

Integrated BEA/BLS Industry-Level Production Account

Initial Statistics for 2014 and Revised Statistics for 1998–2013

On June 29, 2016, the industry-level production account for the United States was updated to include new statistics for 2014 and revised statistics for 1998–2013. In this ongoing collaboration between the Bureau of Economic Analysis (BEA) and the Bureau of Labor Statistics (BLS), gross domestic product (GDP) by industry data from BEA's industry economic accounts are combined with capital and labor hours data from the BLS Productivity Program to create an internally consistent production account. The account contains detailed data on output and inputs in current and constant prices as well as multifactor productivity by industry.¹ The foundations of this account are discussed in detail by Fleck and others.²

Subsequent updates to the statistics have expanded the account to incorporate the latest statistics released by both BEA and BLS. The underlying data for gross output, intermediate inputs, and value added are consistent with the results of BEA's 2015 annual revision of

the industry economic accounts, released on November 5, 2015.³ Data on capital and labor hours reflect revisions to the BLS measures of multifactor productivity released on June 22, 2015.⁴ Revisions to the integrated account for 1998–2011 reflect revisions to capital and labor input hours from BLS. Revisions to the account for 2012–2013 reflect revisions to these series as well as revisions from the annual revision of BEA's industry economic accounts.

For 1998–2014, aggregate value added increased 1.92 percent per year on average (table 2). Increases in capital input accounted for 1.10 percentage points (about 57 percent), of aggregate growth in labor input accounted for 0.43 percentage point (about 22 percent), and increases in multifactor productivity accounted for 0.39 percentage point (about 20 percent). Comparing aggregate growth in 2009–2014 with that in 1998–2007 indicates that the majority of the difference in growth before and after the Great Recession can be attributed to a decline in the contribution

1. The industry-level production account and integrated multifactor productivity measures presented in this article reflect output that is consistent with GDP for the total economy. However, these measures differ in concepts and coverage from the official U.S. multifactor productivity measures from the Bureau of Labor Statistics. See the box "Data Availability."

2. Susan Fleck, Steve Rosenthal, Matthew Russell, Erich H. Strassner, and Lisa Usher, "A Prototype BEA/BLS Industry-Level Production Account for the United States," in *Measuring Economic Sustainability and Progress*, edited by Dale W. Jorgenson, J. Steven Landefeld, and Paul Schreyer (Chicago: University of Chicago Press, for the National Bureau of Economic Research).

3. Kevin B. Barefoot, Edward T. Morgan, Ksenia E. Shadrina, "The 2015 Annual Revision of the Industry Economic Accounts: Initial Statistics for the Second Quarter of 2015 and Revised Statistics for 2012–2014 and the First Quarter of 2015," *SURVEY OF CURRENT BUSINESS* 95 (December 2015).

4. See the release on the BLS Web site.

Amanda S. Lyndaker of BEA prepared this report. Thomas F. Howells III and Jon D. Samuels of BEA and Lucy Eldridge, Steve Rosenthal, and Chris Sparks of BLS supervised the preparation of the statistics. Matthew E. Calby and Justin M. Harper of BEA and Randy Kinoshita of BLS contributed to the preparation of the statistics.

Data Availability

Additional data tables for 1998–2014 for the integrated BEA/BLS industry-level production account, including industry contributions to the aggregate sources of growth and details on capital and labor by industry, are available on [BEAs Web site](#). The GDP by industry accounts for 1947–2014—including gross output, intermediate inputs, and value-added statistics—are also available on BEA's Web site. The official statistics on multifactor productivity are available on the [BLS Web site](#).

of capital input.⁵ These results are consistent with previously published statistics.

In addition to allowing a decomposition of the sources of growth for the economy as a whole, the integrated account tables, which are available on BEA's Web site, allow for more detailed decompositions. Users can identify the sources of growth in aggregate capital, labor, and integrated multifactor productivity by industry and by type of labor or capital asset.

At the industry level, a large portion of the aggregate difference in the contribution of capital input over the two periods was driven by lower capital input contributions in real estate and rental and leasing, finance and insurance, and retail trade.

By type, the revised data show that almost half of the decrease in capital inputs in the post-recession period (2009–2014) relative to 1998–2007 was due to a

5. The Great Recession refers to the most recent recession, which lasted from December 2007 to June 2009, according to the Business Cycle Dating Committee of the National Bureau of Economic Research.

Table 1. Growth in Aggregate Value Added and the Sources of Growth
[Average annual growth rates]

	1998–2014	1998–2007	2007–2014	2007–2009	2009–2014	2009–2014 less 1998–2007
Value added ¹	1.92	2.77	0.84	-1.56	1.80	-0.98
Capital input ²	1.10	1.53	0.54	0.66	0.50	-1.03
Information technology capital ³	0.27	0.39	0.12	0.20	0.09	-0.30
R&D capital.....	0.08	0.09	0.08	0.10	0.07	-0.01
Software capital.....	0.17	0.23	0.09	0.11	0.09	-0.14
Entertainment originals capital	0.03	0.03	0.02	0.02	0.02	-0.01
Other capital.....	0.54	0.78	0.23	0.23	0.22	-0.56
Labor input ²	0.43	0.61	0.21	-1.32	0.82	0.20
College labor.....	0.55	0.63	0.44	-0.11	0.65	0.02
Noncollege labor.....	-0.11	-0.02	-0.23	-1.22	0.16	0.18
Integrated multifactor productivity ²	0.39	0.63	0.09	-0.90	0.48	-0.15

1. Aggregate value-added growth is the sum of share-weighted value-added growth by industry.

2. The contributions of labor, capital, and integrated multifactor productivity are the Domar-weighted sums of each industry's labor, capital, or multifactor productivity contribution to industry output growth.

3. Information technology (IT) capital consists of computer capital, communications capital, and other IT capital.

NOTE. Integrated estimates of multifactor productivity differ from the official estimates produced by the Bureau of Labor Statistics (BLS), which are available on the BLS Web site.

0.56 percentage point decrease in other capital and another third was due to a 0.30 percentage point decrease in information technology capital.⁶

Labor input contributed 0.82 percentage point to the 1.80 average percent change in real value added (45 percent of growth) over the recovery period, compared with a contribution of 0.61 percentage point to the 2.77 average percent change in the period preceding the Great Recession (22 percent of growth). The contribution of labor input in the durable-goods industry to aggregate real valued-added growth turned up, contributing 0.06 percentage point in the post-recession period after subtracting 0.11 percentage point before 2007. The contribution of noncollege labor to real value added growth in the post-recession period increased, compared with the contribution in the 1998–2007 period, while the contribution of college labor was basically unchanged.⁷

With this update to the account, the contribution of integrated multifactor productivity to aggregate value added growth for the 2009–2014 period was 0.15 percentage point lower than the 1998–2007 contribution, reflecting smaller contributions to growth by the durable-goods and nondurable-goods manufacturing sectors during the latter period. Previously published statistics covering 2009–2013 showed a small positive multifactor productivity contribution to growth (0.04 percentage point) during the recovery period. The 0.19 percentage point downward revision primarily reflects a downward revision to real GDP growth in 2013. At the industry level, the multifactor productivity contribution to growth for the finance and insurance industry was revised down 0.11 percentage point, which is consistent with a downward revision to real value added in 2013 for this industry from the annual revision to the industry economic accounts.

The following tables provide additional information on the sources of growth across industries. The [underlying data](#) are available on the industry accounts section of BEA's Web site.

6. Other capital includes about 90 types of other capital equipment and structures, inventories and land.

7. College labor includes workers with a bachelor's degree and above; noncollege labor includes the remainder of workers.

Tables 2 and 3 follow.

Table 2. Sources of Industry Output Growth, 1998–2014

[Average annual growth rates]

	Growth						Growth				
	Output	Capital	Labor	Inter-mediate	Inte-grated MFP		Output	Capital	Labor	Inter-mediate	Inte-grated MFP
Farms.....	1.00	0.16	-0.02	-0.33	1.19	Publishing industries, except internet (includes software).....	1.61	0.88	-0.24	-0.14	1.10
Forestry, fishing, and related activities.....	-0.13	0.52	0.71	-1.79	0.43	Motion picture and sound recording industries.....	1.41	1.12	0.26	-1.06	1.09
Oil and gas extraction.....	2.60	-0.05	0.20	1.08	1.37	Broadcasting and telecommunications.....	4.33	1.60	-0.21	1.76	1.17
Mining, except oil and gas.....	0.06	0.65	-0.12	-0.06	-0.42	Data processing, internet publishing, and other information services.....	8.28	2.74	-0.27	5.07	0.74
Support activities for mining.....	7.04	0.48	2.52	1.75	2.29	Federal Reserve banks, credit intermediation, and related activities.....	1.03	1.26	0.29	-0.50	-0.02
Utilities.....	-0.37	0.67	-0.01	-0.67	-0.35	Securities, commodity contracts, and investments.....	3.32	0.15	0.41	1.83	0.93
Construction.....	-0.90	0.20	0.12	-0.26	-0.96	Insurance carriers and related activities.....	3.37	1.03	0.31	2.05	-0.02
Wood products.....	-1.12	0.02	-0.73	-0.86	0.44	Funds, trusts, and other financial vehicles.....	3.25	0.24	-0.05	1.34	1.71
Nonmetallic mineral products.....	-0.85	0.22	-0.43	-0.43	-0.21	Real estate.....	2.55	1.30	0.06	0.72	0.47
Primary metals.....	0.24	-0.07	-0.52	0.15	0.68	Rental and leasing services and lessors of intangible assets.....	2.36	2.56	-0.07	1.61	-1.74
Fabricated metal products.....	0.25	0.10	-0.21	0.33	0.03	Legal services.....	-0.18	0.92	0.44	0.34	-1.88
Machinery.....	0.47	0.14	-0.41	0.37	0.37	Computer systems design and related services.....	4.76	0.18	2.05	0.61	1.93
Computer and electronic products.....	3.62	0.46	-0.84	-1.88	5.88	Miscellaneous professional, scientific, and technical services.....	2.69	0.70	0.90	1.25	-0.16
Electrical equipment, appliances, and components.....	-1.38	-0.03	-0.52	-1.54	0.70	Management of companies and enterprises.....	3.20	0.26	1.26	2.22	-0.55
Motor vehicles, bodies and trailers, and parts.....	1.19	0.09	-0.30	0.50	0.89	Administrative and support services.....	3.00	0.74	0.77	0.59	0.90
Other transportation equipment.....	1.81	0.23	-0.10	1.32	0.37	Waste management and remediation services.....	1.57	0.16	0.51	0.91	-0.01
Furniture and related products.....	-1.67	0.11	-0.96	-0.72	-0.10	Educational services.....	2.74	0.21	1.62	1.39	-0.48
Miscellaneous manufacturing.....	1.40	0.47	-0.30	0.57	0.66	Ambulatory health care services.....	3.10	0.20	1.50	1.14	0.27
Food and beverage and tobacco products.....	0.47	0.21	0.03	0.34	-0.11	Hospitals and nursing and residential care.....	2.94	0.26	1.02	1.84	-0.18
Textile mills and textile product mills.....	-4.45	-0.19	-1.36	-3.22	0.32	Social assistance.....	3.13	0.12	2.05	1.44	-0.48
Apparel and leather and allied products.....	-4.77	-0.09	-2.66	-3.13	1.11	Performing arts, spectator sports, museums, and related activities.....	2.56	0.13	0.48	1.35	0.60
Paper products.....	-1.03	-0.16	-0.53	-0.22	-0.12	Amusements, gambling, and recreation industries.....	2.29	0.61	0.63	1.20	-0.14
Printing and related support activities.....	-2.00	-0.03	-1.19	-2.10	1.32	Accommodation.....	1.28	0.79	0.05	0.41	0.02
Petroleum and coal products.....	1.33	0.08	-0.02	1.03	0.24	Food services and drinking places.....	1.77	0.01	0.65	0.92	0.19
Chemical products.....	0.35	1.09	-0.12	-0.11	-0.51	Other services, except government.....	0.33	0.42	0.18	0.93	-1.21
Plastics and rubber products.....	-0.38	0.12	-0.32	-0.39	0.21	Federal government.....	1.57	0.60	-0.06	0.94	0.08
Wholesale trade.....	2.73	0.95	0.15	1.25	0.38	State and local government.....	1.38	0.45	0.60	0.30	0.03
Retail trade.....	1.98	0.88	0.14	0.99	-0.02						
Air transportation.....	-1.03	0.09	-0.35	-0.65	-0.12						
Rail transportation.....	1.44	0.10	-0.26	1.00	0.60						
Water transportation.....	3.18	-0.09	0.22	0.75	2.30						
Truck transportation.....	1.20	0.41	0.04	0.73	0.03						
Transit and ground passenger transportation.....	1.33	0.47	0.62	0.84	-0.61						
Pipeline transportation.....	-1.44	1.33	-0.03	-4.15	1.41						
Other transportation and support activities.....	1.80	-0.11	0.26	1.66	-0.01						
Warehousing and storage.....	6.32	0.36	1.36	3.49	1.11						

MFP Multifactor productivity

NOTE: Integrated estimates of multifactor productivity differ from the official estimates produced by the Bureau of Labor Statistics (BLS), which are available on the BLS Web site.

Table 3. Contributions to Aggregate Real Value-Added Growth

[Percentage points]

	1998–2014				1998–2007				2009–2014				2009–2014 less 1998–2007			
	Value added	Capital	Labor	Integrated MFP	Value added	Capital	Labor	Integrated MFP	Value added	Capital	Labor	Integrated MFP	Value added	Capital	Labor	Integrated MFP
Total economy	1.92	1.10	0.43	0.39	2.77	1.53	0.61	0.63	1.80	0.50	0.82	0.48	-0.98	-1.03	0.20	-0.15
Agriculture, forestry, fishing, and hunting	0.03	0.01	0.00	0.03	0.03	0.00	0.01	0.02	0.02	0.01	0.01	0.00	-0.01	0.01	0.00	-0.02
Mining	0.06	0.01	0.02	0.04	0.02	0.00	0.01	0.01	0.11	0.03	0.04	0.04	0.09	0.04	0.03	0.02
Utilities	0.01	0.02	0.00	-0.01	0.01	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.01	0.00	0.00	0.00
Construction	-0.05	0.02	0.01	-0.08	0.00	0.05	0.09	-0.13	0.01	-0.02	0.03	0.00	0.01	-0.06	-0.06	0.13
Durable goods	0.22	0.04	-0.08	0.27	0.36	0.05	-0.11	0.42	0.28	0.02	0.06	0.19	-0.09	-0.03	0.17	-0.23
Nondurable goods	0.00	0.06	-0.04	-0.02	0.07	0.05	-0.06	0.08	-0.07	0.07	0.01	-0.15	-0.14	0.02	0.07	-0.23
Wholesale trade	0.12	0.08	0.01	0.03	0.22	0.12	0.03	0.07	0.16	0.05	0.03	0.08	-0.06	-0.07	0.01	0.01
Retail trade	0.09	0.08	0.01	0.00	0.15	0.13	0.02	0.00	0.10	0.03	0.04	0.04	-0.05	-0.10	0.01	0.03
Transportation and warehousing	0.03	0.01	0.01	0.01	0.05	0.02	0.00	0.03	0.06	0.01	0.05	0.00	0.01	-0.01	0.05	-0.02
Information	0.20	0.13	-0.01	0.09	0.28	0.16	-0.01	0.12	0.14	0.08	0.01	0.06	-0.13	-0.09	0.02	-0.07
Finance and insurance	0.20	0.11	0.04	0.04	0.31	0.19	0.07	0.05	0.06	0.02	0.04	0.00	-0.25	-0.16	-0.03	-0.05
Real estate and rental and leasing	0.29	0.25	0.01	0.04	0.38	0.40	0.02	-0.04	0.24	0.03	0.00	0.20	-0.14	-0.36	-0.02	0.24
Professional, scientific, and technical services	0.16	0.07	0.10	-0.01	0.20	0.10	0.12	-0.02	0.13	0.01	0.12	0.00	-0.06	-0.09	0.01	0.02
Management of companies and enterprises	0.03	0.01	0.04	-0.01	0.01	0.01	0.03	-0.03	0.11	0.01	0.05	0.05	0.10	0.00	0.03	0.07
Administrative and waste management services	0.09	0.03	0.03	0.03	0.13	0.04	0.04	0.04	0.11	0.02	0.08	0.01	-0.01	-0.02	0.04	-0.03
Educational services	0.02	0.00	0.02	-0.01	0.02	0.00	0.03	-0.01	0.01	0.00	0.02	-0.01	-0.02	0.00	-0.01	0.00
Health care and social assistance	0.16	0.02	0.14	0.00	0.17	0.02	0.14	0.00	0.11	0.02	0.14	-0.05	-0.06	0.00	0.00	-0.05
Arts, entertainment, and recreation	0.02	0.01	0.01	0.00	0.02	0.01	0.01	0.00	0.03	0.00	0.02	0.01	0.01	-0.01	0.00	0.01
Accommodation and food services	0.04	0.01	0.02	0.01	0.06	0.01	0.02	0.03	0.08	0.00	0.05	0.03	0.01	-0.01	0.03	0.00
Other services, except government	-0.02	0.02	0.01	-0.05	-0.02	0.02	0.01	-0.06	0.01	0.00	0.01	-0.01	0.03	-0.02	0.00	0.05
Federal government	0.05	0.05	0.00	0.01	0.06	0.05	-0.01	0.02	0.02	0.03	-0.02	0.00	-0.04	-0.02	-0.01	-0.02
State and local government	0.17	0.07	0.09	0.00	0.25	0.08	0.14	0.02	0.06	0.05	0.01	0.00	-0.19	-0.04	-0.13	-0.02
Addenda:																
Private economy components:																
Information technology-producing industries	0.29	0.04	0.01	0.24	0.37	0.05	-0.02	0.34	0.19	0.03	0.06	0.09	-0.19	-0.02	0.08	-0.25
Information technology-using industries	0.99	0.59	0.33	0.07	1.44	0.87	0.43	0.15	0.92	0.24	0.52	0.15	-0.53	-0.63	0.10	0.00
Noninformation technology industries	0.43	0.34	0.01	0.08	0.65	0.48	0.06	0.10	0.62	0.15	0.23	0.24	-0.03	-0.33	0.17	0.13

MFP Multifactor productivity

NOTE: Aggregate value added growth for the total economy appears in the top left corner of each panel with all other values representing contributions to that total. Integrated estimates of

multifactor productivity differ from the official estimates produced by the Bureau of Labor Statistics (BLS), which are available on the BLS Web site.