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TOTAL FACTOR PRODUCTIVITY FOR MAJOR INDUSTRIES – 2021

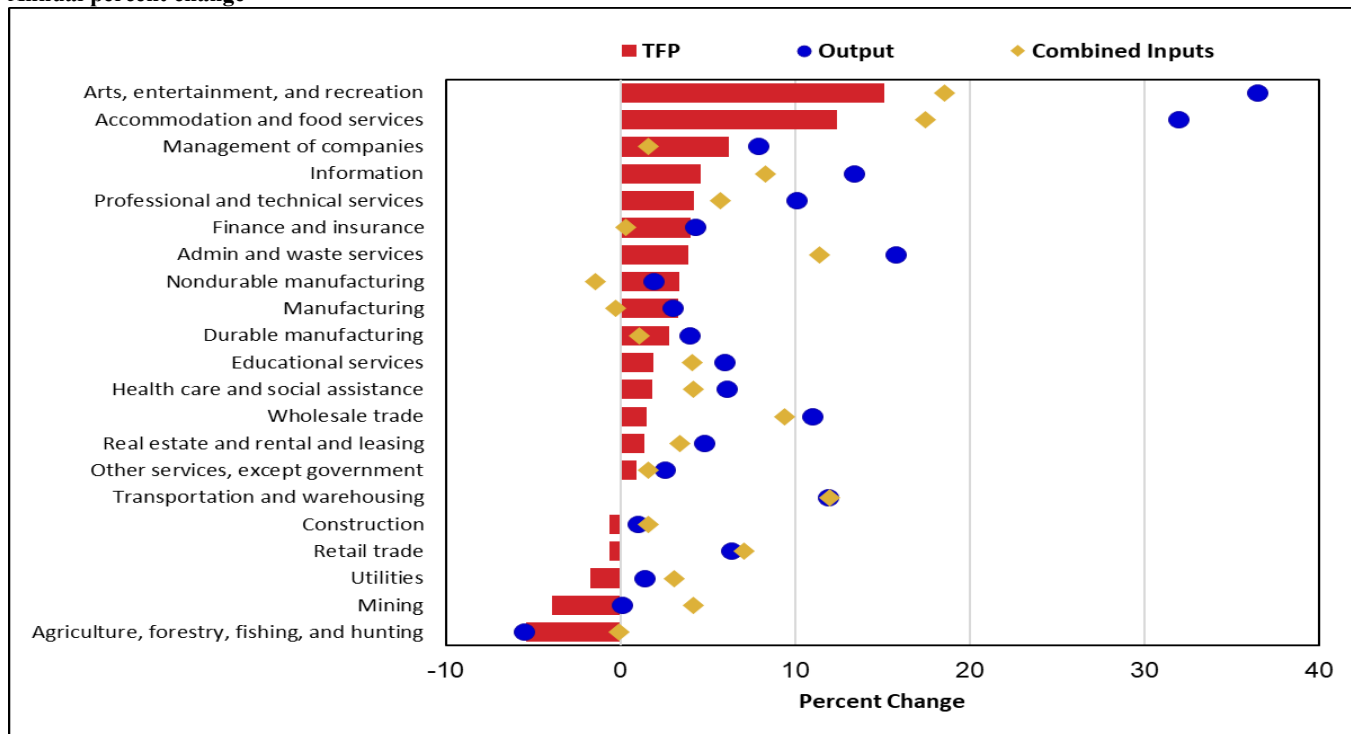
Total factor productivity (TFP) increased in 15 out of 21 major industries in 2021, the U.S. Bureau of Labor Statistics (BLS) reported today. The TFP increases in 2021 were primarily due to widespread output growth outpacing increases in the combined inputs of capital, labor, energy, materials, and services. (See chart 1.)

Output increased in 20 of 21 major industries in 2021. The 2021 output growth was the largest in the series for the following industries: arts, entertainment, and recreation (+36.5 percent), accommodation and food services (+32.0 percent), administrative and waste services (+15.8 percent), information (+13.4 percent), and transportation and warehousing (+11.9 percent). (See table 1.) Ten industries with output growth in 2021 have output declines over the 2019-2021 time period, illustrating that output for these industries is still below their pre-COVID-19 pandemic levels. (See table 3.)

Combined inputs increased in 18 of the 21 industries in 2021, driven by strong growth in labor input and intermediate inputs. (See table 1.) Labor input grew in 18 of 21 industries in 2021 but only 8 industries show growth for the 2019-2021 time period, demonstrating that these 8 industries have yet to re-hire labor lost in 2020.

Chart 1. Total factor productivity, output, and combined inputs, by major industry, 2021

Annual percent change



Methodology Change for Labor Composition

Data in this release reflect new methodology and sources for the estimation of labor composition, which is a measure of the changing skill composition of the work force. Labor composition is used to adjust the number of hours worked by industry to estimate labor input. See www.bls.gov/productivity/technical-notes/labor-composition-for-total-factor-productivity-using-new-method-nov-2022.htm for more information.

Total factor productivity is defined as output per unit of combined inputs. TFP shows the relationship between changes in real sectoral output and changes in the combined inputs of capital input (K), labor input (L), and intermediate inputs (energy (E), materials (M), and services (S)) used in production of final goods and services. It reflects economic growth that is not due to growth in measured KLEMS inputs, including technological change, organizational changes in the production process, and other efficiency improvements.

Industry spotlight: Arts, entertainment, and recreation

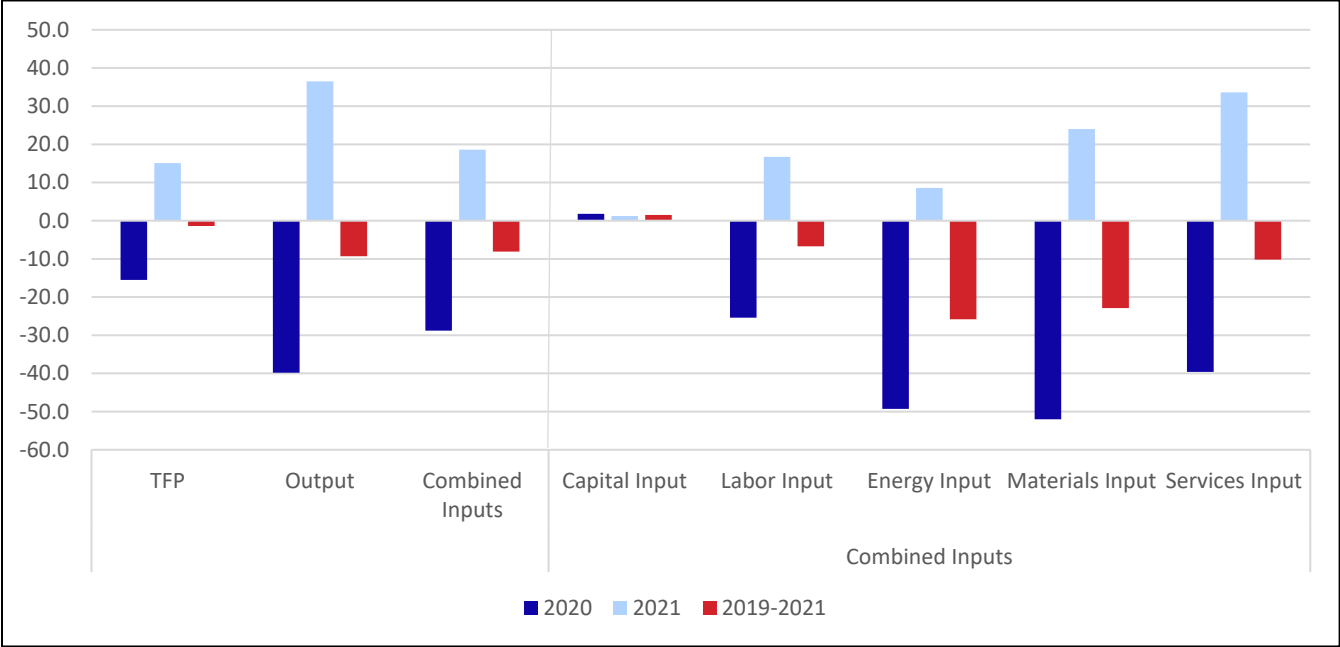
Many industries experienced large growth in TFP and related measures in 2021 but this growth can be misleading without a comparison to 2020 when the COVID-19 pandemic struck the U.S. economy. The arts, entertainment, and recreation industry experienced record declines in 2020 in TFP and related measures and then experienced record growth for these measures in 2021. Growth rates from the 2019-2021 period can be used to gauge the effects the pandemic had on this industry over the last two years.

The reopening of museums, entertainment venues, sports arenas, and parks resulted in record output growth of 36.5 percent in 2021, due to historic TFP and combined inputs growth of 15.1 percent and 18.6 percent, respectively. However, this strong growth only partially offset the historic declines brought on by the COVID-19 pandemic, as output, TFP, and combined inputs all experienced declines over the 2019-2021 time period. (See chart 2 and table 3.)

Looking at the KLEMS components of combined inputs, the story is similar. The arts, entertainment, and recreation industry had double digit growth in labor, materials, and services, with capital and energy also increasing in 2021. Yet for the 2019-2021 time period, the change in all inputs except capital was negative. Thus, although 2021 was a productive year, the arts, entertainment, and recreation industry has not fully recovered to its pre-pandemic levels. (See chart 2.)

Chart 2. Total factor productivity, output, and KLEMS inputs, for arts, entertainment, and recreation, 2020, 2021, and 2019-2021

Annual percent change



Total factor productivity and KLEMS as sources of labor productivity growth

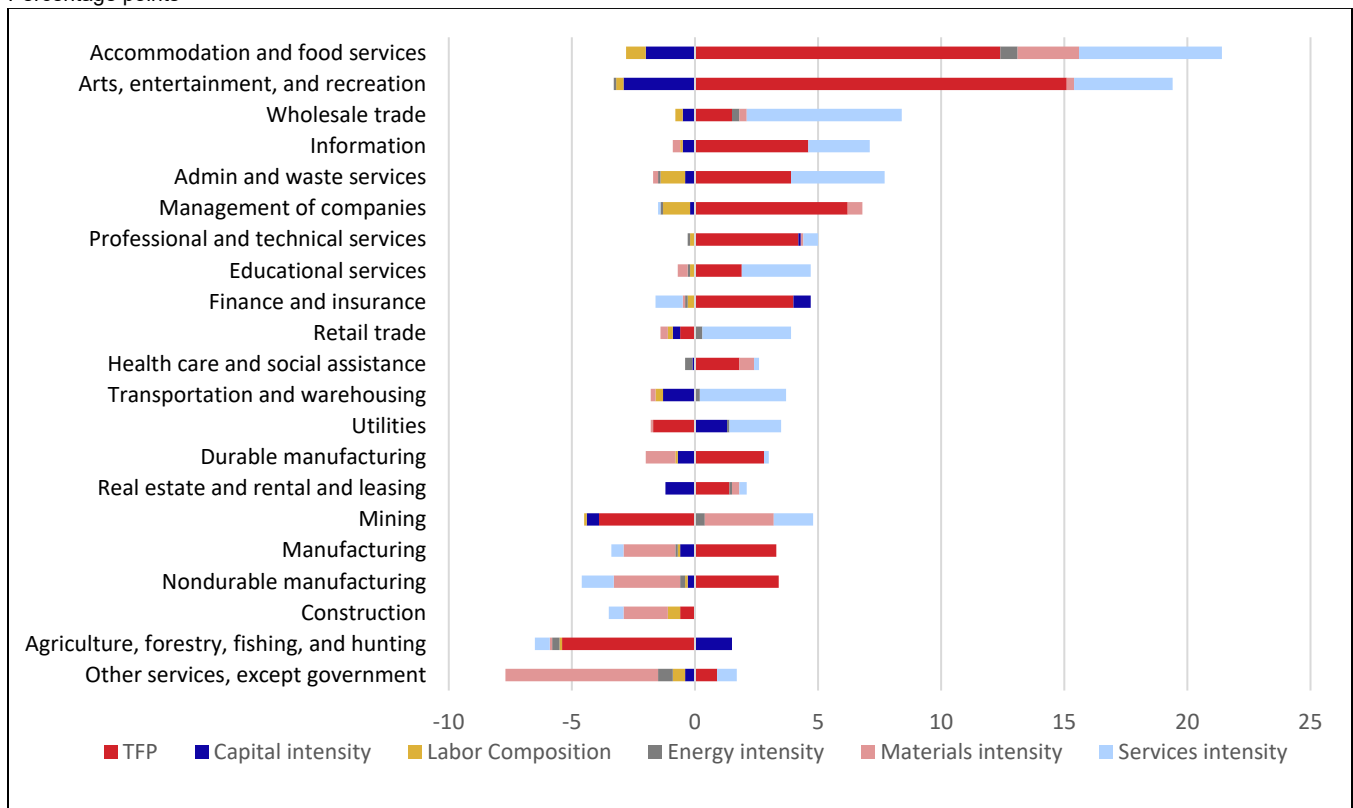
As the economy started to rebuild after the COVID-19 pandemic, industries began to re-hire workers displaced in 2020 and increase inputs to production. As production throughout the economy improved, hours worked increased at a slightly slower rate than output which led to labor productivity increases among 16 of 21 major industries. (See table 5.)

Labor productivity can be expressed as the sum of six components: total factor productivity growth (TFP), contribution of capital intensity, contribution of labor composition, contribution of energy intensity, contribution of materials intensity, and the contribution of services intensity. The contribution of each KLEMS input is defined as the ratio of the services provided by that input to hours worked in the production process, weighted by its share of sectoral output. Examining input contributions and TFP changes reveals the substitution effect of increased use of an input relative to labor on an industry’s labor productivity. (See table 5 and chart 3.)

Of the 16 industries with labor productivity growth in 2021, TFP was the largest contributor to labor productivity growth in 10 industries, with services intensity being the largest contributor for five of the remaining industries. Capital intensity fell in 15 of the 21 industries measured, as hours growth outpaced capital input growth. Changes in labor composition were negative or zero for all industries in 2021, as workers with less experience were most negatively impacted by the pandemic, returned to work.

Chart 3. Sources of labor productivity for major industries, 2021

Percentage points

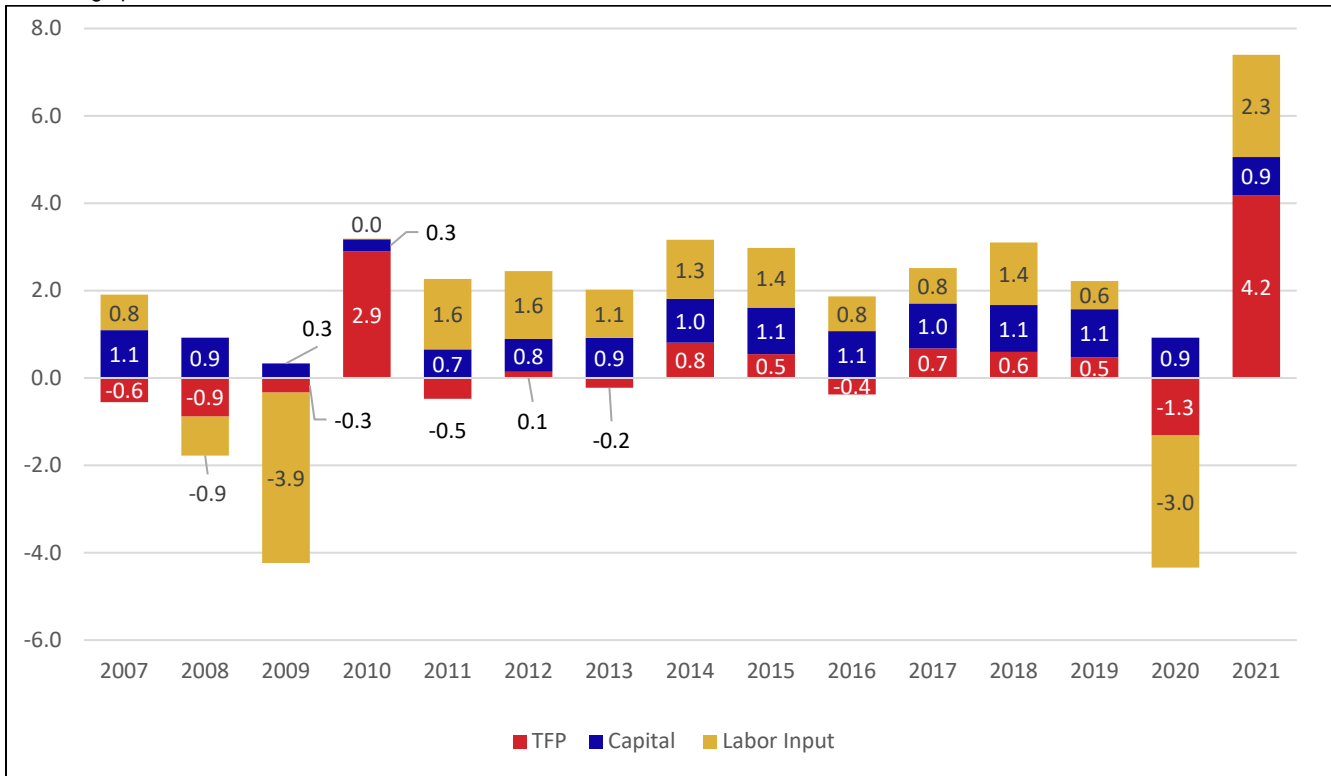


TFP and input contributions to output

The large productivity rebound among major industries in 2021 led to an overall increase in output at the private business sector. The nation's output can be viewed as the sum of three components: total factor productivity, contribution of capital input, and contribution of labor input. TFP contributed 4.2 percentage points of the rise in output, while labor input contributed 2.3 percentage points of the increase. This output growth is the largest since 2010, the first year following the Great Recession of 2008-09. As in 2010, TFP is the predominant contributor to private business output. However, the rebound from the COVID-19 recession is unique with labor input's large contribution to growth. (See chart 4.)

Chart 4. Contributions to output for the private business sector, 2007-21

Percentage points



Note: Contributions may not sum due to aggregation, rounding, and integration of top line to industry

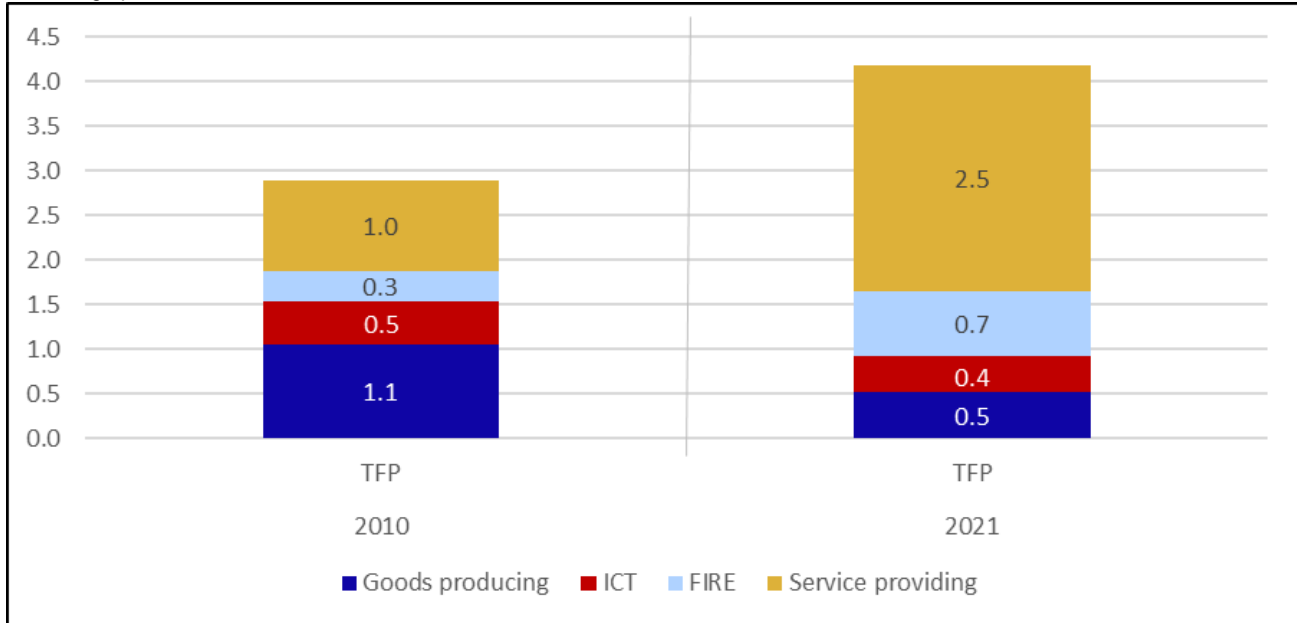
The private business sector can be divided into four sectors: goods producing; information and communication technology (ICT); finance, insurance, and real estate (FIRE); and service providing. Looking at these sectors provides further insights on how the U.S. recovered the year following the COVID-19 recession compared to the year after the Great Recession of 2008 and 2009. (See footnotes after table 7 for industry make-up of each sector.)

TFP's contribution to output

The total factor productivity contribution of 4.2 percentage points to private business output in 2021 was widespread, with all four sectors experiencing positive contributions, led by the service providing sector which had a positive contribution of 2.5 percentage points. Within the service providing sector, accommodation and food services and professional, scientific, and technical services industries were the main upward drivers, with a 0.6-percentage point and 0.5-percentage point contribution, respectively. By contrast, in 2010 after the Great Recession, the goods producing sector made the largest contribution (1.1 percentage point) to TFP growth. (See tables 6 and 7 and chart 5.)

Chart 5. Sector contributions to TFP during economic rebound

Percentage points



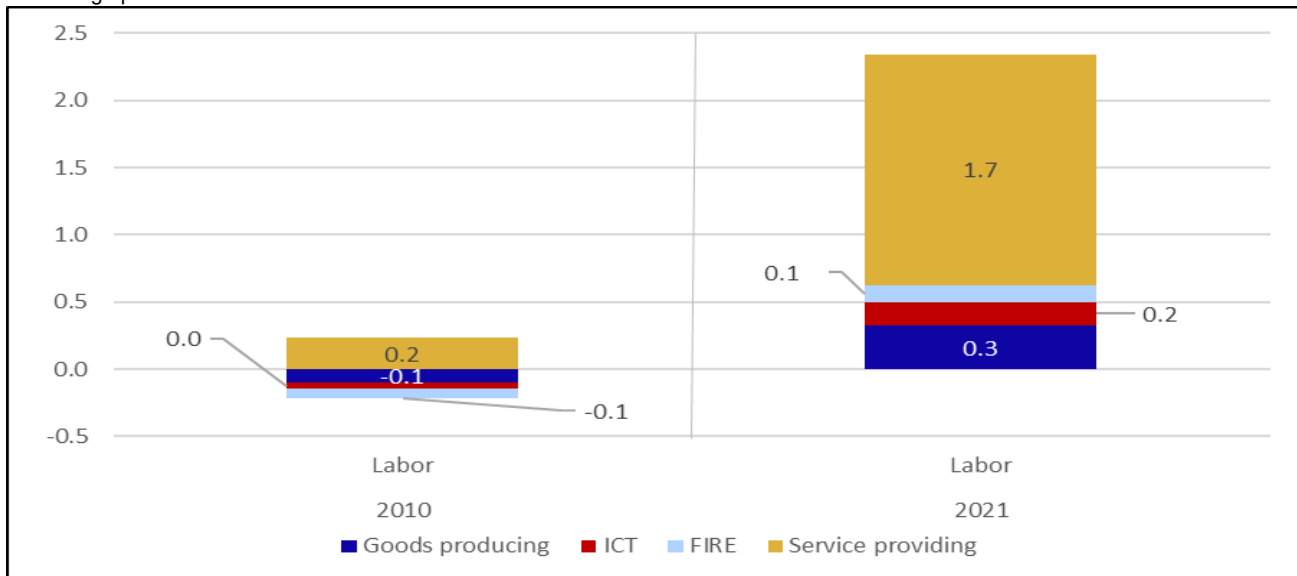
Note: Contributions may not sum due to aggregation, rounding, and integration of top line to industry

Labor’s contribution to output

In 2021, labor input saw positive contributions to private business output within all four aggregated sectors. The service providing sector had the largest positive contribution in 2021 (1.7 percentage points), led by transportation and warehousing (0.3 percentage point) and professional and technical services (0.3 percentage point). By contrast, the labor contribution to output in 2010 was negative in three of the four aggregated sectors but were offset by the positive contribution of the services providing sector (0.2 percentage points). Of note is the similar behavior of the service providing sector during 2021. This labor-intensive sector, which was the hardest hit by the pandemic, is an important part of the economic recovery. (See tables 6 and 7 and chart 6.)

Chart 6. Sector contributions to labor during economic rebound

Percentage points



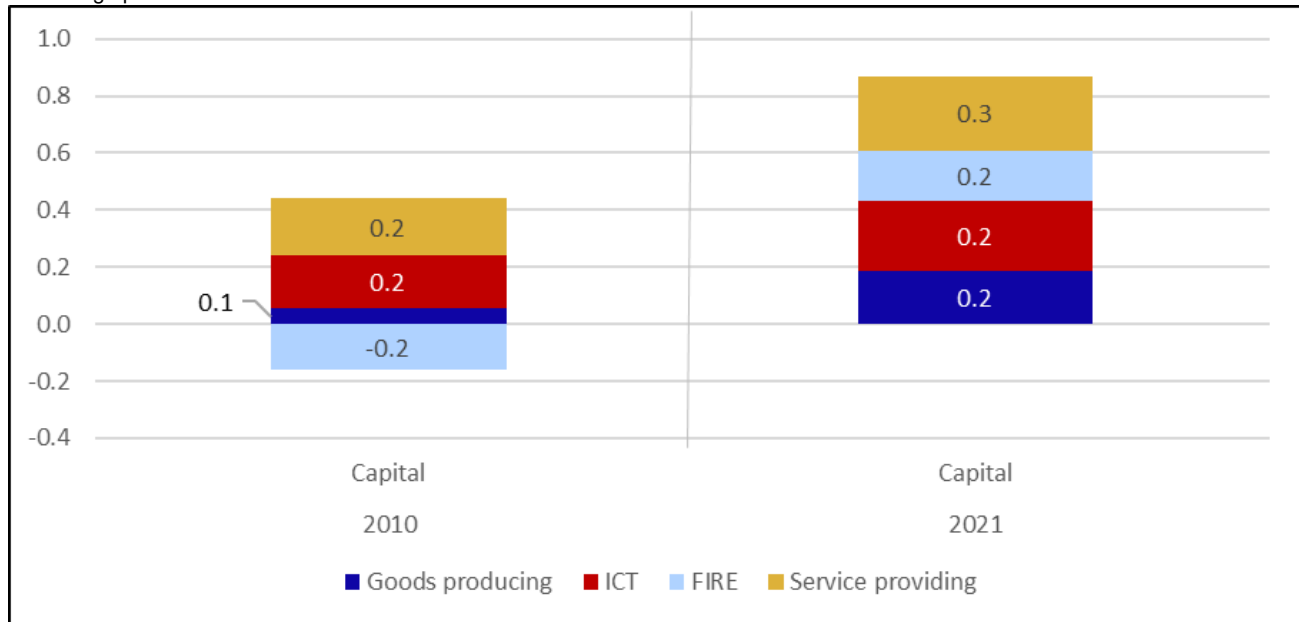
Note: Contributions may not sum due to aggregation, rounding, and integration of top line to industry

Capital's contribution to output

Capital input's positive contribution in 2021 and after the Great Recession reflects the stability of capital stock after downturns. In 2021 all sectors demonstrated a positive contribution of capital, resulting in a 0.9-percentage point contribution of capital input to private business output, while these four sectors' capital input contribution was only 0.3-percentage point in 2010 after the Great Recession. (See chart 7.) Given the financial crisis of 2009, capital in the FIRE sector had a negative impact on the recovery from the Great Recession, yet had a large positive boost to output in 2021. The 0.2-percentage point contribution of the FIRE sector was driven by the finance and insurance industry with a contribution of 0.2 percentage point. In the year after the Great Recession, this industry only had a negative contribution of 0.1 percentage point. (See table 6 and 7 and chart 7.) The goods producing sector increased its contribution of capital to output from 0.1 percentage point in 2010 to 0.2 percentage point in 2021.

Chart 7. Sector contributions to capital during economic rebound

Percentage points



Note: Contributions may not sum due to aggregation, rounding, and integration of top line to industry

Technical Notes

Goods producing sector

This sector contains industries within agriculture, forestry, fishery, and hunting (NAICS 11), mining (NAICS 21), utilities (NAICS 22), construction (NAICS 23), and manufacturing (NAICS 31-33) except computer and electronic products (NAICS 334).

Information and communications technology (ICT) sector

Information and communication technology (ICT) contains the following industries: computer and electronic products (NAICS 334), broadcasting and telecommunications (NAICS 515,517), data processing, internet publishing, and other information services (NAICS 518,519) and computer systems design and related services (NAICS 5415). This definition is generally comparable to that used by the Organization for Economic Cooperation and Development (OECD), which defines the ICT sector using the International Standard Industrial Classification (ISIC) (OECD 2011).

FIRE sector

The finance, insurance, and real estate (FIRE) sector contains industries within finance and insurance (NAICS 52) and real estate and rental and leasing (NAICS 53).

Service providing sector

This sector contains industries within trade (NAICS 42,44-45), transportation and warehousing (NAICS 48-49), publishing, except internet (includes software) (NAICS 511) and motion picture and sound recording (NAICS 512), and industries within services (NAICS 54-81) except computer systems design and related services (NAICS 5415).

Capital input

Data on investment for fixed assets are obtained from BEA. Data on inventories are estimated using data from BEA and additional information from IRS Corporation Income Returns. Data for land in the farm industry are obtained from USDA. Nonfarm industry detail for land is based on IRS book value data. Current-dollar value-added data, obtained from BEA, are used in estimating capital rental prices.

Labor input

Hours at work data reflect Productivity and Costs data as of the November 3, 2022 “Productivity and Costs” news release (USDLE-22-2096) and reflects a new methodology for estimating hours worked. More information on the methodology change can be found at www.bls.gov/productivity/technical-notes/labor-productivity-hours-worked-method-using-ces-all-employee-hours-nov-2022.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.

Energy, materials, and services

Data on energy, materials, and services are obtained from BEA based on BEA annual input-output tables. Tornqvist indexes of each of these three input classes are derived at the NAICS industry level and then aggregated to the industries. Materials inputs are adjusted to exclude transactions between establishments within the same industry for goods producing industries. Services are adjusted to exclude transactions between establishments within the same industry for all non-goods producing industries.

Sectoral output

The output concept used to measure total factor productivity for industries is “sectoral output”. Sectoral output equals gross output (sales, receipts, and other operating income, plus commodity taxes plus changes in inventories), excluding transactions between establishments within the same industry.

2021 manufacturing output measures are estimated based on historical relationships between BLS industrial output, BLS price indexes, and data on industrial production from the Federal Reserve Board. For select service providing industries, output measures are estimated using data from the Quarterly Services Survey from the Census Bureau. For all other nonmanufacturing industries, sectoral output is based on indexes of real quantity and cost measures from the BEA. Data sources by industry for can be found at www.bls.gov/opub/hom/msp/data.htm.

Other information

Detailed information on methods used in this release can be found in the BLS Handbook of Methods. Productivity Measures: Business Sector and Major Sector section at

www.bls.gov/opub/hom/msp/home.htm.

Comprehensive tables containing more detailed data than that which is published in this news release are available upon request at 202-691-5606 or at www.bls.gov/productivity/tables.

Industry specific contributions to output are available at

www.bls.gov/productivity/highlights/contributions-of-total-factor-productivity-major-industry-to-output.htm.

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Table 1. Total factor productivity and related data, 2021

Industry	2012 NAICS Code	Percent change					
		TFP	Output	Combined Inputs	Capital Input	Labor Input	Intermediate Inputs ¹
Agriculture, forestry, fishing, and hunting	11	-5.4	-5.5	-0.1	3.6	-1.2	-2.7
Mining	21	-3.9	0.1	4.2	-1.2	-0.4	13.8
Utilities	22	-1.7	1.4	3.1	2.9	-0.3	4.9
Construction	23	-0.6	1.0	1.6	4.3	3.5	-0.4
Manufacturing	31-33	3.3	3.0	-0.3	1.2	2.8	-3.5
Durable Manufacturing	321,327,33	2.8	4.0	1.1	0.4	2.9	0.0
Nondurable Manufacturing	31,322-326	3.4	1.9	-1.4	2.0	2.7	-4.3
Wholesale trade	42	1.5	11.0	9.4	1.1	2.1	20.8
Retail trade	44,45	-0.6	6.4	7.1	2.3	3.3	12.2
Transportation and warehousing	48-49	0.0	11.9	12.0	0.9	9.2	19.7
Information	51	4.6	13.4	8.3	5.3	6.4	13.1
Finance and insurance	52	4.0	4.3	0.3	3.4	0.5	-4.0
Real estate and rental and leasing	53	1.4	4.8	3.4	0.4	3.8	5.2
Professional and technical services	54	4.2	10.1	5.7	6.3	4.7	7.5
Management of companies	55	6.2	7.9	1.6	0.3	0.5	3.5
Admin and waste services	56	3.9	15.8	11.4	4.5	7.2	19.2
Educational services	61	1.9	6.0	4.1	1.9	1.3	6.2
Health care and social assistance	62	1.8	6.1	4.2	2.9	3.7	4.9
Arts, entertainment, and recreation	71	15.1	36.5	18.6	1.2	16.7	31.2
Accommodation and food services	72	12.4	32.0	17.5	0.0	8.5	39.0
Other services, except government	81	0.9	2.6	1.6	2.4	8.0	-4.5

1. Intermediate inputs is an aggregation of energy, materials, and services

Table 2. Total factor productivity intermediate inputs, 2021

Industry	2012 NAICS Code	Percent change		
		Energy Input	Materials Input	Services Input
Agriculture, forestry, fishing, and hunting	11	-7.8	-1.1	-3.6
Mining	21	15.5	23.2	7.8
Utilities	22	0.1	-4.3	11.9
Construction	23	4.6	-0.6	-0.7
Manufacturing	31-33	-3.9	-4.8	-0.5
Durable manufacturing	321,327,33	-1.5	-2.0	4.4
Nondurable manufacturing	31,322-326	-5.8	-3.4	-7.3
Wholesale trade	42	28.3	16.5	20.9
Retail trade	44,45	17.9	-2.0	14.2
Transportation and warehousing	48-49	13.0	4.8	24.2
Information	51	-3.6	1.4	16.4
Finance and insurance	52	-15.4	-14.5	-3.3
Real estate and rental and leasing	53	5.5	13.8	4.6
Professional and technical services	54	-7.8	6.8	7.9
Management of companies	55	-0.4	20.3	2.1
Admin and waste services	56	-2.8	6.6	22.9
Educational services	61	-1.2	-1.8	8.5
Health care and social assistance	62	-22.3	9.1	4.5
Arts, entertainment, and recreation	71	8.6	24.0	33.6
Accommodation and food services	72	44.4	40.1	38.0
Other services, except government	81	-36.9	-29.0	11.9

Table 3. Total factor productivity and related data, 2019-2021

Industry	2012 NAICS Code	Average annual percent change					
		TFP	Output	Combined Inputs	Capital Input	Labor Input	Intermediate Inputs ¹
Agriculture, forestry, fishing, and hunting	11	-2.0	0.9	2.9	2.0	-0.8	4.9
Mining	21	-0.3	-8.7	-8.4	-0.8	-11.8	-13.1
Utilities	22	-0.2	-0.7	-0.5	2.9	-0.7	-3.5
Construction	23	-0.3	1.4	1.7	4.7	-1.2	3.7
Manufacturing	31-33	1.2	-1.9	-3.1	1.2	-1.4	-7.3
Durable manufacturing	321,327,33	0.9	-2.2	-3.0	0.5	-2.4	-6.0
Nondurable manufacturing	31,322-326	1.4	-1.6	-3.0	1.9	0.3	-6.3
Wholesale trade	42	2.0	3.2	1.3	0.8	-2.0	4.1
Retail trade	44,45	-0.8	3.7	4.6	2.3	-0.1	9.7
Transportation and warehousing	48-49	-3.8	-1.4	2.5	1.5	3.4	1.8
Information	51	3.0	7.6	4.5	5.4	1.2	5.8
Finance and insurance	52	1.9	3.0	1.1	3.9	1.3	-2.6
Real estate and rental and leasing	53	-0.5	0.5	1.0	0.7	-0.3	1.3
Professional and technical services	54	2.8	5.5	2.6	6.4	0.4	5.8
Management of companies	55	2.3	4.9	2.5	0.4	2.5	2.9
Admin and waste services	56	1.5	4.2	2.6	4.6	0.3	5.2
Educational services	61	-3.7	-3.6	0.1	1.9	-3.4	1.8
Health care and social assistance	62	-0.1	-0.6	-0.6	2.9	0.5	-2.3
Arts, entertainment, and recreation	71	-1.4	-9.3	-8.1	1.5	-6.7	-13.0
Accommodation and food services	72	3.4	1.2	-2.1	0.4	-7.6	3.8
Other services, except government	81	-0.2	-4.1	-3.9	2.3	-3.0	-5.6

1. Intermediate inputs is an aggregation of energy, materials, and services

Table 4. Total factor productivity intermediate inputs, 2019-2021

Industry	2012 NAICS Code	Average annual percent change		
		Energy Input	Materials Input	Services Input
Agriculture, forestry, fishing, and hunting	11	0.3	8.1	2.1
Mining	21	-11.0	-4.1	-18.1
Utilities	22	-3.5	-6.7	-2.9
Construction	23	4.3	0.7	13.3
Manufacturing	31-33	-13.7	-7.9	-5.3
Durable manufacturing	321,327,33	-13.5	-6.8	-3.7
Nondurable manufacturing	31,322-326	-14.0	-5.5	-7.6
Wholesale trade	42	11.0	7.3	3.7
Retail trade	44,45	14.9	7.3	9.8
Transportation and warehousing	48-49	-6.6	-6.5	5.7
Information	51	-4.8	-0.6	7.6
Finance and insurance	52	-7.5	-10.8	-2.2
Real estate and rental and leasing	53	-2.1	-4.2	2.1
Professional and technical services	54	-1.2	5.8	6.0
Management of companies	55	6.5	18.5	1.3
Admin and waste services	56	-4.7	-1.2	7.0
Educational services	61	-10.7	4.6	2.0
Health care and social assistance	62	-13.2	1.1	-3.0
Arts, entertainment, and recreation	71	-25.8	-22.9	-10.2
Accommodation and food services	72	9.0	5.4	2.7
Other services, except government	81	-12.2	-15.7	-0.3

Table 5. Sources of labor productivity, 2021

Industry	2012 NAICS code	Percent change	Percentage Point					
		Labor Productivity	TFP	Capital Intensity	Labor Composition	Energy Intensity	Materials Intensity	Services Intensity
Agriculture, forestry, fishing, and hunting	11	-5.0	-5.4	1.5	-0.1	-0.3	-0.1	-0.6
Mining	21	0.2	-3.9	-0.5	-0.1	0.4	2.8	1.6
Utilities	22	1.8	-1.7	1.3	0.0	0.1	-0.1	2.1
Construction	23	-3.5	-0.6	0.0	-0.5	0.0	-1.8	-0.6
Manufacturing	31-33	-0.1	3.3	-0.6	-0.1	-0.1	-2.1	-0.5
Durable Manufacturing	321,327,33	0.9	2.8	-0.7	-0.1	0.0	-1.2	0.2
Nondurable Manufacturing	31,322-326	-1.3	3.4	-0.3	-0.1	-0.2	-2.7	-1.3
Wholesale trade	42	7.6	1.5	-0.5	-0.3	0.3	0.3	6.3
Retail trade	44,45	2.4	-0.6	-0.3	-0.2	0.3	-0.3	3.6
Transportation and warehousing	48-49	1.9	0.0	-1.3	-0.3	0.2	-0.2	3.5
Information	51	6.3	4.6	-0.5	-0.1	0.0	-0.3	2.5
Finance and insurance	52	3.0	4.0	0.7	-0.3	-0.1	-0.1	-1.1
Real estate and rental and leasing	53	0.8	1.4	-1.2	0.0	0.1	0.3	0.3
Professional and technical services	54	4.8	4.2	0.1	-0.2	-0.1	0.1	0.6
Management of companies	55	5.3	6.2	-0.2	-1.1	-0.1	0.6	-0.1
Admin and waste services	56	6.0	3.9	-0.4	-1.0	-0.1	-0.2	3.8
Educational services	61	4.1	1.9	0.0	-0.2	-0.1	-0.4	2.8
Health care and social assistance	62	2.1	1.8	-0.1	0.0	-0.3	0.6	0.2
Arts, entertainment, and recreation	71	16.0	15.1	-2.9	-0.3	-0.1	0.3	4.0
Accommodation and food services	72	19.4	12.4	-2.0	-0.8	0.7	2.5	5.8
Other services, except government	81	-6.1	0.9	-0.4	-0.5	-0.6	-6.2	0.8

Table 6. Industry contributions¹ to private business output by component, 2010

Industry	2012 NAICS Code	Percentage Point		
		TFP	Capital	Labor
Goods producing sector	11-33	1.05	0.05	-0.10
Agriculture, forestry, fishing, and hunting	11	-0.04	0.00	0.00
Mining	21	-0.15	-0.01	0.02
Utilities	22	0.19	0.03	-0.01
Construction	23	-0.02	-0.03	-0.20
Manufacturing	31-33	1.07	0.07	0.09
Durable manufacturing ²	321,327,33	0.82	0.00	0.07
Nondurable manufacturing	31,322-326	0.25	0.07	0.02
ICT³	51x	0.48	0.19	-0.05
Information	51	0.22	0.05	-0.05
FIRE	52-53	0.34	-0.16	-0.07
Finance and insurance	52	-0.18	-0.13	-0.03
Real estate and rental and leasing	53	0.52	-0.03	-0.04
Service providing sector	42-49,54-81	1.02	0.20	0.23
Wholesale trade	42	0.31	-0.02	-0.06
Retail trade	44,45	-0.01	0.03	0.06
Transportation and warehousing	48-49	0.13	-0.02	0.03
Professional and technical services ⁴	54	0.06	0.04	-0.05
Management of companies	55	0.14	0.01	0.01
Admin and waste services	56	0.10	0.02	0.14
Educational services	61	0.01	0.01	0.02
Health care and social assistance	62	-0.14	0.06	0.15
Arts, entertainment, and recreation	71	0.07	0.00	0.00
Accommodation and food services	72	0.13	0.00	0.00
Other services, except government	81	0.00	0.00	-0.01

1. Contributions may not sum due to aggregation, rounding, and integration of the top line to industry

2. Goods producing sector except for computer and electronic products (NAICS 334)

3. Information and communication technology sector (NAICS 51x), is the information major industry (NAICS 51) less publishing, except internet (includes software) (NAICS 511) and motion picture and sound recording (NAICS 512), plus computer and electronic products (NAICS 334) and computer systems design and related services (NAICS 5415)

4. Service providing sector, except for computer systems design and related services (NAICS 5415)

Table 7. Industry contributions¹ to private business output by component, 2021

Industry	2012 NAICS Code	Percentage Point		
		TFP	Capital	Labor
Goods producing sector	11-33	0.52	0.19	0.33
Agriculture, forestry, fishing, and hunting	11	-0.14	0.03	0.00
Mining	21	-0.09	-0.01	-0.01
Utilities	22	-0.06	0.04	0.00
Construction	23	-0.07	0.05	0.16
Manufacturing	31-33	0.88	0.07	0.18
Durable manufacturing ²	321,327,33	0.42	0.00	0.11
Nondurable manufacturing	31,322-326	0.46	0.07	0.06
ICT³	51x	0.40	0.25	0.17
Information	51	0.31	0.01	0.09
FIRE	52-53	0.73	0.18	0.13
Finance and insurance	52	0.53	0.16	0.08
Real estate and rental and leasing	53	0.20	0.02	0.05
Service providing sector	42-49,54-81	2.53	0.26	1.72
Wholesale trade	42	0.17	0.03	0.08
Retail trade	44,45	-0.07	0.04	0.14
Transportation and warehousing	48-49	0.04	0.01	0.27
Professional and technical services ⁴	54	0.49	0.08	0.27
Management of companies	55	0.26	0.00	0.01
Admin and waste services	56	0.27	0.03	0.24
Educational services	61	0.02	0.00	0.01
Health care and social assistance	62	0.21	0.05	0.20
Arts, entertainment, and recreation	71	0.18	0.00	0.09
Accommodation and food services	72	0.64	0.00	0.20
Other services, except government	81	0.03	0.01	0.13

1. Contributions may not sum due to aggregation, rounding, and integration of the top line to industry

2. Goods producing sector except for computer and electronic products (NAICS 334)

3. Information and communication technology sector (NAICS 51x), is the information major industry (NAICS 51) less publishing, except internet (includes software) (NAICS 511) and motion picture and sound recording (NAICS 512), plus computer and electronic products (NAICS 334) and computer systems design and related services (NAICS 5415)

4. Service providing sector, except for computer systems design and related services (NAICS 5415)