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MULTIFACTOR PRODUCTIVITY TRENDS, 2001

Private Business and Private Nonfarm Business

From 2000 to 2001, multifactor productivity fell 1.0 percent in both the private business sector and the private nonfarm business sector for the first time since 1991, the Bureau of Labor Statistics of the U.S. Department of Labor reported.

Although short-term fluctuations of multifactor productivity and output per hour generally move in the same direction, multifactor productivity decreased and output per hour increased in 2001. The 2001 annual changes are summarized in table A, and further detail and historical measures are shown in tables 1 through 6. Manufacturing multifactor productivity measures are not yet available for 2001.

Chart 1. Output per hour of all persons, output per unit of capital, and multifactor productivity in the private business sector, 1948 to 2001 (1948=100)

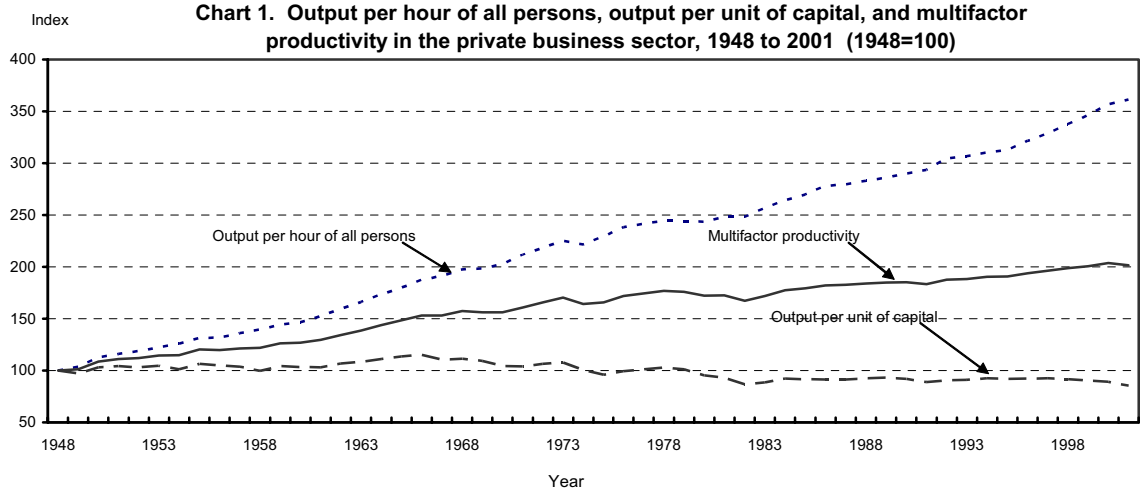

Chart 1 shows the annual indexes of multifactor productivity, output per hour worked, and output per unit of capital services for the 1948-2001 period for private business. Over the last 50 years, capital services have grown more rapidly than hours in the private business sector, and the skills of workers as measured by their education and work experience also have risen over this period. These shifts toward more capital intensive production and workers with more human capital have supplemented multifactor productivity growth, usually allowing output per hour to grow at a faster rate than multifactor productivity.

Multifactor productivity is designed to measure the joint influences on economic growth of technological change, efficiency improvements, returns to scale, reallocation of resources, and other factors. Multifactor productivity, therefore, differs from labor productivity (output per hour) measures that are published quarterly by BLS since it includes information on capital services and other data that are not available on a quarterly basis.

Private business and private nonfarm business

In private business and private nonfarm business, the change in multifactor productivity reflects the difference between the change in real gross domestic product for the sector and the change in labor and capital inputs engaged in the production of this output. The output measures for private business and private nonfarm business are similar to the indexes of output for business and nonfarm business used in the quarterly labor productivity measures, but omit the output of government enterprises.

A change in multifactor productivity reflects the change in output that cannot be accounted for by the change in combined inputs of labor and capital. In contrast, a change in labor productivity reflects the change in output that cannot be accounted for by the change in hours of all persons engaged in production.

Changes in 2000-2001

Private business sector

Multifactor productivity declined 1.0 percent in 2001, the first decline since the 1991 recession. The multifactor productivity decline in 2001 reflected a 0.1 percent decline in output while the combined inputs of capital and labor increased by 0.9 percent. By comparison, in 2000, multifactor productivity increased 1.5 percent as output increased by 4.0 percent and combined inputs grew by 2.5 percent.

In 2001, growth in capital services slowed to 4.0 percent, down from the 5.6 percent increase in 2000. Labor input declined for the first time since 1991. The capital-labor ratio (capital services per hour of all persons) typically grows rapidly when hours fall. The 5.5 percent advance was the largest since 1982 (table 3).

Capital services of equipment grew more rapidly than other asset categories. Within equipment, capital services of information equipment and of software continued to increase sharply in 2001 (table 5). However, both showed the slowest rates of increase since 1995. The largest increase continued to be in computers and related equipment, 23.7 percent.

Labor input reflects the change in hours at work, adjusted for the effects of changing labor composition. Changes in hours at work reflect the combined effects of changes in the average workweek and employment. The labor composition component grew by 0.8 percent in 2001, the largest increase since 1992, while the workweek declined sharply for the second year in a row. Employment declined 0.5 percent in 2001, the first decline since 1992. Labor input fell because of the decline in both the workweek and in employment, exceeding the sharp increase in labor composition.

Table A. Productivity and related data, percent changes 2000-01

	Private Business[1]	Private Nonfarm Business[1]
Productivity		
Multifactor Productivity[2]	-1.0	-1.0
Output per hour of all persons	1.3	1.2
Output per unit of capital services	-4.0	-4.0
Output	-0.1	-0.1
Inputs		
Labor input[3]	-0.6	-0.4
Hours	-1.4	-1.3
Labor Composition[4]	0.8	0.9
Capital services	4.0	4.1
Combined units of labor and capital inputs[5]	0.9	1.0
Analytic ratio:		
Capital services per hour of all persons	5.5	5.5

1. Excludes government enterprises.
2. Output per unit of combined labor and capital inputs.
3. Index of hours worked; hours worked by education and experience group are weighted by each group's share of labor compensation.
4. Ratio of labor input to hours.
5. Labor input index combined with capital service input index, weighted by labor's and capital's shares of nominal output.

Labor productivity (output per hour worked) increased 1.3 percent in 2001. This was the smallest increase since 1995 and was accompanied by a sharp decline in hours worked, 1.4 percent. Capital productivity (output per unit of capital services) fell 4.0 percent, the largest rate of decline since 1982, another recession year.

Private nonfarm business

Multifactor productivity in the private nonfarm business sector declined 1.0 percent in 2001, the first decline since 1991. Output declined by 0.1 percent, and the growth of combined units of capital and labor inputs was 1.0 percent. By comparison, in 2000, multifactor productivity rose 1.4 percent as output increased 3.9 percent and combined inputs rose 2.5 percent.

Labor input declined 0.4 percent in 2001. As in the private business sector, the slow growth of labor input was due to a decline in hours at work that was partially offset by a positive contribution from labor composition. Capital services growth was 4.1 percent, a more modest increase than the rapid growth seen in the previous five years. The fastest growing component of capital services was equipment, 6.9 percent in 2001 (table 6); however the growth in equipment was the slowest since 1995. Capital services of information processing equipment and software rose 11.6 percent, the slowest rate of growth since 1995. As in previous years, the largest increase was in computers and related equipment, 23.7 percent in 2001.

Labor productivity grew 1.2 percent in 2001, and capital productivity dipped 4.0 percent. The decline in capital productivity was the largest since 1982. In 2001, capital services per hour increased at its highest rate since 1982, posting a 5.5 percent gain.

Long-term trends in private business and private nonfarm business

Labor productivity (output per hour) differs from multifactor productivity (output per unit of combined capital and labor inputs) in the treatment of both capital and hours. Labor productivity measures do not explicitly account for the effects of capital or of changes in the composition of labor on output growth. As a result, changes in capital intensity (the capital-hours ratio) and labor composition can influence labor productivity growth. In contrast, multifactor productivity treats capital as an explicit factor of production and, therefore, is net of changes in capital intensity. In addition, the labor input measure used to calculate multifactor productivity reflects the combined effects of changes in hours at work and of shifts in the educational attainment and experience of the work force. Therefore, multifactor productivity accounts for changes in labor composition as well. Long-term labor productivity growth can be viewed as the sum of three components: multifactor productivity growth, the contribution of increased capital intensity, and the contribution of shifts in labor composition (table B).

The contribution of capital intensity equals the change in the capital-hours ratio multiplied by capital's share of total payments to inputs. The contribution of labor composition equals the difference between the growth rate of labor input and the growth rate of hours multiplied by labor's share of total payments. Historically, capital's share has been slightly less than one-third of the total payments.

Private Business Sector

Over the entire 1948 to 2001 period, output per hour grew at an annual rate of 2.5 percent in private business (table B). Of the 2.5 percent growth rate in labor productivity, 1.3 percent can be attributed to increases in multifactor productivity, 0.9 percent to the contribution of capital intensity, and 0.2 percent to changes in labor composition. The contribution of capital intensity is composed of the contribution of information processing equipment and software (0.3 percent) and of the contribution of other types of capital (0.6 percent). Information processing equipment and software is composed of computers and related equipment, communications equipment, instruments and photocopying equipment, and software. Investment in these forms of capital was small prior to 1979 but has grown to nearly half of all investment in recent years.

In the 1948-1973 period, labor productivity, or output per hour, in private industry grew 3.3 percent per year, faster than the average rate for the entire 1948-2001 period. This reflected strong growth in multifactor productivity (2.1 percent), combined with average contributions of capital intensity (0.9 percent) and labor composition (0.2 percent).

After 1973, productivity growth slowed (table B and chart 2). From 1973 to 1979, labor productivity rose only 1.3 percent per year. Gains in multifactor productivity dropped to only 0.6 percent per year. At the same time, the average annual contribution of capital intensity slowed to 0.7 percent, and labor composition made no contribution.

From 1979 to 1990, labor productivity increased at an annual average rate of 1.6 percent, slightly faster than during the previous period (1.3 percent) but still relatively low. Multifactor productivity growth, at 0.5 percent, was about the same as in 1973-1979 (0.6 percent). The contribution of capital intensity inched up from 0.7 percent in 1973-1979 to 0.8 percent in 1979-1990, as information processing equipment began to play an increasingly important role, accounting for nearly two-thirds of the growth in capital intensity. However, the slight improvement in labor productivity growth was primarily due to the change in the composition of the work force, which contributed 0.3 percent to growth after contributing nothing in the previous period.

From 1990 to 1995, labor productivity advanced at an annual rate of 1.5 percent, 0.1 percentage point less than during the 1979-1990 period. Small increases in the rates of growth in multifactor productivity and in the contribution of labor composition were offset by a decline in the contribution of capital services, from 0.8 percent in 1979-1990 to 0.5 percent in 1990-1995. The slower rate of growth in labor productivity was primarily due to the decline in the contribution of capital services. However, information processing capital continued growing in importance, contributing 80 percent of the increase in all capital services.

Table B. Compound average annual rates of growth in output per hour of all persons and the contributions of capital intensity, labor composition, and multifactor productivity, by major sector, 1948 to 2001

(percent per year)

	1948-01	1948-73	1973-79	1979-90	1990-95	1995-00	2000-01
Private business[1]							
Output per hour of all persons	2.5	3.3	1.3	1.6	1.5	2.7	1.3
Contribution of capital intensity[2]	0.9	0.9	0.7	0.8	0.5	1.1	1.7
Contribution of information processing equipment and software[3]	0.3	0.1	0.3	0.5	0.4	0.8	0.8
Contribution of all other capital services	0.6	0.8	0.5	0.3	0.1	0.2	0.9
Contribution of labor composition[4]	0.2	0.2	0.0	0.3	0.4	0.3	0.6
Multifactor productivity[5]	1.3	2.1	0.6	0.5	0.6	1.3	-1.0
Private nonfarm business[1]							
Output per hour of all persons	2.2	2.9	1.2	1.4	1.6	2.5	1.2
Contribution of capital intensity[2]	0.8	0.8	0.7	0.8	0.5	1.1	1.7
Contribution of information processing equipment and software[3]	0.3	0.1	0.3	0.5	0.4	0.8	0.8
Contribution of all other capital services	0.5	0.7	0.5	0.3	0.1	0.2	0.9
Contribution of labor composition[4]	0.2	0.2	0.0	0.3	0.4	0.3	0.6
Multifactor productivity[5]	1.1	1.9	0.4	0.3	0.6	1.1	-1.0
Contribution of R&D to multifactor productivity	0.2	0.2	0.1	0.2	0.2	0.2	0.3

1. Excludes government enterprises.
2. Growth rate in capital services per hour multiplied by capital's share of current dollar costs.
3. Growth rate of information processing equipment and software multiplied by its share of total costs.
4. Growth rate of labor composition (the growth rate of labor input less the growth rate of the hours of all persons) multiplied by labor's share of current dollar costs.
5. Output per unit of combined labor and capital inputs.

Note: Multifactor productivity plus contribution of capital intensity and labor composition may not sum to output per hour due to independent rounding. Contribution of information processing equipment and all other capital may not sum to the contribution of capital intensity due to independent rounding.

From 1995 to 2000, output per hour rebounded to a 2.7 percent growth rate per year, 1.2 percentage points more than during the 1990-1995 period. Most of this acceleration could be attributed to faster multifactor productivity growth, which more than doubled from 0.6 percent to 1.3 percent per year. The remainder of the increase was due to a rise in the contribution of capital services, from 0.5 percent to 1.1 percent; information processing capital accounted for a large part of this increase, contributing 82 percent of all capital increases. This continued the trend in the substitution of information processing equipment for other forms of capital seen in recent years.

Private nonfarm business sector

The trends of the various measures in the private nonfarm business sector were similar to those in the private business sector in each period. Therefore, the patterns of productivity slowdowns after 1973 and rebounds after 1995 correspond closely in the two sectors.

Contribution of research and development to multifactor productivity in private nonfarm business

While multifactor productivity reflects many influences, technological change is one of the primary contributors. For private nonfarm business, BLS also reports estimates of the impact on multifactor productivity growth of firms' spending for research and development (R&D) on all firms within the same industries. Because many people associate research and development spending and the resulting technological improvements with productivity, multifactor productivity has not been adjusted to exclude the effects of research and development. The contribution of research and development averaged 0.2 percent per year for the entire 1948-2001 period, or about 18 percent of total multifactor productivity growth (table B). The contribution of research and development varied little over time, contributing 0.2 percent per year during the 1948-73 period, 0.1 percent during the 1973-79 period and 0.2 percent for all but the last period of 2000-2001 when the contribution was 0.3 percent.

Revisions

Private business and private nonfarm business output series reflect the annual revisions to the National Income and Product Accounts (NIPA), announced by the Bureau of Economic Analysis (BEA) in October 2002.

The hours data for 2001 in this release continue to apply the results of the 2000 Hours at Work survey. This survey is designed to measure the ratio of hours at work to hours paid for production and nonsupervisory employees in nonagricultural establishments. BLS converts hours paid from the Current Employment Statistics program to hours at work using data from this survey. The results from the 2000 Hours at Work survey can be found at http://www.bls.gov/mfp/mprhws.pdf or in print.

Labor composition measures have been updated through 2001. A brief description, "Changes in the Composition of Labor for the BLS Multifactor Productivity Measures," is available at http://www.bls.gov/mfp/mprlabor.pdf or in print.

Comprehensive tables containing additional data beyond the scope of this press release are available upon request, at http://www.bls.gov/mfp/mprdload.htm or in print.

Summary of Methods

The following note describes the major data sources and the procedures used in deriving BLS multifactor productivity indexes. More detailed information on methods, limitations, and data sources is provided in BLS Bulletin 2178 (September 1983), "Trends in Multifactor Productivity, 1948-81." Additional data not contained in the release can be obtained in print or at http://www.bls.gov/mfp.

This release presents data for the private business and private nonfarm business sectors. The private business sector, which accounts for about 76 percent of gross domestic product, includes all of gross domestic product except the output of general government, government enterprises, non-profit institutions, the rental value of owner-occupied real estate, and the output of paid employees of private households. Additionally, the private nonfarm business sector excludes farms, but includes agricultural services. Multifactor measures exclude government enterprises, while the BLS quarterly Productivity and Cost series includes them.

Multifactor productivity measures describe the relationship between output in real terms and the inputs involved in its production. They do not measure the specific contributions of labor, capital, or any other factor of production. Rather, multifactor productivity is designed to measure the joint influences on economic growth of technological change, efficiency improvements, returns to scale, reallocation of resources due to shifts in factor inputs across industries, and other factors.

The multifactor productivity indexes for private business and private nonfarm business are derived by dividing an output index by an index of labor input and capital services. The output indexes are computed as chained superlative indexes (Fisher Ideal indexes) of components of real output. For the years 1948 to 2001, BEA supplies the output indexes. BLS adjusts these to eliminate the output of government enterprises.

Capital input measures the services derived from the stock of physical assets and software. The assets included are fixed business equipment, structures, inventories, and land. Among equipment, BLS provides additional detail for information processing equipment and software (IPES). IPES is composed of four broad classes of assets: computers and related equipment, software, communications equipment, and other IPES equipment. Computers and related equipment includes mainframe computers, personal computers, printers, video displays, and other related equipment. Software is comprised of pre-packaged, custom, and own-account software. Communications equipment is not further differentiated. Other IPES includes scientific and related equipment, photocopying and related equipment, and office and accounting equipment. Structures include nonresidential structures and residential capital that is rented out by profit-making firms or persons.

Financial assets are excluded from capital input measures, as are owner-occupied residential structures. The aggregate capital input measures are obtained by Tornqvist aggregation of the capital stocks for each asset type within each of 53 industries using estimated rental prices for each asset type. Each rental price reflects the nominal rate of return to all assets within the industry and rates of economic depreciation and revaluation for the specific asset; rental prices are adjusted for the effects of taxes. Data on investments in physical assets are obtained from BEA. Current-dollar gross product originating (GPO) data, obtained from BEA, are used in estimating capital rental prices. This news release makes use of revised GPO data, released by BEA in November 2002.

Labor input in private business and private nonfarm business is obtained by Tornqvist-aggregation of the hours worked by all persons, classified by education, work experience, and gender with weights determined by their shares of labor compensation. Hours paid of employees are obtained from the Current Employment Statistics program. The hours at work of proprietors, unpaid family workers, and farm employees are derived from the Current Population Survey. The hours of employees are converted to an at-work basis by using the Hours at Work survey. The growth rate of labor composition is defined as the difference between the growth rate of weighted labor input and the growth rate of the hours of all persons. Additional information concerning data sources and methods of measuring labor composition can be found in BLS Bulletin 2426 (December 1993), "Labor Composition and U.S. Productivity Growth, 1948-90."

The labor and capital components of the input indexes are combined with Tornqvist weights that represent each component's share of total costs. Total costs are defined as the value of output (gross product originating) less a portion of indirect business taxes. Most indirect taxes, such as excise taxes, are excluded from costs; however, property and motor vehicle taxes remain in total costs. The index uses changing weights: The share in each year is averaged with the preceding year's share.

Research and development

The stock of research and development in private nonfarm business is derived by cumulating constant dollar measures of research and development expenditures and allowing for depreciation. Current dollar expenditures for privately financed research and development for the years 1953-2001 are obtained from annual issues of Research and Development in Industry published by the National Science Foundation. BLS develops price deflators and estimates of the rate of depreciation. Further description of these data and methods can be found in BLS Bulletin 2331 (September 1989), "The Impact of Research and Development on Productivity Growth."

Table 1. Private business sector: Productivity and related measures, 1948-2001[1]

Indexes 1996=100

Year	Productivity			Output[3]	Inputs			Capital per hour of all persons
	Output per hour of all persons	Output per unit of capital	Multifactor Productivity[2]		Labor Input[4]	Capital Services[5]	Combined units of labor and capital[6]	
1948	31.1	108.5	51.6	18.6	51.1	17.2	36.1	28.6
1949	32.2	105.5	52.2	18.6	49.4	17.6	35.6	30.5
1950	35.0	111.7	56.0	20.5	50.3	18.3	36.5	31.3
1955	40.9	115.5	62.0	24.9	53.7	21.6	40.2	35.4
1960	45.6	112.0	65.5	27.5	54.0	24.6	42.1	40.7
1965	55.9	123.3	76.6	35.6	58.0	28.9	46.5	45.3
1966	58.2	124.7	78.9	38.1	59.5	30.5	48.2	46.6
1967	59.5	119.9	79.0	38.8	59.4	32.3	49.1	49.6
1968	61.4	120.8	81.1	40.7	60.3	33.7	50.3	50.8
1969	61.7	118.4	80.6	42.0	62.1	35.5	52.1	52.1
1970	63.0	113.1	80.5	42.0	61.0	37.1	52.2	55.7
1971	65.8	112.8	83.0	43.6	60.5	38.7	52.5	58.4
1972	68.0	115.4	85.5	46.5	62.6	40.3	54.5	58.9
1973	70.1	116.9	87.8	49.8	64.8	42.6	56.8	60.0
1974	69.0	109.2	84.6	49.0	65.2	44.9	57.9	63.2
1975	71.4	104.1	85.4	48.5	62.4	46.6	56.8	68.6
1976	74.1	107.8	88.6	51.9	64.2	48.1	58.5	68.7
1977	75.2	109.7	90.0	54.8	66.8	50.0	60.9	68.6
1978	76.1	111.6	91.2	58.2	70.2	52.2	63.9	68.1
1979	76.0	109.8	90.8	60.2	72.4	54.8	66.2	69.2
1980	75.8	103.3	88.8	59.4	71.9	57.6	67.0	73.4
1981	77.3	101.0	88.9	61.0	73.0	60.5	68.7	76.5
1982	77.2	94.2	86.2	59.3	71.7	63.0	68.8	81.9
1983	79.9	96.2	88.6	62.5	73.4	65.0	70.5	83.0
1984	82.2	100.0	91.5	68.1	77.7	68.1	74.4	82.2
1985	83.9	99.5	92.4	71.0	79.6	71.3	76.8	84.3
1986	86.5	99.0	93.9	73.6	80.4	74.4	78.4	87.4
1987	87.0	99.2	94.2	76.3	83.1	76.9	81.0	87.7
1988	88.1	100.4	94.8	79.6	86.3	79.2	83.9	87.7
1989	89.0	101.0	95.3	82.4	88.8	81.6	86.4	88.1
1990	90.2	99.7	95.5	83.6	89.4	83.8	87.5	90.4
1991	91.3	96.5	94.5	82.6	88.3	85.7	87.4	94.6
1992	94.8	98.0	96.7	85.7	89.3	87.5	88.7	96.8
1993	95.4	98.7	97.1	88.5	91.8	89.7	91.1	96.6
1994	96.6	100.4	98.2	92.8	95.6	92.5	94.6	96.2
1995	97.3	99.8	98.4	95.8	98.0	96.0	97.3	97.5
1996	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1997	102.2	100.3	101.2	105.2	103.5	104.9	104.0	101.9
1998	105.0	99.3	102.5	110.5	106.1	111.3	107.9	105.8
1999	107.7	98.2	103.4	115.7	109.0	117.9	111.9	109.7
2000	111.0	96.6	105.0	120.4	110.1	124.5	114.7	114.8
2001	112.4	92.8	103.9	120.2	109.5	129.6	115.7	121.1

See footnotes following table 4.

Source: Bureau of Labor Statistics

Table 2. Private nonfarm business sector: Productivity and related measures, 1948-2001[1]

Indexes 1996=100

Year	Productivity			Output[3]	Inputs			Capital per hour of all persons
	Output per hour of all persons	Output per unit of capital	Multifactor Productivity[2]		Labor Input[4]	Capital Services[5]	Combined units of labor and capital[6]	
1948	35.1	118.4	56.4	18.0	44.1	15.2	31.8	29.7
1949	36.7	115.2	57.6	17.9	42.2	15.6	31.2	31.8
1950	39.1	121.7	61.1	19.7	43.7	16.2	32.3	32.2
1955	44.6	126.4	66.5	24.4	48.6	19.3	36.7	35.3
1960	48.7	121.9	69.4	27.2	50.1	22.3	39.2	39.9
1965	58.6	133.1	80.0	35.5	55.4	26.6	44.3	44.0
1966	60.7	134.5	82.3	38.0	57.2	28.3	46.2	45.1
1967	61.8	128.8	82.2	38.7	57.1	30.0	47.0	47.9
1968	63.7	129.7	84.4	40.8	58.2	31.4	48.3	49.1
1969	63.8	126.7	83.6	42.0	60.1	33.1	50.2	50.4
1970	64.9	120.5	83.1	41.9	59.3	34.8	50.5	53.8
1971	67.6	119.8	85.6	43.6	58.9	36.3	50.9	56.4
1972	69.9	122.4	88.2	46.6	60.9	38.1	52.8	57.1
1973	72.1	124.1	90.7	50.0	63.3	40.3	55.2	58.1
1974	71.0	115.6	87.4	49.2	63.7	42.6	56.3	61.5
1975	73.0	109.1	87.6	48.4	60.9	44.3	55.2	66.9
1976	75.8	113.2	91.1	51.9	62.8	45.9	57.0	66.9
1977	76.9	114.9	92.4	54.9	65.4	47.7	59.3	66.9
1978	77.8	117.0	93.7	58.4	68.8	49.9	62.3	66.5
1979	77.5	114.6	93.1	60.3	71.1	52.6	64.8	67.6
1980	77.3	107.6	91.0	59.6	70.7	55.4	65.5	71.8
1981	78.3	104.2	90.5	60.8	71.7	58.4	67.2	75.1
1982	78.0	96.7	87.5	59.0	70.6	61.0	67.4	80.7
1983	81.4	99.2	90.6	62.8	72.3	63.3	69.3	82.0
1984	83.2	102.6	93.0	68.1	76.7	66.4	73.3	81.1
1985	84.4	101.4	93.4	70.8	78.8	69.8	75.8	83.3
1986	87.1	100.7	94.8	73.5	79.8	73.0	77.6	86.5
1987	87.5	100.5	94.9	76.2	82.5	75.8	80.3	87.0
1988	88.6	101.7	95.6	79.7	85.9	78.3	83.4	87.1
1989	89.3	102.0	95.8	82.4	88.5	80.8	86.0	87.6
1990	90.3	100.4	95.8	83.5	89.2	83.2	87.2	89.9
1991	91.4	97.0	94.8	82.5	87.9	85.1	87.0	94.3
1992	94.8	98.2	96.7	85.5	89.0	87.0	88.4	96.5
1993	95.3	99.0	97.2	88.4	91.8	89.4	91.0	96.3
1994	96.5	100.4	98.2	92.6	95.4	92.2	94.3	96.1
1995	97.5	100.0	98.6	95.8	97.8	95.8	97.2	97.6
1996	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1997	102.0	100.0	101.0	105.1	103.6	105.1	104.1	101.9
1998	104.7	99.0	102.2	110.5	106.4	111.7	108.1	105.8
1999	107.1	97.6	102.9	115.7	109.5	118.5	112.4	109.7
2000	110.3	95.9	104.4	120.2	110.6	125.4	115.2	115.0
2001	111.6	92.0	103.3	120.1	110.1	130.5	116.3	121.3

See footnotes following table 4.

Source: Bureau of Labor Statistics

Table 3. Private business sector: Productivity and related measures, 1949-2001

Percent Change

Year	Productivity			Output[3]	Inputs			Capital per hour of all persons
	Output per hour of all persons	Output per unit of capital	Multifactor Productivity[2]		Labor Input[4]	Capital Services[5]	Combined units of labor and capital[6]	
1949	3.5	-2.8	1.2	-0.2	-3.3	2.7	-1.4	6.5
1950	8.8	5.9	7.3	10.1	2.0	3.9	2.6	2.7
1955	4.6	5.1	4.7	8.5	3.9	3.2	3.7	-0.4
1960	1.9	-0.9	0.6	1.8	0.5	2.8	1.2	2.8
1965	3.6	2.3	3.2	7.0	3.2	4.7	3.7	1.3
1966	4.1	1.1	3.1	6.8	2.6	5.7	3.6	3.0
1967	2.2	-3.8	0.1	1.9	-0.2	5.9	1.7	6.3
1968	3.2	0.7	2.6	5.1	1.6	4.4	2.5	2.5
1969	0.5	-1.9	-0.5	3.0	2.9	5.1	3.6	2.5
1970	2.2	-4.5	-0.2	0.0	-1.7	4.7	0.2	7.0
1971	4.4	-0.3	3.2	3.9	-0.8	4.2	0.7	4.7
1972	3.3	2.3	2.9	6.7	3.4	4.3	3.7	0.9
1973	3.2	1.3	2.7	7.0	3.5	5.7	4.2	1.9
1974	-1.6	-6.6	-3.6	-1.6	0.7	5.3	2.1	5.3
1975	3.5	-4.6	0.9	-1.0	-4.4	3.8	-1.9	8.6
1976	3.7	3.6	3.8	6.9	2.9	3.2	3.0	0.1
1977	1.6	1.7	1.6	5.7	4.0	3.9	4.0	-0.1
1978	1.1	1.8	1.2	6.2	5.2	4.3	4.9	-0.7
1979	-0.1	-1.7	-0.4	3.3	3.1	5.1	3.7	1.6
1980	-0.3	-5.9	-2.3	-1.2	-0.6	5.0	1.1	6.0
1981	2.0	-2.2	0.2	2.7	1.5	5.0	2.6	4.3
1982	-0.2	-6.7	-3.0	-2.9	-1.7	4.2	0.1	7.1
1983	3.5	2.1	2.8	5.4	2.3	3.2	2.6	1.3
1984	2.9	4.0	3.2	8.9	6.0	4.8	5.6	-1.0
1985	2.1	-0.5	1.1	4.3	2.4	4.8	3.2	2.6
1986	3.1	-0.5	1.6	3.7	1.1	4.3	2.1	3.6
1987	0.6	0.2	0.3	3.6	3.3	3.4	3.3	0.4
1988	1.2	1.2	0.7	4.3	3.9	3.0	3.6	0.0
1989	1.0	0.6	0.6	3.5	2.9	3.0	3.0	0.5
1990	1.3	-1.2	0.1	1.5	0.7	2.7	1.3	2.6
1991	1.2	-3.3	-1.0	-1.1	-1.2	2.2	-0.1	4.7
1992	3.8	1.5	2.3	3.7	1.1	2.1	1.4	2.3
1993	0.6	0.7	0.5	3.2	2.9	2.5	2.7	-0.1
1994	1.3	1.7	1.1	4.9	4.1	3.1	3.8	-0.4
1995	0.8	-0.6	0.3	3.2	2.5	3.8	2.9	1.4
1996	2.8	0.2	1.6	4.4	2.1	4.2	2.8	2.5
1997	2.2	0.3	1.2	5.2	3.5	4.9	4.0	1.9
1998	2.7	-1.0	1.3	5.0	2.5	6.1	3.7	3.8
1999	2.6	-1.1	0.9	4.7	2.7	5.9	3.7	3.7
2000	3.0	-1.5	1.5	4.0	1.0	5.6	2.5	4.6
2001	1.3	-4.0	-1.0	-0.1	-0.6	4.0	0.9	5.5

See footnotes following table 4.

Source: Bureau of Labor Statistics

Table 4. Private nonfarm business sector: Productivity and related measures, 1949-2001

Percent Change

Year	Productivity			Output[3]	Inputs			Capital per hour of all persons
	Output per hour of all persons	Output per unit of capital	Multifactor Productivity[2]		Labor Input[4]	Capital Services[5]	Combined units of labor and capital[6]	
1949	4.5	-2.6	2.0	0.0	-4.2	2.7	-2.0	7.3
1950	6.7	5.6	6.0	10.0	3.6	4.2	3.8	1.0
1955	4.7	5.1	4.7	8.9	4.2	3.6	4.0	-0.4
1960	1.3	-1.3	0.5	1.7	0.4	3.1	1.2	2.7
1965	3.1	2.0	2.8	7.1	3.7	5.0	4.1	1.1
1966	3.5	1.1	2.9	7.2	3.3	6.1	4.2	2.5
1967	1.8	-4.2	-0.1	1.7	-0.2	6.2	1.8	6.3
1968	3.2	0.7	2.6	5.4	1.8	4.7	2.7	2.5
1969	0.1	-2.3	-0.9	3.0	3.3	5.5	4.0	2.5
1970	1.6	-4.9	-0.6	-0.1	-1.3	5.0	0.5	6.8
1971	4.2	-0.6	3.0	3.9	-0.7	4.4	0.8	4.8
1972	3.4	2.1	3.0	7.0	3.4	4.7	3.8	1.2
1973	3.2	1.4	2.8	7.4	3.9	5.9	4.5	1.8
1974	-1.5	-6.9	-3.6	-1.6	0.6	5.7	2.1	5.7
1975	2.8	-5.6	0.2	-1.8	-4.4	4.1	-2.0	8.9
1976	3.8	3.8	4.0	7.4	3.1	3.4	3.2	0.0
1977	1.5	1.5	1.4	5.7	4.2	4.1	4.2	0.0
1978	1.3	1.8	1.4	6.5	5.2	4.6	5.0	-0.5
1979	-0.4	-2.0	-0.7	3.2	3.3	5.3	3.9	1.6
1980	-0.3	-6.1	-2.3	-1.2	-0.5	5.3	1.2	6.2
1981	1.3	-3.2	-0.6	2.1	1.5	5.4	2.6	4.6
1982	-0.4	-7.2	-3.3	-3.1	-1.6	4.5	0.2	7.4
1983	4.4	2.6	3.6	6.5	2.4	3.7	2.8	1.7
1984	2.3	3.4	2.6	8.5	6.2	4.9	5.8	-1.1
1985	1.4	-1.2	0.4	3.9	2.7	5.2	3.5	2.6
1986	3.1	-0.7	1.5	3.9	1.3	4.6	2.3	3.9
1987	0.4	-0.2	0.1	3.6	3.4	3.8	3.5	0.6
1988	1.3	1.3	0.7	4.6	4.1	3.3	3.8	0.0
1989	0.8	0.2	0.3	3.4	3.0	3.1	3.1	0.5
1990	1.1	-1.5	-0.1	1.4	0.8	2.9	1.5	2.7
1991	1.3	-3.5	-1.0	-1.2	-1.4	2.4	-0.2	4.9
1992	3.6	1.3	2.0	3.6	1.2	2.3	1.5	2.3
1993	0.6	0.8	0.5	3.5	3.1	2.7	3.0	-0.2
1994	1.3	1.5	1.0	4.7	3.9	3.2	3.7	-0.2
1995	1.0	-0.5	0.5	3.4	2.5	3.9	3.0	1.5
1996	2.5	0.0	1.4	4.4	2.2	4.3	2.9	2.5
1997	2.0	0.0	1.0	5.1	3.6	5.1	4.1	1.9
1998	2.6	-1.1	1.2	5.1	2.7	6.3	3.8	3.8
1999	2.4	-1.3	0.7	4.7	2.9	6.1	3.9	3.7
2000	2.9	-1.8	1.4	3.9	1.0	5.8	2.5	4.8
2001	1.2	-4.0	-1.0	-0.1	-0.4	4.1	1.0	5.5

See footnotes following table 4.

Source: Bureau of Labor Statistics

Footnotes, Tables 1-4

Source: Output data are from the Bureau of Economic Analysis (BEA), U.S. Department of Commerce, and are modified by the Bureau of Labor Statistics (BLS), U.S. Department of Labor. Compensation and hours data are from BLS. Capital measures are based on data supplied by BEA and the U.S. Department of Agriculture. Also see Summary of Methods in this release.

(1) The private business sector includes all of gross domestic product except the output of general government, government enterprises, non-profit institutions, the rental value of owner-occupied real estate, and the output of paid employees of private households. The private nonfarm business sector also excludes farms but includes agricultural services.

(2) Output per unit of combined labor and capital inputs.

(3) Gross domestic product originating in the sector, superlative chained index.

(4) Index of hours at work of all persons including employees, proprietors, and unpaid family workers, classified by education, work experience, and gender. This superlative chain index is computed by combining changes in the hours of each education, experience, and gender group weighted by each group's share of labor compensation.

(5) A measure of the flow of capital services used in the sector.

(6) Labor input combined with capital input, using labor's and capital's shares of costs as weights to form a superlative chained index.

Table 5. Real capital services by asset type, private business, 1948-2001

Average annual growth rates (percent)

	1948-2001	1948-1973	1973-1979	1979-1990	1990-1995	1995-2000	2000-2001
All Assets	3.9	3.7	4.3	3.9	2.7	5.4	4.0
Equipment	5.9	5.5	6.9	5.6	4.4	9.1	6.8
All Information equipment & software (IPES)	11.7	9.8	13.3	14.5	8.5	16.6	11.6
Computers & related equipment	28.3	25.3	35.8	33.2	14.6	40.2	23.7
Software	20.7	27.7	13.2	16.0	13.4	16.4	10.5
Communication equipment	8.7	10.0	7.9	8.2	4.0	8.5	10.0
Other IPES	6.2	6.8	11.0	5.9	3.2	2.8	1.3
All other equipment	3.8	4.8	5.1	1.8	1.7	4.0	3.1
Structures	3.0	3.2	3.0	3.6	1.9	2.2	2.1
Residential rental capital	2.2	2.8	2.6	1.9	0.6	1.3	1.4
Inventories	3.5	4.2	3.5	2.2	2.6	4.5	0.4
Land	2.0	2.0	2.3	2.6	1.0	1.8	1.5

Source: Bureau of Labor Statistics

Note: For a brief discussion of methods used in preparing these data, see Summary of Methods in this release.

Table 6. Real capital services by asset type, private nonfarm business, 1948-2001

Average annual growth rates (percent)

	1948-2001	1948-1973	1973-1979	1979-1990	1990-1995	1995-2000	2000-2001
All Assets	4.1	4.0	4.5	4.3	2.9	5.5	4.1
Equipment	6.1	5.6	7.0	6.0	4.6	9.2	6.9
All Information Equipment & software (IPES)	11.7	9.8	13.3	14.5	8.5	16.6	11.6
Computers & related equipment	28.3	25.3	35.8	33.2	14.6	40.2	23.7
Software	20.7	27.7	13.2	16.0	13.3	16.4	10.5
Communication equipment	8.7	10.0	7.9	8.2	4.0	8.5	10.0
Other IPES	6.2	6.8	11.0	5.9	3.2	2.8	1.2
All other equipment	3.9	4.9	5.1	2.0	1.9	4.1	3.2
Structures	3.1	3.3	3.0	3.7	1.9	2.3	2.2
Residential rental capital	2.2	2.8	2.6	1.9	0.6	1.3	1.4
Inventories	3.7	4.4	3.7	2.4	2.6	4.6	0.4
Land	2.7	2.8	3.3	3.5	1.1	2.0	1.6

Source: Bureau of Labor Statistics

Note: For a brief discussion of methods used in preparing these data, see Summary of Methods in this release.