(Note: The Bureau of Labor Statistics identified an error in the estimates of the contribution of all other intellectual property products and the contribution of all other capital services to labor productivity. This error affects Table B of Multifactor Productivity Trends – 2013. No other measures besides the measures listed above were affected by this error. The data in this release will not be corrected. For more information, please visit www.bls.gov/bls/errata/productivity-correction-11082017.htm.)
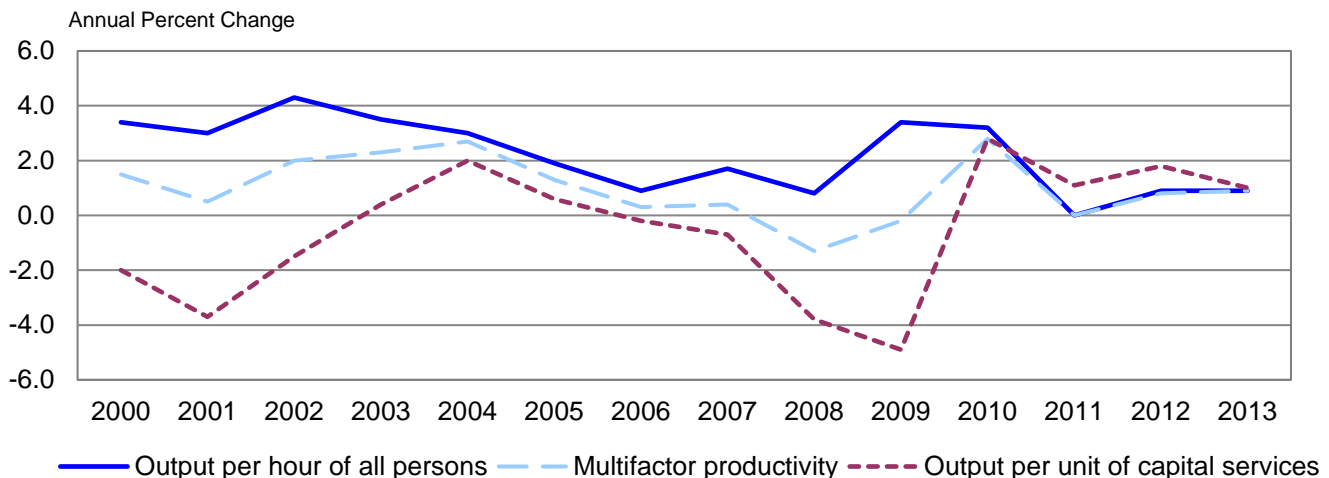
MULTIFACTOR PRODUCTIVITY TRENDS – 2013

Private nonfarm business sector multifactor productivity increased at a 0.9 percent annual rate in 2013, the U.S. Bureau of Labor Statistics reported today. (See chart 1, table A.) This gain in 2013 reflected a 2.7-percent increase in output and a 1.8-percent increase in the combined inputs of capital and labor. Capital services grew by 1.7 percent, the largest gain since 2008, and labor input – which is the combined effect of hours worked and labor composition – grew 1.8 percent. Capital services per hour of all persons decreased at a rate of 0.1 percent in 2013 after falling 0.8 percent in 2012. The decreases in 2011, 2012, and 2013 are the only three years of decline in this measure of capital intensity which began in 1987. (See table 1.)

Multifactor productivity measures the change in output relative to the change in capital and labor inputs used to produce that output. It is designed to measure the joint influences of technological change, efficiency improvements, returns to scale, reallocation of resources, and other factors of economic growth, accounting for the effects of capital and labor. Multifactor productivity annual measures differ from BLS quarterly labor productivity (output per hour worked) measures because the former also include the influences of capital services and shifts in the composition of the workforce. Additionally, much of the source data needed to construct multifactor productivity measures are not available on a quarterly basis.

Private business sector multifactor productivity increased at a 1.1 percent annual rate in 2013, reflecting a 2.9-percent increase in output and a 1.7-percent increase in the combined inputs of capital and labor. (See table 2.)

Chart 1. Output per hour of all persons, multifactor productivity, and output per unit of capital services in the private nonfarm business sector, 2000-2013

**Historical trends in the private nonfarm business sector**

Multifactor productivity in the private nonfarm business sector grew 0.9 percent annually from 1987 to 2013, reflecting a 2.9-percent growth in output and a 2.0-percent growth in combined inputs. (See table A.) For the 2007-2013 period, multifactor productivity grew 0.5 percent, due to a 1.0-percent increase in output coupled with a 0.5-percent increase in combined inputs. The increase in combined inputs reflected a 1.4-percent increase in capital services, a 0.5-percent decline in hours, and a 0.5-percent increase in labor composition. (See table A.)

Annual labor productivity growth can be viewed as the sum of three components: multifactor productivity growth, the contribution of capital intensity, and the contribution of shifts in labor composition. Prior to 1995, and more recently for the 2007-2013 period, multifactor productivity and the contributions of capital intensity to labor productivity grew 0.5 percent and 0.7 percent, respectively. The remaining contribution of labor composition contributed to an overall growth of output per hour. The contributions to labor productivity growth differed from the 1995-2000 and 2000-2007 periods, when upward shifts in multifactor productivity and capital intensity resulted in stronger output per hour growth. (See chart 2, table B.)

Information processing equipment (IPE) and intellectual property products (IPP) showed the strongest growth among the various capital asset components. For the 2007-2013 period, real capital services of IPE grew 4.3 percent annually and IPP grew 3.0 percent annually in the private nonfarm business sector. (See table 5.) Both IPE and IPP have experienced a steady deceleration in growth from their peak in 1995-2000; in the 1995-2000 period IPE grew 18.4 percent and IPP grew 8.5 percent.

The revised multifactor productivity measure for 2013 is based on more recent source data than were available for the preliminary multifactor productivity release, published on July 9, 2014, www.bls.gov/news.release/archives/prod3_07092014.pdf. Multifactor productivity growth rates in the private nonfarm business sector were revised from 0.3 percent to 0.9 percent in 2013, and from 1.5 percent to 0.8 percent in 2012. (See table C.)

Chart 2. Percentage point contributions to growth in output per hour in the private nonfarm business sector, 1987-2013
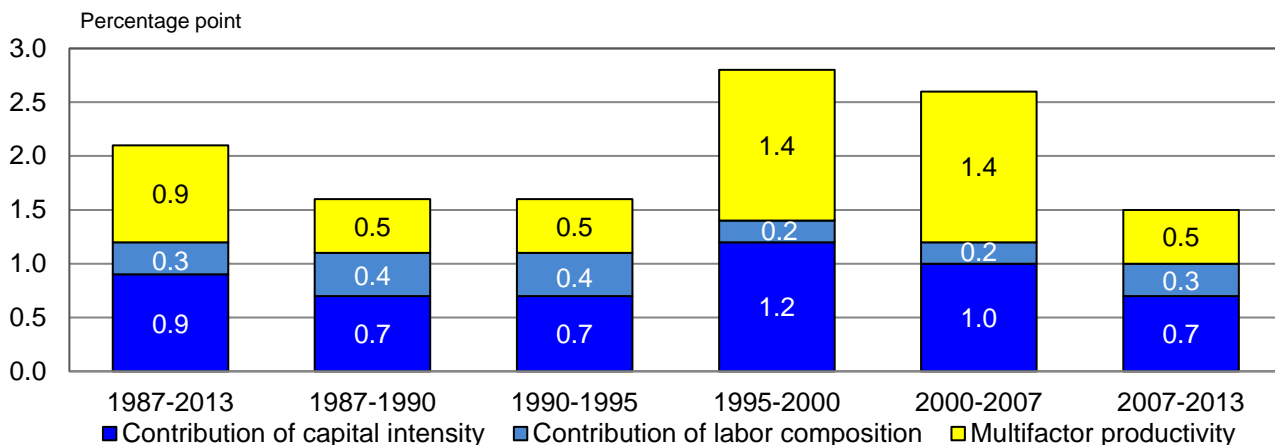
Note: Multifactor productivity plus the contributions of capital intensity and labor composition may not sum to output per hour due to independent rounding.

Table A. Compound annual growth rates for productivity, output, and inputs in the private nonfarm business and private business sectors for selected periods, 1987-2013

Percent

	1987-2013	1987-1990	1990-1995	1995-2000	2000-2007	2007-2013	2012-2013
<u>Private nonfarm business[1]</u>							
Productivity							
Multifactor Productivity[2]	0.9	0.5	0.5	1.4	1.4	0.5	0.9
Output per hour of all persons	2.1	1.6	1.6	2.9	2.6	1.5	0.9
Output per unit of capital services	-0.5	-0.5	-0.4	-0.8	-0.4	-0.4	1.0
Output	2.9	3.3	3.0	5.0	2.8	1.0	2.7
Inputs							
Combined inputs[3]	2.0	2.8	2.4	3.6	1.4	0.5	1.8
Labor Input[4]	1.2	2.3	2.0	2.4	0.5	0.0	1.8
Hours	0.8	1.7	1.3	2.1	0.2	-0.5	1.8
Labor composition[5]	0.5	0.6	0.7	0.3	0.3	0.5	0.0
Capital services	3.4	3.8	3.4	5.9	3.3	1.4	1.7
Analytic ratio							
Capital services per hour of all persons	2.6	2.1	2.0	3.7	3.1	1.9	-0.1
<u>Private business[1]</u>							
Productivity							
Multifactor Productivity[2]	1.0	0.6	0.5	1.6	1.4	0.5	1.1
Output per hour of all persons	2.2	1.7	1.6	3.0	2.7	1.6	1.2
Output per unit of capital services	-0.4	-0.5	-0.3	-0.6	-0.4	-0.3	1.2
Output	2.9	3.3	2.9	5.1	2.8	1.0	2.9
Inputs							
Combined inputs[3]	1.9	2.7	2.4	3.4	1.4	0.5	1.7
Labor Input[4]	1.2	2.1	2.1	2.3	0.5	0.0	1.7
Hours	0.7	1.5	1.4	2.0	0.1	-0.6	1.7
Labor composition[5]	0.5	0.6	0.7	0.3	0.3	0.5	0.1
Capital services	3.3	3.8	3.2	5.7	3.2	1.3	1.7
Analytic ratio							
Capital services per hour of all persons	2.6	2.2	1.8	3.7	3.1	1.9	0.0

1 Excludes government enterprises.

2 Output per combined units of labor input and capital services.

3 The growth rate of each input is weighted by its share of current dollar costs.

4 Hours at work by age, education, and gender group are weighted by each group's share of the total wage bill.

5 Ratio of labor input to hours.

Table B. Compound annual growth rates in output per hour of all persons and the contributions of capital intensity, labor composition, and multifactor productivity in the private nonfarm business and private business sectors for selected periods, 1987-2013

Percent

	1987-2013	1987-1990	1990-1995	1995-2000	2000-2007	2007-2013	2012-2013
Private nonfarm business[1]							
Output per hour of all persons	2.1	1.6	1.6	2.9	2.6	1.5	0.9
Contribution of capital intensity[2]	0.9	0.7	0.7	1.2	1.0	0.7	0.0
Contribution of information processing equipment[3]	0.3	0.3	0.3	0.6	0.3	0.2	0.0
Contribution of research and development[4]	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Contribution of all other intellectual property products[5]	0.2	0.2	0.4	0.4	-0.1	0.1	-0.1
Contribution of all other capital services	0.3	0.1	-0.1	0.1	0.7	0.3	0.0
Contribution of labor composition[6]	0.3	0.4	0.4	0.2	0.2	0.3	0.0
Multifactor productivity[7]	0.9	0.5	0.5	1.4	1.4	0.5	0.9
Contribution of R&D to multifactor productivity	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Private business[1]							
Output per hour of all persons	2.2	1.7	1.6	3.0	2.7	1.6	1.2
Contribution of capital intensity[2]	0.9	0.7	0.6	1.2	1.0	0.7	0.0
Contribution of information processing equipment[3]	0.3	0.3	0.3	0.6	0.3	0.2	0.0
Contribution of research and development[4]	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Contribution of all other intellectual property products[5]	0.2	0.2	0.4	0.4	-0.1	0.1	0.0
Contribution of all other capital services	0.3	0.1	-0.1	0.1	0.7	0.3	0.0
Contribution of labor composition[6]	0.3	0.4	0.5	0.2	0.2	0.3	0.1
Multifactor productivity[7]	1.0	0.6	0.5	1.6	1.4	0.5	1.1

1. Excludes government enterprises.
2. Capital services per hour multiplied by capital's share of current dollar costs.
3. Information processing equipment per hour multiplied by its share of current dollar costs.
4. Research and development per hour multiplied by its share of current dollar costs.
5. Software and artistic originals per hour multiplied by their share of current dollar costs.
6. Labor composition multiplied by labor's share of current dollar costs.
7. Output per unit of combined labor input and capital services.

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

Table C. Annual growth rates of the previous and revised multifactor productivity measures in the private nonfarm business and private business sectors for the 1987-2013 period

Annual percent change from previous year

Year	Private Nonfarm Business		Private Business	
	Previous	Revised	Previous	Revised
1988	1.0	1.0	0.7	0.7
1989	0.1	0.1	0.4	0.3
1990	0.3	0.4	0.6	0.7
1991	-0.8	-0.8	-0.8	-0.8
1992	2.5	2.5	2.8	2.8
1993	-0.1	-0.1	-0.2	-0.2
1994	0.6	0.7	0.6	0.7
1995	0.3	0.3	0.0	0.0
1996	1.4	1.5	1.8	1.8
1997	0.7	0.7	0.9	0.9
1998	1.6	1.7	1.6	1.6
1999	1.8	1.7	2.0	1.9
2000	1.4	1.5	1.6	1.7
2001	0.5	0.5	0.5	0.6
2002	2.1	2.0	2.1	2.0
2003	2.4	2.3	2.6	2.5
2004	2.8	2.7	2.9	2.8
2005	1.4	1.3	1.4	1.3
2006	0.3	0.3	0.4	0.3
2007	0.4	0.4	0.3	0.3
2008	-1.3	-1.3	-1.2	-1.2
2009	-0.3	-0.2	-0.1	0.0
2010	2.7	2.8	2.6	2.7
2011	0.7	0.0	0.6	-0.1
2012	1.5	0.8	1.4	0.7
2013	0.3	0.9	0.7	1.1

Technical Notes

Capital Services

Capital services are the services derived from the stock of physical assets and intellectual property assets. There are 90 asset types for fixed business equipment, structures, inventories, land, and intellectual property products. Data on investment for fixed assets are obtained from BEA. Data on inventories are estimated using BEA and additional information from IRS Corporation Income Returns. Data for land in the farm sector are obtained from USDA. Nonfarm industry detail for land is based on IRS book value data. Current-dollar value-added data, obtained from BEA, are used in estimating capital rental prices.

BLS provides additional detail in tables 5 and 6 on information processing equipment and intellectual property products. Information processing equipment is composed of three broad classes of assets: computers and related equipment, communications equipment, and other information processing equipment. Computers and related equipment includes mainframe computers, personal computers, printers, terminals, tape drives, storage devices, and integrated systems. Communications equipment is not further differentiated. Other information processing equipment includes medical equipment and related instruments, electromedical instruments, nonmedical instruments, photocopying and related equipment, and office and accounting machinery. Intellectual property products are composed of three broad classes of assets: software, research and development, and artistic originals. Software is comprised of pre-packaged, custom, and own-account software. Research and development is creative work undertaken to increase the stock of knowledge for the purpose of discovering or developing new products or improving existing ones. Artistic originals include theatrical movies, long-lived television programs, books, music, and other forms of entertainment. Structures include nonresidential structures and residential capital that are rented out by profit-making firms or persons.

Financial assets are excluded from capital services measures, as are owner-occupied residential structures. The aggregate capital services measures are obtained by Tornqvist aggregation of the capital stocks for each asset type within each of 60 NAICS industry groupings 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. Current-dollar capital costs can be defined as each asset's rental price multiplied by its constant-dollar stock, adjusting for capital composition effects.

Labor Input

Labor input in private business and private nonfarm business is obtained by a chained superlative Tornqvist aggregation of the hours at work by all persons, classified by age, education, and gender with weights determined by each group's share of the total wage bill. Hours paid of employees are largely obtained from the Current Employment Statistics program (CES). These hours paid are then converted to an at work basis by using information from the Employment Cost Index (ECI) of the National Compensation Survey (NCS) benchmarked to the Hours at Work Survey. Hours at work for nonproduction and supervisory workers are derived using data from the Current Population Survey (CPS), the CES, and the NCS. The hours at work of proprietors, unpaid family workers, and farm employees are derived from the Current Population Survey. Hours at work data reflect Productivity and Costs data as of the February 5, 2015 "Productivity and Costs" news release (USDL-15-0157). 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 Cindy Zoghi, 2007, "Measuring Labor Composition: A Comparison of Alternate Methodologies" http://www.bls.gov/bls/fesacp1121407.pdf and in "Changes in the Composition of Labor for BLS Multifactor Productivity Measures, 2013" http://www.bls.gov/mfp/mprlabor.pdf.

Combined Inputs

Labor input and capital services are combined using a chained superlative Tornqvist aggregation, applying weights that represent each component's share of total costs. The chained superlative Tornqvist index uses changing weights; the share in each year is averaged with the preceding year's share. Total costs are defined as the value of output less a portion of taxes on production and imports. Most taxes on production and imports, such as excise taxes, are excluded from costs; however, property and motor vehicle taxes remain in total costs.

Capital Intensity

Capital intensity is the ratio of capital services to hours worked in the production process. The higher the capital to hours ratio, the more capital intensive the production process is.

In a production process, profit maximizing/cost-minimizing firms adjust the factor proportions of capital and labor if the price of one factor falls relative to the price of the other factor; there would be a tendency for the firms to substitute the less expensive factor for the more expensive one. In the short run, changes in hours worked are more variable than changes in capital services. Changes in hours worked in business cycles can result in volatility of the capital intensity ratio over short periods of time. In the long run an increase in wages relative to the price of capital will induce the firm to substitute capital for labor, resulting in an increase in capital intensity.

Rising labor costs are, in fact, an incentive for firms to introduce automated production processes. Industry estimates of capital to hours ratios can be obtained at http://www.bls.gov/mfp/mprdload.htm.

Output

Private business sector output is a chain-type, current-weighted index constructed after excluding from gross domestic product (GDP) the following outputs: general government, nonprofit institutions, private households (including owner-occupied housing), and government enterprises. This release presents data for the private business and private nonfarm business sectors. The private business sector accounted for approximately 74 percent of gross domestic product in 2013. Additionally, the private nonfarm business sector excludes farms from the private business sector, but includes agricultural services. Multifactor measures exclude government enterprises, while the BLS quarterly Productivity and Cost series include them. The output measures are based on the revised National Income and Product Accounts (NIPA) data released by BEA on January 30, 2015.

Multifactor Productivity

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

The multifactor productivity indexes for private business and private nonfarm business are derived by dividing an output index by an index of capital services and labor input. The output indexes are computed as chained superlative indexes (Fisher Ideal indexes) of components of real output.

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 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.

The research and development data in the private nonfarm business sector presented here show the effect of spillovers from economic units that conduct research and development. BEA publishes measures of research and development investments in each industry that include estimates of the direct returns to firms conducting such research and development activities. By combining the direct returns to firms conducting research and development with the spillover effect of other firms, a picture of the total overall effects of research and development can be drawn.

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." http://www.bls.gov/mfp/mfparchive.htm. BLS measures of year-to-year contributions of research and development to the private nonfarm business sector and measures of the stock of research and development are available at http://www.bls.gov/mfp/rdtable.pdf .

Other Information

Comprehensive tables containing additional data beyond the scope of this press release are available upon request at 202-691-5606 or at http://www.bls.gov/mfp/mprdload.htm . More detailed information on methods, limitations, and data sources of capital and labor are provided in BLS Bulletin 2178 (September 1983), "Trends in Multifactor Productivity, 1948-81" http://www.bls.gov/mfp/mfparchive.htm, and on the BLS Multifactor Productivity website under the title "Technical Information About the BLS Multifactor Productivity Measures" for Major Sectors and 18 NAICS 3-digit Manufacturing Industries at http://www.bls.gov/mfp/mprtech.pdf. General information is available on the BLS Multifactor Productivity website at http://www.bls.gov/mfp/mprover.htm. Additional data not contained in the release, can be obtained in print or at http://www.bls.gov/mfp. A number of comprehensive tables set up as zip files can be downloaded at http://www.bls.gov/mfp/mprdload.htm. Included in the additional data available in the home page is a zip file containing selected multifactor productivity data that links 1948- 87 SIC data to NAICS data from 1987 forward. This file includes data for the private business and private nonfarm business sector.

Table 1. Private nonfarm business sector: productivity and related measures for the 1987-2013[1] period

Annual percent change from previous year

Year	Productivity			Output[3]	Inputs			Capital services per hour of all persons
	Output per hour of all persons	Output per unit of capital services	Multifactor Productivity[2]		Labor Input[4]	Capital Services[5]	Combined units of labor input and capital services[6]	
1988	1.7	0.7	1.0	4.6	3.5	3.8	3.6	0.9
1989	0.9	-0.3	0.1	3.7	3.4	4.1	3.6	1.2
1990	2.1	-1.8	0.4	1.5	0.0	3.5	1.1	4.0
1991	2.0	-3.5	-0.8	-0.5	-1.1	3.0	0.2	5.7
1992	4.3	1.5	2.5	4.1	1.0	2.5	1.5	2.7
1993	0.2	-0.1	-0.1	3.2	3.4	3.3	3.3	0.3
1994	1.0	1.0	0.7	4.7	4.1	3.6	4.0	0.0
1995	0.8	-0.8	0.3	3.6	2.6	4.4	3.2	1.6
1996	2.7	-0.2	1.5	4.6	2.1	4.8	3.0	2.9
1997	1.6	-0.2	0.7	5.3	4.1	5.5	4.5	1.8
1998	3.1	-0.8	1.7	5.3	2.4	6.2	3.6	4.0
1999	3.4	-1.0	1.7	5.6	2.5	6.7	3.8	4.4
2000	3.4	-2.0	1.5	4.4	1.1	6.5	2.8	5.5
2001	3.0	-3.7	0.5	0.9	-1.6	4.8	0.3	7.0
2002	4.3	-1.5	2.0	1.8	-1.8	3.3	-0.2	5.9
2003	3.5	0.4	2.3	3.2	-0.1	2.7	0.8	3.1
2004	3.0	2.0	2.7	4.5	1.3	2.5	1.7	1.0
2005	1.9	0.6	1.3	3.8	2.1	3.2	2.4	1.3
2006	0.9	-0.2	0.3	3.3	2.7	3.5	3.0	1.1
2007	1.7	-0.7	0.4	2.4	1.4	3.1	2.0	2.4
2008	0.8	-3.8	-1.3	-1.3	-1.4	2.6	0.0	4.8
2009	3.4	-4.9	-0.2	-4.1	-6.5	0.9	-3.9	8.8
2010	3.2	2.8	2.8	3.2	0.4	0.4	0.4	0.4
2011	0.0	1.1	0.0	2.2	2.9	1.1	2.3	-1.1
2012	0.9	1.8	0.8	3.3	3.0	1.5	2.4	-0.8
2013	0.9	1.0	0.9	2.7	1.8	1.7	1.8	-0.1

See footnotes following table 4.   Source: Bureau of Labor Statistics

Table 2. Private business sector: productivity and related measures for the 1987-2013[1] period

Annual percent change from previous year

| Year | Productivity | | | Output[3] | Inputs | | | Capital services per hour of all persons |
	Output per hour of all persons	Output per unit of capital services	Multifactor Productivity[2]		Labor Input[4]	Capital Services[5]	Combined units of labor input and capital services[6]	
1988	1.5	0.3	0.7	4.3	3.4	4.0	3.6	1.2
1989	1.1	-0.2	0.3	3.9	3.3	4.0	3.5	1.3
1990	2.4	-1.6	0.7	1.6	-0.2	3.3	1.0	4.1
1991	1.9	-3.3	-0.8	-0.5	-1.0	2.9	0.3	5.4
1992	4.5	1.9	2.8	4.3	1.0	2.4	1.5	2.5
1993	0.2	-0.2	-0.2	3.0	3.1	3.1	3.1	0.4
1994	0.9	1.3	0.7	4.9	4.5	3.5	4.2	-0.5
1995	0.4	-0.9	0.0	3.2	2.6	4.1	3.1	1.4
1996	3.1	0.1	1.8	4.7	1.9	4.5	2.8	2.9
1997	1.9	0.1	0.9	5.3	3.9	5.3	4.4	1.8
1998	3.2	-0.8	1.6	5.2	2.2	6.0	3.5	4.0
1999	3.6	-0.8	1.9	5.6	2.3	6.5	3.6	4.4
2000	3.6	-1.7	1.7	4.5	1.1	6.3	2.8	5.3
2001	3.1	-3.7	0.6	0.8	-1.8	4.6	0.2	7.0
2002	4.2	-1.3	2.0	1.8	-1.8	3.1	-0.2	5.6
2003	3.7	0.6	2.5	3.2	-0.2	2.6	0.7	3.1
2004	3.1	2.0	2.8	4.5	1.2	2.5	1.7	1.2
2005	2.0	0.6	1.3	3.8	2.0	3.2	2.5	1.4
2006	1.0	-0.3	0.3	3.2	2.5	3.5	2.9	1.2
2007	1.5	-0.8	0.3	2.2	1.3	3.0	1.9	2.3
2008	0.8	-3.6	-1.2	-1.2	-1.3	2.5	0.0	4.5
2009	3.5	-4.6	0.0	-3.9	-6.5	0.7	-3.9	8.5
2010	3.2	2.8	2.7	3.2	0.5	0.4	0.5	0.4
2011	-0.1	0.9	-0.1	2.1	2.9	1.3	2.3	-0.9
2012	0.8	1.6	0.7	3.2	2.9	1.5	2.4	-0.8
2013	1.2	1.2	1.1	2.9	1.7	1.7	1.7	0.0

See footnotes following table 4.   Source: Bureau of Labor Statistics

Table 3. Private nonfarm business sector: indexes of productivity and related measures, 1987-2013[1]

Indexes 2009=100

Year	Productivity			Output[3]	Inputs			Capital services per hour of all persons
	Output per hour of all persons	Output per unit of capital services	Multifactor Productivity[2]		Labor Input[4]	Capital Services[5]	Combined units of labor input and capital services[6]	
1987	61.2	121.7	82.6	53.4	78.5	43.8	64.6	50.3
1988	62.2	122.6	83.4	55.8	81.2	45.5	66.9	50.7
1989	62.7	122.2	83.5	57.9	84.0	47.4	69.3	51.3
1990	64.1	119.9	83.8	58.8	83.9	49.0	70.1	53.4
1991	65.3	115.7	83.2	58.4	83.0	50.5	70.3	56.4
1992	68.1	117.5	85.3	60.8	83.9	51.8	71.3	58.0
1993	68.3	117.4	85.2	62.8	86.7	53.5	73.7	58.1
1994	69.0	118.6	85.8	65.7	90.3	55.4	76.6	58.1
1995	69.5	117.7	86.1	68.1	92.7	57.8	79.1	59.0
1996	71.4	117.5	87.3	71.2	94.6	60.6	81.5	60.8
1997	72.6	117.3	87.9	74.9	98.5	63.9	85.2	61.9
1998	74.9	116.3	89.4	78.9	100.8	67.9	88.3	64.4
1999	77.4	115.1	90.9	83.3	103.4	72.4	91.7	67.2
2000	80.0	112.8	92.3	87.0	104.5	77.1	94.2	70.9
2001	82.5	108.6	92.8	87.7	102.8	80.7	94.5	75.9
2002	86.0	107.0	94.7	89.3	100.9	83.4	94.3	80.4
2003	89.1	107.5	96.9	92.1	100.8	85.7	95.1	82.8
2004	91.7	109.6	99.5	96.2	102.1	87.8	96.7	83.7
2005	93.5	110.3	100.9	99.9	104.2	90.6	99.0	84.8
2006	94.3	110.1	101.2	103.2	107.0	93.7	102.0	85.7
2007	95.9	109.4	101.6	105.6	108.5	96.6	104.0	87.7
2008	96.7	105.2	100.2	104.3	106.9	99.1	104.0	91.9
2009	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2010	103.2	102.8	102.8	103.2	100.4	100.4	100.4	100.4
2011	103.2	103.9	102.8	105.5	103.3	101.5	102.7	99.3
2012	104.2	105.8	103.7	109.0	106.4	103.1	105.2	98.5
2013	105.1	106.8	104.6	111.9	108.4	104.8	107.0	98.4

See footnotes following table 4.   Source: Bureau of Labor Statistics

Table 4. Private business sector: indexes of productivity and related measures, 1987-2013[1]

Indexes 2009=100

| Year | Productivity | | | Output[3] | Inputs | | | Capital services per hour of all persons |
	Output per hour of all persons	Output per unit of capital services	Multifactor Productivity[2]		Labor Input[4]	Capital Services[5]	Combined units of labor input and capital services[6]	
1987	60.3	118.6	81.4	53.3	79.5	44.9	65.4	50.9
1988	61.3	119.0	82.0	55.6	82.2	46.7	67.8	51.5
1989	62.0	118.8	82.3	57.7	84.8	48.6	70.2	52.2
1990	63.5	116.9	82.8	58.7	84.6	50.2	70.8	54.3
1991	64.7	113.0	82.1	58.3	83.8	51.6	71.1	57.2
1992	67.6	115.1	84.4	60.8	84.7	52.8	72.1	58.7
1993	67.7	114.9	84.2	62.6	87.3	54.5	74.4	58.9
1994	68.3	116.5	84.8	65.7	91.3	56.4	77.5	58.6
1995	68.6	115.4	84.8	67.8	93.7	58.8	79.9	59.4
1996	70.7	115.6	86.4	71.0	95.5	61.4	82.2	61.2
1997	72.0	115.6	87.2	74.8	99.3	64.7	85.8	62.3
1998	74.3	114.7	88.6	78.7	101.5	68.6	88.8	64.8
1999	77.0	113.8	90.3	83.1	103.8	73.0	92.0	67.6
2000	79.7	111.9	91.8	86.8	105.0	77.6	94.6	71.2
2001	82.2	107.8	92.3	87.5	103.1	81.2	94.8	76.2
2002	85.7	106.4	94.2	89.1	101.2	83.7	94.5	80.5
2003	88.8	107.1	96.6	91.9	101.0	85.9	95.2	83.0
2004	91.6	109.2	99.3	96.1	102.3	88.0	96.8	83.9
2005	93.4	109.8	100.6	99.8	104.4	90.9	99.2	85.1
2006	94.3	109.5	101.0	103.1	107.0	94.1	102.1	86.1
2007	95.8	108.7	101.2	105.3	108.4	96.9	104.0	88.1
2008	96.6	104.8	100.0	104.1	106.9	99.3	104.0	92.1
2009	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2010	103.2	102.8	102.7	103.2	100.5	100.4	100.5	100.4
2011	103.1	103.7	102.6	105.4	103.4	101.6	102.8	99.4
2012	103.9	105.4	103.3	108.7	106.5	103.2	105.2	98.7
2013	105.2	106.6	104.5	111.8	108.3	104.9	107.0	98.7

See footnotes following table 4.   Source: Bureau of Labor Statistics

Footnotes, Tables 1-4

Source: The Bureau of Labor Statistics (BLS) develops productivity measures using output and compensation data published by the Bureau of Economic Analysis (BEA), hours data published by other BLS programs, and capital data supplied by BEA and U.S. Department of Agriculture. Also see Technical Notes in this release.

(1) The private business sector covers gross domestic product with the exception of 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 further excludes farms but includes agricultural services.

(2) Output per combined units of labor input and capital services.

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

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

(5) A measure of the flow of capital services used in the sector. Capital services measure the services derived from the stock of physical assets and intellectual property products.

(6) The growth rates of labor input and capital services are combined by weighting with their respective shares of current dollar costs, and aggregating into a chained superlative index.

Table 5. Compound average annual growth rates in real capital services by asset type, private nonfarm business sector, 1987-2013

Percent

	1987-2013	1987-1990	1990-1995	1995-2000	2000-2007	2007-2013	2012-2013
All Assets	3.4	3.8	3.4	5.9	3.3	1.4	1.7
Equipment	4.5	3.8	4.1	9.0	4.6	1.6	2.5
Information Processing Equipment (IPE)	9.4	9.0	8.2	18.4	8.7	4.3	2.8
Computers & related equipment	17.8	18.8	16.0	40.6	13.8	6.6	2.8
Communication equipment	7.2	5.9	5.2	10.8	8.5	5.1	4.7
Other IPE	2.6	2.6	3.7	3.4	2.5	1.0	0.3
All other equipment	2.3	1.5	2.2	4.6	2.7	0.5	2.4
Structures	1.7	3.0	2.0	2.2	1.3	0.8	0.8
Intellectual Property Products (IPP)	5.9	8.2	6.7	8.5	5.0	3.0	2.9
Research and Development	3.8	5.7	4.2	4.6	2.9	3.0	2.4
Software	10.5	17.8	13.4	16.8	7.7	3.2	3.7
Artistic Originals	3.3	3.7	3.4	3.9	3.6	2.3	2.4
Residential rental capital	1.3	1.9	0.9	1.8	2.2	-0.3	-0.3
Inventories	2.4	3.4	2.3	4.4	2.3	0.5	2.0
Land	0.7	1.6	1.1	1.2	0.5	-0.2	0.8

Source: Bureau of Labor Statistics
Note: For a brief discussion of methods used in preparing these data, see Technical Notes in this release.

Table 6. Compound average annual growth rates in real capital services by asset type, private business sector, 1987-2013

Percent

	1987-2013	1987-1990	1990-1995	1995-2000	2000-2007	2007-2013	2012-2013
All Assets	3.3	3.8	3.2	5.7	3.2	1.3	1.7
Equipment	4.4	3.6	3.9	8.8	4.5	1.6	2.5
Information Processing Equipment (IPE)	9.4	9.0	8.2	18.4	8.7	4.3	2.8
Computers & related equipment	17.8	18.8	16.0	40.6	13.8	6.6	2.8
Communication equipment	7.2	5.9	5.2	10.8	8.5	5.1	4.7
Other IPE	2.7	2.7	3.7	3.4	2.7	1.3	0.6
All other equipment	2.2	1.2	2.0	4.5	2.7	0.5	2.4
Structures	1.6	2.9	1.9	2.1	1.2	0.8	0.8
Intellectual Property Products (IPP)	5.9	8.2	6.7	8.5	5.0	3.0	2.9
Research and Development	3.8	5.7	4.2	4.6	2.9	3.0	2.4
Software	10.5	17.8	13.5	16.8	7.7	3.2	3.7
Artistic Originals	3.3	3.7	3.4	3.9	3.6	2.3	2.4
Residential rental capital	1.3	1.9	0.9	1.8	2.2	-0.3	-0.3
Inventories	2.3	2.9	2.3	4.2	2.2	0.4	1.8
Land	0.8	3.3	0.9	0.8	0.6	-0.4	0.5

Source: Bureau of Labor Statistics
Note: For a brief discussion of methods used in preparing these data, see Technical Notes in this release.