

Integrated BEA/BLS Industry-level Production Account: Now Covering 1998-2013¹

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The purpose of this article is to summarize the update to the Integrated BEA/BLS Industry-level Production Account for the United States. This account now covers 1998 to 2013, and contains detailed data on output and inputs in current and constant prices, and multifactor productivity by industry.² Below, we use the account to present up-to-date information on the sources of U.S. economic growth from an industry perspective.

The production account reflects an ongoing collaboration between the BEA and BLS to construct measures of output and inputs that are consistent with the Gross Domestic Product by Industry Accounts. (Fleck, et al. 2013) describes the foundations of the account in detail, while (Rosenthal, et al. 2014) expands the account to incorporate the results and methodological changes of the 2013 comprehensive revision of the U.S. national income and product accounts, the 2007 benchmark

¹ Mark Dumas and Steve Rosenthal are economists with the Bureau of Labor Statistics; Tom Howells and Jon Samuels are economists with the Bureau of Economic Analysis. We thank Matt Calby, Justin Harper, and Amanda Lyndaker of BEA and Randy Kinoshita of BLS for their work on the estimates.

² The industry-level production account and integrated MFP measures presented here reflect output consistent with GDP for the total economy, but differ in concepts and coverage from the official U.S. MFP measures. See <http://www.bls.gov/mfp/> for the official estimates and <http://www.bls.gov/mfp/mprload.htm> for the underlying data.

input-output (IO) account, and the times series of integrated gross domestic product by industry and annual IO accounts for the United States. They use the results covering 1998-2012 to analyze the sources of growth during the ongoing economic recovery.

The update of the account to include 2013 contains the same basic structure as the earlier statistics covering 1998-2012. The underlying gross output, intermediate input, and value added data are consistent with the results of the 2014 annual revision of the industry economic accounts, released on November 13, 2014.³ Data on capital and labor inputs are consistent with the BLS multifactor productivity release on June 23, 2015.⁴

Tables 1-3 and Charts 1-6 present updates of the results from (Rosenthal, et al. 2014). For the period as a whole, aggregate value added increased by 1.96 percent per year on average.⁵ Increases in capital input accounted for 1.14 percentage points (close to 60% of aggregate growth), growth in labor input 0.40 percentage points (about 20% of aggregate growth), and increases in MFP for 0.43 percentage points (a little more than 20% of aggregate growth). Qualitatively, the results through 2013 are consistent with (Rosenthal, et al. 2014) in attributing the majority of the difference in aggregate growth during the ongoing recovery compared to the period preceding the recovery to a decline in the contribution of capital input.

The underlying tables (provided online at <http://www.bea.gov/industry/index.htm>) allow users to determine each industry's contribution to aggregate value added growth, and each industry's contribution to the aggregate contribution of capital, labor, and MFP presented in Table 1. For example, the contributions tables show that the Computer and electronic products industry was the largest

³ See (Howells and Morgan 2014) for details.

⁴ See www.bls.gov/news.release/pdf/prod3.pdf.

⁵ Log growth rates are used.

contributor to aggregate MFP growth over the 1998-2013 period, while Construction and Other services were a significant drag on aggregate MFP growth.

As an update to (Rosenthal, et al. 2014), we use the industry-level production account to analyze how the ongoing recovery compares to the period predating the 2007-2009 Great Recession. Declines in the contributions of capital input over the 2009-2013 period relative to the 1998-2007 period in Real Estate; Federal Reserve banks, credit intermediation, and related activities; Retail trade; and Construction account for over half of the relative decline in the contribution of capital inputs during the recovery. Mining related industries saw a small increase in the contribution of capital during the 2009-2013 period relative to the 1997-2007 period.

Almost all of the increase in the contribution of labor inputs during the 2009-2013 period relative to the 1998-2007 period was due to an increase in Non-college labor. This relative increase was broad-based across industries, with 47 of the 63 industries having a larger contribution of Non-college labor during the ongoing recovery compared to the prerecession period. Finally, aggregate MFP growth for the 2009-2013 period 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 during the 2009-2013 period, while the contributions of Motor vehicles, Construction, and Real estate were significantly higher.

The subsequent tables and figures provide additional information on the sources of growth across industries. The underlying data is available on the industry accounts section of the BEA website: <http://www.bea.gov/industry/index.htm>.

Bibliography

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Table 1: Sources of Industry Output Growth 1998-2013

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

Notes: Average annual percentage growth. A contribution is a share-weighted growth rate. Integrated MFP estimates differ from official estimates produced by the BLS. See <http://www.bls.gov/mfp/> for the official estimates.

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
	Contributions				
Value-Added	1.96	2.77	0.75	-1.57	1.90
Capital Input	1.14	1.54	0.53	0.68	0.46
IT Capital	0.29	0.40	0.12	0.20	0.09
R&D Capital	0.09	0.09	0.08	0.10	0.07
Software Capital	0.18	0.23	0.09	0.11	0.09
Entertainment Originals Capital	0.03	0.03	0.02	0.02	0.02
Other Capital	0.56	0.79	0.21	0.24	0.19
Labor Input	0.40	0.60	0.08	-1.31	0.78
College Labor	0.53	0.63	0.39	-0.11	0.64
Non-college Labor	-0.14	-0.02	-0.31	-1.20	0.14
Integrated MFP	0.43	0.63	0.13	-0.94	0.67

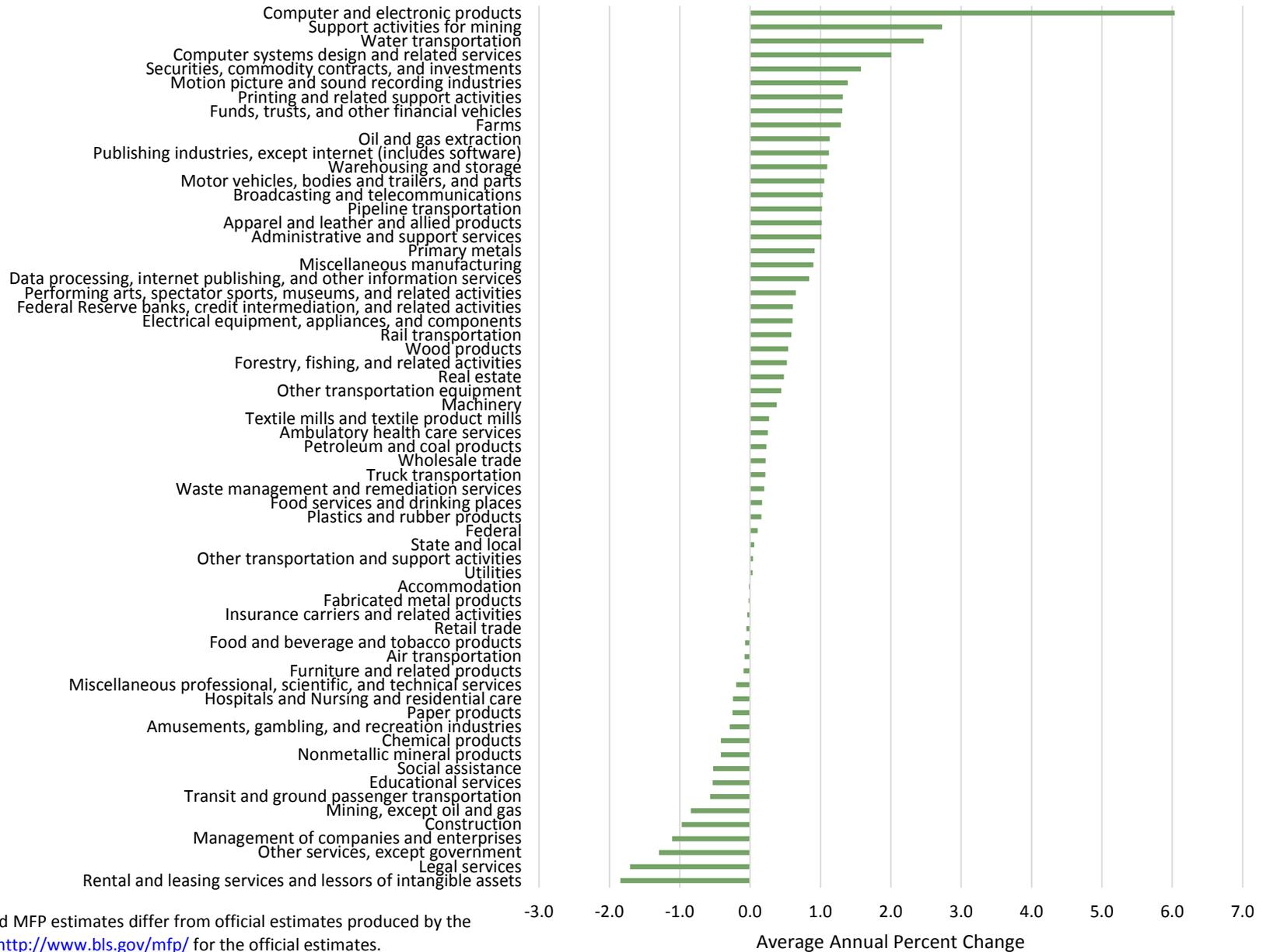
Notes: Aggregate value added growth is the aggregate of share weighed industry value added growth. The contribution of capital, labor, and integrated MFP are the weighted industry contributions. IT Capital is Computer, Communications and Other IT capital. Integrated MFP estimates differ from official BLS. See <http://www.bls.gov/mfp/> for the official estimates.

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	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	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

Notes. A contribution is a share weighted growth rate. The information technology classification is from Jorgenson, Ho, and Samuels (2014). Integrated MFP estimates differ from official estimates produced by the BLS. See <http://www.bls.gov/mfp/> for the official estimates.

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



Integrated MFP estimates differ from official estimates produced by the BLS. See <http://www.bls.gov/mfp/> for the official estimates.

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

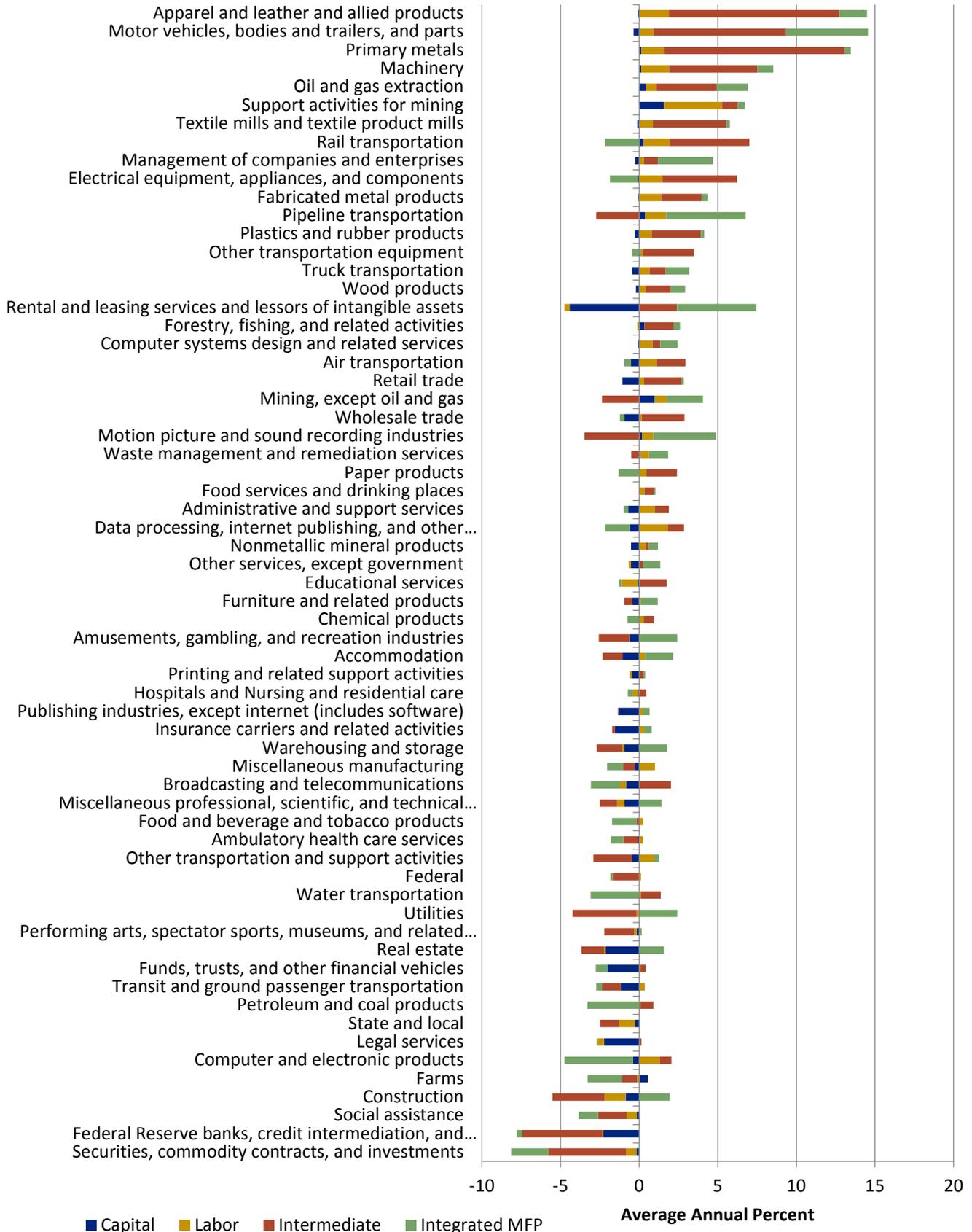


Chart 3. Industry Contributions to Economy-Wide Value-Added Growth for 2009-2013 Less 1998-2007

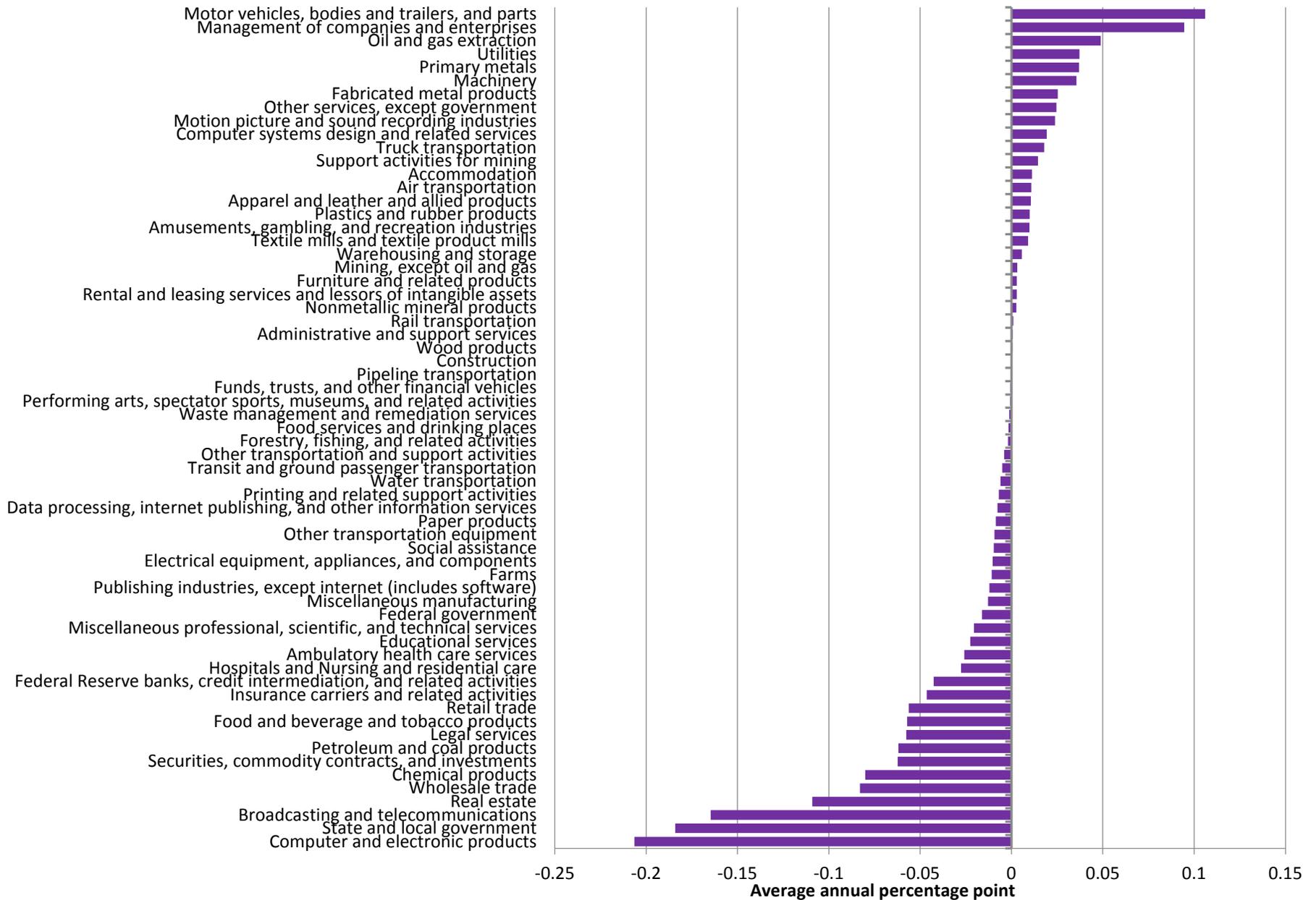


Chart 4. Industry Contributions to Economy-Wide Capital Contribution for 2009-2013 Less 1998-2007

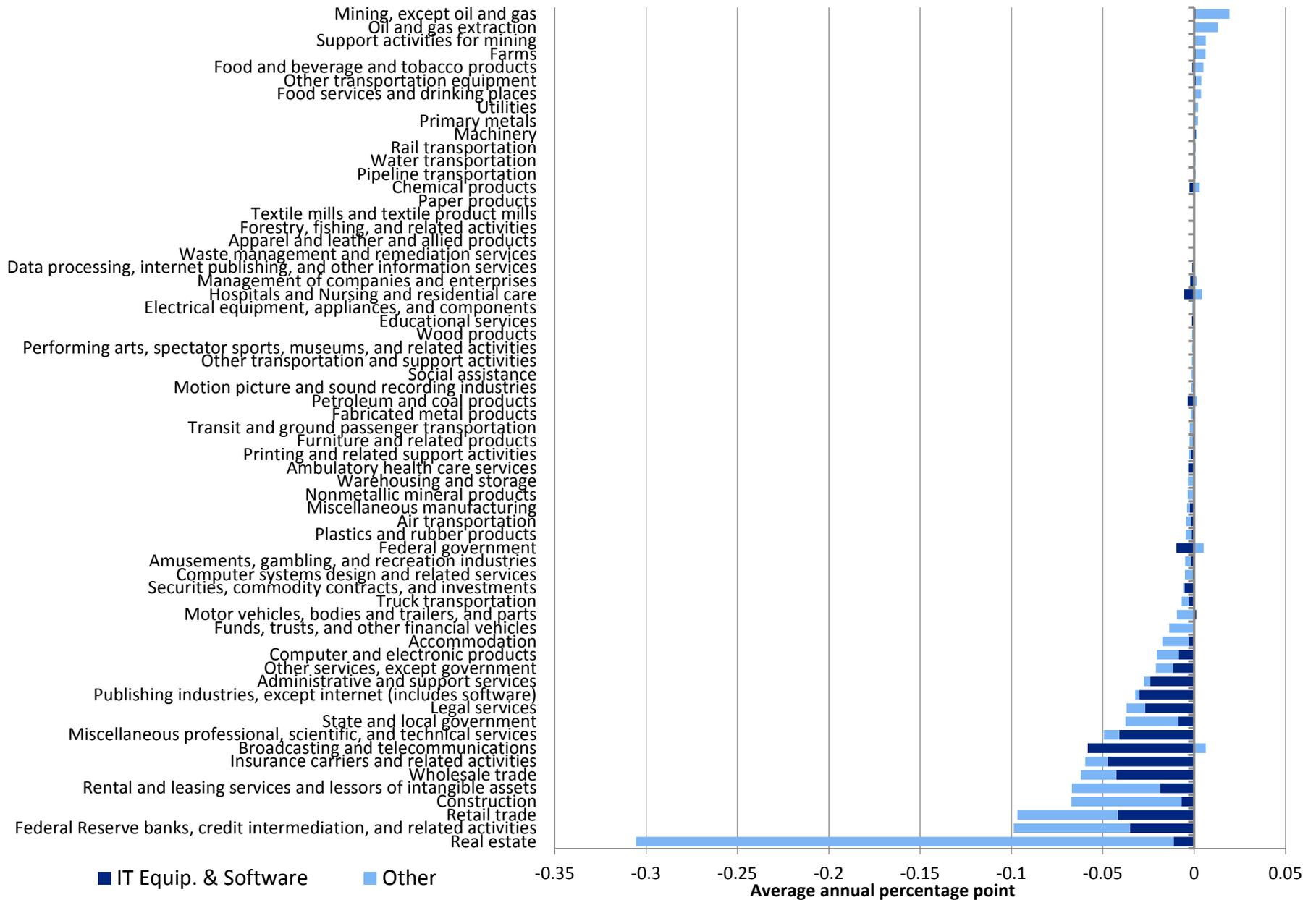


Chart 5. Industry Contributions to Economy-Wide Labor Contribution for 2009-2013 Less 1998-2007

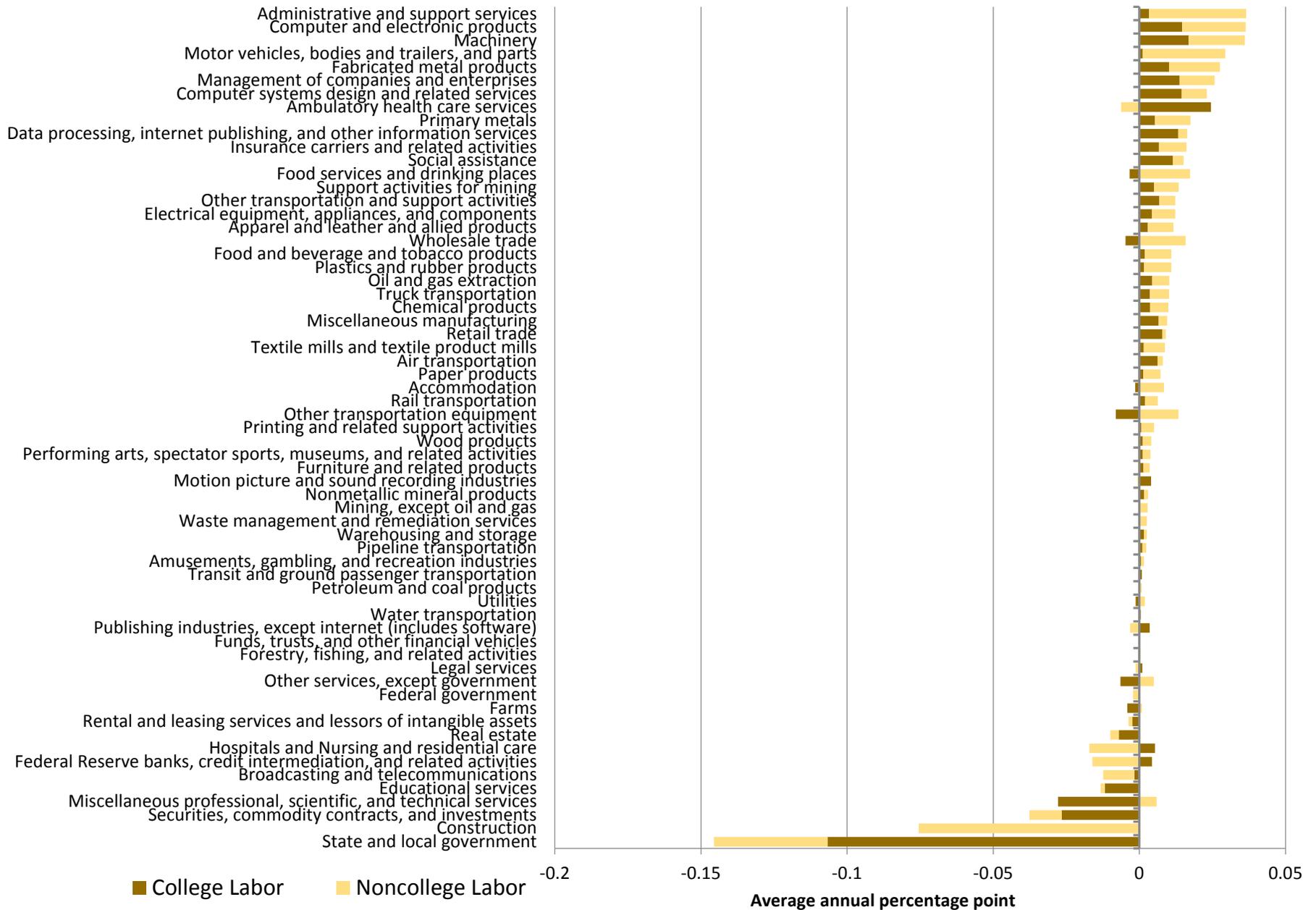


Chart 6. Industry Contributions to Economy-Wide Integrated MFP Contribution for 2009-2013 less 1998-2007

