NEWS RELEASE
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U. S. DEPARTMENT OF LABOR

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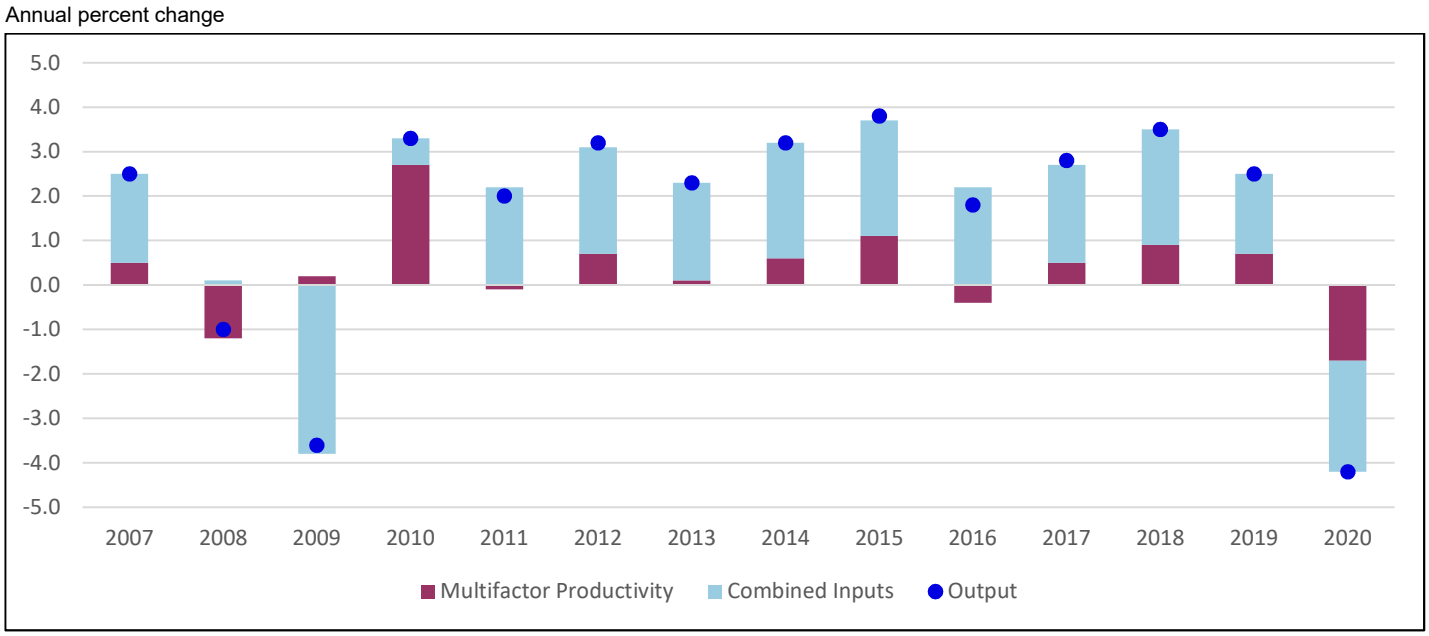
MULTIFACTOR PRODUCTIVITY TRENDS – 2020

Private nonfarm business sector multifactor productivity decreased 1.7 percent in 2020, the U.S. Bureau of Labor Statistics reported today. (See chart 1, table A.) This 2020 decrease reflects a 4.2-percent decrease in output and a 2.5-percent decrease in the combined inputs of capital and labor. Capital services grew by 2.4 percent and labor input–which is the combined effect of hours worked and labor composition–decreased by 5.2 percent. (See table 1.)

Chart 1. Multifactor productivity, combined inputs, and output in the private nonfarm business sector, 2007-20



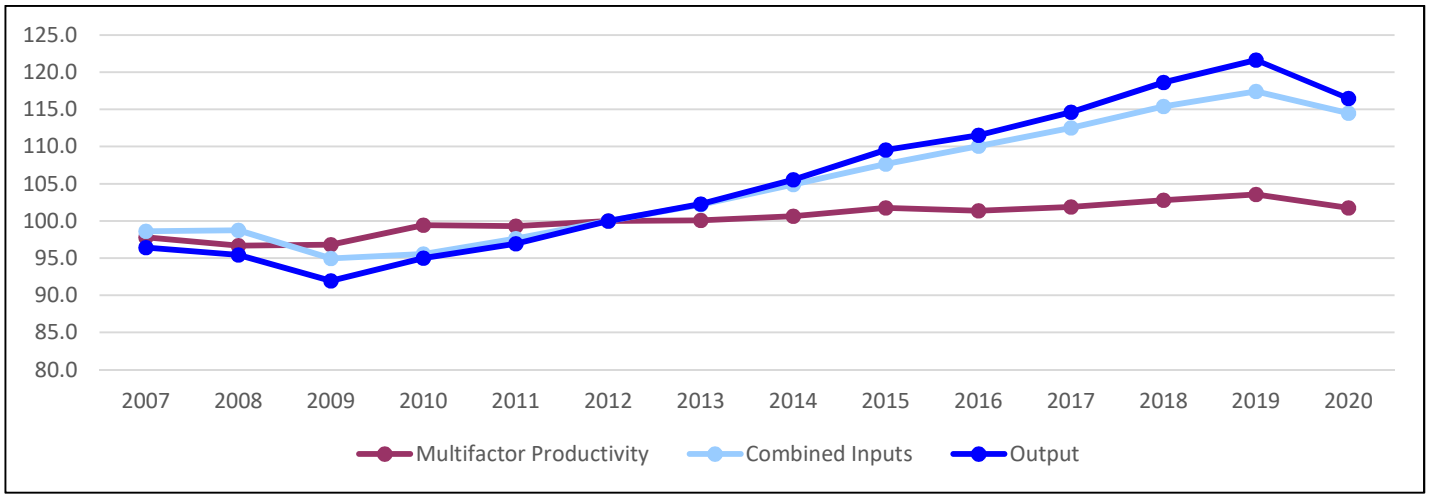
Multifactor productivity (MFP) is calculated by dividing an index of real output by an index of combined units of labor input and capital services. Multifactor productivity annual measures differ from BLS quarterly labor productivity (output per hour worked) measures because the former also includes the influences of capital services and shifts in the composition of workers. Measures for the most recent year of this release are preliminary estimates. See the Technical Notes for additional information.

Private business sector multifactor productivity also decreased 1.7 percent in 2020, as output decreased 4.1 percent and combined inputs decreased 2.4 percent. (See table A, table 2.)

Multifactor Productivity Trends

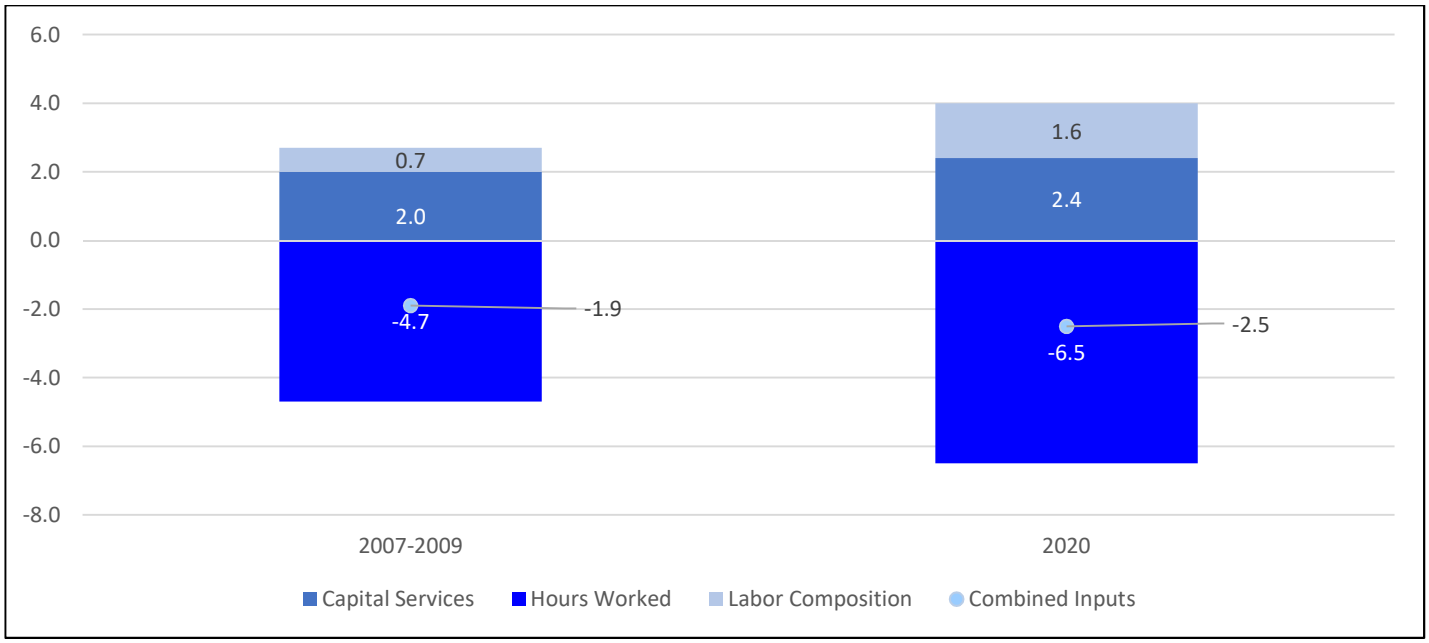
The 1.7-percent decline in nonfarm private business sector MFP in 2020 was the result of combined inputs decreasing (-2.5 percent) less than the decrease in real value added output (-4.2 percent). The 1.7-percent decline in MFP is the largest decline in the measure since the Great Recession period of 2007-09, which is also the last time both private nonfarm business output and private nonfarm business combined inputs decreased. (See chart 2).

Chart 2. Multifactor productivity, output, and combined input indexes in the private nonfarm business sector, 2007-20
Index 2012=100



The components of combined inputs can be broken down into capital services, hours worked, and labor composition. The 2020 capital services growth of 2.4 percent was similar to the Great Recession's capital services growth of 2.0 percent. Hours worked experienced its largest decline since 2009 at 6.5 percent. Labor composition in 2020 had a record growth of 1.6 percent which outpaced the 2007-09 recessionary growth by almost a full percentage point. (See chart 3).

Chart 3. Combined inputs, capital services, hours worked, and labor composition, selected time periods
Average annual growth/percent growth



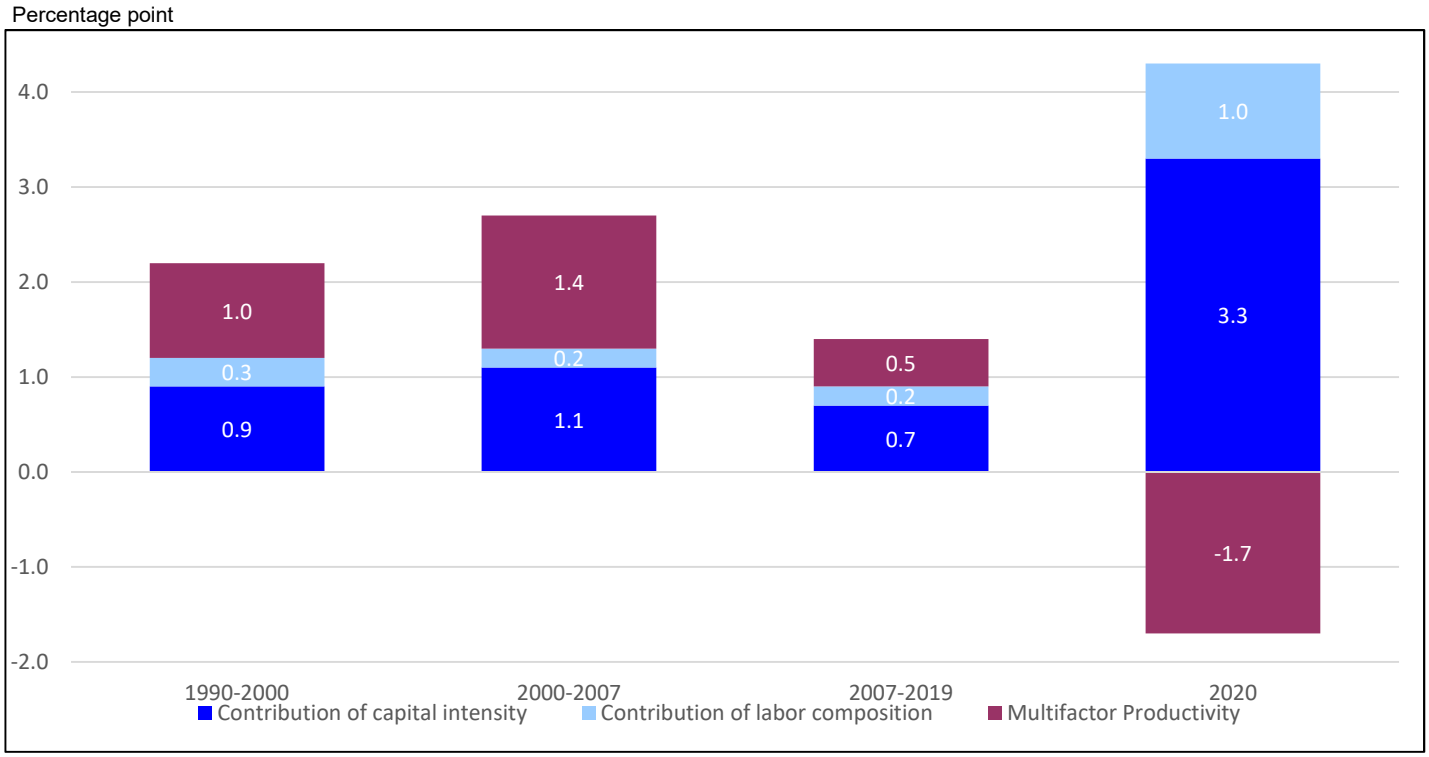
Labor Productivity Trends

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 the composition of labor. In 2020, private nonfarm business labor productivity increased 2.5 percent, the highest since a 3.4-percent increase in 2010.

For private nonfarm business in 2020, the contribution of capital intensity to labor productivity was 3.3 percentage points, the largest contribution in the history of the series which began in 1948. (See chart 4.) 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. The 2020 increase in the contribution of capital intensity was due to a 6.5-percent decline in hours worked.

The contribution of labor composition of 1.0 percentage points in 2020 is the largest annual contribution to labor productivity since the series began in 1948. The labor composition index estimates the effect of shifts in the age, education, and gender composition of the workforce on hours worked. The 2020 growth in the contribution of labor composition was again due to the large hours decline of 6.5 percent and a shift in the composition of the workforce to older and more educated employees.

Chart 4. Contributions to labor productivity growth, private nonfarm business sector, selected time periods



Note: Multifactor productivity plus the contributions of capital intensity and labor composition may not sum to labor productivity due to independent rounding.

Capital Services Trends

Capital services in the private nonfarm business sector increased at an average annual rate of 3.0 percent in 2019, the latest year of available detailed capital data. This was the largest single year of growth since 2015 when capital services grew 3.1 percent. Chart 5 shows how the growth of capital services by asset category for private nonfarm business in 2019 outpaced the growth in the 2007-19 business cycle. The high capital services growth in 2019 was driven by intellectual property products and equipment. Intellectual property products grew 5.8 percent in 2019, larger than the average annual growth rate of 4.5 percent in the 2007-19 business cycle. Equipment grew 3.6 percent in 2019, slightly higher than the 2007-19 business cycle average annual growth rate of 3.2 percent. (See chart 5, table C.)

The 2007-19 business cycle continued the slowdown in capital services growth. Its average annual growth rate of 2.4 percent is almost half of the peak average annual growth rate of 4.7 percent in the 1990-2000 business cycle, and 1.1-percentage points lower than the previous 2000-07 business cycle. (See table C.)

Chart 5. Capital services growth in the private nonfarm business sector, selected time periods

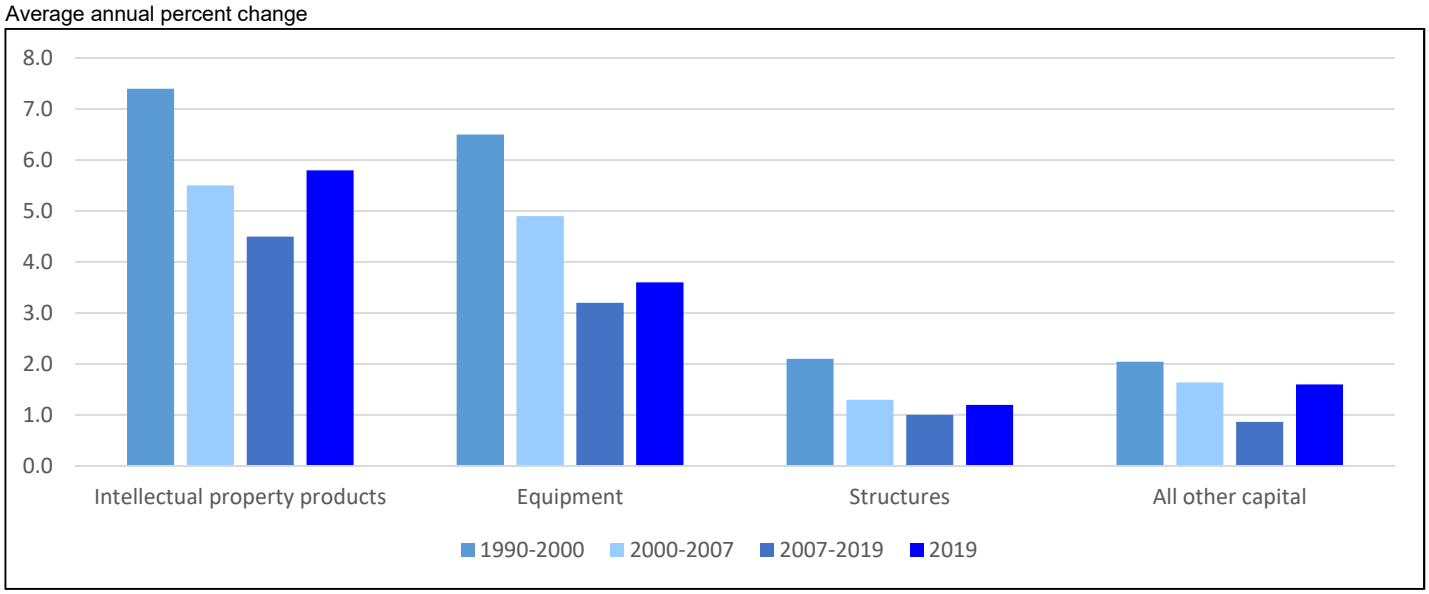


Table A. Productivity, output, and inputs in the private nonfarm business and private business sectors for selected periods, 1987-2020

Average annual growth rates

	1987-2020	1987-1990	1990-2000	2000-2007	2007-2019	2018-2019	2019-2020
Private nonfarm business[1]							
Productivity							
Multifactor Productivity[2]	0.7	0.4	1.0	1.4	0.5	0.7	-1.7
Labor productivity[3]	2.0	1.4	2.2	2.7	1.4	1.8	2.5
Output per unit of capital	-0.7	-0.5	-0.6	-0.6	-0.4	-0.5	-6.4
Output	2.7	3.2	4.0	2.9	2.0	2.5	-4.2
Combined inputs[4]	1.9	2.8	3.0	1.5	1.5	1.8	-2.5
Labor Input[5]	1.2	2.3	2.2	0.5	0.9	1.0	-5.2
Hours	0.7	1.8	1.7	0.1	0.5	0.7	-6.5
Labor composition[6]	0.5	0.5	0.5	0.4	0.4	0.3	1.6
Capital services	3.4	3.8	4.7	3.5	2.4	3.0	2.4
Analytic ratio							
Capital intensity[7]	2.7	2.0	2.9	3.4	1.8	2.3	9.5
Private business[1]							
Productivity							
Multifactor Productivity[2]	0.8	0.5	1.0	1.4	0.5	0.7	-1.7
Labor productivity[3]	2.0	1.6	2.3	2.8	1.4	1.8	2.5
Output per unit of capital	-0.6	-0.5	-0.5	-0.6	-0.3	-0.5	-6.4
Output	2.7	3.2	4.0	2.9	2.0	2.5	-4.1
Combined inputs[4]	1.9	2.7	2.9	1.4	1.5	1.8	-2.4
Labor Input[5]	1.1	2.2	2.2	0.4	0.9	1.0	-5.1
Hours	0.7	1.6	1.7	0.1	0.5	0.7	-6.4
Labor composition[6]	0.5	0.5	0.5	0.4	0.4	0.3	1.5
Capital services	3.3	3.7	4.5	3.4	2.3	3.0	2.4
Analytic ratio							
Capital intensity[7]	2.7	2.0	2.8	3.4	1.8	2.2	9.5

1 Excludes government enterprises.
2 Output per combined units of labor input and capital services.
3 Output per hour worked.
4 The growth rate of each input is weighted by its share of current dollar costs.
5 Hours worked by age, education, and gender group are weighted by each group's share of median wages.
6 Ratio of labor input to hours.
7 Capital services per hour.

Table B. Labor productivity growth and the contributions of capital intensity, labor composition, and multifactor productivity to labor productivity growth, private nonfarm business and private business sectors

Average annual growth rates/ percentage point contributions

	1987-2019	1987-2020*	1987-1990	1990-2000	2000-2007	2007-2019	2018-2019	2019-2020*
Private nonfarm business[1]								
Labor productivity Growth[2]	2.0	2.0	1.4	2.2	2.7	1.4	1.8	2.5
Contribution of capital intensity[3]	0.9	0.9	0.6	0.9	1.1	0.7	0.9	3.3
Contribution of information processing equipment (IPE)[4]	0.3	-	0.3	0.4	0.4	0.2	0.2	-
Contribution of research and development (R&D)[5]	0.1	-	0.1	0.1	0.1	0.1	0.2	-
Contribution of intellectual property products (IPP) excluding R&D[6]	0.2	-	0.2	0.2	0.2	0.2	0.3	-
Contribution of capital services excluding IPP & IPE	0.2	-	0.1	0.2	0.4	0.2	0.3	-
Contribution of labor composition[7]	0.3	0.3	0.4	0.3	0.2	0.2	0.2	1.0
Multifactor productivity Growth[8]	0.8	0.7	0.4	1.0	1.4	0.5	0.7	-1.7
Contribution of R&D to multifactor productivity	0.2	-	0.2	0.2	0.2	0.1	0.2	-
Private business[1]								
Labor productivity Growth[2]	2.0	2.0	1.6	2.3	2.8	1.4	1.8	2.5
Contribution of capital intensity[3]	0.8	0.9	0.7	0.9	1.1	0.7	0.8	3.3
Contribution of information processing equipment (IPE)[4]	0.3	-	0.3	0.4	0.4	0.2	0.2	-
Contribution of research and development (R&D)[5]	0.1	-	0.1	0.1	0.1	0.1	0.2	-
Contribution of intellectual property products (IPP) excluding R&D[6]	0.2	-	0.2	0.2	0.2	0.2	0.3	-
Contribution of capital services excluding IPE & IPP	0.2	-	0.1	0.2	0.4	0.2	0.3	-
Contribution of labor composition[7]	0.3	0.3	0.4	0.3	0.3	0.2	0.2	1.0
Multifactor productivity Growth[8]	0.9	0.8	0.5	1.0	1.4	0.5	0.7	-1.7

1 Excludes government enterprises.
2 Output per hour worked.
3 Capital services per hour multiplied by capital's share of current dollar costs.
4 Information processing equipment per hour multiplied by its share of current dollar costs.
5 Research and development per hour multiplied by its share of current dollar costs.
6 Software and artistic originals per hour multiplied by their share of current dollar costs.
7 Labor composition multiplied by labor's share of current dollar costs.
8 Output per combined units of labor input and capital services.
* - identifies where data for the most recent year are not available.

Note: Multifactor productivity plus contribution of capital intensity and labor composition may not sum to labor productivity due to independent rounding. Contributions of the components of capital intensity may not sum to the total contribution of capital intensity due to independent rounding.

Table C. Real capital services growth by asset type, private nonfarm business and private business sectors

Average annual growth rates

	1987-2019	1987-1990	1990-2000	2000-2007	2007-2019	2018-2019
Private nonfarm business[1]						
All assets	3.5	3.8	4.7	3.5	2.4	3.0
Equipment	4.6	3.8	6.5	4.9	3.2	3.6
Information processing equipment (IPE)	9.4	8.5	13.0	9.5	6.8	6.6
Computers & related equipment	15.6	18.4	28.1	14.4	6.1	5.8
Communication equipment	9.1	6.2	7.9	9.7	10.4	9.6
Other IPE	3.0	2.1	3.3	3.2	2.9	4.1
All other equipment	2.5	1.7	3.5	2.9	1.7	2.5
Structures	1.6	2.9	2.1	1.3	1.0	1.2
Intellectual property products (IPP)	5.9	7.8	7.4	5.5	4.5	5.8
Research and development	4.5	5.8	5.4	4.2	3.5	4.4
Software	10.3	17.0	13.9	8.2	6.8	8.9
Artistic originals	3.1	3.8	3.7	3.6	2.0	2.1
Rental residential capital	1.1	2.0	1.4	2.2	0.1	0.5
Inventories	2.7	3.2	3.5	2.2	2.2	3.4
Land	0.8	1.3	1.3	0.7	0.4	1.3
Private business[1]						
All assets	3.4	3.7	4.5	3.4	2.3	3.0
Equipment	4.5	3.5	6.3	4.9	3.2	3.5
Information processing equipment (IPE)	9.5	8.5	13.0	9.6	6.8	6.6
Computers & related equipment	15.6	18.4	28.1	14.4	6.1	5.8
Communication equipment	9.1	6.2	7.9	9.7	10.4	9.6
Other IPE	3.1	2.1	3.4	3.3	3.1	4.0
All other equipment	2.4	1.4	3.3	2.8	1.8	2.5
Structures	1.5	2.8	2.0	1.2	1.0	1.2
Intellectual property products (IPP)	5.9	7.8	7.4	5.5	4.5	5.8
Research and development	4.5	5.8	5.4	4.2	3.5	4.4
Software	10.3	17.0	13.9	8.2	6.8	8.9
Artistic originals	3.1	3.8	3.7	3.6	2.0	2.1
Rental residential capital	1.1	2.0	1.4	2.2	0.1	0.5
Inventories	2.6	2.7	3.4	2.1	2.1	3.1
Land	0.8	3.0	1.0	0.7	0.1	1.2

1 Excludes government enterprises.

Note: Real capital services by asset type are not available for the most recent reference year. For a brief discussion of methods used in preparing these data see the Technical Notes in this release.

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 the Bureau of Economic Analysis (BEA). Data on inventories are estimated using information from BEA and the Internal Revenue Service (IRS) Corporation Income Returns. Data for land in the farm sector are obtained from the U.S. Department of Agriculture (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.

Additional detail on information processing equipment and intellectual property products are available in table C. 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 and custom. 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. Research and Development also includes own-account R&D for software which had previously been classified in software. 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 61 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.

Capital services measures constructed for the most recent year are preliminary and are based on less detail than the rest of the series. These measures consist of 6 asset types as opposed to the 90 asset types for fixed business equipment, structures, inventories, land, and intellectual property products included in estimates for all previous years. The assets included in the most recent year are structures, fixed business equipment, intellectual property products, inventories, rental residences, and land. Investments, depreciation, and capital income are estimated for each of these six aggregates. Capital services are calculated by a chained superlative Tornqvist index combining stocks of the six asset categories, weighted by capital income shares. See the June 2005 Monthly Labor Review article, "Preliminary estimates of multifactor productivity growth" located at www.bls.gov/opub/mlr/2005/06/art3full.pdf.

Labor Input

Labor input in private business and private nonfarm business is obtained by a chained superlative Tornqvist aggregation of the hours worked, 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 (CES) program. Weekly paid hours are adjusted to hours worked using data from the National Compensation Survey (NCS) for 1996 forward and data from the BLS Hours at Work survey, conducted for this purpose, prior to 1990. Between 1990 and 1995, weekly paid hours are adjusted to hours at work using a combination of NCS and Hours at Work survey data. Hours worked for nonproduction and supervisory workers are derived using data from the Current Population Survey (CPS), CES, and NCS. The hours worked of proprietors, unpaid family workers, and farm employees are derived from the CPS. Hours worked data reflect estimates in the March 4, 2021 "Productivity and Costs" news release (www.bls.gov/news.release/archives/ prod2_03042021.htm).

The estimates of 2020 hours worked for the private nonfarm business and private business sectors are extrapolated from the hours worked reported in the nonfarm business and business sectors, respectively, in the March 4, 2021 "Productivity and Costs" news release (www.bls.gov/news.release/archives/prod2_03042021.htm). 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. The index of hours worked of all persons including employees, proprietors, and unpaid family workers, classified by age, education, and gender are weighted together using median wages to compute the labor composition estimates reflecting the different skillset of the work force. These cell estimates are smoothed using a three year moving average to address missing observations and reduce volatility.

Additional information concerning data sources and methods of measuring labor composition can be found in "Changes in the Composition of Labor for BLS Multifactor Productivity Measures, 2014" (www.bls.gov/mfp/mprlabor.pdf).

Combined Inputs

Labor input and capital services are combined using chained superlative Tornqvist aggregation, applying weights that represent each component's average 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 becomes.

In a production process, profit-maximizing/cost-minimizing firms adjust the factor proportions of capital and labor when the price of one factor is less than the other factor; there is 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 www.bls.gov/mfp/mprdload.htm.

Value-Added 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. Additionally, the private nonfarm business sector excludes farms from the private business sector, but includes agricultural services. Multifactor productivity measures exclude government enterprises, while the BLS quarterly Productivity and Costs series include them.

The output measures are based on the National Income and Product Accounts (NIPA) data released by BEA on February 26, 2021. The estimates of 2020 output for the private nonfarm business and private business sectors are extrapolated from the output reported in the nonfarm business and business sectors, respectively, in the March 4, 2021 “Productivity and Costs” news release (www.bls.gov/news.release/archives/prod2_ 03042021.htm).

Multifactor Productivity

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 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 combined inputs 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 aggregating different vintages of 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" at 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 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 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” (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” (www.bls.gov/mfp/mprtech.pdf). General information is available on the BLS website at www.bls.gov/mfp/mprover.htm. Additional data not contained in the release can be obtained at www.bls.gov/mfp. Comprehensive tables for the private business and private nonfarm business sector can be downloaded at www.bls.gov/mfp/mprdload.htm, including data that links 1948-87 SIC data to NAICS data from 1987 forward.

Table 1. Private nonfarm business sector: productivity and related measures for the 1987-2020[1] period

Annual percent change from previous year

Year	Productivity			Value-added output[4]	Inputs			Capital Intensity[8]
	Labor productivity[2]	Output per unit of capital services	Multifactor Productivity[3]		Labor[5]	Capital Service[6]	Combined units of labor and capital services[7]	
1988	1.7	0.8	1.0	4.6	3.4	3.8	3.5	0.9
1989	0.9	-0.4	0.2	3.7	3.2	4.1	3.5	1.3
1990	1.7	-1.9	0.1	1.5	0.4	3.4	1.4	3.7
1991	1.8	-3.5	-0.4	-0.5	-1.6	3.1	-0.1	5.5
1992	4.4	1.5	2.9	4.0	0.5	2.6	1.1	2.9
1993	0.2	-0.3	-0.4	3.1	3.6	3.4	3.6	0.4
1994	0.8	0.7	0.4	4.6	4.3	3.9	4.1	0.1
1995	1.2	-1.0	0.2	3.5	2.7	4.5	3.3	2.2
1996	2.1	-0.3	1.0	4.5	2.9	4.8	3.5	2.4
1997	1.9	-0.3	0.9	5.1	3.5	5.4	4.2	2.1
1998	3.1	-0.7	1.5	5.4	2.6	6.1	3.8	3.8
1999	3.8	-0.7	2.1	5.7	2.1	6.5	3.5	4.6
2000	3.3	-1.7	1.5	4.7	1.7	6.5	3.2	5.1
2001	2.9	-3.9	0.5	0.9	-1.6	4.9	0.4	7.1
2002	4.4	-1.6	2.0	1.7	-2.0	3.4	-0.3	6.2
2003	3.9	0.4	2.3	3.3	-0.1	2.9	0.9	3.5
2004	2.9	1.5	2.2	4.2	1.6	2.7	2.0	1.4
2005	2.2	0.5	1.5	4.0	1.9	3.4	2.4	1.7
2006	1.1	-0.2	0.5	3.5	2.6	3.7	3.0	1.4
2007	1.8	-0.8	0.5	2.5	1.2	3.4	2.0	2.7
2008	1.2	-3.8	-1.2	-1.0	-1.4	2.9	0.1	5.2
2009	3.8	-4.7	0.2	-3.6	-6.6	1.1	-3.8	8.9
2010	3.4	2.5	2.7	3.3	0.5	0.8	0.6	0.9
2011	-0.1	0.3	-0.1	2.0	2.4	1.7	2.2	-0.4
2012	0.8	1.2	0.7	3.2	2.7	2.0	2.4	-0.4
2013	0.5	-0.2	0.1	2.3	2.0	2.5	2.2	0.8
2014	0.8	0.4	0.6	3.2	2.5	2.8	2.6	0.5
2015	1.6	0.7	1.1	3.8	2.4	3.1	2.6	0.9
2016	0.4	-1.2	-0.4	1.8	1.7	3.0	2.2	1.6
2017	1.2	0	0.5	2.8	1.9	2.7	2.2	1.2
2018	1.5	0.6	0.9	3.5	2.4	2.8	2.6	0.8
2019	1.8	-0.5	0.7	2.5	1.0	3.0	1.8	2.3
2020	2.5	-6.4	-1.7	-4.2	-5.2	2.4	-2.5	9.5

See footnotes following table 4.

Source: Bureau of Labor Statistics

Table 2. Private business sector: productivity and related measures for the 1987-2020[1] period

Annual percent change from previous year

Year	Productivity			Value-added output[4]	Inputs			Capital Intensity[8]
	Labor productivity[2]	Output per unit of capital services	Multifactor Productivity[3]		Labor[5]	Capital Services[6]	Combined units of labor and capital services[7]	
1988	1.5	0.4	0.8	4.3	3.2	3.9	3.4	1.1
1989	1.1	-0.2	0.4	3.8	3.1	4.0	3.4	1.3
1990	2.0	-1.6	0.4	1.6	0.2	3.2	1.2	3.7
1991	1.7	-3.4	-0.5	-0.5	-1.5	2.9	-0.1	5.3
1992	4.6	1.8	3.1	4.2	0.5	2.4	1.1	2.8
1993	0.1	-0.4	-0.5	2.9	3.4	3.3	3.4	0.5
1994	0.6	1.0	0.4	4.8	4.7	3.8	4.4	-0.4
1995	0.8	-1.1	-0.1	3.1	2.7	4.3	3.2	1.9
1996	2.4	0.1	1.3	4.7	2.6	4.6	3.3	2.4
1997	2.1	0.0	1.2	5.2	3.4	5.2	4.0	2.1
1998	3.1	-0.7	1.6	5.2	2.5	5.9	3.6	3.8
1999	4.0	-0.6	2.3	5.7	1.9	6.3	3.4	4.6
2000	3.4	-1.4	1.6	4.8	1.7	6.3	3.2	4.9
2001	3.0	-3.8	0.5	0.8	-1.8	4.8	0.3	7.1
2002	4.4	-1.4	2.0	1.8	-1.9	3.2	-0.3	5.9
2003	4.0	0.5	2.5	3.3	-0.2	2.8	0.8	3.4
2004	3.0	1.5	2.3	4.3	1.5	2.8	2.0	1.5
2005	2.2	0.5	1.5	4.0	1.9	3.5	2.4	1.8
2006	1.2	-0.3	0.4	3.5	2.5	3.8	3.0	1.5
2007	1.7	-0.8	0.5	2.4	1.1	3.2	1.9	2.6
2008	1.1	-3.6	-1.1	-1.0	-1.4	2.7	0.1	4.9
2009	3.9	-4.4	0.3	-3.5	-6.5	1.0	-3.8	8.7
2010	3.4	2.5	2.7	3.3	0.5	0.8	0.6	0.9
2011	-0.1	0.1	-0.2	1.9	2.4	1.8	2.2	-0.3
2012	0.7	1.0	0.6	3.1	2.7	2.1	2.5	-0.3
2013	0.9	0.0	0.4	2.5	1.8	2.5	2.1	0.9
2014	0.7	0.4	0.5	3.2	2.6	2.7	2.7	0.3
2015	1.5	0.9	1.1	3.8	2.5	2.9	2.7	0.6
2016	0.4	-1.0	-0.3	1.9	1.7	2.9	2.2	1.4
2017	1.2	0.0	0.5	2.7	1.8	2.7	2.2	1.2
2018	1.6	0.7	1.0	3.5	2.3	2.8	2.5	0.9
2019	1.8	-0.5	0.7	2.5	1.0	3.0	1.8	2.2
2020	2.5	-6.4	-1.7	-4.1	-5.1	2.4	-2.4	9.5

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

Table 3. Private nonfarm business sector: indexes of productivity and related measures, 1987-2020[1]

Indexes 2012=100

Year	Productivity			Value-added output[4]	Inputs			Capital Intensity[8]
	Labor productivity[2]	Output per unit of capital services	Multifactor Productivity[3]		Labor[5]	Capital Services[6]	Combined units of labor and capital services[7]	
1987	58.1	118.6	79.8	48.5	74.4	40.9	60.8	49.0
1988	59.0	119.5	80.7	50.8	76.8	42.5	62.9	49.4
1989	59.5	119.0	80.8	52.6	79.3	44.2	65.1	50.0
1990	60.6	116.8	80.9	53.4	79.6	45.7	66.0	51.9
1991	61.7	112.6	80.5	53.1	78.3	47.2	66.0	54.7
1992	64.4	114.3	82.8	55.3	78.7	48.4	66.7	56.4
1993	64.5	113.9	82.5	57.0	81.6	50.0	69.1	56.6
1994	65.0	114.7	82.8	59.6	85.1	52.0	72.0	56.6
1995	65.7	113.6	83.0	61.7	87.3	54.3	74.4	57.9
1996	67.1	113.3	83.8	64.5	89.8	56.9	77.0	59.3
1997	68.4	113.0	84.6	67.8	93.0	60.0	80.2	60.5
1998	70.5	112.2	85.9	71.5	95.5	63.7	83.2	62.8
1999	73.2	111.4	87.7	75.5	97.5	67.8	86.1	65.7
2000	75.6	109.5	89.0	79.1	99.1	72.2	88.9	69.0
2001	77.8	105.3	89.4	79.8	97.5	75.8	89.3	73.9
2002	81.3	103.6	91.2	81.2	95.5	78.4	89.0	78.5
2003	84.4	104.0	93.4	83.9	95.5	80.7	89.8	81.2
2004	86.8	105.5	95.4	87.4	97.0	82.9	91.6	82.3
2005	88.7	106.0	96.8	90.9	98.8	85.7	93.8	83.7
2006	89.7	105.8	97.3	94.1	101.4	88.9	96.7	84.8
2007	91.4	104.9	97.8	96.4	102.7	91.9	98.6	87.1
2008	92.4	100.9	96.7	95.4	101.2	94.6	98.7	91.6
2009	96.0	96.1	96.8	92.0	94.6	95.7	95.0	99.8
2010	99.3	98.6	99.4	95.0	95.0	96.4	95.6	100.7
2011	99.2	98.8	99.3	96.9	97.3	98.1	97.6	100.4
2012	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2013	100.5	99.8	100.1	102.3	102.0	102.5	102.2	100.8
2014	101.4	100.1	100.6	105.5	104.6	105.4	104.9	101.2
2015	103.0	100.8	101.8	109.5	107.1	108.6	107.7	102.1
2016	103.4	99.6	101.4	111.5	108.9	111.9	110.1	103.7
2017	104.6	99.7	101.9	114.6	111.0	115.0	112.5	104.9
2018	106.1	100.3	102.8	118.6	113.6	118.3	115.4	105.8
2019	108.0	99.8	103.6	121.6	114.8	121.9	117.4	108.3
2020	110.7	93.4	101.8	116.5	108.8	124.8	114.5	118.6

See footnotes following table 4.

Source: Bureau of Labor Statistics

Table 4. Private business sector: indexes of productivity and related measures, 1987-2020[1]

Indexes 2012=100

Year	Productivity			Value-added output[4]	Inputs			Capital Intensity[8]
	Labor productivity[2]	Output per unit of capital services	Multifactor Productivity[3]		Labor[5]	Capital Services[6]	Combined units of labor and capital services[7]	
1987	57.5	115.8	78.9	48.6	75.2	42.0	61.6	49.6
1988	58.4	116.3	79.6	50.7	77.6	43.6	63.7	50.2
1989	59.0	116.1	79.9	52.7	80.0	45.4	65.9	50.8
1990	60.2	114.2	80.2	53.5	80.2	46.8	66.7	52.7
1991	61.3	110.4	79.8	53.2	78.9	48.2	66.7	55.5
1992	64.1	112.4	82.3	55.5	79.3	49.4	67.4	57.1
1993	64.2	111.9	81.9	57.1	82.0	51.0	69.7	57.3
1994	64.6	113.1	82.3	59.8	85.9	52.9	72.7	57.1
1995	65.1	111.8	82.2	61.7	88.2	55.2	75.1	58.2
1996	66.7	111.8	83.3	64.6	90.5	57.7	77.6	59.6
1997	68.1	111.8	84.2	67.9	93.6	60.8	80.7	60.9
1998	70.2	111.1	85.5	71.5	95.9	64.4	83.6	63.2
1999	73.0	110.5	87.5	75.6	97.8	68.4	86.4	66.1
2000	75.5	108.9	88.9	79.2	99.4	72.8	89.2	69.4
2001	77.8	104.8	89.3	79.9	97.7	76.2	89.4	74.3
2002	81.2	103.3	91.1	81.3	95.8	78.7	89.2	78.6
2003	84.5	103.8	93.4	84.0	95.6	80.9	89.9	81.3
2004	87.0	105.4	95.6	87.6	97.1	83.1	91.7	82.5
2005	88.9	105.9	97.0	91.1	98.9	86.0	93.9	84.0
2006	90.0	105.6	97.4	94.3	101.4	89.3	96.7	85.2
2007	91.5	104.7	97.9	96.5	102.6	92.2	98.6	87.4
2008	92.6	100.9	96.8	95.5	101.2	94.6	98.7	91.7
2009	96.2	96.5	97.1	92.2	94.6	95.5	95.0	99.7
2010	99.4	98.9	99.7	95.2	95.1	96.3	95.5	100.6
2011	99.3	99.0	99.4	97.0	97.4	98.0	97.6	100.3
2012	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2013	100.9	100.0	100.4	102.5	101.8	102.5	102.1	100.9
2014	101.6	100.4	100.9	105.7	104.5	105.3	104.8	101.2
2015	103.1	101.3	102.0	109.8	107.1	108.4	107.6	101.8
2016	103.6	100.2	101.7	111.8	109.0	111.6	110.0	103.3
2017	104.8	100.2	102.2	114.9	111.0	114.6	112.4	104.5
2018	106.5	100.9	103.2	118.9	113.5	117.8	115.2	105.5
2019	108.3	100.4	104.0	121.9	114.7	121.3	117.2	107.9
2020	111.0	94.0	102.2	116.8	108.8	124.3	114.4	118.1

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 hour worked.

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

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

(5) Index of hours worked 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 total wages.

(6) 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.

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

(8) Capital services per hour.