0.02	0.13	0.02	0.09	0.05	-0.03	0.03	0.02	0.05	0.03	0.03	-0.02
32 Pipelines, except natural gas	14.25	46	-0.02	0.01	-0.01	0.00	-0.01	-0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01
33 Transportation services	2.38	47	0.01	0.01	-0.01	0.00	0.00	0.01	0.03	-0.01	0.01	0.03	0.00	0.00	0.01	0.01	0.01
		481, 482,															
34 Telephone and telegraph	22.98	489	0.13	0.11	0.14	0.23	0.12	0.10	0.28	0.00	0.17	0.33	0.23	0.14	0.20	0.06	0.06
35 Radio and television	10.07	483, 484	0.02	0.08	0.05	0.03	0.03	0.09	-0.09	-0.02	0.00	-0.01	0.05	0.05	-0.02	-0.07	-0.07
36 Electric, gas, and sanitary services	6.40	49	0.13	0.12	-0.05	0.02	0.08	0.22	0.04	-0.09	-0.12	0.29	0.08	0.09	0.04	0.04	-0.05
Transportation and Public Utilities			0.44	0.46	0.33	0.27	0.42	0.40	0.45	-0.12	0.04	0.65	0.45	0.39	0.29	-0.09	-0.09
37 Wholesale trade	1.50	50,51	-0.03	0.69	0.60	0.23	0.36	-0.23	0.76	0.71	1.01	0.24	0.15	0.27	0.57	0.30	0.30
38 Retail trade	0.17	52-59	-0.17	0.43	0.17	-0.27	-0.01	-0.35	0.43	0.57	0.55	0.08	0.26	-0.03	0.38	0.41	0.41
39 Depository institutions	2.07	60	0.23	0.15	-0.14	0.00	-0.09	0.29	-0.01	0.08	0.18	0.21	0.36	0.07	0.17	0.09	0.09
40 Nondepository institutions	12.39	61	-0.03	-0.03	0.05	0.04	-0.12	0.09	0.06	0.17	-0.03	0.00	0.10	0.00	0.06	0.06	0.06
41 Security and commodity brokers	2.10	62	-0.07	-0.04	0.24	0.24	0.21	0.00	0.54	0.28	0.45	0.49	0.58	0.10	0.47	0.37	0.37
42 Insurance carriers	1.94	63	-0.09	0.32	-0.18	0.12	-0.06	0.05	-0.11	0.20	-0.05	-0.02	-0.04	0.03	-0.01	-0.03	-0.03
43 Insurance agents, brokers, and service	0.41	64	-0.02	-0.01	-0.06	-0.10	-0.01	-0.04	-0.03	-0.02	0.03	0.11	0.02	-0.04	0.02	0.06	0.06
44 Holding and other investment offices	1.65	67	0.04	-0.04	0.05	0.06	-0.10	0.03	-0.08	0.03	0.21	-0.12	-0.09	0.01	-0.01	-0.02	-0.02
Finance and Insurance			0.06	0.35	-0.04	0.36	-0.17	0.42	0.37	0.75	0.80	0.67	0.93	0.16	0.70	0.54	0.54
45 Hotels and other lodging places	0.16	70	-0.02	0.03	0.04	0.00	0.00	0.03	0.02	-0.07	-0.07	-0.04	0.00	0.02	-0.03	-0.05	-0.05
46 Personal services	0.43	72	-0.06	-0.01	0.00	0.01	-0.03	-0.02	-0.03	0.03	0.06	-0.05	-0.01	-0.02	0.00	0.02	0.02
47 Business services	0.64	73	0.02	0.06	0.03	-0.19	-0.06	-0.31	-0.05	0.02	-0.22	0.05	-0.03	-0.08	-0.05	0.03	0.03
48 Auto repair, services, and parking	0.20	75	0.00	0.02	-0.03	-0.05	0.02	-0.01	-0.04	-0.03	0.06	0.03	0.00	-0.01	0.01	0.01	0.01
49 Miscellaneous repair services	0.63	76	-0.02	0.02	-0.03	-0.02	0.02	-0.01	-0.03	-0.01	0.00	-0.02	0.00	-0.01	-0.01	-0.01	-0.01
50 Motion pictures	2.28	78	-0.05	-0.02	0.00	0.04	-0.07	-0.01	-0.01	-0.01	0.02	0.00	0.01	-0.02	0.00	0.02	0.02
51 Amusement and recreation services	0.10	79	0.00	0.01	0.06	-0.09	-0.06	-0.04	-0.02	0.01	0.00	0.00	-0.06	-0.02	-0.02	0.01	0.01
52 Health services	0.42	80	-0.12	-0.20	-0.28	-0.40	-0.27	-0.12	-0.05	-0.22	-0.12	0.03	0.09	-0.23	-0.05	0.18	0.18
53 Legal services	0.49	81	0.03	-0.05	0.03	-0.10	-0.04	0.07	-0.13	0.09	0.02	0.02	0.06	-0.01	0.01	0.02	0.02
54 Educational services	0.06	82	-0.02	-0.01	-0.09	-0.03	-0.02	-0.03	-0.06	-0.05	-0.05	-0.06	-0.05	-0.03	-0.05	-0.02	-0.02
		83,84,86,															
55 Other services	0.34	87,89	-0.09	-0.33	0.08	-0.05	-0.11	-0.18	-0.14	-0.12	-0.11	-0.09	-0.04	-0.12	-0.10	0.01	0.01
Services			-0.33	-0.49	-0.19	-0.88	-0.63	-0.63	-0.55	-0.36	-0.41	-0.13	-0.02	-0.53	-0.29	0.23	0.23
Sum of Contributions			0.12	1.46	1.91	0.62	1.34	0.68	2.04	2.39	2.81	2.89	2.27	1.02	2.48	1.46	1.46

Source: ESA estimates derived from BEA data.

Table A-4.11a: PRICE GROWTH IN ALL INDUSTRIES OF THE U.S. NONFARM BUSINESS SECTOR, 1989-2000
(Percentage Point)

Industry	ITEQ/ FTE Rank	SIC	Annual Price Growth (Percentage Point)											Average (Pct. Pt.) 1989-00
			1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	
1 Metal mining	2.96	10	-0.0212	-0.0231	-0.0088	-0.0161	0.0195	0.0235	-0.0202	-0.0115	-0.0235	-0.0106	0.0054	-0.0079
2 Coal mining	0.81	12	-0.0171	-0.0129	-0.0148	-0.0356	-0.0156	-0.0217	-0.0134	-0.0105	-0.0099	-0.0229	-0.0078	-0.0166
3 Nonmetallic minerals, except fuels	0.64	14	0.0040	0.0019	-0.0003	-0.0052	0.0056	0.0050	-0.0006	0.0075	0.0000	0.0029	-0.0065	0.0013
4 Construction	0.11	15,16,17	0.2082	0.0757	-0.0212	0.1886	0.2229	0.2643	0.1861	0.2453	0.2836	0.3334	0.4022	0.2172
5 Lumber and wood products	0.20	24	0.0011	0.0248	0.0826	0.1368	0.0476	-0.0056	-0.0139	0.0302	0.0022	0.0210	-0.0452	0.0256
6 Furniture and fixtures	0.16	25	0.0192	0.0148	0.0019	0.0002	0.0175	0.0024	0.0235	0.0103	0.0131	0.0098	0.0020	0.0104
7 Stone, clay, and glass products	0.42	32	0.0019	0.0201	-0.0007	0.0149	0.0280	0.0244	0.0086	0.0100	0.0259	0.0302	-0.0017	0.0147
8 Primary metal industries	0.57	33	-0.0562	-0.0666	-0.0277	-0.0202	0.0605	0.1311	-0.0665	-0.0016	-0.0212	-0.0870	0.0387	-0.0106
9 Fabricated metal products	0.32	34	0.0924	0.0753	0.0213	0.0106	-0.0095	-0.0050	0.0710	0.0259	0.0630	0.0610	-0.0026	0.0367
10 Industrial machinery and equipment	0.76	35	0.0048	0.0092	-0.0834	-0.1270	-0.0924	-0.1657	-0.1646	-0.2576	-0.2833	-0.2462	-0.0787	-0.1350
Electronic and other electric														
11 equipment	1.27	36	-0.0766	-0.0328	-0.1000	-0.0838	-0.1555	-0.5018	-0.3860	-0.2741	-0.5179	-0.3962	-0.4064	-0.2665
12 Motor vehicles and equipment	0.56	371	0.0126	0.1406	0.1338	0.1089	0.0901	-0.0168	0.0912	-0.0094	0.0079	0.0664	-0.0129	0.0557
		37												
13 Other transportation equipment	0.74	exc371	0.0944	0.0993	0.0934	0.0376	0.0256	0.0150	0.0349	0.0129	0.0160	0.0218	0.0712	0.0475
14 Instruments and related products	1.59	38	0.1141	0.0883	0.0763	0.0511	0.0309	0.0295	0.1063	0.0726	0.0812	0.0363	0.0811	0.0698
Miscellaneous manufacturing														
15 industries	0.29	39	0.0213	0.0278	0.0185	0.0132	0.0029	-0.0056	0.0130	0.0067	0.0103	0.0048	-0.0007	0.0102
16 Tobacco products	2.44	21	0.0767	0.0974	0.0897	-0.0273	-0.0933	0.0013	0.0110	0.0291	0.0751	0.2229	0.0580	0.0491
17 Textile mill products	0.26	22	0.0069	0.0118	0.0125	-0.0069	-0.0233	0.0021	0.0223	0.0146	0.0148	0.0051	-0.0198	0.0036
18 Apparel and other textile products	0.13	23	0.0188	0.0251	0.0155	0.0096	0.0007	-0.0184	0.0145	0.0016	0.0119	0.0178	-0.0093	0.0080
19 Paper and allied products	1.00	26	-0.0265	-0.0367	-0.0073	-0.0729	0.0586	0.3698	-0.1357	-0.0796	0.0665	0.0168	0.1505	0.0276
20 Printing and publishing	0.84	27	0.1314	0.1484	0.1244	0.1113	0.0678	0.0102	0.1620	0.0880	0.0905	0.0682	0.0656	0.0971
21 Chemicals and allied products	3.72	28	0.0010	0.1507	0.0493	0.0993	0.0762	0.1993	-0.0554	0.0091	0.1583	-0.0606	-0.0003	0.0570
Rubber and miscellaneous plastics														
22 products	0.26	30	0.0193	0.0216	-0.0089	-0.0013	-0.0094	-0.0186	0.0170	-0.0200	0.0397	-0.0027	-0.0110	0.0023
23 Leather and leather products	0.16	31	0.0050	0.0032	0.0018	0.0020	0.0013	0.0026	0.0001	0.0015	0.0026	0.0003	-0.0016	0.0017
24 Railroad transportation	1.73	40	-0.0264	-0.0210	-0.0073	0.0047	0.0026	-0.0067	-0.0175	0.0037	0.0216	-0.0127	-0.0148	-0.0067
Local and interurban passenger														
25 transit	0.28	41	0.0028	0.0356	0.0191	0.0045	0.0025	0.0107	0.0147	0.0033	0.0184	-0.0064	-0.0083	0.0088
26 Trucking and warehousing	0.36	42	0.0346	-0.0540	-0.0097	0.0315	0.0209	0.0266	-0.0483	0.1638	0.1525	0.0320	-0.0350	0.0286
27 Water transportation	0.42	44	-0.0142	0.0174	-0.0053	-0.0025	-0.0021	0.0046	-0.0071	-0.0024	0.0103	0.0238	0.0183	0.0037
28 Transportation by air	1.45	45	-0.1176	0.0952	-0.0256	0.0769	-0.0484	0.0346	-0.0979	0.0602	0.0923	-0.0017	-0.0264	0.0038
29 Pipelines, except natural gas	14.25	46	0.0198	-0.0121	0.0056	-0.0004	0.0091	0.0111	-0.0098	-0.0077	0.0031	-0.0003	0.0001	0.0017
30 Transportation services	2.38	47	0.0243	0.0300	0.0134	0.0011	0.0022	-0.0074	-0.0026	0.0116	-0.0075	-0.0022	0.0238	0.0079
		481,												
31 Telephone and telegraph	22.98	482, 489	-0.0160	0.0227	-0.0034	-0.0076	0.0534	-0.0402	-0.0820	-0.0217	-0.0100	-0.1386	-0.1497	-0.0357
32 Radio and television	10.07	483, 484	0.0724	0.0042	0.0347	0.0603	0.0237	0.0418	0.0831	0.0768	0.0771	0.0486	0.0779	0.0546
33 Wholesale trade	1.50	50, 51	0.4196	-0.0266	-0.1925	0.2572	0.4042	0.4162	-0.3586	-0.3011	-0.5699	0.0354	0.3308	0.0377
34 Retail trade	0.17	52-59	0.4866	0.5418	0.3382	0.3421	0.1595	0.0389	-0.1084	-0.0846	-0.0728	0.0214	-0.0350	0.1480
35 Depository institutions	2.07	60	0.1393	0.5456	0.5340	-0.0875	0.1105	0.2810	0.2916	0.5042	0.2417	0.1844	0.2365	0.2710
36 Nondepository institutions	12.39	61	0.0168	0.0259	0.0031	0.0125	0.0289	0.0243	-0.0153	-0.0581	-0.0091	-0.0324	-0.0034	-0.0006
37 Security and commodity brokers	2.10	62	0.0058	0.0057	0.0685	-0.0006	-0.0707	-0.0143	-0.0297	-0.1271	-0.1454	-0.6507	-0.6109	-0.1427
38 Insurance carriers	1.94	63	0.1499	0.1077	0.1913	0.2771	0.1665	0.2903	0.1852	0.1849	0.0782	0.1260	0.2142	0.1792
Insurance agents, brokers, and														
39 service	0.41	64	0.0917	0.0020	0.1222	0.1584	0.0656	0.0707	0.0523	0.0439	0.0346	0.0196	0.0069	0.0607
40 Holding and other investment offices	1.65	67	0.0199	0.0023	0.0307	0.0072	-0.0032	0.0230	0.0268	0.0312	0.0347	0.0285	0.0581	0.0236
41 Hotels and other lodging places	0.16	70	0.0494	0.0804	0.0277	0.0381	0.0316	0.0186	0.0194	0.1064	0.0795	0.0802	0.0424	0.0522
42 Personal services	0.43	72	0.0563	0.0506	0.0320	0.0359	0.0338	0.0189	0.0256	0.0331	0.0203	0.0249	0.0299	0.0329
43 Business services	0.64	73	0.2089	0.1612	0.1841	0.1057	0.0524	0.2259	0.2437	0.1976	0.2756	0.2743	0.3759	0.2096
44 Auto repair, services, and parking	0.20	75	0.0557	0.0665	0.0530	0.0494	0.0404	0.0454	0.0153	0.0542	0.0448	0.0163	0.0356	0.0433
45 Miscellaneous repair services	0.63	76	0.0268	0.0260	0.0435	0.0386	0.0075	0.0086	0.0338	0.0216	0.0268	0.0396	0.0326	0.0278
46 Motion pictures	2.28	78	0.0273	0.0245	0.0063	0.0007	0.0140	0.0111	0.0253	0.0100	0.0045	0.0285	0.0315	0.0167
47 Amusement and recreation services	0.10	79	0.0483	0.0519	0.0274	0.0327	0.0378	0.0305	0.0403	0.0351	0.0501	0.0220	0.0647	0.0401
48 Health services	0.42	80	0.6301	0.6185	0.6161	0.5035	0.4144	0.2782	0.2211	0.2324	0.2958	0.2340	0.2075	0.3865
49 Legal services	0.49	81	0.1759	0.1369	0.1283	0.1060	0.0756	0.0659	0.0753	0.0837	0.0752	0.0477	0.0683	0.0944
50 Educational services	0.06	82	0.0608	0.0611	0.0525	0.0316	0.0397	0.0303	0.0541	0.0452	0.0637	0.0498	0.0568	0.0496
		83,84,86												
51 Other services, n.e.c.	0.34	,87,89	0.2632	0.2878	0.3890	0.1075	0.1456	0.2486	0.1907	0.2368	0.2091	0.2469	0.2476	0.2339
Sum of Contributions (Pct.)			3.5477	3.7519	3.1251	2.5727	2.1744	2.5081	0.7262	1.4380	1.2018	0.8318	1.5462	2.1294

Note: Table A-4.1 up to Table A-4.10 cover 55 industries. In contrast, Tables A-4.11a, 4.11b, 4.11c and Table A-4.12 cover 51 industries. See footnote 5, p. 33, Table 4.1, p. 35, and footnote 13, p. 38, for the excluded industries and the reasons for their exclusion.

Source: ESA estimates derived from BEA data.

Table A-4.11b: PRICE GROWTH IN TOP-HALF INDUSTRIES OF THE U.S. NONFARM BUSINESS SECTOR, 1989-2000
(Percentage Point)

Industry	ITEQ/ FTE Rank 1996	SIC	(Percentage Point)											Average (Pct. Pt.) 1989-00
			1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1987-98	1998-99	1999-00	1989-00
31 Telephone and telegraph	22.98	481,482,489	-0.0327	0.0465	-0.0069	-0.0154	0.1081	-0.0812	-0.1633	-0.0429	-0.0197	-0.2721	-0.2958	-0.0705
29 Pipelines, except natural gas	14.25	46	0.0403	-0.0247	0.0114	-0.0007	0.0185	0.0224	-0.0195	-0.0152	0.0062	-0.0006	0.0002	0.0035
36 Nondepository institutions	12.39	61	0.0342	0.0529	0.0062	0.0254	0.0586	0.0491	-0.0304	-0.1149	-0.0179	-0.0636	-0.0068	-0.0007
32 Radio and television	10.07	483,484	0.1478	0.0085	0.0708	0.1226	0.0480	0.0843	0.1656	0.1519	0.1512	0.0954	0.1540	0.1091
21 Chemicals and allied products	3.72	28	0.0021	0.3083	0.1005	0.2017	0.1545	0.4025	-0.1103	0.0181	0.3105	-0.1190	-0.0005	0.1153
1 Metal mining	2.96	10	-0.0432	-0.0472	-0.0179	-0.0328	0.0395	0.0474	-0.0401	-0.0228	-0.0460	-0.0207	0.0106	-0.0158
16 Tobacco products	2.44	21	0.1566	0.1993	0.1829	-0.0555	-0.1889	0.0027	0.0219	0.0576	0.1474	0.4384	0.1145	0.0979
30 Transportation services	2.38	47	0.0497	0.0613	0.0273	0.0023	0.0044	-0.0150	-0.0051	0.0230	-0.0146	-0.0044	0.0470	0.0160
46 Motion pictures	2.28	78	0.0558	0.0502	0.0129	0.0013	0.0284	0.0224	0.0503	0.0197	0.0088	0.0559	0.0623	0.0335
37 Security and commodity brokers	2.10	62	0.0118	0.0117	0.1396	-0.0011	-0.1432	-0.0289	-0.0592	-0.2513	-0.2849	-1.2766	-1.2061	-0.2808
35 Depository institutions	2.07	60	0.2842	1.1157	1.0891	-0.1777	0.2239	0.5674	0.5811	0.9976	0.4740	0.3620	0.4673	0.5441
38 Insurance carriers	1.94	63	0.3059	0.2201	0.3902	0.5629	0.3375	0.5861	0.3690	0.3657	0.1533	0.2473	0.4232	0.3601
24 Railroad transportation	1.73	40	-0.0539	-0.0428	-0.0148	0.0096	0.0053	-0.0135	-0.0349	0.0072	0.0423	-0.0249	-0.0293	-0.0136
40 Holding and other investment offices	1.65	67	0.0407	0.0048	0.0626	0.0147	-0.0065	0.0464	0.0535	0.0616	0.0678	0.0560	0.1149	0.0469
14 Instruments and related products	1.59	38	0.2329	0.1805	0.1556	0.1039	0.0626	0.0596	0.2118	0.1437	0.1592	0.0713	0.1602	0.1401
33 Wholesale trade	1.50	50,51	0.8564	-0.0544	-0.3925	0.5225	0.8191	0.8404	-0.7142	-0.5955	-1.1172	0.0695	0.6535	0.0807
28 Transportation by air	1.45	45	-0.2400	0.1947	-0.0522	0.1562	-0.0980	0.0699	-0.1950	0.1190	0.1810	-0.0032	-0.0521	0.0073
11 Electronic and other electric equipment	1.27	36	-0.1563	-0.0670	-0.2039	-0.1702	-0.3151	-1.0128	-0.7686	-0.5419	-1.0151	-0.7775	-0.8025	-0.5301
19 Paper and allied products	1.00	26	-0.0540	-0.0750	-0.0149	-0.1482	0.1187	0.7469	-0.2702	-0.1575	0.1305	0.0329	0.2975	0.0552
20 Printing and publishing	0.84	27	0.2682	0.3036	0.2538	0.2262	0.1374	0.0206	0.3227	0.1741	0.1776	0.1338	0.1297	0.1952
2 Coal mining	0.81	12	-0.0349	-0.0265	-0.0301	-0.0723	-0.0315	-0.0439	-0.0266	-0.0207	-0.0195	-0.0449	-0.0154	-0.0333
10 Industrial machinery and equipment	0.76	35	0.0097	0.0189	-0.1700	-0.2581	-0.1873	-0.3346	-0.3278	-0.5093	-0.5552	-0.4832	-0.1555	-0.2684
13 Other transportation equipment	0.74	37exc371	0.1927	0.2032	0.1906	0.0765	0.0518	0.0302	0.0694	0.0255	0.0314	0.0428	0.1408	0.0959
3 Nonmetallic minerals, except fuels	0.64	14	0.0082	0.0038	-0.0006	-0.0105	0.0114	0.0102	-0.0012	0.0148	0.0000	0.0056	-0.0128	0.0026
43 Business services	0.64	73	0.4263	0.3297	0.3755	0.2147	0.1063	0.4561	0.4853	0.3907	0.5403	0.5383	0.7426	0.4187
45 Miscellaneous repair services	0.63	76	0.0548	0.0533	0.0888	0.0785	0.0153	0.0174	0.0673	0.0428	0.0526	0.0779	0.0645	0.0557
8 Primary metal industries	0.57	33	-0.1146	-0.1362	-0.0564	-0.0410	0.1225	0.2647	-0.1325	-0.0031	-0.0417	-0.1708	0.0765	-0.0211
12 Motor vehicles and equipment	0.56	371	0.0257	0.2876	0.2729	0.2210	0.1826	-0.0340	0.1818	-0.0185	0.0154	0.1305	-0.0255	0.1127
Sum of Contributions (Pct.)			2.4746	3.1806	2.4701	1.5567	1.6837	2.7828	-0.3193	0.3197	-0.4823	-0.9037	1.0570	1.2564

Note: Table A-4.1 up to Table A-4.10 cover 55 industries. In contrast, Tables A-4.11a, 4.11b, 4.11c and Table A-4.12 cover 51 industries.

See footnote 5, p. 33, Table 4.1, p. 35, and footnote 13, p. 38, for the excluded industries and the reasons for their exclusion.

Source: ESA estimates derived from BEA data.

Table A-4.11c: PRICE GROWTH IN BOTTOM-HALF INDUSTRIES OF THE U.S. NONFARM BUSINESS SECTOR, 1989-2000

Industry	FTE Rank 1996	SIC	(Percentage Point)												Average (Pct. Pt.) 1989-00
			1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1987-98	1998-99	1999-00		
49 Legal services	0.49	81	0.3448	0.2679	0.2517	0.2087	0.1491	0.1305	0.1513	0.1693	0.1534	0.0972	0.1382	0.1875	
42 Personal services	0.43	72	0.1104	0.0991	0.0628	0.0707	0.0666	0.0373	0.0514	0.0670	0.0414	0.0508	0.0606	0.0653	
48 Health services	0.42	80	1.2355	1.2106	1.2089	0.9916	0.8180	0.5513	0.4439	0.4700	0.6037	0.4770	0.4201	0.7664	
7 Stone, clay, and glass products	0.42	32	0.0038	0.0392	-0.0014	0.0294	0.0553	0.0484	0.0173	0.0201	0.0529	0.0615	-0.0035	0.0294	
27 Water transportation	0.42	44	-0.0279	0.0340	-0.0104	-0.0048	-0.0042	0.0091	-0.0143	-0.0048	0.0210	0.0486	0.0371	0.0076	
39 Insurance agents, brokers, and service	0.41	64	0.1799	0.0039	0.2397	0.3118	0.1296	0.1400	0.1050	0.0887	0.0706	0.0400	0.0139	0.1203	
26 Trucking and warehousing	0.36	42	0.0678	-0.1058	-0.0190	0.0620	0.0413	0.0527	-0.0970	0.3313	0.3112	0.0652	-0.0709	0.0581	
			83,84,86,												
51 Other services, n.e.c.	0.34	87,89	0.5160	0.5633	0.7633	0.2117	0.2873	0.4925	0.3829	0.4790	0.4267	0.5033	0.5014	0.4661	
9 Fabricated metal products	0.32	34	0.1812	0.1474	0.0417	0.0209	-0.0187	-0.0100	0.1426	0.0523	0.1285	0.1244	-0.0053	0.0732	
15 Miscellaneous manufacturing industries	0.29	39	0.0418	0.0544	0.0364	0.0260	0.0056	-0.0110	0.0260	0.0735	0.0210	0.0099	-0.0014	0.0202	
25 Local and interurban passenger transit	0.28	41	0.0055	0.0697	0.0374	0.0088	0.0050	0.0211	0.0295	0.0066	0.0375	-0.0130	-0.0167	0.0174	
17 Textile mill products	0.26	22	0.0135	0.0230	0.0246	-0.0137	-0.0461	0.0042	0.0447	0.0295	0.0302	0.0104	-0.0402	0.0073	
22 Rubber and miscellaneous plastics products	0.26	30	0.0378	0.0422	-0.0174	-0.0026	-0.0185	-0.0369	0.0342	-0.0404	0.0810	-0.0054	-0.0223	0.0047	
44 Auto repair, services, and parking	0.20	75	0.1093	0.1301	0.1041	0.0972	0.0797	0.0899	0.0308	0.1095	0.0914	0.0332	0.0722	0.0861	
5 Lumber and wood products	0.20	24	0.0021	0.0485	0.1621	0.2694	0.0940	-0.0112	-0.0279	0.0612	0.0046	0.0428	-0.0914	0.0504	
34 Retail trade	0.17	52-59	0.9540	1.0603	0.6635	0.6737	0.3149	0.0772	-0.2177	-0.1712	-0.1485	0.0437	-0.0710	0.2890	
41 Hotels and other lodging places	0.16	70	0.0968	0.1574	0.0544	0.0751	0.0623	0.0368	0.0389	0.2152	0.1621	0.1634	0.0858	0.1044	
23 Leather and leather products	0.16	31	0.0098	0.0063	0.0036	0.0040	0.0025	0.0051	0.0001	0.0030	0.0054	0.0007	-0.0031	0.0034	
6 Furniture and fixtures	0.16	25	0.0376	0.0290	0.0038	0.0005	0.0346	0.0047	0.0472	0.0208	0.0268	0.0200	0.0041	0.0208	
18 Apparel and other textile products	0.13	23	0.0369	0.0492	0.0304	0.0189	0.0014	-0.0364	0.0291	0.0033	0.0243	0.0362	-0.0188	0.0159	
4 Construction	0.11	15,16,17	0.4083	0.1482	-0.0416	0.3714	0.4401	0.5235	0.3738	0.4961	0.5790	0.6797	0.8145	0.4357	
47 Amusement and recreation services	0.10	79	0.0948	0.1017	0.0538	0.0644	0.0746	0.0604	0.0810	0.0710	0.1023	0.0449	0.1310	0.0800	
50 Educational services	0.06	82	0.1192	0.1197	0.1031	0.0623	0.0783	0.0601	0.1086	0.0913	0.1300	0.1015	0.1151	0.0990	
Sum of Contributions (Pct.)			4,5786	4,2991	3,7555	3,5574	2,6528	2,2394	1,7814	2,5826	2,9563	2,6359	2,0494	3,0080	

Note: Table A-4.1 up to Table A-4.10 cover 55 industries. In contrast, Tables A-4.11a, 4.11b, 4.11c and Table A-4.12 cover 51 industries. See footnote 5, p. 33, Table 4.1, p. 35, and footnote 13, p. 38, for the excluded industries and the reasons for their exclusion.

Source: ESA estimates derived from BEA data.

APPENDIX B

Let GDP be the aggregate (chained 1996 dollars) gross domestic product of industries in the U.S. nonfarm business sector and FTE be the total sum of workers in these industries in each year during 1989-2000. Also, let the subscripts $t-1$ and t represent any two succeeding years during this period. Thus, the overall nonfarm business sector GDP per FTE annual growth rate is, by definition,

$$(1) \quad \frac{\frac{GDP_t}{FTE_t} - \frac{GDP_{t-1}}{FTE_{t-1}}}{\frac{GDP_{t-1}}{FTE_{t-1}}} = \frac{\left(\frac{GDP_t}{GDP_{t-1}} - 1\right) - \left(\frac{FTE_t}{FTE_{t-1}} - 1\right)}{\frac{FTE_t}{FTE_{t-1}}}.$$

where

$$(2) \quad \frac{GDP_t}{GDP_{t-1}} - 1 = \text{annual growth rate of aggregate GDP}$$

and

$$(3) \quad \frac{FTE_t}{FTE_{t-1}} - 1 = \text{annual growth rate of total FTE}.$$

Decomposing the Overall GDP Per FTE Growth Rate

The overall GDP per FTE annual growth rate in equation (1) can be decomposed into the individual contributions of the 55 industries (see footnote 5, p. 33, and Table 4.1, page 35, in the text) by decomposing the annual growth rates of aggregate GDP in equation (2) and of total FTE workers in equation (3). Before decomposing the annual growth rate of aggregate GDP, the real aggregate levels in chained (1996) dollars must first be obtained from the nominal and (real) chained dollar GDP levels of each of the 55 industries following BEA's chained dollar aggregation procedure (see Seskin, Eugene P. and Robert P. Parker, "A Guide to the NIPA's," *Survey of Current Business*, Vol. 78, March 1998, pp. 26-68). Once the aggregate GDP levels are obtained, the decomposition of (2) is accomplished by BEA's formula for component (e.g., an industry) contributions to the growth rate of a chained dollar aggregate (see Moulton, Brent R. and Eugene P. Seskin, "A Preview of the 1999 Comprehensive Revision of the National Income and Product Accounts," *Survey of Current Business*, Vol. 79, October 1999, pp. 6-17.)

Following BEA's exact formula for a component's, e.g., an industry's, contribution to the aggregate GDP growth rate, equation (2) can be expressed as,

$$(4) \quad \frac{GDP_t}{GDP_{t-1}} - 1 = \sum_i^N w_{i,t}^q \left(\frac{q_{i,t} - q_{i,t-1}}{q_{i,t-1}} \right)$$

where $w_{i,t}^q$ is the industry's "GDP growth weight" referred to in the text; $q_{i,t-1}$ and $q_{i,t}$ are the levels of the industry's chained dollar GDP in the two adjoining periods $t-1$ and t ; and N is the total number of industries. The expression inside the parenthesis is the industry's chained dollar GDP growth rate.

The formula for the "GDP growth weight" is,

$$(5) \quad w_{i,t}^q = \frac{((p_{i,t} / P_t^F) + p_{i,t-1}) q_{i,t-1}}{\sum_i^N ((p_{i,t} / P_t^F) + p_{i,t-1}) q_{i,t-1}} ; \quad \sum_i^N w_{i,t}^q = 1$$

where $p_{i,t-1}$ and $p_{i,t}$ are the implicit price deflators or ratios (1996 = 1) of an industry's nominal GDP to its chained dollar GDP in each period. In (5), P_t^F is the chain-type Fisher ideal price index computed using $q_{i,t-1}$, $q_{i,t}$, $p_{i,t-1}$ and $p_{i,t}$.

Letting $l_{i,t-1}$ and $l_{i,t}$ be an industry's FTE levels in the two adjoining periods, then the corresponding total FTEs for all N industries are,

$$(6) \quad FTE_{t-1} = \sum_i^N l_{i,t-1} \quad ; \quad FTE_t = \sum_i^N l_{i,t}$$

since total FTE in each period is the arithmetic sum of the FTE levels across industries. It follows from (6) that,

$$(7) \quad \frac{FTE_t}{FTE_{t-1}} - 1 = \sum_i^N w_{i,t}^l \left(\frac{l_{i,t} - l_{i,t-1}}{l_{i,t-1}} \right)$$

where $w_{i,t}^l$ is the industry's "FTE growth weight" referred to in the text and the expression inside the parenthesis is the industry's FTE growth rate. It can be verified from (6) and (7) that

$$(8) \quad w_{i,t}^l = \frac{l_{i,t-1}}{FTE_{t-1}}$$

which means that the “FTE growth weight” of an industry from period $t-1$ to period t is the industry’s share of total FTE in period $t-1$.

By substituting equations (4) and (7) into (1), it can be seen that,

$$(9) \quad \frac{\frac{GDP_t}{FTE_t} - \frac{GDP_{t-1}}{FTE_{t-1}}}{\frac{GDP_{t-1}}{FTE_{t-1}}} = \frac{\sum_i^N w_{i,t}^q \left(\frac{q_{i,t} - q_{i,t-1}}{q_{i,t-1}} \right) - \sum_i^N w_{i,t}^l \left(\frac{l_{i,t} - l_{i,t-1}}{l_{i,t-1}} \right)}{\frac{FTE_t}{FTE_{t-1}}}$$

Comparing an Industry’s Contribution to Overall Productivity Growth to its Productivity Growth

By factoring out the summation sign, each component being summed in (9) is the individual *industry’s contribution to the overall productivity growth rate* that is given by,

$$(10) \quad \frac{w_{i,t}^q \left(\frac{q_{i,t} - q_{i,t-1}}{q_{i,t-1}} \right) - w_{i,t}^l \left(\frac{l_{i,t} - l_{i,t-1}}{l_{i,t-1}} \right)}{\frac{FTE_t}{FTE_{t-1}}}$$

In contrast, the expression for the *industry’s individual productivity growth rate* is similar to that in (1) and is given by,

$$(11) \quad \frac{\left(\frac{q_{i,t} - q_{i,t-1}}{q_{i,t-1}} \right) - \left(\frac{l_{i,t} - l_{i,t-1}}{l_{i,t-1}} \right)}{\frac{l_{i,t}}{l_{i,t-1}}}$$

It can be seen that the sign of the industry’s contribution to the overall productivity growth in (10) is *not* necessarily the same as the sign of its individual productivity growth rate in (11) unless the GDP growth weight, $w_{i,t}^q$ equals the FTE growth weight, $w_{i,t}^l$.

There is no basis in economic theory for $w_{i,t}^q$ to equal $w_{i,t}^l$ and, empirically, the data show that they are not equal except by accident. Therefore, productivity growth trends in individual industries are *misleading* indicators of industry-level contributions to the overall productivity growth rate. Hence, this study computes the expression in (10) to determine *exactly* these industry-level contributions to overall productivity growth.

Determining An Industry's Contribution to Overall Inflation

It can be verified that the growth rate of aggregate chained dollar GDP given by equation (4) exactly equals the growth rate of BEA's chain-type quantity index and the growth rate of the underlying chain-type Fisher quantity index. Because the roles of prices and quantities are symmetric in the definition of the Fisher index formula, simply switching quantities (q) to prices (p), vice versa, converts the formulas in (4) and (5) so as to yield an exact measure of a component's (e.g., an industry's) contribution to the growth rate of the chain-type Fisher ideal price index. This contribution is the component's contribution to the overall inflation rate, since it can also be verified that the growth rate of the chain-type Fisher ideal price index equals the growth rate of the aggregate GDP implicit price deflator, the ratio of total nominal GDP to aggregate chained dollar GDP for all 51 industries in each period (see footnote 5, p. 33, Table 4.1, page 35, and footnote 13, p. 38, in the text for the excluded industries and the reasons for their exclusion).

Following the above discussion, by simply switching notation, it follows from (4) that an industry's contribution to the overall GDP inflation rate is,

$$(12) \quad w_{i,t}^p \left(\frac{p_{i,t} - p_{i,t-1}}{p_{i,t-1}} \right)$$

where $w_{i,t}^p$ is the industry's "price growth weight" defined by,

$$(13) \quad w_{i,t}^p = \frac{((q_{i,t} / Q_t^F) + q_{i,t-1}) p_{i,t-1}}{\sum_i ((q_{i,t} / Q_t^F) + q_{i,t-1}) p_{i,t-1}} ; \quad \sum_i w_{i,t}^p = 1 .$$

In (13), Q_t^F is the chain-type Fisher ideal quantity index computed using $q_{i,t-1}$, $q_{i,t}$, $p_{i,t-1}$ and $p_{i,t}$. The sum of (12) across all industries equals the overall GDP inflation rate in this study.

APPENDIX TO CHAPTER V

Jobs in the New Economy

This appendix contains supplemental data, data sources and methodologies for estimating the employment effects of information technologies as described in Chapter V of *Digital Economy 2002*. (DE2002)

IT-PRODUCING INDUSTRY EMPLOYMENT

Most of the employment estimates used in this analysis are from the Current Employment Statistics (CES) survey, conducted monthly on a sample of nonfarm establishments by the Bureau of Labor Statistics (BLS) in conjunction with state employment security agencies. (Table A-5.1) Private nonfarm employment includes all full and part-time employees except those in the agricultural and government sectors. These data are available monthly and annually via the BLS website for most three-digit and some four-digit SIC categories.

For some IT-producing industries, employment data were not available at the 4-digit SIC level, but instead at the 2- or 3-digit SIC level. In five cases, SIC 357 - Computer and office equipment, SIC 367 - Electronic components and accessories, SIC 737 - Computer and data processing services, SIC 481 - Telecommunications and SIC 483 - Cable and pay television, all of the 4-digit sub-industries were identified as IT-producing industries. Therefore, industries for which data were missing could be computed as a residual from the 2- or 3-digit aggregates. For example, most of SIC 48 (Communications services) have been defined as IT-producing industries, but CES data are only available for 481, 483, and 484. After subtracting employment levels in SICs 481, 483, and 484 from SIC 48, the residual was reported as employment in a combined industry including SICs 482 and 489.

In DE2002, SIC 483, Radio and television and broadcasting was removed from the list of IT-producing industries. The data in the following tables were revised historically, to 1992 to reflect this definitional change. Therefore, the aggregate estimates for "Communications" sector and the total for all IT-producing industries will not match those reported in *Digital Economy 2000*, *The Emerging Digital Economy II*, and *The Emerging Digital Economy*.

BLS also collects employment data through the Covered Employment and Wages (ES202) program, a Federal-State cooperative program that counts all employees covered by unemployment insurance programs. These data are published annually in *Employment and Wages, Annual Averages* and are available on the BLS website (<http://www.bls.gov/cew/home.htm>). When CES employment figures were not available at the necessary level of detail (4-digit SIC level) and a residual could not be calculated, employment levels were estimated by applying the 4-digit SIC level employment distribution of the ES202 numbers to the aggregate (3-digit SIC level) CES numbers. When CES employment numbers were not available at the 3-digit SIC level, ES202 employment numbers were used. The most recent ES202 estimates are for 2000. Therefore, estimates reported for 2001 (Figures 5.1 and 5.2 in DE2002), exclude industries SIC 3695, 3826, and 5734.

Table A-5.1
Information Technology Producing Industries: Employment Trends, 1992 to 2000

(000s)

	SIC Code	1992	1993	1994	1995	1996	1997	1998	1999	2000	Change 92-00	AAG 92-00
Total private employment		89,956	91,872	95,036	97,885	100,189	103,133	106,042	108,709	111,079	21,123	2.7
Year to year percent change			2.1%	3.4%	3.0%	2.4%	2.9%	2.8%	2.5%	2.2%		
Hardware												
Computers	3571	241.9	216.1	201.1	190.0	189.3	197.2	203.6	195.7	198.0	-43.9	-2.5
Computers and equipment wholesalers	5045pt.	277.0	270.4	271.2	285.1	304.7	334.8	371.7	392.0	387.7	110.7	4.3
Computers and equipment retailers	5734pt.	75.3	78.2	84.5	93.7	102.4	115.7	125.5	136.8	142.5	67.2	8.3
Computer storage devices & peripheral equipment	3572,7	91.3	93.2	97.9	104.5	114.2	118.7	118.7	114.8	107.3	16.0	2.0
Computer terminals, office and accounting machines	3575,8,9	57.8	54.1	55.2	57.7	58.3	60.0	59.4	57.0	56.1	-1.7	-0.4
Electron tubes	3671	26.9	24.8	24.5	24.0	22.9	21.9	20.7	20.7	20.1	-6.8	-3.6
Semiconductors	3674	217.4	213.8	220.5	235.2	259.6	277.2	284.2	272.1	293.9	76.5	3.8
Printed circuit boards, electronic capacitors	3672,5-8	156.6	161.6	168.2	187.0	195.7	205.0	204.3	195.6	210.5	53.9	3.8
Electronic components, n.e.c.	3679	126.5	127.5	131.0	134.6	138.4	146.2	150.5	152.4	157.7	31.2	2.8
Industrial instruments for measurement	3823	61.0	60.5	62.0	64.2	66.2	66.5	68.1	69.9	72.6	11.6	2.2
Instruments for measuring electricity	3825	76.1	72.8	71.2	71.2	74.3	75.4	75.8	68.3	69.6	-6.5	-1.1
Analytical instruments	3826	28.1	28.1	26.9	28.1	29.7	31.3	32.0	31.9	32.7	4.6	1.9
Total Hardware		1,435.9	1,401.1	1,414.3	1,475.3	1,555.6	1,649.9	1,714.5	1,707.2	1,748.7	312.7	2.5
Software and Computer Services												
Computer programming services	7371	168.6	188.3	209.9	245.3	276.2	321.8	378.7	454.7	518.7	350.1	15.1
Prepackaged software wholesalers	5045pt.	14.6	14.2	14.3	15.0	16.0	17.6	19.6	20.6	20.4	5.8	4.3
Prepackaged software retailers	5734pt.	4.0	4.0	4.3	4.7	5.2	6.1	6.6	7.2	7.5	3.5	8.3
Prepackaged software	7372	130.8	144.8	157.4	180.8	201.0	224.5	247.0	270.1	299.9	169.1	10.9
Computer integrated systems design	7373	102.5	109.5	116.4	129.9	143.5	161.3	181.5	210.7	223.5	121.0	10.2
Computer processing and data preparation	7374	204.4	207.3	209.5	223.1	230.0	242.9	253.7	276.1	284.8	80.4	4.2
Information retrieval services	7375	45.2	46.2	48.0	56.9	70.2	83.1	102.5	158.4	243.0	197.8	23.4
Computer maintenance and repair	7378	42.8	41.8	44.5	48.6	53.3	57.9	58.4	58.2	53.7	10.9	2.9
Computer services management, rental and leasing	7376,7,9	141.2	154.9	172.9	205.3	253.5	317.9	393.2	447.2	471.3	330.1	16.3
Total Software and Computer Services		853.9	911.0	977.1	1,109.6	1,248.9	1,433.1	1,641.2	1,903.2	2,122.8	1,268.9	12.1
Communications Equipment												
Household audio and video equipment	3651	59.8	59.5	59.9	55.7	54.8	53.8	55.0	54.1	53.6	-6.2	-1.4
Telephone and telegraph equipment	3661	109.6	110.0	109.5	111.7	114.5	120.0	125.7	120.9	126.7	17.1	1.8
Radio and TV communications equipment n.e.c.	3663,9	128.9	129.0	138.3	153.2	155.8	157.3	154.0	147.6	149.5	20.6	1.9
Magnetic and optical recording media 1/	3695	18.3	18.2	18.8	16.7	16.8	17.9	16.1	11.9	11.7	-6.6	-5.4
Total Communications Equipment		316.6	316.7	326.5	337.3	341.9	349.0	350.8	334.5	341.5	24.9	1.0
Communications Services												
Telephone communications	481	885.2	879.0	893.4	899.7	911.4	970.9	1,012.8	1,078.7	1,133.9	248.7	3.1
Telephone and telegraph communications	482,489	25.6	24.4	24.7	26.7	28.4	31.2	33.4	33.2	33.9	8.3	3.6
Cable and other pay TV services	4841	130.6	136.2	144.5	155.5	170.0	174.2	183.9	199.2	215.8	85.2	6.5
Total Communications Services		1,041.4	1,039.6	1,062.6	1,081.9	1,109.8	1,176.3	1,230.1	1,311.1	1,383.6	342.2	3.6
Total IT Producing Industries		3,647.9	3,668.4	3,780.6	4,004.2	4,256.2	4,608.3	4,936.6	5,256.0	5,596.6	1,948.7	5.5
Year to year percent change			0.6%	3.1%	5.9%	6.3%	8.3%	7.1%	6.5%	6.5%		
Share of total private employment		4.1%	4.0%	4.0%	4.1%	4.2%	4.5%	4.7%	4.8%	5.0%		

Source: ESA estimates based on Bureau of Labor Statistics data.

AAG- average annual rate of growth

Estimates of employment by wholesale and retail sellers of computer equipment and software (SICs 5045 and 5734) were divided among the computer hardware and software and computer services categories using the same distribution as value added — 95 percent to computer hardware and 5 percent to software and computer services.

IT-PRODUCING INDUSTRY WAGES

Industry level wage data are collected through the BLS ES202 program and include gross wages and salaries, bonuses, stock options, tips and other gratuities and in some cases the value of meals and lodging. These estimates along with CES industry employment were used to compute annual wages per worker shown in Figure 5.3 in *Digital Economy 2002*. (Tables A-5.2 and A-5.3)

Since employment estimates are from the CES survey and wages are from the ES202 survey, they do not exactly match employment per worker estimates using ES202 employment numbers (as published by BLS, the American Electronics Association and others). These simple averages are for purposes of comparing relative wages across industries and should not be interpreted as official BLS estimates of mean or median earnings. Estimates of wages per worker include all occupations in each industry and should not be confused with earnings for specific occupations which are discussed below.

IT OCCUPATIONAL EMPLOYMENT

Occupations considered to be essential to IT and to electronic commerce were selected based on consultations with BLS and are the same as those used for the original *Emerging Digital Economy* report. Our definition of IT occupations is broader than the “core” IT occupations *i.e.*, computer scientists, engineers, programmers and systems analysts used by the Technology Administration, National Science Foundation, Information Technology Association of America and others. (See Box on right.) This is because the definition of IT occupations used in this analysis covers

IT Related Jobs

Engineering managers
Computer and information systems managers
Computer and information scientists, research
Computer programmers
Computer software engineers, applications
Computer software engineers, systems software
Computer support specialists
Computer systems analysts
Database administrators
Network and computer systems administrators
Network systems and data communications analysts
Computer hardware engineers
Electrical engineers
Electronics engineers, except computer
Electrical and electronic engineering technicians
Data entry keyers
Computer, ATM, and office machine repairers
Telecommunications equipment installers and repairers
Electrical and electronics repairers, commercial and industrial equipment
Electrical power-line installers and repairers
Telecommunications line installers and repairers
Electrical and electronic equipment assemblers
Electromechanical equipment assemblers
Semiconductor processors
Switchboard operators, including answering service
Telephone operators
Billing and posting clerks and machine operators
Computer operators
Mail and other office machine operators

Source: ESA in consultation with BLS.

occupations not only involved in conducting electronic commerce, but in maintaining the infrastructure that enables it.

The occupations listed above do not match those published in earlier Digital Economy reports

Table A-5.2
Information Technology Producing Industries: Annual Wages Per Worker, 1992 to 2000

	SIC	1992	1993	1994	1995	1996	1997	1998	1999	2000	Change 1992 to 2000	AAG% 1992 to 2000
Average All Private Industries		\$25,400	\$25,700	\$26,200	\$27,200	\$28,300	\$29,800	\$31,500	\$32,900	\$35,000	\$9,600	4.1
Average IT-Producing Industries		\$41,800	\$43,100	\$44,500	\$46,900	\$49,700	\$53,500	\$58,500	\$65,600	\$73,800	\$32,000	7.4
Hardware												
Computers	3571	\$52,400	\$54,700	\$55,600	\$59,600	\$62,400	\$69,800	\$82,200	\$98,000	\$124,300	\$71,900	11.4
Computer equipment wholesalers	5045pt.	\$52,500	\$52,900	\$52,900	\$54,300	\$56,700	\$62,100	\$69,200	\$80,400	\$88,200	\$35,700	6.7
Computer equipment retailers	5734pt.	\$32,200	\$30,500	\$32,000	\$33,700	\$34,900	\$37,300	\$40,900	\$43,300	\$47,900	\$15,700	5.1
Computer storage devices & peripheral equipment	3572,7	\$41,200	\$42,700	\$42,900	\$46,500	\$51,000	\$58,400	\$57,400	\$65,600	\$84,200	\$43,000	9.3
Computer terminals, office and accounting machines	3575,8,9	\$43,300	\$44,800	\$44,300	\$46,600	\$49,500	\$52,900	\$58,000	\$64,300	\$67,600	\$24,300	5.7
Electron tubes	3671	\$38,400	\$37,600	\$39,800	\$41,900	\$41,000	\$44,200	\$45,800	\$48,400	\$59,900	\$21,500	5.7
Semiconductors	3674	\$44,500	\$47,400	\$49,500	\$53,800	\$54,400	\$59,700	\$64,300	\$74,900	\$93,500	\$49,000	9.7
Printed circuit boards, electronic capacitors	3672,5-8	\$25,700	\$26,500	\$27,500	\$28,300	\$29,400	\$31,600	\$33,400	\$35,100	\$39,800	\$14,100	5.6
Electronic components, n.e.c.	3679	\$29,700	\$30,700	\$31,900	\$32,900	\$33,900	\$35,600	\$36,800	\$41,800	\$45,900	\$16,200	5.6
Industrial instruments for measurement	3823	\$35,100	\$35,800	\$37,000	\$38,400	\$40,500	\$43,200	\$45,700	\$48,500	\$54,300	\$19,200	5.6
Instruments for measuring electricity	3825	\$42,500	\$44,000	\$48,200	\$51,600	\$54,500	\$59,300	\$64,000	\$70,600	\$82,500	\$40,000	8.6
Laboratory analytical instruments	3826	\$38,700	\$39,200	\$42,600	\$44,200	\$50,100	\$49,900	\$54,600	\$58,700	\$75,400	\$36,700	8.7
Hardware		\$42,400	\$43,300	\$44,200	\$46,300	\$48,300	\$52,800	\$57,800	\$65,900	\$77,200	\$34,800	7.8
Software and Computer Services												
Computer programming services	7371	\$46,200	\$47,600	\$50,100	\$52,700	\$56,900	\$60,000	\$63,400	\$69,000	\$81,600	\$35,400	7.4
Prepackaged software wholesalers	5045pt.	\$52,500	\$52,900	\$52,900	\$54,300	\$56,700	\$62,100	\$69,200	\$80,500	\$88,300	\$35,800	6.7
Prepackaged software retailers	5734pt.	\$32,300	\$31,700	\$33,300	\$35,100	\$36,400	\$37,300	\$40,900	\$43,300	\$47,900	\$15,600	5.0
Prepackaged software	7372	\$57,000	\$54,500	\$57,000	\$63,700	\$70,100	\$79,200	\$96,100	\$115,400	\$117,400	\$60,400	9.5
Computer integrated systems design	7373	\$48,600	\$49,700	\$52,700	\$54,700	\$59,400	\$62,000	\$64,600	\$69,400	\$78,700	\$30,100	6.2
Computer processing and data preparation	7374	\$34,400	\$36,100	\$36,600	\$39,700	\$43,300	\$44,700	\$46,300	\$49,200	\$52,300	\$17,900	5.4
Information retrieval services	7375	\$36,700	\$38,900	\$38,600	\$42,200	\$45,300	\$48,500	\$61,400	\$73,200	\$89,500	\$52,800	11.8
Computer maintenance and repair	7378	\$36,600	\$37,500	\$37,200	\$37,800	\$39,500	\$40,100	\$42,700	\$42,700	\$44,800	\$8,200	2.6
Computer services management, rental and leasing	7376,7,9	\$46,000	\$46,800	\$48,900	\$51,800	\$54,600	\$58,700	\$63,700	\$68,400	\$74,900	\$28,900	6.3
Software and Computer Services		\$44,300	\$45,300	\$47,200	\$50,700	\$54,800	\$58,800	\$65,000	\$72,200	\$80,900	\$36,600	7.8
Communications Equipment												
Household audio and video equipment	3651	\$32,700	\$33,900	\$36,900	\$32,400	\$35,100	\$39,300	\$40,700	\$42,600	\$45,000	\$12,300	4.1
Telephone and telegraph equipment	3661	\$42,400	\$45,400	\$46,800	\$49,900	\$54,600	\$57,400	\$65,100	\$70,700	\$80,500	\$38,100	8.3
Radio and TV communications equipment n.e.c.	3663,9	\$39,100	\$40,300	\$40,100	\$42,700	\$44,400	\$48,000	\$52,200	\$57,200	\$68,200	\$29,100	7.2
Magnetic and optical imaging devices	3695	\$37,500	\$38,800	\$39,300	\$39,200	\$45,700	\$43,000	\$45,100	\$45,000	\$42,800	\$5,300	1.7
Communications Equipment		\$38,900	\$40,800	\$41,700	\$43,200	\$46,400	\$49,700	\$54,700	\$59,200	\$68,300	\$29,400	7.3
Communications Services												
Telephone communications	481	\$41,400	\$43,300	\$45,100	\$46,800	\$48,700	\$50,900	\$53,400	\$58,800	\$62,100	\$20,700	5.2
Telephone and telegraph communications	482,489	\$41,700	\$44,100	\$47,200	\$48,500	\$52,900	\$54,600	\$58,900	\$71,200	\$76,500	\$34,800	7.9
Cable and other pay TV services	4841	\$29,600	\$30,500	\$31,400	\$34,600	\$35,500	\$37,900	\$41,700	\$47,000	\$47,200	\$17,600	6.0
Communications Services		\$39,900	\$41,600	\$43,200	\$45,100	\$46,700	\$49,100	\$51,800	\$57,300	\$60,100	\$20,200	5.3

Source: ESA calculations based on BLS data.

AAG- average annual rate of growth

Table A-5.3
Information Technology Producing Industries: Total Annual Wages, 1992 to 2000

	1992	1993	1994	1995	1996	1997	1998	1999	2000	Change 1992 to 2000	AAG% 1992 to 2000
All Private Industries	\$2,282,598	\$2,365,301	\$2,494,459	\$2,658,927	\$2,837,335	\$3,071,609	\$3,337,622	\$3,577,739	\$3,885,819	\$1,603,221	6.9
IT-Producing Industries	\$152,598	\$158,080	\$166,191	\$187,865	\$211,392	\$246,417	\$288,783	\$344,838	\$413,068	\$260,490	13.3
Hardware											
Computers	12,666	11,811	11,187	11,317	11,821	13,762	16,745	19,180	24,610	11,844	8.7
Computer and equipment wholesalers	14,543	14,315	14,344	15,482	17,284	20,786	25,716	31,526	34,210	19,667	11.3
Computer and equipment retailers	2,426	2,385	2,705	3,158	3,578	4,317	5,133	5,924	6,832	4,406	13.8
Computer storage devices & peripheral equipment	3,761	3,975	4,200	4,861	5,823	6,931	8,811	7,527	9,036	5,275	11.6
Computer terminals, office and accounting machines, and office machines, n.e.c.	2,500	2,424	2,447	2,687	2,883	3,174	3,447	3,665	3,791	1,291	5.3
Electron tubes	1,032	932	974	1,005	938	969	947	1,001	1,204	172	1.9
Semiconductors	9,670	10,126	10,923	12,654	14,124	16,549	18,287	20,383	27,490	17,820	14.0
Printed circuit boards, electronic capacitors, resistors, coils, transformers, and connectors	4,023	4,276	4,622	5,291	5,754	6,473	6,829	6,860	8,374	4,351	9.6
Electronic components, n.e.c.	3,759	3,908	4,185	4,430	4,695	5,210	5,536	6,364	7,241	3,482	8.5
Industrial instruments for measurement	2,140	2,168	2,297	2,467	2,679	2,873	3,112	3,388	3,946	1,806	7.9
Instruments for measuring electricity	3,234	3,202	3,431	3,671	4,052	4,468	4,822	4,852	5,745	2,511	7.4
Laboratory analytical instruments	1,088	1,102	1,147	1,243	1,484	1,563	1,745	1,872	2,466	1,378	10.8
Total Hardware	\$60,976	\$60,656	\$62,496	\$68,303	\$75,156	\$87,074	\$99,161	\$112,513	\$134,946	\$74,070	10.5
Software/Services											
Computer programming services	7,793	8,954	10,507	12,935	15,721	19,311	24,015	31,363	42,329	34,536	23.6
Prepackaged software wholesalers	765	753	755	815	910	1,094	1,353	1,659	1,801	1,035	11.3
Prepackaged software retailers	128	126	142	166	188	227	270	312	360	232	13.8
Prepackaged software	7,455	7,890	8,968	11,517	14,086	17,776	23,748	31,156	35,199	27,744	21.4
Computer integrated systems design	7372	4,977	6,140	7,107	8,517	10,007	11,729	14,630	17,591	12,614	17.1
Computer processing and data preparation	7374	7,026	7,673	8,868	9,968	10,854	11,751	13,588	14,900	7,874	9.9
Information retrieval services	1,659	1,797	1,852	2,401	3,181	4,031	6,297	11,590	21,747	20,068	37.9
Computer maintenance and repair	1,566	1,567	1,657	1,838	2,108	2,320	2,492	2,487	2,405	839	5.5
Computer services management, rental and leasing, and maintenance and repair	6,491	7,254	8,459	10,640	13,853	18,671	25,048	30,577	35,304	28,813	23.6
Total Software/Services	\$37,926	\$41,239	\$46,119	\$56,250	\$68,490	\$84,291	\$106,705	\$137,363	\$171,634	\$133,868	20.8
Communications Equipment											
Household audio and video equipment	1,955	2,015	2,210	1,803	1,924	2,117	2,240	2,302	2,413	458	2.7
Telephone and telegraph equipment	4,645	4,994	5,129	5,574	6,256	6,887	8,192	8,544	10,197	5,552	10.3
Radio and TV communications equipment and communications equipment, n.e.c.	5,037	5,202	5,541	6,547	6,917	7,555	8,044	8,437	10,189	5,162	9.2
Magnetic and optical recording media	685	706	741	656	770	769	728	536	501	-184	-3.8
Total Communications Equipment	\$12,322	\$12,917	\$13,621	\$14,580	\$15,867	\$17,328	\$19,194	\$19,819	\$23,310	\$10,988	8.3
Communications Services											
Telephone communications	36,641	38,037	40,248	42,083	44,347	49,421	54,081	63,418	70,418	33,777	8.5
Telephone and telegraph communications	1,068	1,076	1,166	1,296	1,503	1,705	1,966	2,362	2,594	1,526	11.7
Cable and other pay TV services	3,865	4,155	4,541	5,373	6,029	6,597	7,677	9,363	10,185	6,320	12.9
Total Communications Services	\$41,574	\$43,268	\$45,955	\$48,752	\$51,879	\$57,723	\$63,732	\$75,143.3	\$83,198	\$41,624	9.1

AAG - average annual rate of growth

Source: ESA calculations based on BLS data.

because in 1999, BLS started using the new Standard Occupational Classification (SOC) system. The new SOC system has expanded and combined some occupations and added some new ones. For example, computer engineers now have three separate occupations – computer hardware engineer, computer software engineer-applications, and computer software engineer-systems software. Network and computer systems administrators, network systems and data communications analysts, and computer and information scientists-research are newly classified occupations. Engineering managers were separated from computer and information systems managers. Billing, and calculating machine operators, however, were combined with billing rate clerks to create a new occupation called billing and posting clerks and machine operators.

Occupational employment is collected as part of the annual Occupational Employment Statistics (OES) survey. (<http://www.bls.gov/oes/home.htm>) The OES survey is conducted in a three year cycle, during which one-third of the sample is surveyed each year. Because changes in the SOC started in 1999, the 2000 data were computed from only a two-year cycle. Employees in IT occupations are counted across all industries, including government and agricultural services. Employment in IT occupations for 2000 are in Table A-5.4 and descriptions of duties are in Table A-5.5.

EDUCATION AND TRAINING REQUIREMENTS BY OCCUPATION

The Bureau of Labor Statistics classifies occupations into 1 of 11 categories that describe the education and training needed by most workers to become fully qualified. *Note that these education and training categories were not intended to be measured as skills.* The eleven categories include occupations that require training ranging from short-term on-the-job training to a first professional degree. A concordance is provided in the box below that shows the 11 BLS categories and how they correspond to the three levels of training intensity presented in Appendix Table A-5.4 and Figure 5.4 in the *Digital Economy 2002* report.

Concordance of BLS and ESA Education and Training Requirement Levels	
BLS Categories	ESA Intensity Levels
First professional degree	High
Doctoral degree	High
Master's degree	High
Work experience, plus a bachelor's or higher degree	High
Bachelor's degree	High
Associate's degree	High
Post-secondary vocational training	Moderate
Work experience in a related occupation.	Moderate
Long-term on-the-job training	Moderate
Moderate-term on-the-job training	Low
Short-term on-the-job training	Low

Table A-5.4
Employment and Wages, by Occupation, 2000
 from OES survey

Occupation	Employment	Median Annual Wages	Education/ training requirement*
Engineering managers	242,280	\$84,070	High
Computer and information systems managers	283,480	\$78,830	High
Computer and information scientists, research	25,800	\$70,600	High
Computer programmers	530,730	\$57,600	High
Computer software engineers, applications	374,640	\$67,660	High
Computer software engineers, systems software	264,610	\$69,530	High
Computer support specialists	522,570	\$36,460	High
Computer systems analysts	463,300	\$59,340	High
Database administrators	108,000	\$51,980	High
Network and computer systems administrators	234,040	\$51,270	High
Network systems and data communications analysts	119,220	\$54,500	High
Computer hardware engineers	63,680	\$67,310	High
Electrical engineers	162,400	\$64,920	High
Electronics engineers, except computer	123,690	\$64,830	High
Electrical and electronic engineering technicians	244,570	\$40,020	High
Data entry keyers	458,720	\$21,300	Moderate
Computer, automated teller, and office machine repairers	142,390	\$31,370	Moderate
Telecommunications equipment installers and repairers, except line installers	192,470	\$44,030	Moderate
Electrical and electronics repairers, commercial and industrial equipment	81,760	\$36,920	Moderate
Electrical power-line installers and repairers	96,200	\$45,780	Moderate
Telecommunications line installers and repairers	168,480	\$38,110	Moderate
Electrical and electronic equipment assemblers	367,150	\$21,440	Moderate
Electromechanical equipment assemblers	72,550	\$23,210	Moderate
Semiconductor processors	67,000	\$25,440	Moderate
Switchboard operators, including answering service	243,100	\$20,200	Low
Telephone operators	52,150	\$28,000	Low
Billing and posting clerks and machine operators	492,040	\$24,560	Low
Computer operators	186,460	\$27,660	Low
Mail clerks and mail machine operators, except postal service	182,460	\$19,840	Low
Other office machine operators	86,380	\$20,800	Low
Total	6,652,320		

High: Associate degree, bachelor's degree or work experience plus a bachelor's degree or higher

Moderate: long-term on-the-job training, work experience in a related occupation or post secondary vocational training

Low: short to moderate-term on-the-job training

*The grouping of education and training categories into high, moderate and low requirement levels reflects the author's interpretation of training intensity. BLS classifies occupations into 11 categories that describe education and training needed by most workers to become fully qualified. A description of these education and training categories can be found in the November 2001, Monthly Labor Review.

Source: Bureau of Labor Statistics.

IT OCCUPATIONAL WAGES

Median wages by occupation that are reported in Table A-5-4, are also from the OES survey and can be downloaded from the OES website. (<http://www.bls.gov/oes/home.htm>). Wages are straight time, gross pay and includes some types of bonuses and commissions. Like employment, wages are collected on a 3-year cycle, but the 2000 wages are based on only two years because of SOC changes.

For additional information on BLS surveys and related methodologies, see the *BLS Handbook of Methods*, April 1997. (<http://www.bls.gov/opub/hom/home.htm>)

**Table A-5.5
Information Technology Occupations**

Occupation	Description of Duties
Engineering managers	Plan, direct, or coordinate activities in such fields as architecture and engineering or research and development in these fields.
Computer and information systems managers	Plan, direct, or coordinate activities in such fields as electronic data processing, information systems, systems analysis, and computer programming.
Computer and information scientists, research	Conduct research into fundamental computer and information science as theorists, designers, or inventors. Solve or develop solutions to problems in the field of computer hardware and software.
Computer programmers	Convert statements of problems and procedures to flow charts for coding into computer language. Develop and write programs to store, locate, and retrieve data and information. May program web sites.
Computer software engineers, applications	Develop, create, and modify general computer applications software or specialized utility programs. Analyze user needs and develop software solutions. Design software or customize software for client use. May analyze and design databases within an application area.
Computer software engineers, systems software	Research, design, develop, and test operating systems-level software, compilers, and network distribution software for a variety of computing applications. (medical, industrial, military, general) Set operational specifications and formulate and analyze software requirements.
Computer support specialists	Provide technical assistance to computer system users. Answer questions or resolve computer problems for clients in person or via telephone. May provide assistance in the use of computer hardware and software, including printing, installation, word processing, electronic mail, and operating systems.
Computer systems analysts	Analyze science, engineering, business, and all other data processing problems for application to electronic data processing systems. Analyze user requirements, procedures, and problems to automate or improve existing systems. May analyze or recommend commercially available software.
Database administrators	Coordinate, test and implement changes to computer databases using database management systems. May plan, coordinate, and implement security measures to safeguard computer databases.
Network and computer systems administrators	Install, configure, support, monitor and maintain an organization's local area network (LAN), wide area network (WAN), and Internet system. May supervise network support and client server specialists and plan, coordinate, and implement network security measures.
Network systems and data communications analysts	Analyze, design, test, and evaluate network systems, such as local area networks (LAN), wide area networks (WAN), Internet, intranet, and other data communications systems. Research and recommend network and data communications hardware and software. Include telecommunications specialists who deal with the interfacing of computer and communications equipment. May supervise computer programmers.
Computer hardware engineers	Research, design, develop, and test computer or computer-related equipment for commercial, industrial, military, or scientific use. May supervise the manufacturing and installation of computer or computer-related equipment and components.
Electrical engineers	Design, develop, test, or supervise the manufacturing and installation of electrical equipment, components, or systems for commercial, industrial, military, or scientific use.
Electronics engineers, except computer	Research, design, develop, and test electronic components and systems for commercial, industrial, military, or scientific use. Design electronic circuits and components for use in fields such as telecommunications, aerospace guidance and propulsion control, acoustics, or instruments and controls.

**Table A-5.5
Information Technology Occupations contd.**

Occupation	Description of Duties
Electrical and electronic engineering technicians	Apply electrical and electronic theory, usually under the direction of engineering staff, to design, build, repair, calibrate, and modify electrical components, circuitry, controls, and machinery for subsequent evaluation and use by engineering design staff.
Data entry keyers	Operate data entry device, such as keyboard or photo composing perforator. Duties may include verifying data and preparing materials for printing.
Computer, automated teller, and office machine repairers	Repair, maintain, or install computers, word processing systems, automated teller machines, and electronic office machines, such as duplicating and fax machines.
Telecommunications equipment installers and repairers, except line installers	Set-up, rearrange, or remove switching and dialing equipment used in central offices. Install and repair telephones and other communication equipment.
Electrical and electronics repairers, commercial and industrial equipment	Repair, test, adjust, or install electronic equipment, such as industrial controls, transmitters, and antennas.
Electrical power-line installers and repairers	Install or repair cables or wires used in electrical power or distribution systems. May erect poles and light or heavy duty transmission towers.
Telecommunications line installers and repairers	String and repair telephone and television cable, including fiber optics and other equipment for transmitting messages or television programming.
Electrical and electronic equipment assemblers	Assemble or modify electrical or electronic equipment, such as computers, test equipment telemetering systems, electric motors, and batteries.
Electromechanical equipment assemblers	Assemble or modify electromechanical equipment or devices, such as servomechanisms, gyros, dynamometers, magnetic drums, tape drives, brakes, control linkage, actuators, and appliances.
Semiconductor processors	Perform any or all of the functions in the manufacture of electronic semiconductors, including loading semiconductor material into furnace; sawing formed ingots into segments; cleaning, polishing, and loading wafers into series of special purpose furnaces, chemical baths, and equipment used to form circuitry.
Switchboard operators, including answering service	Operate telephone business systems equipment or switchboards to relay incoming, outgoing, and interoffice calls. May supply information to callers and record messages.
Telephone operators	Provide information by accessing alphabetical and geographical directories. Assist customers with special billing requests, such as charges to a third party and credits or refunds for incorrectly dialed numbers or bad connections. May handle emergency calls and assist children or people with physical disabilities to make telephone calls.
Billing and posting clerks and machine operators	Compile, compute, and record billing, accounting, statistical, and other numerical data for billing purposes. Prepare billing invoices for services rendered or for delivery or shipment of goods.
Computer operators	Monitor and control computer and peripheral electronic data processing equipment to process business, scientific, engineering, and other data according to operating instructions. May set controls on computer and peripheral devices. Monitor and respond to operating and error messages.

Source: Bureau of Labor Statistics.