



Internet address: <http://www.bls.gov/mfp>
Historical, technical
information: (202) 691-5606
Media contact: (202) 691-5902

USDL 06-513
Thursday, March 23, 2006
For Release: 10:00 AM EST

MULTIFACTOR PRODUCTIVITY TRENDS, 2003 AND 2004

Private Business and Private Nonfarm Business

The Bureau of Labor Statistics of the U.S. Department of Labor reported today multifactor productivity data – output per combined units of labor and capital inputs – for 2003 and 2004. The annual rates of multifactor productivity change from 2002 to 2003 and from 2003 to 2004 were:

	2002-03	2003-04
Private business sector	2.8	2.9
Private nonfarm business sector	2.7	2.9

Multifactor productivity in the private business and private nonfarm business sectors in 2003 and 2004 show the fastest rates of growth in the current time series, which go back to 1987. In both sectors, multifactor productivity grew at a slightly faster pace in 2004 than in 2003. The 2002-3 and 2003-4 annual changes are summarized in table A, and further detail and historical measures are shown in tables 1 through 6.

Multifactor productivity is designed to measure the joint influences of economic growth on technological change, efficiency improvements, returns to scale, reallocation of resources, and other factors, allowing for the effects of capital and labor. Multifactor productivity, therefore, differs from labor productivity (output per hour worked) 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.

Multifactor productivity measures for the private business and private nonfarm business sectors are now developed from data based on the 1997 North American Industry Classification System (NAICS). These measures are not comparable with the measures for the private business and private nonfarm business sectors previously reported on a 1987 Standard Industrial Classification (SIC) basis. This is because major sector multifactor productivity measures are aggregated from industry detail data that are largely unavailable on a NAICS basis before 1987. In addition, the hours of proprietors and unpaid family workers, compensation, and measures of labor composition, which are collected on a 2002 NAICS basis, are converted to a 1997 NAICS basis for this report.

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 the output of government enterprises is omitted.

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.

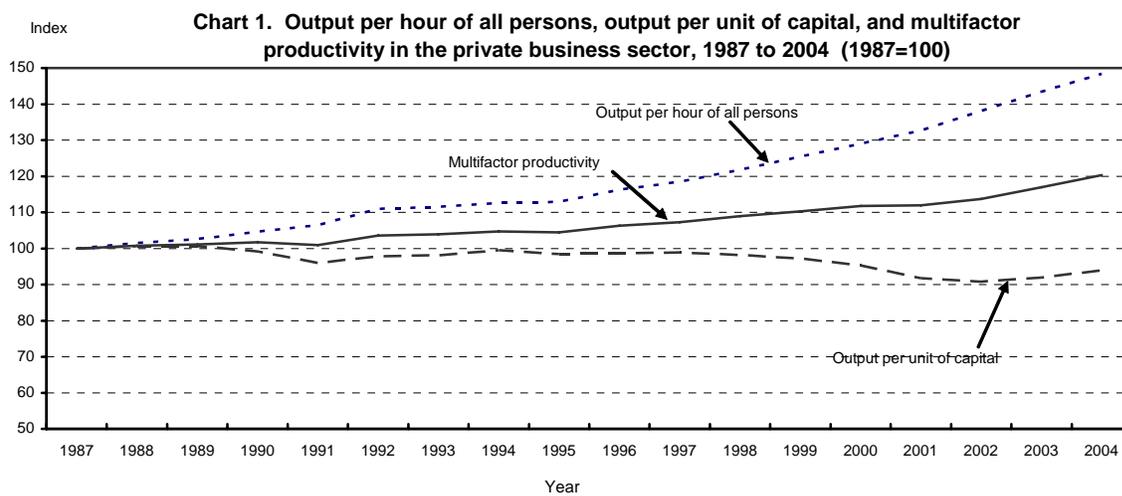


Chart 1 shows the annual indexes of multifactor productivity, output per hour worked, and output per unit of capital services for the 1987-2004 period for private business. Over the last 17 years, capital services have grown more rapidly than hours in the private business sector, and the skills of workers -- as measured by their education and work experience -- also have risen over this period. These shifts toward more capital intensive production and toward workers with more human capital have supplemented multifactor productivity growth, usually allowing output per hour to grow at a faster rate than multifactor productivity.

Private business sector

Changes in 2003. Multifactor productivity rose 2.8 percent in 2003. Along with an almost similar increase in 2004, it was the largest rate of increase in the current time series. The multifactor productivity gain in 2003 reflected a 3.4 percent increase in output and a more modest 0.6 percent increase in the combined inputs of capital and labor.

Growth in capital services slowed to 2.1 percent, the slowest growth since the current series began in 1987. Labor input posted a slight drop of 0.1 percent, marking the third consecutive year that labor input declined. It had fallen 1.4 percent in 2001 and 1.3 percent in 2002. Hours fell 0.5 percent in 2003. The capital-labor ratio (capital services per hour of all persons) increased by 2.7 percent.

Equipment capital services grew 3.5 percent in 2003, much more rapidly than other broad categories of capital assets (see table 5). Within equipment, services of computers and related equipment grew 14.1 percent, software 5.2 percent, communication equipment 4.9 percent, other information processing equipment 3.0 percent, and all other equipment 1.1 percent. However, these rates are markedly lower than in the 1995-2000 period. Services of structures and land continued to grow at rates similar to recent years, about one percent. In the 1995-2000 period, services of structures were growing at a compound average annual rate of 2.0 percent and services of land 0.7 percent. Inventories grew at an annual rate of 0.8 percent in 2003, down from the 3.9 percent compound average annual rate of growth in the 1995-2000 period.

Table A. Productivity and related data, percent changes 2002-03 and 2003-04

	Private Business ¹		Private Nonfarm Business ¹	
	2002-03	2003-04	2002-03	2003-04
<u>Productivity</u>				
Multifactor Productivity ²	2.8	2.9	2.7	2.9
Output per hour of all persons	4.0	3.4	3.9	3.4
Output per unit of capital services	1.3	2.3	1.2	2.4
<u>Output</u>				
	3.4	4.8	3.4	4.9
<u>Inputs</u>				
Labor input ³	-0.1	1.5	0.0	1.6
Hours	-0.5	1.3	-0.5	1.4
Labor Composition ⁴	0.4	0.2	0.5	0.2
Capital services	2.1	2.5	2.2	2.4
Combined units of labor and capital inputs ⁵	0.6	1.8	0.7	1.9
<u>Analytic ratio:</u>				
Capital services per hour of all persons	2.7	1.2	2.6	1.0

1. Excludes government enterprises.
2. Output per unit of combined labor and capital inputs.
3. Index of hours at work; hours at work 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 input reflects the change in hours at work adjusted for the effects of changing labor composition. As mentioned previously, labor input fell 0.1 percent. The modest decline of labor input was due to a decline in hours at work that was almost offset by a strong positive contribution from labor composition (see table A). Hours fell 0.5 percent in 2003, the third consecutive year of decline. Changes in labor composition, as measured by shifts in the educational attainment and work experience of the work force, rose 0.4 percent (see “Changes in the Composition of Labor for the BLS Multifactor Productivity Measures, 2004”, available at <http://www.bls.gov/web/mprlabor.pdf>). Employment declined 0.1 percent in 2003.

Labor productivity (output per hour worked) increased 4.0 percent, nearly the same as the growth rate of 4.1 percent in 2002. Capital productivity (output per unit of capital services) grew 1.3 percent, the first increase since 1997.

Changes in 2004. Multifactor productivity grew at an annual rate of 2.9 percent, 0.1 percent more than in 2003. The combined inputs of labor and capital grew 1.8 percent, the fastest rise since the 2.6 percent increase in 2000, and output rose at even a faster pace, 4.8 percent.

Capital services increased 2.5 percent in 2004. Hours rose 1.3 percent, ending three consecutive years of declines. As a result, the change in the capital-labor ratio, which is roughly equivalent to the growth in capital services less the increase in labor hours, grew 1.2 percent.

Equipment continued to account for most of the growth in capital services, rising 4.0 percent, with information processing equipment and software exhibiting the fastest growth rate among all equipment types, 7.0 percent. Services of structures grew at the same 0.9 percent rate as in 2003. Growth rates for inventories and land almost doubled from the previous year. Inventories grew 1.5 percent, higher than the 0.8 percent increase in 2003. Land rose 1.7 percent, up from 1.0 percent in 2003.

Labor productivity grew more slowly, 3.4 percent, than the 4.1 and 4.0 percent increases in 2002 and 2003, respectively. Labor input rose by 1.5 percent after falling in the three previous years. Most of the increase in labor input came from the 1.3 percent increase in hours; labor composition added an additional 0.2 percent. Capital productivity grew 2.3 percent, the highest rate of growth in the current time series.

Private nonfarm business

Changes in 2003. Multifactor productivity in the private nonfarm business sector rose 2.7 percent in 2003. It was the largest rate of increase in the current time series. Output increased 3.4 percent, and the combined inputs of capital and labor increased 0.7 percent.

Labor input was unchanged. Capital services grew 2.2 percent, the fourth consecutive year in which growth in capital services decelerated. The fastest growing component of capital services was equipment (see table 6). However, growth in equipment, 3.5 percent, was relatively slow compared to the extremely high compound annual average rate of growth in 1995-2000 of 9.5 percent. The increase in equipment in 2003 was largely due to capital services of information processing equipment and software rising by 6.4 percent. As in previous years, the fastest growth in equipment was in computers and related equipment, which grew 14.1 percent.

Labor productivity grew 3.9 percent and capital productivity rose 1.2 percent. Capital services per hour increased at the rate of 2.6 percent.

Changes in 2004. Multifactor productivity in the private nonfarm business sector increased 2.9 percent, a 0.2 percentage point increase from the previous year. Output grew 4.9 percent, an increase of 1.5 percentage points from 2003, and the growth of combined capital and labor inputs rose 1.9 percent, an increase from 0.7 percent in 2003.

Labor input rose 1.6 percent in 2004, up from no growth in 2003. Hours at work contributed 1.4 of the 1.6 percent increase in labor input with labor composition providing the additional 0.2 percentage point. Capital services grew 2.4 percent and, as a result, the capital-labor ratio rose only 1.0 percent, compared to 2.6 percent in 2003.

Labor productivity grew 3.4 percent, a drop from the 3.9 percent increase in 2003. Capital productivity grew 2.4 percent, the second consecutive annual increase.

Historical trends in private business and private nonfarm business

Labor productivity (output per hour worked) 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 nor do they account for 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. Historical trends in 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 (see 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 a third of total payments.

Because trends in the private nonfarm business sector were similar to those in the private business sector in each period, the description that follows focuses exclusively on the private business sector.

Over the 1987-2004 period, output per hour worked grew at an annual rate of 2.4 percent in private business (see table B). Of the 2.4 percent growth rate in labor productivity, 1.1 percent can be attributed to increases in multifactor productivity, 0.9 percent to the contribution of capital intensity, and 0.4 percent to changes in labor composition. Since 1987, output per hour worked has accelerated, growing 1.5 percent in the 1990-95 period, 2.7 percent in the 1995-2000 period, and 3.6 percent in the 2000-2004 period.

In the period 1987-1990, all of the productivity measures (see table B) grew to varying degrees. Multifactor productivity increased at annual average rate of 0.6 percent. Labor productivity grew at annual average rate of 1.5 percent. The contribution of capital intensity averaged a growth rate of 0.6 percent with information processing equipment exhibiting a growth rate of 0.4 percent and other capital services growing 0.1 percent. The contribution of labor composition increased 0.4 percent.

Over the 1990-1995 period, increases in the productivity measures were similar to those in the 1987-1990 period. Multifactor productivity rose 0.5 percent. Labor productivity grew at 1.5 percent, the same rate as in 1987-1990. The contribution of capital intensity grew 0.5 percent, with information processing equipment contributing over 80 percent of this growth. The contribution of labor composition rose 0.4 percent, the same as in the previous period.

In the latter half of the 1990s, growth in productivity measures accelerated. Multifactor productivity growth expanded 1.4 percent and output per hour growth nearly doubled from the previous period, to 2.7 percent. Growth of the contribution of capital intensity doubled from the previous period to 1.1 percent. The growth of the two components of the contribution of capital intensity, information processing equipment and other capital services, also doubled from the previous period, with information processing equipment commanding an even more predominant share of the total contribution of capital services. The growth of information processing equipment rose to 0.9 percent while other capital services grew 0.2 percent. The contribution of labor composition dropped 0.1 percentage point from the previous period, to 0.3 percent.

In the 2000-2004 period, productivity measures continued to accelerate but at a slower pace. Multifactor productivity growth increased an additional 0.5 percentage points from the previous period to 1.9 percent. Labor productivity continued its upward trend, rising to 3.6 percent. The contribution of capital intensity growth gained 0.1 percentage points from the previous period to 1.2 percent. Growth in the composition of capital intensity came in equal parts from both of the major components. The contribution of information processing equipment dropped to a growth rate of 0.6 percent from 0.9 percent in the previous period. At the same time, other capital services rose to 0.6 percent. The contribution of labor composition growth increased to 0.5 percent.

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, 1987 to 2004

(percent per year)

	1987-04	1987-90	1990-95	1995-00	2000-04	2002-03	2003-04
<u>Private business</u> ¹							
Output per hour of all persons	2.4	1.5	1.5	2.7	3.6	4.0	3.4
Contribution of capital intensity ²	0.9	0.6	0.5	1.1	1.2	0.8	0.4
Contribution of information processing equipment and software ³	0.6	0.4	0.5	0.9	0.6	0.4	0.4
Contribution of all other capital services	0.2	0.1	0.1	0.2	0.6	0.4	0.0
Contribution of labor composition ⁴	0.4	0.4	0.4	0.3	0.5	0.3	0.1
Multifactor productivity ⁵	1.1	0.6	0.5	1.4	1.9	2.8	2.9
<u>Private nonfarm business</u> ¹							
Output per hour of all persons	2.3	1.5	1.6	2.5	3.5	3.9	3.4
Contribution of capital intensity ²	0.9	0.6	0.6	1.1	1.2	0.8	0.3
Contribution of information processing equipment and software ³	0.6	0.4	0.5	0.9	0.6	0.4	0.4
Contribution of all other capital services	0.2	0.1	0.1	0.2	0.5	0.4	0.0
Contribution of labor composition ⁴	0.4	0.4	0.4	0.3	0.5	0.3	0.1
Multifactor productivity ⁵	1.0	0.5	0.6	1.2	1.9	2.7	2.9
Contribution of R&D to multifactor productivity	0.2	0.2	0.2	0.2	0.3	0.3	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 per hour 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.

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 1987-2004 period, or about 17 percent of total multifactor productivity growth (see table B). The contribution of research and development varied little over time, contributing 0.2 percent per year during the following periods: 1987-90, 1990-95 period, and 1995-2000. The contribution of research and development to multifactor productivity increased to 0.3 percent in recent years, the 2000-04 period.

Revisions

Private business and private nonfarm business output series to 2004 reflect the annual revisions to the National Income and Product Accounts (NIPA), announced by the Bureau of Economic Analysis (BEA) in July 2005.

The index numbers and rates of percent changes reported by BLS for multifactor productivity are rounded to one decimal place. Effective with the release of today's data, all percent changes in this release and on the BLS web site are calculated using index numbers rounded to three decimal places. These index numbers are available at the BLS web site, <http://www.bls.gov/data/home.htm>, or by contacting the BLS Division of Major Sector Productivity. (Telephone 202-691-5606 or e-mail DPRWEB@BLS.GOV)

Previously, the percent changes were calculated using the data underlying the index numbers rather than the index numbers themselves. The change in calculation method may cause published productivity growth rates to change slightly – likely by no more than a tenth – from the rates that were calculated using the earlier method. The convention of publishing in the news release index values rounded to one decimal place will continue.

BLS built multifactor productivity measures from three-digit NAICS detail. Most critical data were not reported on a NAICS basis for years prior to 1998. Detailed GDP by industry data, are available from 1998 forward, but from 1987-1997, many of the income components needed to construct capital rental prices were obtained by applying 1997 SIC-to-NAICS conversion factors to SIC data and adjusting to the resulting NAICS totals. A similar procedure was applied to manufacturing inventories. Detailed nonmanufacturing inventories were constructed using total inventory for the private business sector and nonmanufacturing industry shares of total inventory derived from the IRS book value of inventories reported for NAICS industries. Land data were only available from 1998 to 2002 on a NAICS basis. As a consequence, land estimates from 1987 to 1997 were calculated using a combination of SIC to NAICS conversion factors and more detailed IRS data. Data for 2003 and 2004 were extrapolated using detailed IRS data for 2002.

The Bureau of Labor Statistics has used Current Population Survey (CPS) data to measure the hours of nonfarm proprietors and unpaid family workers, and all persons working in the farm sector using the hours worked by people whose main job falls into these categories. Since the Productivity and Costs release of June 2005, hours for primary and secondary jobs held by persons working more than one job were processed separately and assigned to the appropriate class of worker for each job, rather than assigning all hours to the primary job. Hours worked in a second job as a nonfarm employee by a proprietor (or other selected category of worker for whom our source is the CPS) were deducted to avoid double-counting. Conversely, hours worked as a proprietor in a secondary job by a person who is primarily an employee were included. This multiple-jobholder adjustment yielded an improved measure of hours at work by sector and industry and the employment series approximated a count of jobs rather than persons. This adjustment has not yet been implemented within the manufacturing sector, where there are very few proprietors.

Labor composition measures have been updated through 2004. A brief description, "Changes in the Composition of Labor for the BLS Multifactor Productivity Measures, 2004" is available at <http://www.bls.gov/web/mprlabor.pdf>.

Comprehensive tables containing additional data not included in this news release are available at <http://www.bls.gov/mfp/mprdownload.htm> or in print upon request.

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.", the BLS Handbook of Methods, Chapter 10 at <http://www.bls.gov/opub/hom/pdf/homch10.pdf>, and on the BLS Multifactor Productivity website at <http://www.bls.gov/mfp/mfpover.htm>. Additional data not contained in the release can be obtained in print or at <http://www.bls.gov/mfp>.

Capital Input: 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, terminals, tape drives, storage devices, and integrated systems. Software is comprised of pre-packaged, custom, and own-account software. Communications equipment is not further differentiated. Other IPES includes medical equipment and related instruments, electromedical instruments, nonmedical instruments, photocopying and related equipment, and office and accounting machinery. 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 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. Data on investments in physical assets are obtained from BEA. Data on inventories are obtained from BEA using additional information from IRS Corporation Income Returns. Estimates for land in the farm sector are obtained from USDA. Nonfarm industry detail is based on IRS book value data. Current-dollar gross product originating (GPO) data, obtained from BEA, are used in estimating capital rental prices.

Labor Input: Labor input in private business and private nonfarm business is obtained by Tornqvist aggregation of the hours at work by all persons, classified by education, work experience, and gender with weights determined by their shares of labor compensation. Hours paid of employees are largely obtained from CES. These hours of employees are then converted to an at-work basis by using information from the Employment Cost Index (ECI) of the National Compensation Survey and the Hours at Work Survey. Hours at work for nonproduction and supervisory workers are derived using data from the 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 2, 2006 news release. It does not reflect benchmark revisions to the CES survey and other revisions to hours released on February 3, 2006. 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."

Combined Inputs: 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 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. The index uses changing weights: The share in each year is averaged with the preceding year's share.

Output: This release presents data for the private business and private nonfarm business sectors. The private business sector, which accounted for approximately 77 percent of gross domestic product in 2000, 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 from the private business sector, but includes agricultural services. Multifactor measures exclude government enterprises, while the BLS quarterly Productivity and Cost series include them.

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, capital, or any other factor of production. Rather, multifactor productivity is designed to measure the joint influences of output, capital, and labor 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 1987 to 2004, BEA supplies the output indexes. BLS adjusts these to eliminate the output of government enterprises.

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 1987-2004 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, 1987-2004¹

Indexes 2000=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	
1987	77.5	104.9	89.5	62.4	75.2	59.5	69.8	73.8
1988	78.7	105.6	90.2	65.2	77.9	61.7	72.3	74.5
1989	79.5	105.6	90.5	67.6	80.3	64.0	74.7	75.3
1990	81.1	104.0	91.0	68.6	80.4	66.0	75.4	78.0
1991	82.5	100.7	90.3	68.1	79.4	67.6	75.4	81.9
1992	86.0	102.6	92.7	70.9	80.2	69.1	76.5	83.9
1993	86.4	102.9	93.0	73.2	82.5	71.2	78.7	84.0
1994	87.3	104.4	93.7	76.8	86.2	73.6	82.0	83.6
1995	87.5	103.3	93.5	79.2	88.7	76.6	84.7	84.7
1996	90.1	103.5	95.1	82.8	90.5	80.0	87.1	87.1
1997	91.8	103.7	96.0	87.2	94.1	84.1	90.8	88.5
1998	94.4	103.0	97.5	91.5	96.3	88.8	93.9	91.6
1999	97.2	102.0	98.7	96.2	98.9	94.3	97.5	95.3
2000	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2001	102.8	96.3	100.2	100.5	98.6	104.4	100.3	106.8
2002	107.0	95.2	101.8	102.0	97.3	107.1	100.2	112.3
2003	111.2	96.4	104.7	105.5	97.2	109.4	100.8	115.3
2004	115.0	98.6	107.7	110.6	98.7	112.1	102.7	116.6

See footnotes following table 4.

Source: Bureau of Labor Statistics

Table 2. Private nonfarm business sector: Productivity and related measures, 1987-2004¹

Indexes 2000=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	
1987	78.0	106.4	90.2	62.4	74.7	58.7	69.2	73.3
1988	79.4	107.6	91.1	65.3	77.4	60.7	71.7	73.8
1989	80.0	107.3	91.2	67.6	79.9	63.0	74.1	74.5
1990	81.5	105.5	91.6	68.6	80.0	65.0	74.9	77.3
1991	82.9	101.9	91.0	68.1	78.9	66.8	74.8	81.4
1992	86.4	103.5	93.2	70.8	79.7	68.4	76.0	83.5
1993	86.8	103.9	93.5	73.2	82.2	70.5	78.3	83.6
1994	87.8	105.2	94.3	76.7	85.6	72.9	81.4	83.5
1995	88.3	104.3	94.3	79.3	88.1	76.0	84.1	84.7
1996	90.7	104.2	95.6	82.8	90.1	79.5	86.6	87.0
1997	92.1	104.1	96.3	87.2	93.7	83.7	90.5	88.5
1998	94.7	103.4	97.7	91.5	96.0	88.5	93.7	91.5
1999	97.3	102.3	98.8	96.3	98.9	94.2	97.5	95.2
2000	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2001	102.7	96.3	100.1	100.5	98.7	104.5	100.4	106.7
2002	106.9	95.1	101.8	102.1	97.3	107.3	100.2	112.4
2003	111.1	96.3	104.6	105.5	97.3	109.6	100.9	115.4
2004	114.9	98.6	107.7	110.6	98.9	112.3	102.8	116.6

See footnotes following table 4.

Source: Bureau of Labor Statistics

Table 3. Private business sector: Productivity and related measures, 1988-2004

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	
1988	1.6	0.7	0.8	4.4	3.5	3.7	3.6	0.9
1989	1.0	0.0	0.3	3.7	3.1	3.7	3.3	1.0
1990	2.1	-1.5	0.6	1.5	0.0	3.1	1.0	3.6
1991	1.6	-3.2	-0.7	-0.7	-1.2	2.6	0.0	5.0
1992	4.3	1.8	2.6	4.1	1.0	2.2	1.4	2.4
1993	0.5	0.3	0.3	3.2	2.9	2.9	2.9	0.2
1994	1.0	1.5	0.8	5.0	4.5	3.4	4.1	-0.5
1995	0.2	-1.1	-0.3	3.0	2.8	4.2	3.3	1.4
1996	3.0	0.2	1.7	4.6	2.1	4.4	2.8	2.7
1997	1.9	0.2	1.0	5.3	3.9	5.1	4.3	1.7
1998	2.8	-0.7	1.5	4.9	2.3	5.6	3.4	3.5
1999	3.0	-1.0	1.3	5.2	2.7	6.2	3.8	4.0
2000	2.8	-2.0	1.3	3.9	1.1	6.0	2.6	4.9
2001	2.8	-3.7	0.2	0.5	-1.4	4.4	0.3	6.8
2002	4.1	-1.1	1.7	1.5	-1.3	2.6	-0.1	5.2
2003	4.0	1.3	2.8	3.4	-0.1	2.1	0.6	2.7
2004	3.4	2.3	2.9	4.8	1.5	2.5	1.8	1.2

See footnotes following table 4.

Source: Bureau of Labor Statistics

Table 4. Private nonfarm business sector: Productivity and related measures, 1988-2004
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	
1988	1.7	1.1	1.0	4.6	3.7	3.5	3.6	0.6
1989	0.7	-0.2	0.1	3.5	3.2	3.8	3.4	1.0
1990	1.9	-1.7	0.4	1.5	0.1	3.2	1.1	3.7
1991	1.8	-3.4	-0.6	-0.8	-1.4	2.7	-0.1	5.3
1992	4.1	1.5	2.4	3.9	1.1	2.4	1.5	2.6
1993	0.5	0.4	0.3	3.5	3.2	3.0	3.1	0.1
1994	1.2	1.3	0.8	4.8	4.1	3.5	3.9	-0.1
1995	0.6	-0.9	0.0	3.3	2.9	4.3	3.3	1.5
1996	2.6	-0.1	1.4	4.5	2.3	4.6	3.0	2.7
1997	1.6	-0.1	0.7	5.2	4.1	5.3	4.5	1.7
1998	2.8	-0.7	1.5	5.0	2.4	5.7	3.5	3.5
1999	2.8	-1.1	1.1	5.2	3.0	6.4	4.1	4.0
2000	2.7	-2.2	1.2	3.8	1.1	6.2	2.6	5.1
2001	2.7	-3.7	0.1	0.5	-1.3	4.5	0.4	6.7
2002	4.1	-1.2	1.7	1.5	-1.4	2.7	-0.2	5.4
2003	3.9	1.2	2.7	3.4	0.0	2.2	0.7	2.6
2004	3.4	2.4	2.9	4.9	1.6	2.4	1.9	1.0

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, 1987-2004

Average annual growth rates (percent)

	1987 to 2004	1987 to 1990	1990 to 1995	1995 to 2000	2000 to 2004	2002 to 2003	2003 to 2004
All Assets	3.8	3.5	3.0	5.5	2.9	2.1	2.5
Equipment	6.1	4.6	4.8	9.3	4.9	3.5	4.0
All Information Processing Equipment & Software (IPES)	11.8	10.8	9.5	17.3	9.0	6.4	7.0
Computers & related equipment	24.3	19.3	16.7	40.7	18.8	14.1	15.1
Software	14.5	19.1	14.4	17.5	7.6	5.2	5.8
Communication equipment	7.6	6.2	5.4	10.7	7.6	4.9	5.1
Other IPES	3.4	3.2	4.0	3.2	2.9	3.0	4.0
All other equipment	2.4	1.2	1.8	4.2	1.8	1.1	1.8
Structures	1.9	2.7	1.8	2.0	1.2	0.9	0.9
Residential rental capital	1.5	2.0	1.1	1.7	1.5	1.5	1.7
Inventories	2.2	2.8	1.8	3.9	0.3	0.8	1.5
Land	1.3	3.0	1.3	0.7	0.9	1.0	1.7

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, 1987-2004

Average annual growth rates (percent)

	1987 to 2004	1987 to 1990	1990 to 1995	1995 to 2000	2000 to 2004	2002 to 2003	2003 to 2004
All Assets	3.9	3.5	3.2	5.6	2.9	2.2	2.4
Equipment	6.2	4.8	5.0	9.5	4.9	3.5	4.0
All Information Processing Equipment & Software (IPES)	11.8	10.7	9.5	17.3	9.0	6.4	7.0
Computers & related equipment	24.3	19.3	16.6	40.7	18.8	14.1	15.0
Software	14.5	19.1	14.4	17.5	7.6	5.2	5.8
Communication equipment	7.6	6.2	5.4	10.7	7.6	4.9	5.1
Other IPES	3.3	3.2	4.0	3.2	2.9	3.0	4.0
All other equipment	2.5	1.5	1.9	4.2	1.8	1.1	1.7
Structures	1.9	2.8	1.9	2.0	1.2	0.9	0.9
Residential rental capital	1.5	2.0	1.1	1.7	1.5	1.5	1.7
Inventories	2.2	2.8	1.8	3.9	0.3	0.8	1.5
Land	1.2	1.8	1.3	1.0	0.8	1.0	1.0

Source: Bureau of Labor Statistics

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