

BEA BRIEFING

Integrated BEA/BLS Industry-Level Production Account Update

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THE INTEGRATED industry-level production account for the United States was recently updated to cover 1998–2013; previously, it covered 1998–2012. The integrated production account combines industry-level output and intermediate inputs from the gross domestic product (GDP) by industry accounts of the Bureau of Economic Analysis (BEA) with information on capital and labor inputs from the Bureau of Labor Statistics (BLS) Productivity Program to form an internally consistent industry-level 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 production account reflects an ongoing collaboration between BEA and BLS.

Fleck and others (2014) describe the foundations of the account in detail, while Rosenthal and others (2014) expand the account to incorporate the results and the methodological changes of the 2013 comprehensive revision of the U.S. national income and product accounts, the 2007 benchmark input-output account, and the time series of integrated gross domestic product by industry and annual input-output accounts for the United States.

The update of the account to include statistics for 2013 contains the same basic structure as the statistics

1. The industry-level production account and integrated multifactor productivity measures presented in this article reflect output consistent with GDP for the total economy, but differ in concepts and coverage from the official U.S. multifactor productivity measures from the Bureau of Labor Statistics, which are available on [the BLS Web site](#).

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for 1998–2012. The underlying data for gross output, intermediate inputs, and value added are consistent with the results of the 2014 annual revision of the industry economic accounts, released on November 13, 2014.² Data on capital and labor inputs are consistent with the BLS measures of multifactor productivity released on June 23, 2015.³

Tables 1–3 and charts 1–6 update the results from Rosenthal and others (2014). For 1998–2013, aggregate value added increased by 1.96 percent per year on average.⁴ Increases in capital input accounted for 1.14 percentage points (close to 60 percent of aggregate growth), growth in labor input accounted for 0.40 percentage point (about 20 percent), and increases in multifactor productivity accounted for 0.43 percentage point (a little more than 20 percent). Qualitatively, the results through 2013 are consistent with Rosenthal and others in attributing the majority of the difference in aggregate growth during the ongoing recovery (compared with the period preceding the recovery) to a decline in the contribution of capital input.

The [underlying tables](#), which are available on BEA's Web site, allow users to translate the sources of growth in table 1 into each industry's contribution to aggregate value-added growth and each industry's contribution to aggregate capital, labor, and multifactor productivity growth.

In this update to Rosenthal and others (2014), the industry-level production account is used to analyze how the ongoing recovery compares with the period predating the 2007–2009 Great Recession. Declines in the contributions of capital input in 2009–2013 relative to 1998–2007 in real estate, in Federal Reserve banks, credit intermediation, and related activities, in retail trade, and in construction account for more than

2. For details, see [Howells and Morgan](#) (2014).

3. See [the release](#) on the BLS Web site.

4. Log growth rates are used.

half of the relative decline in the contribution of capital inputs during the recovery. Mining-related industries' contribution of capital in 2009–2013 increased relative to the 1997–2007 period.

Almost all of the increase in the contribution of labor inputs in 2009–2013 relative to 1998–2007 was due to an increase in noncollege labor.⁵ This increase was broad based across industries: 47 of the 63 industries had a larger contribution of noncollege labor during the ongoing recovery (compared with the prerecession period). Finally, the contribution of multifactor productivity growth for 2009–2013 was similar to the 1998–2007 contribution, but the sources across industries were significantly different. The contributions of computers and electronic products, broadcasting and telecommunications, and chemical products were significantly lower in 2009–2013, while the contributions of motor vehicles, construction, and real estate were significantly higher.

The following tables and charts provide additional information on the sources of growth across indus-

tries. The [underlying data](#) are available on the industry accounts section of BEA's Web site.

Bibliography

Fleck, Susan, Steve Rosenthal, Matthew Russell, Erich H. Strassner, and Lisa Usher. 2014. "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

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5. College labor includes workers with a BA degree and above; noncollege labor includes the remainder of workers.

Tables 1 through 3 and charts 1 through 6 follow.

Table 1. Sources of Industry Output Growth, 1998–2013

[Average annual growth rates]

	Growth						Growth				
	Output	Capital	Labor	Inter-mediate	Inte-grated MFP		Output	Capital	Labor	Inter-mediate	Inte-grated MFP
Farms.....	0.82	0.13	-0.08	-0.52	1.29	Publishing industries, except internet (includes software).....	1.46	1.00	-0.30	-0.35	1.12
Forestry, fishing, and related activities.....	0.07	0.47	0.60	-1.53	0.52	Motion picture and sound recording industries.....	1.52	1.14	0.19	-1.19	1.39
Oil and gas extraction.....	2.10	-0.12	0.18	0.90	1.13	Broadcasting and telecommunications.....	4.37	1.66	-0.23	1.91	1.03
Mining, except oil and gas.....	-0.28	0.83	-0.16	-0.10	-0.84	Data processing, internet publishing, and other information services.....	8.25	2.58	-0.40	5.23	0.84
Support activities for mining.....	7.28	0.43	2.27	1.85	2.73	Federal Reserve banks, credit intermediation, and related activities.....	1.31	1.23	0.35	-0.88	0.61
Utilities.....	-0.48	0.63	-0.05	-1.09	0.03	Securities, commodity contracts, and investments.....	4.00	0.16	0.34	1.93	1.57
Construction.....	-1.13	0.21	0.03	-0.40	-0.97	Insurance carriers and related activities...	3.22	0.98	0.29	1.98	-0.04
Wood products.....	-1.53	0.01	-0.78	-1.30	0.54	Funds, trusts, and other financial vehicles	2.66	0.22	-0.07	1.20	1.31
Nonmetallic mineral products.....	-1.66	0.17	-0.45	-0.96	-0.42	Real estate.....	2.69	1.36	0.06	0.78	0.48
Primary metals.....	0.69	-0.09	-0.55	0.41	0.92	Rental and leasing services and lessors of intangible assets.....	1.98	2.67	-0.08	1.24	-1.84
Fabricated metal products.....	-0.28	0.07	-0.24	-0.08	-0.02	Legal services.....	-0.13	1.02	0.40	0.16	-1.71
Machinery.....	0.78	0.15	-0.42	0.68	0.38	Computer systems design and related services.....	4.87	0.19	1.94	0.74	2.01
Computer and electronic products.....	3.49	0.47	-0.84	-2.17	6.03	Miscellaneous professional, scientific, and technical services.....	2.53	0.74	0.89	1.09	-0.20
Electrical equipment, appliances, and components.....	-1.79	-0.04	-0.53	-1.82	0.61	Management of companies and enterprises.....	2.92	0.67	1.23	2.13	-1.11
Motor vehicles, bodies and trailers, and parts.....	1.40	0.08	-0.38	0.64	1.05	Administrative and support services.....	2.73	0.78	0.67	0.27	1.02
Other transportation equipment.....	1.62	0.24	-0.12	1.06	0.44	Waste management and remediation services.....	1.68	0.16	0.46	0.87	0.20
Furniture and related products.....	-2.20	0.11	-1.05	-1.16	-0.09	Educational services.....	3.08	0.22	1.66	1.73	-0.53
Miscellaneous manufacturing.....	1.75	0.41	-0.29	0.73	0.90	Ambulatory health care services.....	3.25	0.20	1.55	1.24	0.25
Food and beverage and tobacco products	0.29	0.19	0.03	0.14	-0.07	Hospitals and nursing and residential care.....	3.04	0.27	1.09	1.93	-0.25
Textile mills and textile product mills.....	-4.56	-0.20	-1.42	-3.21	0.27	Social assistance.....	3.28	0.12	2.01	1.68	-0.53
Apparel and leather and allied products	-6.84	-0.08	-2.75	-5.03	1.02	Performing arts, spectator sports, museums, and related activities.....	2.64	0.13	0.47	1.39	0.65
Paper products.....	-1.88	-0.17	-0.55	-0.90	-0.25	Amusements, gambling, and recreation industries.....	2.15	0.62	0.62	1.20	-0.29
Printing and related support activities.....	-2.61	-0.01	-1.29	-2.63	1.32	Accommodation.....	1.14	0.85	-0.01	0.33	-0.02
Petroleum and coal products.....	0.86	-0.01	-0.02	0.66	0.23	Food services and drinking places.....	1.69	0.01	0.60	0.91	0.17
Chemical products.....	0.29	1.07	-0.14	-0.23	-0.42	Other services, except government.....	-0.01	0.45	0.15	0.68	-1.30
Plastics and rubber products.....	-0.79	0.11	-0.37	-0.70	0.16	Federal government.....	1.85	0.68	-0.03	1.09	0.11
Wholesale trade.....	2.59	1.01	0.14	1.21	0.22	State and local government.....	1.59	0.52	0.59	0.42	0.06
Retail trade.....	2.02	0.90	0.11	1.06	-0.05						
Air transportation.....	-1.51	0.08	-0.37	-1.14	-0.08						
Rail transportation.....	1.11	0.09	-0.35	0.78	0.59						
Water transportation.....	3.16	-0.10	0.21	0.59	2.47						
Truck transportation.....	0.93	0.39	-0.06	0.38	0.22						
Transit and ground passenger transportation.....	1.15	0.40	0.50	0.81	-0.57						
Pipeline transportation.....	-2.21	1.08	-0.11	-4.21	1.02						
Other transportation and support activities.....	1.66	-0.07	0.19	1.49	0.04						
Warehousing and storage.....	6.51	0.43	1.34	3.64	1.10						

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

	1998– 2013	1998– 2007	2007– 2013	2007– 2009	2009– 2013	2009– 2013 less 1998– 2007
Value added ¹	1.96	2.77	0.75	-1.57	1.90	-0.87
Capital input ²	1.14	1.54	0.53	0.68	0.46	-1.08
Information technology capital ³	0.29	0.40	0.12	0.20	0.09	-0.31
R&D capital	0.09	0.09	0.08	0.10	0.07	-0.01
Software capital	0.18	0.23	0.09	0.11	0.09	-0.15
Entertainment originals capital	0.03	0.03	0.02	0.02	0.02	-0.01
Other capital.....	0.56	0.79	0.21	0.24	0.19	-0.60
Labor input ²	0.40	0.60	0.08	-1.31	0.78	0.17
College labor.....	0.53	0.63	0.39	-0.11	0.64	0.01
Noncollege labor.....	-0.14	-0.02	-0.31	-1.20	0.14	0.16
Integrated multifactor productivity ²	0.43	0.63	0.13	-0.94	0.67	0.04

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.

Table 3. Contributions to Aggregate Value-Added Growth
[Percentage points]

	1998–2013				1998–2007				2009–2013				2009–2013 less 1998–2007			
	Value added	Capital	Labor	Inte- grated MFP	Value added	Capital	Labor	Inte- grated MFP	Value added	Capital	Labor	Inte- grated MFP	Value added	Capital	Labor	Inte- grated MFP
Total economy	1.96	1.14	0.40	0.43	2.77	1.54	0.60	0.63	1.90	0.46	0.78	0.67	-0.87	-1.08	0.17	0.04
Agriculture, forestry, fishing, and hunting.....	0.03	0.00	0.00	0.03	0.03	0.00	0.01	0.02	0.02	0.01	0.00	0.00	-0.01	0.01	0.00	-0.02
Mining.....	0.06	0.01	0.01	0.03	0.02	0.00	0.01	0.01	0.08	0.03	0.03	0.02	0.07	0.04	0.03	0.00
Utilities.....	0.01	0.02	0.00	0.00	0.01	0.02	0.00	0.00	0.05	0.02	0.00	0.03	0.04	0.00	0.00	0.03
Construction.....	-0.06	0.02	0.01	-0.09	0.00	0.05	0.09	-0.13	0.00	-0.02	0.01	0.01	0.00	-0.07	-0.08	0.14
Durable goods.....	0.23	0.04	-0.09	0.28	0.36	0.05	-0.11	0.42	0.33	0.01	0.08	0.24	-0.03	-0.04	0.18	-0.18
Nondurable goods.....	0.00	0.06	-0.04	-0.02	0.07	0.05	-0.05	0.08	-0.11	0.05	0.01	-0.17	-0.18	0.00	0.07	-0.25
Wholesale trade.....	0.11	0.08	0.01	0.02	0.22	0.12	0.03	0.07	0.13	0.06	0.04	0.04	-0.08	-0.06	0.01	-0.03
Retail Trade.....	0.09	0.08	0.01	0.00	0.15	0.12	0.02	0.00	0.09	0.03	0.03	0.03	-0.06	-0.10	0.01	0.03
Transportation and warehousing.....	0.03	0.01	0.00	0.01	0.05	0.02	0.00	0.03	0.07	0.00	0.05	0.02	0.02	-0.02	0.04	-0.01
Information.....	0.20	0.13	-0.02	0.09	0.28	0.16	-0.01	0.12	0.11	0.08	0.00	0.04	-0.16	-0.09	0.01	-0.08
Finance and insurance.....	0.23	0.11	0.04	0.08	0.31	0.18	0.07	0.05	0.16	0.00	0.04	0.11	-0.15	-0.18	-0.03	0.06
Real estate and rental and leasing.....	0.30	0.25	0.01	0.04	0.38	0.39	0.02	-0.04	0.27	0.02	0.01	0.24	-0.11	-0.37	-0.01	0.28
Professional, scientific, and technical services.....	0.16	0.07	0.10	-0.01	0.19	0.10	0.11	-0.02	0.14	0.01	0.12	0.01	-0.06	-0.09	0.00	0.03
Management of companies and enterprises.....	0.02	0.02	0.03	-0.03	0.01	0.02	0.03	-0.04	0.10	0.02	0.05	0.03	0.09	0.00	0.03	0.07
Administrative and waste management services.....	0.10	0.03	0.03	0.04	0.12	0.04	0.04	0.04	0.12	0.01	0.08	0.03	0.00	-0.03	0.04	-0.01
Educational services.....	0.02	0.00	0.02	-0.01	0.02	0.00	0.03	-0.01	0.00	0.00	0.02	-0.02	-0.02	0.00	-0.01	-0.01
Health care and social assistance.....	0.16	0.02	0.14	-0.01	0.17	0.02	0.14	0.00	0.10	0.02	0.16	-0.08	-0.06	-0.01	0.02	-0.08
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	0.01	0.01
Accommodation and food services.....	0.04	0.01	0.02	0.01	0.06	0.01	0.02	0.03	0.07	0.00	0.04	0.03	0.01	-0.01	0.02	0.00
Other services, except government.....	-0.03	0.02	0.01	-0.05	-0.02	0.02	0.01	-0.06	0.00	0.00	0.01	-0.01	0.02	-0.02	0.00	0.05
Federal government.....	0.06	0.05	0.00	0.01	0.06	0.05	-0.01	0.02	0.05	0.05	-0.01	0.01	-0.02	0.00	0.00	-0.01
State and local government.....	0.19	0.09	0.09	0.01	0.26	0.10	0.14	0.02	0.08	0.06	0.00	0.02	-0.18	-0.04	-0.15	0.00
Addenda:																
Private economy components:																
Information technology-producing Industries.....	0.29	0.04	0.00	0.25	0.37	0.05	-0.02	0.34	0.18	0.02	0.06	0.09	-0.19	-0.03	0.08	-0.24
Information technology-using Industries.....	1.00	0.62	0.31	0.07	1.43	0.87	0.42	0.14	0.98	0.23	0.53	0.22	-0.45	-0.63	0.11	0.07
Noninformation technology industries.....	0.42	0.34	-0.01	0.09	0.64	0.47	0.06	0.10	0.62	0.09	0.20	0.32	-0.02	-0.38	0.14	0.22

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.

Chart 1. Industry Integrated Multifactor Productivity Growth for 1998–2013

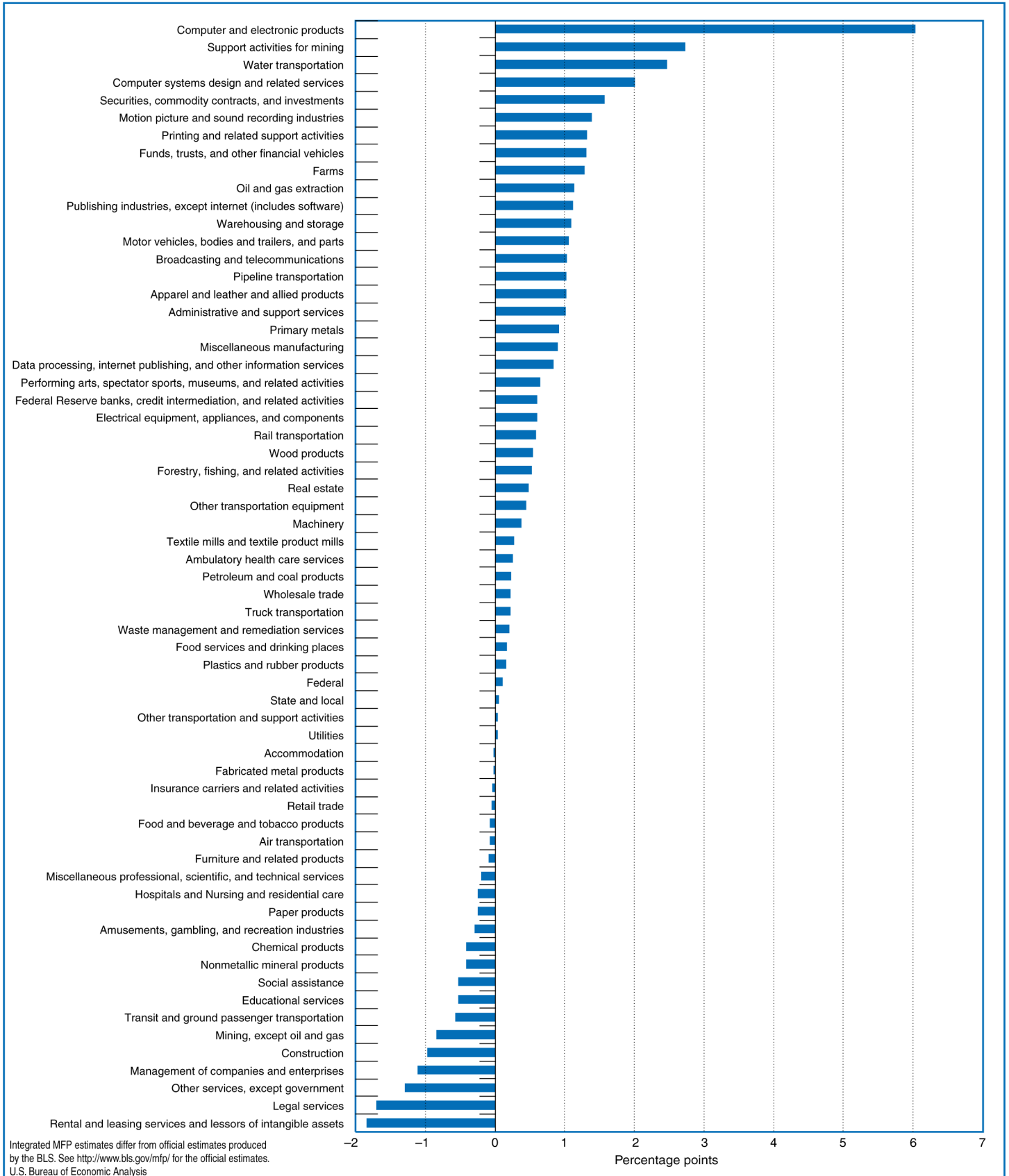


Chart 2. Industry Output Growth Differences for 2009–2013 Less 1998–2007

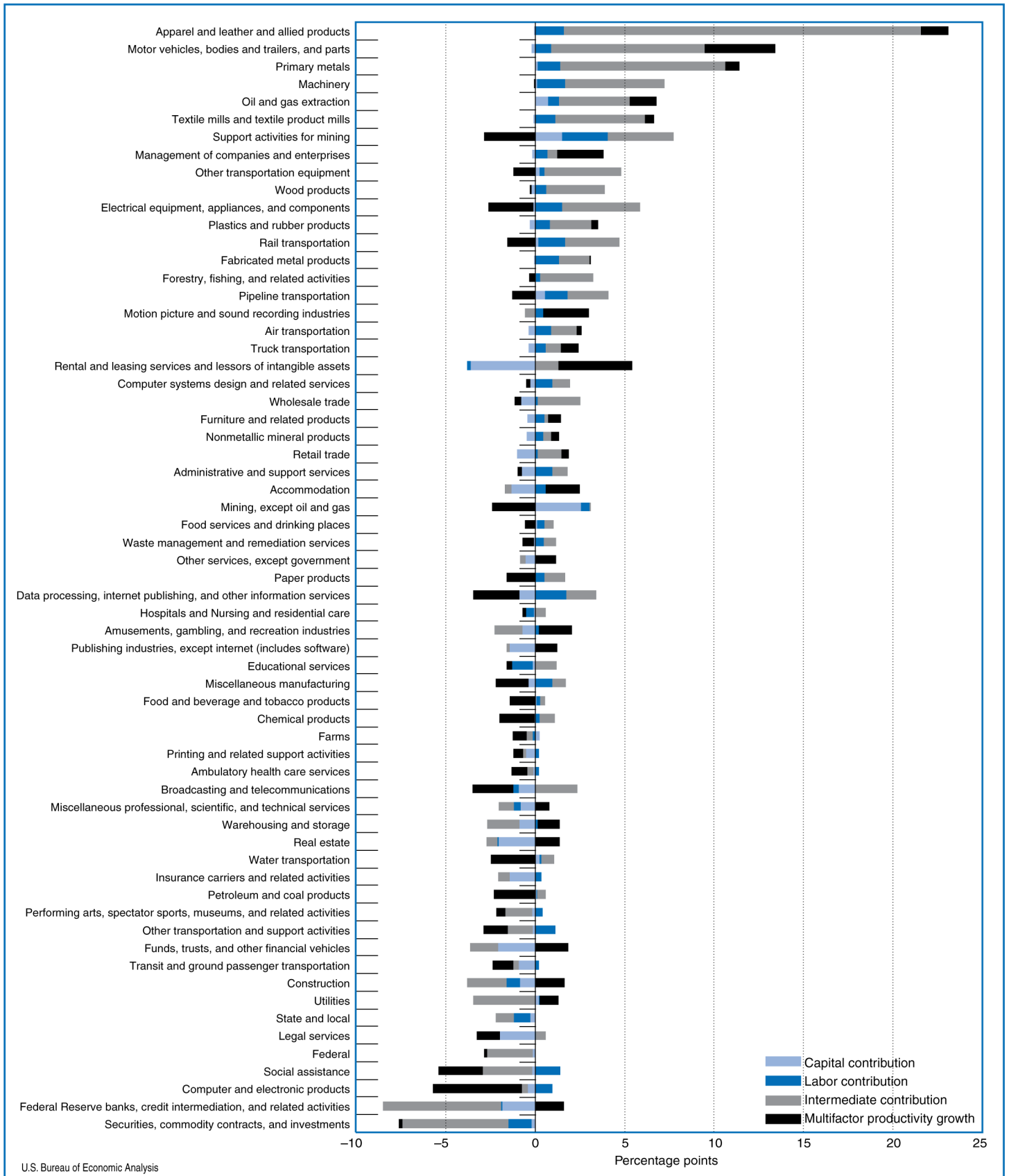


Chart 3. Industry Contributions to Economy-Wide Value-Added Growth for 2009–2013 Less 1998–2007

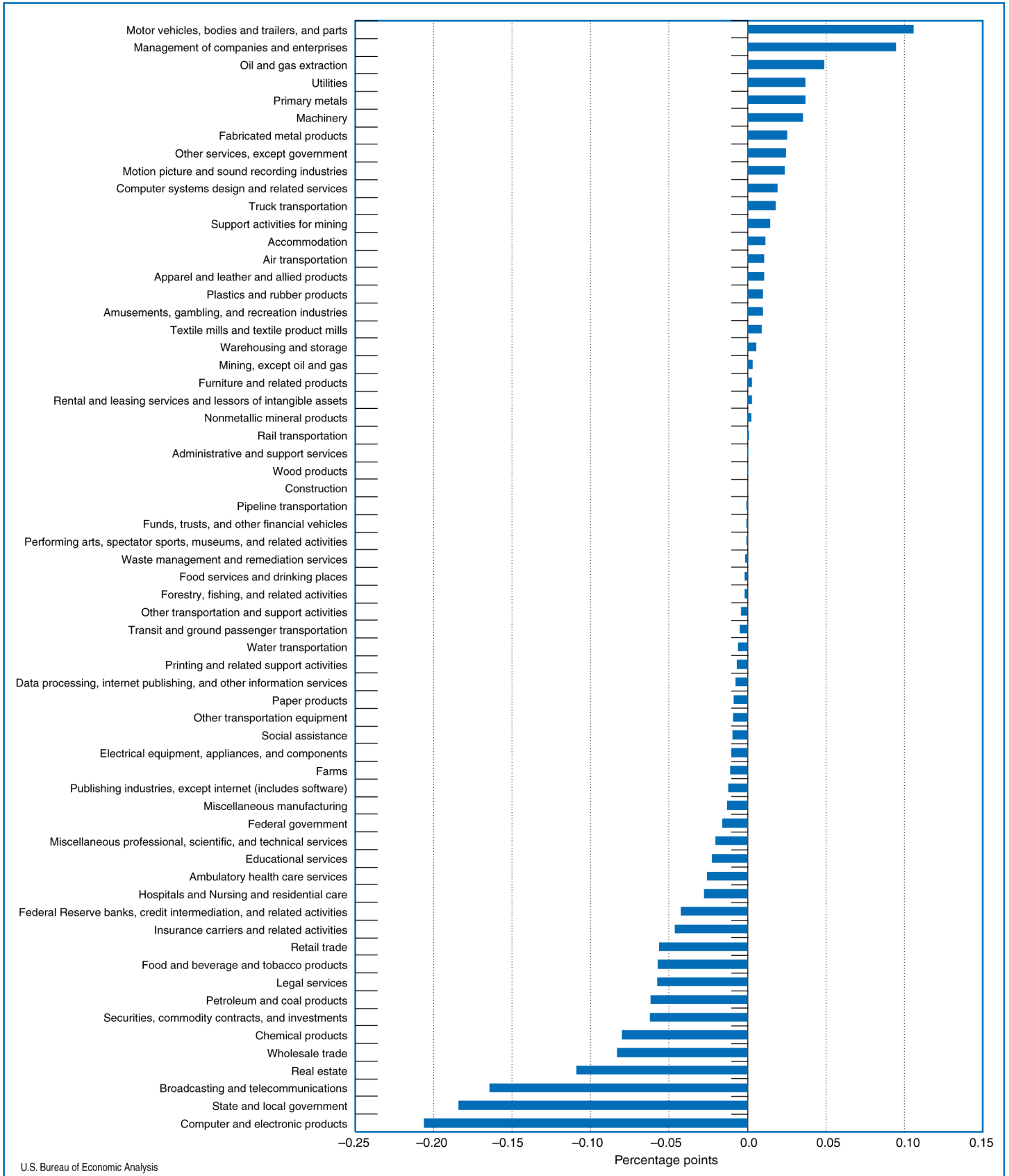


Chart 4. Industry Contributions to Economy-Wide Capital Contribution for 2009–2013 Less 1998–2007

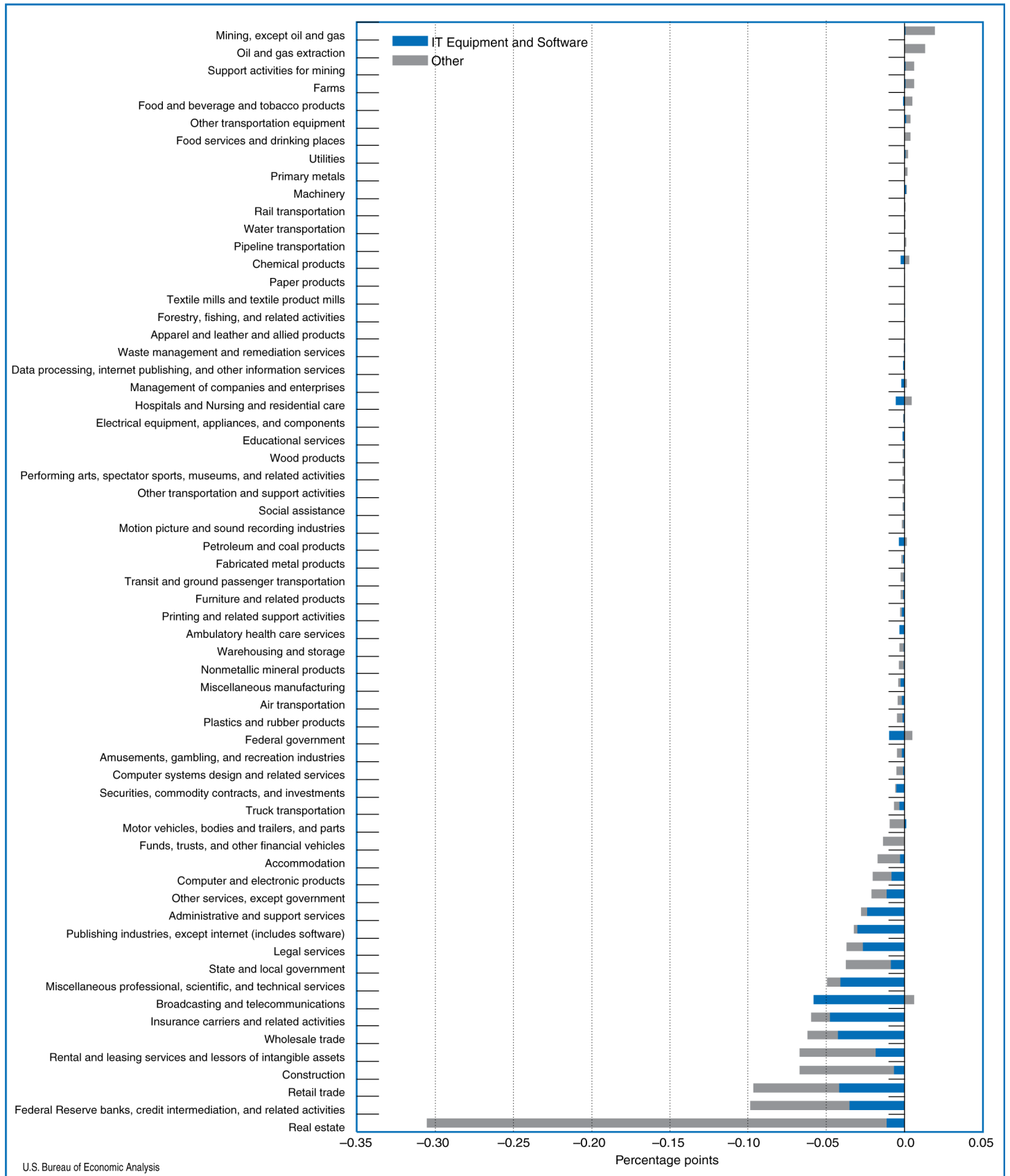


Chart 5. . Industry Contributions to Economy-Wide Labor Contribution for 2009–2013 Less 1998–2007

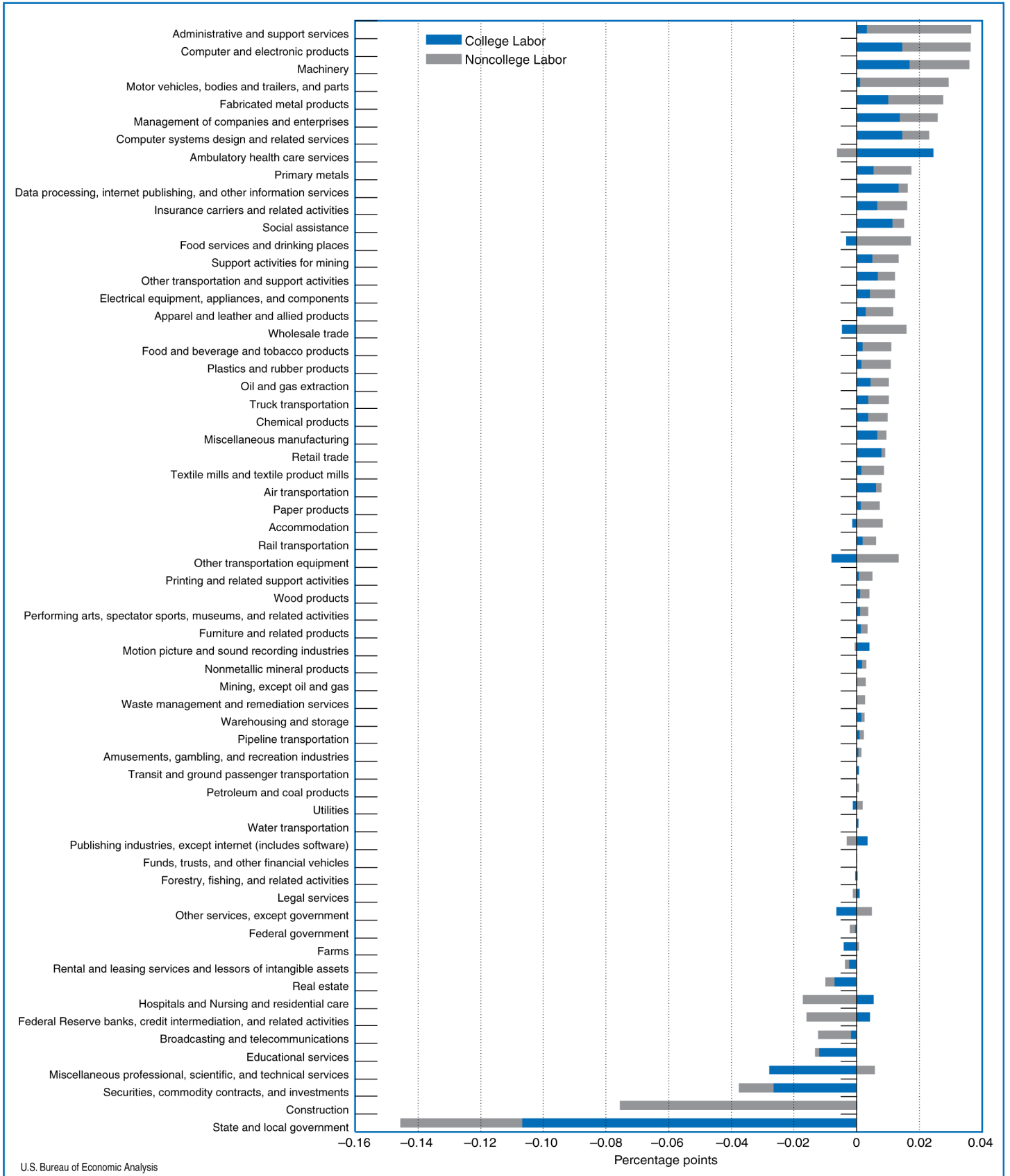


Chart 6. . Industry Contributions to Economy-Wide Integrated MFP Contribution for 2009–2013 Less 1998–2007

