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USDL 98-187
For Release: 10:00 AM EDT
Wednesday, May 6, 1998

MULTIFACTOR PRODUCTIVITY TRENDS, 1995 AND 1996

Private Business, Private Nonfarm Business, and Manufacturing

The Bureau of Labor Statistics of the U.S. Department of Labor today reported multifactor productivity data--output per unit of combined labor and capital inputs--for 1995 and 1996. Multifactor productivity differs from the labor productivity (output per hour) measures that are published quarterly by BLS. Multifactor productivity, unlike labor productivity, requires information on capital services and other data not available on a quarterly basis.

In the most recent years available, multifactor productivity in the private business and private nonfarm business sectors changed at the following percentage rates:

	1994-95	1995-96
Private business	-0.3	1.0
Private nonfarm business	-0.2	0.9

Multifactor productivity in private business and private nonfarm business fell in 1995 for the first time since 1991. Productivity rebounded in 1996 in both sectors; the gains were the largest since 1992. The 1995 and 1996 annual changes are summarized in table A; further detail and historical measures are shown in tables 1 through 8. The historical measures of multifactor productivity have been substantially revised to incorporate revisions to source data. See page 9 for a more complete description of the revisions.

Private business and private nonfarm business

For 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. Multifactor productivity does not measure the specific contributions of labor, capital, or any other factor of production. Instead, it reflects the joint effects of many factors, including new technology, economies of scale, managerial skill, and changes in the organization of production.

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.

Private business sector

1995. Multifactor productivity fell slightly, 0.3 percent, in 1995, continuing a pattern of small gains and losses that began in 1993. The slight decline in 1995 offset about half of the gains of 1993 and 1994. Output grew 2.4 percent, and the combined inputs of capital and labor rose 2.7 percent. The increase in output was the smallest since the recession year of 1991.

Growth in capital services outpaced labor input in 1995. Capital services accelerated to a growth rate of 3.2 percent -- the steepest gain since 1987, but still slightly slower than the average 3.7 percent rate over the last 50 years. While all forms of capital grew more rapidly in 1995 than in 1994, equipment and inventories grew most rapidly (table 7). Labor input growth slowed to 2.5 percent, an increase comparable with that of 1993. Virtually all of the rise in labor input was due to gains in employment; the work week and the distribution of workers by educational attainment and work experience were essentially unchanged.

Labor productivity or output per hour worked was unchanged in 1995. This was the first time labor productivity failed to grow since 1987. Capital productivity (the ratio of output to capital services) dipped 0.8 percent. Capital services per hour rose for the first time since 1992, posting a gain of 0.8 percent in 1995.

1996. Multifactor productivity rose 1.0 percent in 1996, the largest gain since 1992. Most of the faster growth in productivity was the result of a sharp 3.5 percent increase in output, as the growth rate of combined inputs slowed to 2.5 percent.

The trend of accelerating growth in capital services and slower growth in labor input continued in 1996. Capital services increased 3.7 percent or 0.5 percent faster than in 1995. Among the types of capital, only equipment grew appreciably faster than in 1995. Equipment continues to account for most of the acceleration in the growth rate of capital services. Labor input growth slowed to 1.9 percent. Employment gains and shifts in the composition of the work force accounted for all of the growth in labor input; the average work week declined.

Table A. Productivity and related data, percentage changes, 1994-95 and 1995-96

Item	Private Business[1]		Private Nonfarm Business[1]	
	1994-5	1995-6	1994-5	1995-6
Productivity				
Multifactor Productivity[2]	-0.3	1.0	-0.2	0.9
Output per hour of all persons	0.0	2.0	0.2	1.9
Output per unit of capital services	-0.8	-0.2	-0.7	-0.3
Output	2.4	3.5	2.6	3.5
Inputs				
Labor input[3]	2.5	1.9	2.5	2.1
Capital services	3.2	3.7	3.4	3.8
Combined units of labor and capital inputs[4]	2.7	2.5	2.8	2.6
Analytic ratio:				
Capital services per hour of all persons	0.8	2.2	0.9	2.2

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

Labor productivity rose 2.0 percent in 1996. This rate was much faster than during the 1993-95 period. Capital productivity declined slightly in 1996. Capital services per hour advanced sharply at a 2.2 percent rate, reflecting the faster growth in capital services and the slower growth in hours at work. This was the largest gain since 1991.

Private nonfarm business

1995. In 1995, multifactor productivity in private nonfarm business declined 0.2 percent, offsetting most of the increase in 1994 (tables 2 and 5). Output rose 2.6 percent, and combined units of capital and labor inputs advanced 2.8 percent. Labor input grew 2.5 percent; most of this growth was due to increased employment. Capital services grew 3.4 percent, the largest gain in 8 years. The services of equipment and of inventories were the fastest growing components of capital services (table 7).

Labor productivity grew 0.2 percent in 1995, about the same rate as in 1994. The 0.7 percent drop in capital productivity was the first since 1991. Capital services per hour, which fell in 1993 and 1994, posted a 0.9 percent gain in 1995.

1996. Multifactor productivity in 1996 advanced 0.9 percent, the most rapid growth since 1992. Output rose 3.5 percent, and combined units of capital and labor increased 2.6 percent. The trend of faster growth in capital services and slower growth in labor input continued in 1996. Capital services rose 3.8 percent, while labor input grew 2.1 percent.

Labor productivity jumped 1.9 percent in 1996. Contributing to this gain was a 2.2 percent increase in capital services per hour. Capital productivity declined 0.3 percent, but this was only about half the size of the decline in 1995.

Long-term trends in private business and private nonfarm business

Labor productivity growth (output per hour) differs from multifactor productivity (output per unit of combined capital and labor inputs) in the treatment of both capital and hours. Labor productivity measures do not explicitly account for the effects of capital or shifts 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. However, multifactor productivity (MFP) treats capital as an explicit factor of production, and so it is computed net of changes in capital intensity. In addition, BLS measures labor input as the combined effect of changes in hours at work and shifts in the educational attainment and work experience of the work force. Therefore, MFP is computed net of changes in labor composition as well. Long-term labor productivity growth can be viewed as the sum of three components: Multifactor productivity growth, the contribution of increased capital intensity, and the contribution of shifts in the composition of the work force.

From 1948 to 1996, output per hour grew at an annual rate of 2.3 percent in private business and 2.0 percent in private nonfarm business (table B). Of the 2.3 percent growth rate in labor productivity in private business, 1.2 percent can be attributed to increases in multifactor productivity, 0.8 percent to the contribution of capital intensity, and 0.2 percent to changes in labor composition. The trends in the private nonfarm business sectors were similar. The contribution of capital intensity equals the change in the capital-hours ratio multiplied by capital's share of total costs. 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 costs. Historically, capital's share has been less than one-third of total costs.

From 1948 to 1973, multifactor productivity grew at an annual rate of 2.1 percent in private business and 1.9 percent in private nonfarm business. These rates, combined with the growth rates in the contributions of capital intensity and labor composition, resulted in labor productivity growth rates of 3.3 percent and 2.9 percent, respectively, in private business and private nonfarm business.

Table B. Compound average annual rates of growth in output per hour of all persons, the contributions of capital intensity, labor composition, and multifactor productivity, by major sector, 1948 to 1996

(percent per year)

Item	1948-96	1948-73	1973-79	1979-90	1990-96
Private business[1]					
Output per hour of all persons	2.3	3.3	1.3	1.2	1.1
Contribution of capital intensity[2]	0.8	0.9	0.6	0.7	0.4
Contribution of labor composition[3]	0.2	0.2	0.0	0.3	0.4
Multifactor productivity[4]	1.2	2.1	0.6	0.2	0.3
Private nonfarm business[1]					
Output per hour of all persons	2.0	2.9	1.1	1.0	1.1
Contribution of capital intensity[2]	0.7	0.8	0.7	0.7	0.4
Contribution of labor composition[3]	0.2	0.1	0.0	0.3	0.4
Multifactor productivity[4]	1.1	1.9	0.4	0.0	0.2
Contribution of R&D to multifactor productivity	0.2	0.2	0.1	0.2	0.2

1. Excludes government enterprises.
2. Growth rate in capital services per hour times capital's share of current dollar costs.
3. Growth rate of labor composition (the growth rate of labor input less the growth rate of hours of all persons) times labor's share of current dollar costs.
4. Output per unit of combined labor and capital inputs.

Note: The sum of multifactor productivity and the contributions may not equal labor productivity due to independent rounding.

The post-1973 productivity slowdown is apparent in these data. During the period 1973 to 1979, gains in multifactor productivity slowed to only 0.6 percent per year in private business. At the same time, the average annual contribution of capital intensity to labor productivity growth decreased to 0.6 percent, and labor composition made no contribution. Labor productivity, therefore, increased only 1.3 percent per year from 1973 to 1979. A similar slowdown occurred in private nonfarm business during the 1973-79 period.

Between 1979 and 1990, multifactor productivity was almost unchanged in private business and private nonfarm business. Output per hour, nevertheless, continued to advance at about the same rates as in the 1973-79 period. The contribution of labor composition increased to 0.3 percent per year in both sectors, essentially offsetting the decline in multifactor productivity growth.

During the 1990-96 period, labor productivity in both sectors continued to advance at about the same rates as in the previous period. However, the sources of labor productivity shifted after 1990. The contribution of capital services slowed from 0.7 percent per year during the 1979-90 period to only 0.4 percent per year in private business. As the baby boom generation completed its entrance into prime working age, the contribution of labor composition accelerated to 0.4 percent per year. Multifactor productivity grew 0.3 percent per year. Trends in private nonfarm business were virtually identical.

While MFP reflects many influences, it is generally believed that technological change is one of the primary contributors. For private nonfarm business, BLS also reports estimates of the direct effects of firms' spending for research and development (R&D) on MFP growth within their own industries. Because many people associate R&D spending and the resulting technological improvements with productivity, BLS has not adjusted MFP to exclude the effects of R&D. Instead, the estimated effects are shown separately (table B). The contribution of R&D averaged 0.2 percent per year for the entire 1948-96 period. The contribution of R&D slowed during the 1973-79 period and has since increased slightly.

Manufacturing

The BLS multifactor productivity measures (MFP) for manufacturing differ in several ways from those underlying the private business and private nonfarm business measures in their treatment of labor input, output, and classes of factor inputs. First, the manufacturing measure of labor input is a direct aggregate of hours. This is in contrast to the major sector measures for which estimates of the effects of changing labor composition have been developed.

In addition, the output concept used for the data on multifactor productivity in manufacturing is "sectoral output." Sectoral output is similar to gross output, but excludes shipments from one manufacturing establishment to another. The resulting multifactor productivity measure compares what is produced in the manufacturing sector for use outside of manufacturing with the inputs used in the manufacturing process obtained from outside of manufacturing. The comparison excludes flows between manufacturing establishments from measures of both output and inputs.

Finally, MFP in manufacturing compares "sectoral output" to three classes of inputs: 1) Hours at work of labor employed within manufacturing; 2) capital services employed by manufacturing establishments; and 3) purchases of energy, materials, and business services from outside of manufacturing (intermediates).

In manufacturing, intermediates are the largest input in terms of costs. Furthermore, research has shown that substitution among inputs, including intermediates, affects productivity change. It is therefore important to include intermediates in productivity measures at the level of manufacturing. In contrast, the more aggregate productivity measures in this release compare "value-added" output to two classes of inputs, capital and labor. Because of all these differences in methods, productivity change in manufacturing cannot be directly compared with changes in private business or private nonfarm business.

Manufacturing productivity in 1995 and 1996 and historical trends

Multifactor productivity in manufacturing rose 3.9 percent in 1995 and 2.6 percent in 1996 (table C). The 1995 productivity gain was the largest since 1959. While multifactor productivity growth slowed in 1996, the increase was still larger than the average over the post-war period (tables 3 and 6).

In 1995, sectoral output posted a 4.5 percent increase. Combined inputs grew only 0.6 percent, the smallest increase since 1991. Energy use increased 1.8 percent. Non-energy materials input declined 2.6 percent -- the first drop in materials since 1991 and the largest decline since 1987. Hours edged up 0.4 percent, while capital services increased 3.1 percent.

Table C. Productivity and related data in manufacturing, percentage changes, 1949-96

(percent per year)

Item	1949-96	1949-73	1973-79	1979-90	1990-96	1994-5	1995-6
Productivity							
Multifactor Productivity[1]	1.2	1.5	-0.4	1.0	1.9	3.9	2.6
Output per hour of all persons	2.7	2.6	2.0	2.6	3.6	4.1	4.7
Output per unit of capital services	-0.4	0.0	-2.2	-1.0	1.0	1.4	0.6
Sectoral Output	3.3	4.1	2.4	1.9	3.3	4.5	4.2
Inputs							
Hours[2]	0.6	1.4	0.3	-0.7	-0.2	0.4	-0.5
Capital services	3.7	4.1	4.7	2.9	2.3	3.1	3.5
Energy	2.9	5.0	0.6	0.3	2.3	1.8	1.4
Non-energy materials	2.4	2.6	5.3	0.8	1.8	-2.6	3.1
Purchased business services	4.6	5.1	4.2	4.2	3.9	4.3	1.7
Combined inputs[3]	2.0	2.5	2.8	0.9	1.4	0.6	1.6

1. Output per unit of combined hours, capital, energy, materials and purchased business services inputs.
2. Hours at work of all persons.
3. The growth rate of each input is weighted by its share of nominal costs.

In 1996, the 2.6 percent gain in multifactor productivity was accompanied by a 4.2 percent advance in sector output and a 1.6 percent increase in combined inputs. Output growth was similar to gains in recent years. The increase in combined inputs was slightly below the post-war average. Energy use continued to expand at a moderate pace of 1.4 percent in 1996. Materials reversed its 1995 decline with a gain in 1996 of 3.1 percent. Capital services continued its strong growth, posting a 3.5 advance, the largest increase since 1985. Hours declined 0.5 percent.

Multifactor productivity grew 1.2 percent annually between 1949 and 1996. Sectoral output increased at a 3.3 percent annual rate, and combined inputs rose 2.0 percent per year (table C). Unlike the private business and private nonfarm business sectors, the productivity slowdown in manufacturing was confined to the 1973-79 period. Multifactor productivity, which had been growing 1.5 percent annually prior to 1973, fell 0.4 percent per year between 1973 and 1979. Since combined inputs grew at about the same rate in both periods, the decline in the growth rate of productivity was associated with slower output growth.

Between 1979 and 1990, multifactor productivity growth in manufacturing rebounded sharply to 1.0 percent per year. Sectoral output growth continued to slow, and, in this period, input growth rates also fell. Hours declined, and the growth rates for both capital services and materials fell sharply.. As a result, combined inputs grew less than 1 percent annually. The rebound in productivity is associated with slower growth in combined inputs. Between 1990 and 1996, multifactor productivity growth accelerated, exceeding the pre-1973 growth rate. Multifactor productivity advanced 1.9 percent per year during this period, primarily because output growth nearly doubled to 3.3 percent per year while combined inputs rose only 1.4 percent annually. The decline in hours abated, but the growth rate of materials doubled. Energy use, which had been almost stagnant, jumped 2.3 percent per year after 1990.

Among detailed manufacturing industries, electrical and electronic machinery and textile mills reported the largest long-term gains in multifactor productivity (table 8). Over the 1949-96 period, multifactor productivity fell gradually in the printing and publishing and the leather goods industries. Since 1990, productivity in electrical and electronic machinery has grown rapidly at 9.4 percent per year. Industrial and commercial machinery also has posted large productivity gains of 4.5 percent annually.

Revisions

The historical data for multifactor productivity in all sectors and industries reflect several important changes and revisions to the data sources used to develop these series. The new measures reflect new work by the Bureau of Economic Analysis (BEA), U.S. Department of Commerce, on fixed reproducible tangible wealth. (These new measures are described in an article by Arnold Katz and Shelby Herman, "Improved Estimates of Fixed Reproducible Tangible Wealth, 1929-95," in the May 1997 Survey of Current Business.) BLS uses the BEA data on new investments in estimating capital services inputs. In addition to data revisions, BEA expanded the detail available on office, accounting, and computer equipment. This category was divided into seven categories of computers and computer peripherals and a residual category of office and accounting equipment. In addition, BEA used new empirical evidence on economic depreciation in revising its wealth estimates. BLS adjusted its service-life estimates of non-residential capital for consistency with this new evidence. The effective depreciation rates for equipment were largely unchanged. However, based on the empirical evidence, BEA reduced the depreciation rates for most structures. While this had the effect of nearly doubling the BLS measures of productive stocks of non-residential structures and land, it had almost no effect on the growth rates of structures or land. A description of the revisions to the capital measures, entitled "Revisions to Capital Inputs for the BLS Multifactor Productivity Measures," is available upon request and can be found on the BLS web site at **http://stats.bls.gov/mprcaptl.htm**. A printed version of this paper may be requested by calling (202) 606-5606.

Private business and private nonfarm business output series now fully reflect the comprehensive revisions to the National Income and Product Accounts (NIPAs) announced by the Bureau of Economic Analysis on January 19, 1996, and further updated on July 31, 1997. In the previous news release, BLS had used chain-type, annually-weighted indexes of output. However, until this release, BLS had not incorporated other aspects of the comprehensive revisions into its multifactor productivity measures. The revised figures no longer exclude the statistical discrepancy – the measure of the difference between GDP as measured on the product side and the income side of the NIPAs.

Data on business services in manufacturing have been revised for the years 1988 to 1996. The revised measures incorporate some information from the preliminary 1992 input-output table published by the BEA.

Price deflators at the 4-digit SIC level have been revised by BEA. The largest revisions are for computers and semiconductors, which are now based on BEA's hedonic price indexes. Constant dollar outputs and inputs in manufacturing and detailed industries reflect revisions in the price deflators.

Revisions to employment and hours reflect improved BLS estimates of the hours of non-production workers and revisions to employment of proprietors prior to 1958 and after 1978. Labor composition measures have been updated through 1996. A brief description, entitled "Changes in the Composition of Labor for the BLS Multifactor Productivity Measures, 1995 and 1996," is available on the BLS website at **http://stats.bls.gov/mprlabor.htm** or in print.

Table D. Average annual growth rate in private business output and inputs, 1948-94

(percent per year)

	Output	Capital Services	Labor Input	Multifactor Productivity
Revised measures	3.4	3.7	1.4	1.3
Previous measures	3.4	3.7	1.3	1.3

Previous measures are from news release 95-518, January 16, 1996

The revisions to output, capital, and multifactor productivity were negligible for the entire period (table D). For capital, increases in the growth rates of equipment, inventories, and rental residential structures are entirely offset by shifts in the asset weights toward a more slowly growing asset, land.

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." Methods for measuring manufacturing multifactor productivity are discussed in William Gullickson, "Measurement of productivity growth in U.S. manufacturing," in the July 1995 issue of the Monthly Labor Review.

The multifactor productivity data for private business and private nonfarm business indexes are derived by dividing an output index by an index of labor input and capital services. The output indexes are computed as chained superlative indexes (Fisher Ideal indexes) of components of real output. For the years 1948-96, the output indexes are supplied by the Bureau of Economic Analysis (BEA). BLS adjusts these to eliminate the output of government enterprises.

Capital input measures the services derived from the stock of physical assets. The assets included are fixed business equipment, structures, inventories, and land. Structures include nonresidential structures and residential capital which is rented out by profit-making firms or persons. Financial assets are excluded as are owner-occupied residential structures. The aggregate capital measures are obtained by (Tornqvist) weighting the capital stocks for each asset type within each of 53 industries using estimated rental prices for each asset type. Each rental price reflects the nominal rate of return to all assets within the industry and rates of economic depreciation and revaluation for the specific asset; rental prices are adjusted for the effects of taxes. Data on investments in physical assets are obtained from BEA. Current-dollar gross product originating (GPO) data, obtained from BEA, are used in estimating capital rental prices. This news release makes use of revised GPO data released by BEA in November 1997.

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

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

The manufacturing multifactor productivity index is derived by dividing an output index by an index of combined hours, capital services, energy, materials, and purchased business services. The output index for total manufacturing is computed using a chained superlative index (Tornqvist) of 4-digit SIC industry outputs. Industry outputs are developed by BLS from data obtained from the Annual Survey of Manufacturers (ASM) and the Census of Manufacturers (CM) from the Bureau of the Census, U.S. Department of Commerce, together with Producer Price Indexes from BLS and price data from BEA. Output data between 1988 and 1991 have been adjusted to reflect data on shipments from manufacturing establishments compiled by the Bureau of the Census. These data adjust for previously uncaptured growth of new establishments for the years 1988-91; adjustments for data after 1992 are not yet available. Using these data, BLS has prepared sectoral output measures by excluding transactions between manufacturing establishments in the same sector.

Labor input in manufacturing is measured as the sum of hours at work of all persons. The construction of hours at work follows the methods used in the private business sector described above, except that hours in manufacturing are directly additive and do not include the effect of changing labor composition.

Energy input is constructed using price and quantity data from the ASM, the CM and the Manufacturing Energy Consumption Survey of the Energy Information Administration, U.S. Department of Energy, together with BLS Producer Price Indexes. The series on non-energy materials input also relies on ASM and CM data. Indexes of purchased business services are developed by BLS using input-output tables to estimate the proportion of costs attributed to nine types of services. Tornqvist indexes of each of these three input classes are developed at the 2-digit SIC level and then aggregated to total manufacturing. As with the sectoral output measures, input measures are adjusted to exclude transactions between establishments within the same sector.

The five input indexes (capital services, hours, energy, materials, and purchased business services) are combined using (Tornqvist) weights which represent each component's share of total costs. Total costs are defined as the value of manufacturing sectoral output. The index uses changing weights: The share in each year is averaged with the preceding year's share.

The stock of research and development (R&D) in private nonfarm business is derived by cumulating constant dollar measures of R&D expenditures and allowing for depreciation. Current dollar expenditures for privately financed R&D for the years 1953-96 are obtained from annual issues of Research and Development in Industry published by the National Science Foundation. Price deflators and estimates of the rate of depreciation are developed by BLS. 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."

This release presents data for the private business, private nonfarm business, and manufacturing sectors. The private business sector, which accounts for about 76 percent of gross domestic product, includes all of gross domestic product except the output of general government, government enterprises, non-profit institutions, the rental value of owner-occupied real estate, and the output of paid employees of private households. The private nonfarm business sector also excludes farms, but includes agricultural services. Manufacturing sector output is measured as the value of all production delivered to non-manufacturing industries plus deliveries to final demand.

These private business, private nonfarm business, and manufacturing 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, they reflect the joint effects of many factors, including new technology, economies of scale, managerial skill, and change in the organization of production.

Table 1. Private business sector: Productivity and related measures, 1948-96[1]

Indexes 1992=100

Year	Productivity			Output[3]	Inputs			Capital per hour of all persons
	Output per hour of all person	Output per unit of capital	Multifactor Productivity[2]		Labor Input[4]	Capital Services[5]	Combined units of labor and capital[6]	
1948	34.7	116.6	56.2	23.0	57.3	19.7	41.0	29.8
1949	35.9	113.4	56.8	23.0	55.4	20.2	40.4	31.6
1950	39.0	120.2	61.0	25.3	56.5	21.0	41.5	32.5
1951	40.3	121.5	62.3	26.9	58.4	22.1	43.2	33.1
1952	41.1	120.2	62.9	27.5	58.6	22.9	43.7	34.2
1953	42.5	121.9	64.3	28.7	59.7	23.6	44.7	34.9
1954	43.6	117.9	64.4	28.4	58.0	24.1	44.1	37.0
1955	45.6	123.7	67.4	30.8	60.2	24.9	45.7	36.8
1956	45.7	121.6	67.1	31.4	61.2	25.8	46.8	37.6
1957	47.2	120.0	68.0	31.9	60.6	26.6	46.8	39.3
1958	48.5	115.3	68.3	31.2	57.9	27.1	45.7	42.1
1959	49.9	120.5	70.6	33.4	60.3	27.8	47.4	41.5
1960	50.8	119.1	70.9	34.0	60.7	28.6	48.0	42.7
1961	52.7	118.5	72.3	34.7	60.0	29.2	47.9	44.4
1962	55.1	122.5	74.9	36.9	61.6	30.2	49.3	45.0
1963	57.3	123.7	77.0	38.6	62.1	31.2	50.1	46.3
1964	59.9	126.7	80.0	41.1	63.2	32.4	51.3	47.3
1965	62.1	129.3	82.5	43.9	65.2	34.0	53.3	48.0
1966	64.5	130.5	85.0	46.9	66.9	35.9	55.2	49.5
1967	66.0	125.7	85.1	47.8	66.8	38.0	56.2	52.5
1968	68.3	125.8	87.3	50.2	67.6	39.9	57.5	54.3
1969	68.6	123.4	86.8	51.7	69.6	41.9	59.6	55.6
1970	70.1	117.8	86.6	51.6	68.4	43.8	59.6	59.5
1971	73.1	117.5	89.3	53.6	67.9	45.7	60.0	62.2
1972	75.5	120.0	91.9	57.3	70.2	47.7	62.3	62.9
1973	78.0	122.0	94.6	61.3	72.6	50.3	64.8	63.9
1974	76.7	114.1	91.2	60.3	73.1	52.9	66.1	67.2
1975	79.4	109.0	92.1	59.7	69.9	54.8	64.8	72.8
1976	82.2	113.1	95.5	63.7	71.9	56.4	66.7	72.7
1977	83.5	115.4	97.2	67.4	74.8	58.4	69.3	72.4
1978	84.4	117.3	98.4	71.5	78.6	60.9	72.6	72.0
1979	84.1	115.3	97.8	73.6	81.0	63.8	75.2	72.9
1980	83.8	108.1	95.4	72.6	80.5	67.2	76.1	77.5
1981	85.3	105.6	95.5	74.5	81.7	70.5	78.0	80.8
1982	85.1	98.4	92.6	72.2	80.3	73.4	78.1	86.4
1983	87.7	100.1	94.7	75.8	82.1	75.8	80.1	87.6
1984	90.0	104.3	97.6	82.4	87.0	79.0	84.4	86.3
1985	91.5	103.6	98.4	85.6	89.1	82.7	87.0	88.4
1986	94.0	102.7	99.6	88.4	90.1	86.1	88.8	91.5
1987	94.0	102.4	99.3	91.1	93.1	89.0	91.8	91.8
1988	94.6	103.3	99.4	94.6	96.8	91.6	95.1	91.6
1989	95.4	103.9	99.9	97.8	99.7	94.1	97.9	91.8
1990	96.1	102.1	99.5	98.6	100.3	96.6	99.1	94.1
1991	96.7	98.6	98.1	96.9	99.0	98.3	98.8	98.1
1992	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1993	100.2	100.7	100.2	102.7	102.8	102.0	102.6	99.5
1994	100.5	102.3	100.6	107.0	107.2	104.6	106.4	98.3
1995	100.5	101.5	100.3	109.6	109.9	108.0	109.3	99.1
1996	102.6	101.3	101.3	113.4	112.0	112.0	112.0	101.3

See footnotes following table 6.

Source: Bureau of Labor Statistics

Table 2. Private nonfarm business sector: Productivity and related measures, 1948-96[1]

Indexes 1992=100

Year	Productivity			Output[3]	Inputs			Capital per hour of all persons
	Output per hour of all person	Output per unit of capital	Multifactor Productivity[2]		Labor Input[4]	Capital Services[5]	Combined units of labor and capital[6]	
1948	39.2	124.2	61.3	22.3	49.6	17.9	36.4	31.6
1949	41.0	121.0	62.5	22.3	47.5	18.4	35.6	33.8
1950	43.7	128.0	66.3	24.5	49.2	19.1	37.0	34.1
1951	45.0	130.8	68.0	26.4	51.6	20.2	38.8	34.4
1952	45.6	129.3	68.1	27.0	52.4	20.9	39.7	35.2
1953	46.5	131.0	68.9	28.2	54.1	21.6	41.0	35.5
1954	47.6	126.2	68.9	27.8	52.5	22.0	40.4	37.7
1955	49.8	132.7	72.1	30.3	54.8	22.8	42.0	37.5
1956	49.6	130.4	71.5	30.9	56.2	23.7	43.3	38.1
1957	50.9	128.7	72.1	31.5	56.1	24.5	43.7	39.5
1958	52.1	123.5	72.3	30.9	53.7	25.0	42.7	42.2
1959	53.6	129.4	74.8	33.2	56.2	25.6	44.4	41.4
1960	54.3	127.4	75.0	33.7	56.5	26.5	44.9	42.6
1961	56.0	126.6	76.0	34.4	56.3	27.1	45.2	44.2
1962	58.6	131.0	78.7	36.7	58.1	28.1	46.7	44.7
1963	60.6	132.1	80.7	38.4	58.8	29.1	47.6	45.9
1964	63.2	135.6	83.8	41.0	60.2	30.3	49.0	46.6
1965	65.2	138.0	86.1	43.9	62.4	31.8	51.0	47.2
1966	67.4	139.3	88.5	47.1	64.5	33.8	53.2	48.4
1967	68.6	133.6	88.4	47.9	64.5	35.8	54.1	51.4
1968	71.0	133.7	90.7	50.4	65.4	37.7	55.6	53.1
1969	71.1	130.7	89.9	51.9	67.6	39.7	57.7	54.4
1970	72.2	124.3	89.3	51.8	66.7	41.7	58.0	58.1
1971	75.2	123.6	92.0	53.8	66.2	43.5	58.5	60.8
1972	77.8	126.3	94.8	57.5	68.5	45.6	60.7	61.6
1973	80.3	128.2	97.5	61.8	71.2	48.2	63.4	62.6
1974	79.0	119.5	94.0	60.8	71.6	50.9	64.6	66.1
1975	81.2	113.0	94.3	59.7	68.4	52.8	63.3	71.8
1976	84.1	117.5	98.0	64.0	70.5	54.5	65.3	71.6
1977	85.4	119.6	99.6	67.7	73.5	56.6	67.9	71.4
1978	86.5	121.7	101.0	72.0	77.2	59.2	71.3	71.1
1979	85.8	118.7	99.9	74.0	79.8	62.3	74.1	72.3
1980	85.5	111.3	97.5	73.1	79.4	65.6	74.9	76.8
1981	86.5	107.8	96.9	74.5	80.5	69.1	76.8	80.3
1982	86.1	100.1	93.7	72.1	79.2	72.0	76.9	86.0
1983	89.5	102.8	96.9	76.5	81.1	74.5	79.0	87.1
1984	91.2	106.2	99.0	82.7	86.1	77.9	83.5	85.9
1985	92.2	104.9	99.3	85.7	88.5	81.6	86.3	87.8
1986	94.6	103.9	100.4	88.6	89.6	85.3	88.3	91.1
1987	94.5	103.3	99.9	91.3	92.7	88.4	91.4	91.5
1988	95.2	104.2	100.2	95.1	96.6	91.2	94.9	91.3
1989	95.7	104.5	100.4	98.1	99.6	93.9	97.8	91.6
1990	96.2	102.5	99.7	98.8	100.3	96.4	99.1	93.9
1991	96.9	98.8	98.3	97.0	98.9	98.2	98.6	98.0
1992	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1993	100.1	100.8	100.2	103.0	103.1	102.2	102.8	99.3
1994	100.5	102.1	100.5	107.1	107.3	104.9	106.6	98.4
1995	100.7	101.4	100.3	109.9	110.0	108.4	109.5	99.3
1996	102.6	101.1	101.2	113.7	112.3	112.5	112.4	101.5

See footnotes following table 6.

Source: Bureau of Labor Statistics

Table 3. Manufacturing sector: Productivity and related measures, 1949-96

Indexes 1992=100

Year	Productivity			Sectoral Output[8]	Inputs					
	Output per hour of all person	Output per unit of capital	Multifactor Productivity[7]		Hours[9]	Capital Services[5]	Energy	Materials	Purchased business services	Combined units of all inputs[10]
1949	33.3	130.0	62.8	26.3	79.0	20.2	28.6	34.1	13.4	41.9
1950	33.8	138.1	66.0	28.9	85.4	20.9	30.0	33.9	15.7	43.8
1951	33.5	134.9	66.1	30.8	91.9	22.9	33.5	34.8	17.5	46.6
1952	34.8	135.4	67.1	32.4	93.2	23.9	34.6	37.0	18.0	48.3
1953	35.9	141.5	68.3	35.2	97.9	24.9	35.7	40.6	19.1	51.5
1954	36.8	131.4	68.3	32.9	89.5	25.1	36.7	37.7	18.1	48.2
1955	38.4	139.6	70.3	36.3	94.4	26.0	41.8	41.5	20.2	51.6
1956	38.2	134.0	69.3	36.6	95.9	27.3	45.8	41.8	21.1	52.8
1957	39.0	130.3	69.8	36.8	94.3	28.2	46.6	41.5	21.7	52.7
1958	39.5	119.8	68.6	34.2	86.6	28.5	46.8	39.6	20.5	49.8
1959	40.3	128.1	71.6	37.2	92.4	29.0	49.8	39.9	21.9	51.9
1960	41.0	126.3	71.8	37.7	92.0	29.8	50.9	40.9	22.3	52.5
1961	42.3	124.7	72.4	37.9	89.6	30.4	51.1	42.0	22.2	52.4
1962	43.4	129.2	75.1	40.5	93.3	31.3	54.2	41.8	23.7	53.9
1963	45.2	131.8	77.2	42.6	94.3	32.3	57.1	42.7	25.9	55.2
1964	47.1	135.8	79.5	45.4	96.2	33.4	62.8	44.7	27.5	57.1
1965	48.1	139.1	81.6	49.0	101.9	35.2	66.5	46.2	29.4	60.1
1966	48.7	139.2	81.9	52.8	108.5	37.9	71.2	49.1	33.3	64.4
1967	50.6	132.6	81.5	54.6	107.9	41.2	76.5	51.9	37.8	66.9
1968	52.3	131.6	83.7	57.3	109.5	43.5	81.5	52.9	37.9	68.5
1969	53.1	128.3	84.5	58.8	110.8	45.9	84.7	52.0	40.2	69.7
1970	54.8	119.6	83.2	57.1	104.2	47.8	83.6	54.8	38.8	68.7
1971	58.4	119.1	85.6	58.6	100.5	49.2	86.2	57.2	38.5	68.5
1972	60.5	125.3	88.8	63.6	105.1	50.8	88.8	59.7	41.0	71.6
1973	62.2	129.1	90.8	68.7	110.5	53.2	91.9	63.7	44.6	75.7
1974	62.9	120.6	86.1	67.9	107.9	56.3	93.2	72.0	48.0	78.9
1975	64.8	106.7	83.8	63.0	97.3	59.0	86.8	70.6	46.5	75.2
1976	67.4	112.1	86.8	68.7	101.9	61.2	90.0	76.1	47.5	79.2
1977	69.7	115.9	88.0	74.0	106.2	63.9	90.2	83.7	51.5	84.1
1978	70.5	116.8	89.0	78.0	110.6	66.8	91.3	88.6	51.2	87.7
1979	70.1	112.8	88.5	79.1	112.7	70.1	95.1	87.0	57.0	89.4
1980	70.5	103.1	86.9	75.8	107.6	73.5	91.3	84.9	56.0	87.2
1981	71.6	99.4	88.0	76.4	106.8	76.9	91.0	84.5	53.0	86.9
1982	75.5	92.9	89.4	73.7	97.6	79.3	81.9	81.2	51.6	82.4
1983	77.9	96.3	91.1	77.1	98.9	80.1	82.8	83.0	58.4	84.6
1984	80.2	102.6	94.1	84.5	105.4	82.4	88.1	91.0	57.6	89.9
1985	83.2	101.7	95.2	87.1	104.6	85.6	85.2	94.6	60.1	91.5
1986	86.9	101.7	96.7	89.6	103.1	88.1	86.0	96.1	65.7	92.6
1987	89.4	102.6	99.5	92.7	103.7	90.3	91.5	92.2	71.5	93.1
1988	90.7	105.5	101.1	96.9	106.8	91.9	95.2	92.6	78.6	95.8
1989	90.8	103.7	99.6	97.4	107.2	93.9	95.8	93.8	85.4	97.7
1990	93.0	101.1	99.2	97.5	104.8	96.5	98.0	95.1	89.6	98.3
1991	94.9	97.2	98.3	95.4	100.6	98.2	98.5	94.6	91.1	97.1
1992	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1993	102.0	101.7	101.3	103.4	101.4	101.7	105.2	103.5	101.0	102.0
1994	105.2	105.3	104.3	109.1	103.7	103.7	108.5	105.6	106.0	104.7
1995	109.6	106.7	108.3	114.1	104.1	106.9	110.4	102.9	110.6	105.3
1996	114.7	107.4	111.1	118.8	103.6	110.6	112.0	106.1	112.4	107.0

See footnotes following table 6.

Source: Bureau of Labor Statistics

Table 4. Private business sector: Productivity and related measures, 1948-96

Percent Change

Year	Productivity			Output[3]	Inputs			Capital per hour of all persons
	Output per hour of all person	Output per unit of capital	Multifactor Productivity[2]		Labor Input[4]	Capital Services[5]	Combined units of labor and capital[6]	
1949	3.5	-2.7	1.2	-0.2	-3.3	2.6	-1.4	6.4
1950	8.8	5.9	7.2	10.1	2.0	3.9	2.6	2.7
1951	3.1	1.1	2.2	6.4	3.4	5.2	4.1	2.0
1952	2.2	-1.1	0.9	2.2	0.3	3.3	1.3	3.3
1953	3.4	1.5	2.3	4.6	1.9	3.1	2.2	1.9
1954	2.4	-3.3	0.1	-1.2	-2.8	2.2	-1.3	6.0
1955	4.6	5.0	4.6	8.5	3.9	3.4	3.7	-0.3
1956	0.3	-1.7	-0.4	1.8	1.7	3.6	2.3	2.1
1957	3.2	-1.3	1.5	1.6	-1.1	3.0	0.1	4.6
1958	2.8	-3.9	0.4	-2.0	-4.3	2.0	-2.4	7.0
1959	2.9	4.5	3.3	7.1	4.2	2.5	3.6	-1.5
1960	1.7	-1.2	0.5	1.7	0.5	2.9	1.3	2.9
1961	3.6	-0.5	1.9	1.9	-1.1	2.4	0.0	4.1
1962	4.7	3.3	3.6	6.5	2.7	3.1	2.8	1.4
1963	3.9	1.0	2.8	4.5	0.8	3.4	1.6	2.9
1964	4.6	2.5	3.9	6.4	1.7	3.8	2.4	2.1
1965	3.5	2.1	3.1	7.0	3.3	4.9	3.8	1.4
1966	4.0	0.9	3.0	6.7	2.6	5.8	3.6	3.1
1967	2.2	-3.7	0.2	1.9	-0.2	5.8	1.7	6.1
1968	3.5	0.1	2.6	5.0	1.2	5.0	2.4	3.5
1969	0.5	-2.0	-0.5	3.0	2.9	5.1	3.6	2.5
1970	2.1	-4.5	-0.2	-0.1	-1.7	4.6	0.1	6.9
1971	4.3	-0.3	3.1	3.9	-0.7	4.2	0.7	4.6
1972	3.3	2.2	2.9	6.8	3.4	4.5	3.7	1.1
1973	3.2	1.6	2.9	7.0	3.5	5.3	4.1	1.6
1974	-1.6	-6.5	-3.6	-1.6	0.7	5.2	2.0	5.2
1975	3.5	-4.5	0.9	-1.1	-4.4	3.6	-2.0	8.4
1976	3.5	3.7	3.8	6.8	2.9	2.9	2.9	-0.2
1977	1.6	2.1	1.8	5.7	4.0	3.6	3.9	-0.4
1978	1.1	1.6	1.2	6.1	5.1	4.4	4.8	-0.5
1979	-0.5	-1.7	-0.6	2.9	3.1	4.7	3.6	1.3
1980	-0.4	-6.3	-2.4	-1.3	-0.6	5.3	1.1	6.3
1981	1.9	-2.3	0.1	2.6	1.4	5.0	2.5	4.2
1982	-0.3	-6.8	-3.1	-3.0	-1.7	4.1	0.1	7.0
1983	3.1	1.7	2.3	5.0	2.3	3.2	2.6	1.3
1984	2.6	4.2	3.0	8.6	6.0	4.3	5.4	-1.5
1985	1.8	-0.7	0.8	3.9	2.4	4.6	3.1	2.5
1986	2.7	-0.8	1.2	3.3	1.1	4.1	2.1	3.5
1987	0.0	-0.4	-0.3	3.0	3.3	3.4	3.3	0.4
1988	0.6	0.9	0.2	3.9	4.0	2.9	3.7	-0.3
1989	0.9	0.6	0.5	3.4	3.0	2.8	2.9	0.2
1990	0.7	-1.7	-0.4	0.8	0.6	2.6	1.2	2.5
1991	0.6	-3.5	-1.4	-1.8	-1.3	1.8	-0.3	4.2
1992	3.4	1.4	2.0	3.2	1.0	1.8	1.3	2.0
1993	0.2	0.7	0.2	2.7	2.8	2.0	2.6	-0.5
1994	0.4	1.6	0.4	4.2	4.3	2.5	3.7	-1.2
1995	0.0	-0.8	-0.3	2.4	2.5	3.2	2.7	0.8
1996	2.0	-0.2	1.0	3.5	1.9	3.7	2.5	2.2

See footnotes following table 6.

Source: Bureau of Labor Statistics

Table 5. Private nonfarm business sector: Productivity and related measures, 1948-96

Percent Change

Year	Productivity			Output[3]	Inputs			Capital per hour of all persons
	Output per hour of all person	Output per unit of capital	Multifactor Productivity[2]		Labor Input[4]	Capital Services[5]	Combined units of labor and capital[6]	
1949	4.4	-2.6	2.0	0.0	-4.1	2.6	-2.0	7.2
1950	6.7	5.8	6.1	10.0	3.6	4.0	3.7	0.9
1951	2.9	2.2	2.7	7.8	4.8	5.5	5.0	0.7
1952	1.3	-1.1	0.0	2.2	1.7	3.4	2.2	2.5
1953	2.0	1.3	1.2	4.5	3.2	3.2	3.2	0.7
1954	2.3	-3.6	0.0	-1.4	-2.9	2.3	-1.4	6.1
1955	4.7	5.1	4.7	8.9	4.2	3.6	4.0	-0.4
1956	-0.4	-1.7	-0.9	2.1	2.6	3.9	3.0	1.4
1957	2.5	-1.3	1.0	1.8	-0.1	3.2	0.9	3.9
1958	2.4	-4.1	0.3	-2.1	-4.3	2.1	-2.4	6.8
1959	2.9	4.8	3.4	7.6	4.7	2.6	4.0	-1.9
1960	1.2	-1.6	0.3	1.6	0.4	3.2	1.3	2.8
1961	3.2	-0.6	1.3	1.9	-0.3	2.6	0.6	3.8
1962	4.7	3.5	3.6	6.9	3.2	3.4	3.3	1.1
1963	3.5	0.9	2.5	4.5	1.2	3.7	2.0	2.6
1964	4.3	2.6	3.8	6.8	2.3	4.1	2.9	1.6
1965	3.0	1.8	2.7	7.0	3.8	5.1	4.2	1.2
1966	3.5	0.9	2.8	7.1	3.3	6.1	4.2	2.5
1967	1.8	-4.1	-0.1	1.7	-0.1	6.1	1.8	6.2
1968	3.5	0.1	2.6	5.3	1.4	5.2	2.6	3.4
1969	0.1	-2.2	-0.9	3.0	3.3	5.4	3.9	2.4
1970	1.5	-4.9	-0.7	-0.2	-1.3	4.9	0.5	6.7
1971	4.2	-0.6	3.0	3.8	-0.6	4.4	0.8	4.7
1972	3.4	2.1	3.0	7.0	3.4	4.8	3.8	1.2
1973	3.2	1.5	2.8	7.4	3.8	5.8	4.4	1.7
1974	-1.5	-6.8	-3.5	-1.6	0.6	5.6	2.0	5.6
1975	2.7	-5.4	0.3	-1.8	-4.4	3.8	-2.1	8.6
1976	3.6	3.9	4.0	7.2	3.1	3.1	3.1	-0.3
1977	1.5	1.8	1.6	5.7	4.2	3.8	4.1	-0.3
1978	1.3	1.7	1.4	6.4	5.1	4.6	4.9	-0.4
1979	-0.8	-2.4	-1.1	2.8	3.3	5.3	3.9	1.7
1980	-0.4	-6.2	-2.3	-1.2	-0.6	5.3	1.1	6.2
1981	1.2	-3.1	-0.6	1.9	1.5	5.2	2.6	4.5
1982	-0.6	-7.2	-3.3	-3.2	-1.6	4.3	0.1	7.1
1983	4.0	2.7	3.4	6.1	2.4	3.4	2.7	1.3
1984	1.8	3.3	2.2	8.0	6.2	4.5	5.7	-1.5
1985	1.1	-1.2	0.2	3.6	2.7	4.9	3.4	2.3
1986	2.7	-1.0	1.1	3.5	1.3	4.5	2.3	3.7
1987	-0.2	-0.6	-0.4	3.0	3.4	3.6	3.5	0.5
1988	0.7	0.9	0.2	4.1	4.2	3.2	3.9	-0.2
1989	0.6	0.3	0.2	3.2	3.1	2.9	3.0	0.3
1990	0.5	-1.9	-0.6	0.7	0.7	2.7	1.3	2.5
1991	0.7	-3.6	-1.4	-1.8	-1.4	1.9	-0.4	4.5
1992	3.2	1.2	1.7	3.1	1.2	1.9	1.4	2.0
1993	0.1	0.8	0.2	3.0	3.1	2.2	2.8	-0.7
1994	0.3	1.3	0.3	3.9	4.1	2.6	3.7	-0.9
1995	0.2	-0.7	-0.2	2.6	2.5	3.4	2.8	0.9
1996	1.9	-0.3	0.9	3.5	2.1	3.8	2.6	2.2

See footnotes following table 6.

Source: Bureau of Labor Statistics

Table 6. Manufacturing sector: Productivity and related measures, 1950-96

Percent Change

	Productivity				Inputs					
Year	Output per hour of all person	Output per unit of capital	Multifactor Productivity[7]	Sectoral Output[8]	Hours[9]	Capital Services[5]	Energy	Materials	Purchased business services	Combined units of all inputs[10]
1950	1.7	6.3	5.2	9.9	8.1	3.4	4.9	-0.8	17.3	4.5
1951	-0.9	-2.3	0.1	6.7	7.6	9.2	11.6	2.8	11.8	6.5
1952	3.7	0.4	1.4	5.2	1.4	4.7	3.2	6.2	2.4	3.7
1953	3.3	4.4	1.9	8.5	5.0	3.9	3.2	9.9	6.5	6.5
1954	2.3	-7.1	-0.1	-6.4	-8.5	0.8	3.0	-7.2	-5.5	-6.3
1955	4.6	6.2	2.9	10.3	5.5	3.8	13.8	10.1	11.6	7.1
1956	-0.7	-4.0	-1.3	0.8	1.5	5.0	9.6	0.6	4.7	2.2
1957	2.1	-2.8	0.7	0.4	-1.6	3.3	1.7	-0.7	2.7	-0.2
1958	1.3	-8.0	-1.8	-7.0	-8.2	1.1	0.4	-4.6	-5.5	-5.3
1959	2.0	6.9	4.4	8.8	6.7	1.8	6.5	0.8	6.9	4.2
1960	1.8	-1.4	0.2	1.3	-0.4	2.7	2.0	2.7	1.6	1.1
1961	3.2	-1.3	0.8	0.6	-2.6	1.9	0.4	2.6	-0.5	-0.3
1962	2.7	3.6	3.8	6.9	4.1	3.2	6.1	-0.5	7.0	2.9
1963	4.1	2.0	2.8	5.2	1.0	3.1	5.4	2.1	9.1	2.3
1964	4.3	3.0	2.9	6.5	2.1	3.3	10.1	4.8	6.1	3.4
1965	2.1	2.5	2.6	8.0	5.9	5.4	5.8	3.2	7.3	5.3
1966	1.2	0.0	0.5	7.7	6.5	7.7	7.1	6.4	13.2	7.3
1967	4.0	-4.7	-0.5	3.4	-0.5	8.5	7.4	5.6	13.5	3.9
1968	3.5	-0.8	2.6	5.0	1.5	5.8	6.6	2.0	0.2	2.4
1969	1.5	-2.5	0.9	2.6	1.1	5.3	4.0	-1.7	6.1	1.7
1970	3.3	-6.8	-1.5	-2.9	-5.9	4.1	-1.3	5.4	-3.4	-1.4
1971	6.4	-0.4	2.9	2.6	-3.5	3.0	3.1	4.3	-1.0	-0.2
1972	3.6	5.2	3.8	8.4	4.6	3.1	3.0	4.5	6.5	4.5
1973	2.8	3.0	2.2	8.0	5.0	4.8	3.5	6.6	8.7	5.7
1974	1.2	-6.6	-5.2	-1.2	-2.3	5.8	1.4	13.1	7.8	4.3
1975	2.9	-11.5	-2.6	-7.2	-9.8	4.9	-6.9	-1.9	-3.1	-4.7
1976	4.0	5.1	3.5	9.0	4.8	3.7	3.8	7.7	2.2	5.3
1977	3.5	3.3	1.5	7.8	4.1	4.3	0.1	10.0	8.4	6.2
1978	1.2	0.8	1.1	5.4	4.2	4.5	1.2	5.9	-0.7	4.2
1979	-0.6	-3.4	-0.6	1.4	1.9	5.0	4.2	-1.8	11.3	2.0
1980	0.5	-8.6	-1.7	-4.1	-4.6	4.9	-4.0	-2.4	-1.7	-2.4
1981	1.5	-3.6	1.2	0.8	-0.7	4.6	-0.4	-0.5	-5.3	-0.4
1982	5.5	-6.6	1.6	-3.6	-8.6	3.2	-10.0	-4.0	-2.7	-5.1
1983	3.3	3.7	2.0	4.6	1.3	0.9	1.1	2.3	13.2	2.6
1984	3.0	6.5	3.2	9.7	6.5	2.9	6.4	9.6	-1.3	6.2
1985	3.8	-0.8	1.2	3.0	-0.7	3.9	-3.3	4.0	4.4	1.8
1986	4.4	0.0	1.6	2.9	-1.5	2.9	0.9	1.6	9.2	1.2
1987	2.9	0.9	2.9	3.4	0.6	2.5	6.4	-4.1	8.9	0.5
1988	1.5	2.8	1.6	4.6	3.0	1.7	4.1	0.5	9.9	2.9
1989	0.1	-1.7	-1.5	0.5	0.4	2.2	0.6	1.3	8.6	1.9
1990	2.4	-2.5	-0.5	0.2	-2.2	2.8	2.3	1.4	5.0	0.7
1991	2.0	-3.8	-0.9	-2.1	-4.1	1.8	0.5	-0.6	1.7	-1.3
1992	5.4	2.9	1.7	4.8	-0.6	1.8	1.5	5.7	9.8	3.0
1993	2.0	1.7	1.3	3.4	1.4	1.7	5.2	3.5	1.0	2.0
1994	3.1	3.5	2.9	5.5	2.3	1.9	3.2	2.0	5.0	2.6
1995	4.1	1.4	3.9	4.5	0.4	3.1	1.8	-2.6	4.3	0.6
1996	4.7	0.6	2.6	4.2	-0.5	3.5	1.4	3.1	1.7	1.6

See footnotes following table 6.

Source: Bureau of Labor Statistics

Footnotes, Tables 1-6

Source: Output data are from the Bureau of Economic Analysis (BEA), U.S. Department of Commerce, and 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. See also 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 the 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.

(7) Sectoral output per combined units of capital, hours, energy, non-energy materials, and purchased business services.

(8) Manufacturing gross output excluding transactions between manufacturing establishments, superlative chained index.

(9) Hours at work of all persons.

(10) Combined units of capital services, hours, energy, non-energy materials, and purchased business services, superlative chained index.

Table 7. Real capital input by asset type, 1948-96

Average annual growth rates (percent)

Private business						
Period	All Assets	Equipment	Structures	Residential rental capital	Inventories	Land
1948-96	3.7	5.4	3.1	2.6	3.5	2.2
1948-73	3.8	5.5	3.2	3.2	4.3	2.1
1973-79	4.1	6.7	2.9	2.8	3.7	1.8
1979-90	3.8	5.2	3.5	2.0	2.1	3.3
1990-96	2.5	4.0	1.8	0.6	2.3	1.0
1995	3.2	5.4	1.7	0.8	4.9	0.9
1996	3.7	6.8	1.8	0.8	2.5	1.2
Private nonfarm business						
Period	All Assets	Equipment	Structures	Residential rental capital	Inventories	Land
1948-96	3.9	5.6	3.1	2.6	3.7	2.8
1948-73	4.0	5.6	3.2	3.2	4.6	2.8
1973-79	4.4	6.8	2.9	2.8	3.9	3.1
1979-90	4.0	5.5	3.6	2.0	2.3	3.6
1990-96	2.6	4.2	1.9	0.6	2.4	1.2
1995	3.4	5.5	1.8	0.8	5.1	1.4
1996	3.8	6.9	1.8	0.8	2.7	1.5

Source: Bureau of Labor Statistics

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

Table 8. Manufacturing industries: Multifactor productivity trends, 1949-96

Average annual growth rates

Industry	1949-96	1949-73	1973-79	1979-90	1990-96
Manufacturing	1.2	1.5	-0.4	1.0	1.9
Nondurable manufacturing	0.7	1.3	-0.5	0.3	0.4
Food and kindred products	0.5	0.7	0.0	0.4	0.4
Tobacco manufactures	N.A.	N.A.	N.A.	N.A.	N.A.
Textile mill products	2.2	2.2	3.3	2.0	1.4
Apparel & related products	0.7	0.7	1.9	0.5	-0.6
Paper and allied products	0.7	1.5	-1.2	-0.1	0.5
Printing and publishing	-0.2	0.5	-0.7	-1.1	-0.9
Chemicals & allied products	1.1	2.5	-2.3	0.6	0.5
Petroleum refining	0.4	0.8	-0.5	0.1	0.5
Rubber & misc. plastic products	0.7	0.9	-1.8	1.4	1.1
Leather & leather products	-0.4	-0.1	-0.2	-1.2	-0.2
Durable manufacturing	1.5	1.5	-0.3	1.6	3.0
Lumber and wood products	1.2	1.6	0.6	2.1	-1.3
Furniture and fixtures	0.6	0.6	0.6	0.5	0.6
Stone, clay, glass & concrete products	0.8	1.1	-1.2	1.2	1.3
Primary metals industries	0.1	0.4	-1.9	0.2	1.1
Fabricated metals products	0.4	0.5	-0.8	0.5	1.3
Industrial & commercial machinery	1.6	0.8	0.1	2.8	4.5
Electrical & electronic machinery	3.2	2.2	1.5	3.1	9.4
Transportation equipment	0.7	1.4	-0.3	0.1	0.1
Instruments	1.6	1.9	1.7	1.5	0.4
Miscellaneous manufacturing	1.0	1.5	-0.9	1.5	0.2

N.A. - Multifactor productivity measures are not published because of the small size of the industry and data limitations. This industry is included in the aggregate for total manufacturing.

Note: Multifactor productivity measures by industry are not directly comparable to measures for aggregate manufacturing because industry measures exclude transactions only within the specific industry while the aggregate manufacturing measures also exclude transactions between all manufacturing industries.