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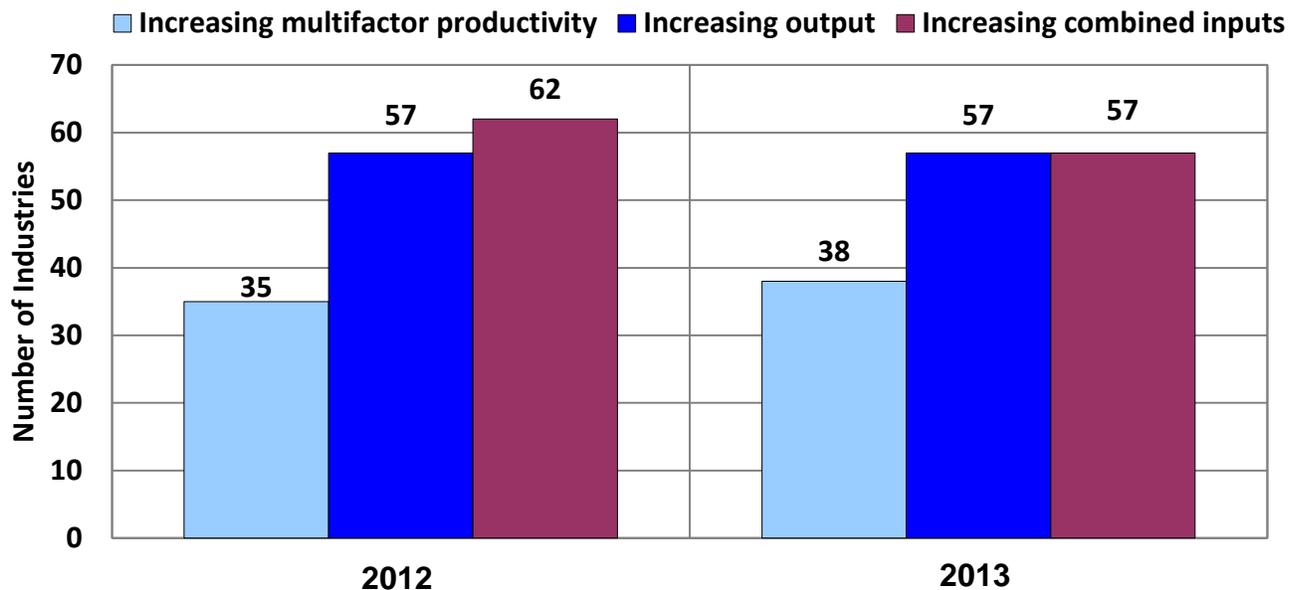
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MULTIFACTOR PRODUCTIVITY TRENDS FOR DETAILED INDUSTRIES, 2013

Multifactor productivity – defined as output per unit of combined inputs – rose in 38 of the 86 4-digit NAICS manufacturing industries in 2013, as well as in the two transportation industries that are measured, the U.S. Bureau of Labor Statistics reported today. This was up from 2012, when multifactor productivity increased in 35 manufacturing and in the two transportation industries.

Chart 1. Number of manufacturing industries with increases in multifactor productivity, output, and combined inputs, 2012-2013



Multifactor Productivity: Definition and Concepts

Multifactor productivity indexes relate the change in real output to the change in the combined inputs of labor, capital, and intermediate purchases consumed in producing that output.

Multifactor productivity growth measures the extent to which output growth exceeds the growth in inputs. A variety of factors that influence economic growth are not specifically accounted for among measured inputs, including: technological change, returns to scale, enhancements in managerial and staff

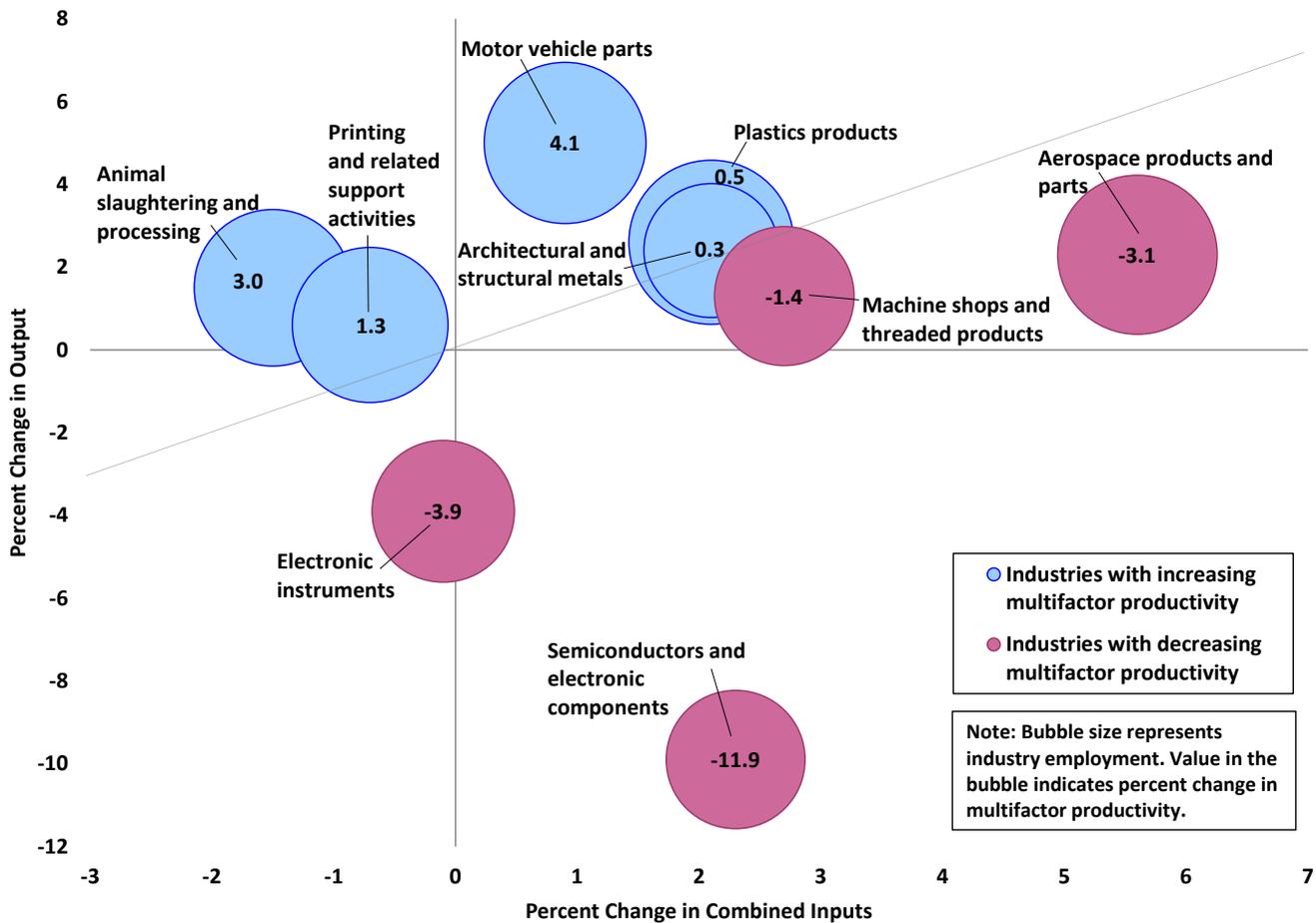
skills, changes in the organization of production, and other efficiency improvements. Multifactor productivity reflects these factors.

2013 Trends in Multifactor Productivity

Among manufacturing industries, the greatest increase in multifactor productivity occurred in communications equipment (17.3 percent). Four other industries experienced multifactor productivity gains greater than 6.4 percent: seafood product preparation and packaging, audio and video equipment, alumina and aluminum production and processing, and iron and steel mills and ferroalloys.

Chart 2 shows the percent change in multifactor productivity in 2013 for the largest 4-digit manufacturing industries (those with employment over 350,000). Of those industries, multifactor productivity increased the most in motor vehicle parts, as output increased much more than combined inputs.

Chart 2. Percent changes in multifactor productivity, output, and combined inputs in the largest (by employment) manufacturing industries, 2013



In the two measured transportation industries, multifactor productivity increased 1.6 percent in air transportation and 0.5 percent in line-haul railroads.

Components of Multifactor Productivity Growth: Output and Combined Inputs

In 2013, 43 industries experienced increases in both output and combined inputs. In 2012, 50 industries experienced increases in both components.

In 2013, output increased in 57 manufacturing industries, the same number as in 2012. The following industries had double-digit increases in **output** in 2013:

- Agricultural chemicals (16.1 percent)
- Railroad rolling stock (14.1 percent)
- Communications equipment (11.3 percent)

Output declined the most in footwear (-12.7 percent) and in magnetic media manufacturing and reproducing (-11.2 percent).

Combined inputs of capital, labor, and intermediate purchases rose in 57 manufacturing industries in 2013, compared to 62 industries in 2012. Growth in intermediate purchases was widespread, rising in 60 industries. Fewer manufacturing industries experienced growth in labor hours (43 industries) and capital services (33 industries).

The following industries had the largest increases in **combined inputs** in 2013:

- Household appliances (17.0 percent)
- Leather and hide tanning and finishing (16.8 percent)
- Railroad rolling stock (16.2 percent)
- Agricultural chemicals (9.1 percent)
- Motor vehicle bodies and trailers (8.9 percent)

For some manufacturing industries, multifactor productivity rose despite falling output, as combined inputs fell more rapidly. This occurred in three industries:

- Other leather and allied products
- Computer and peripheral equipment
- Electric lighting equipment

Multifactor productivity rose in 17 of the 28 manufacturing industries that recorded a decline in combined inputs in 2013. Within this group, the largest declines in combined inputs occurred in computer and peripheral equipment and in communications equipment.

In the air transportation industry, output increased 1.4 percent and combined inputs declined 0.2 percent. In line-haul railroads, output rose 2.7 percent and combined inputs increased 2.2 percent.

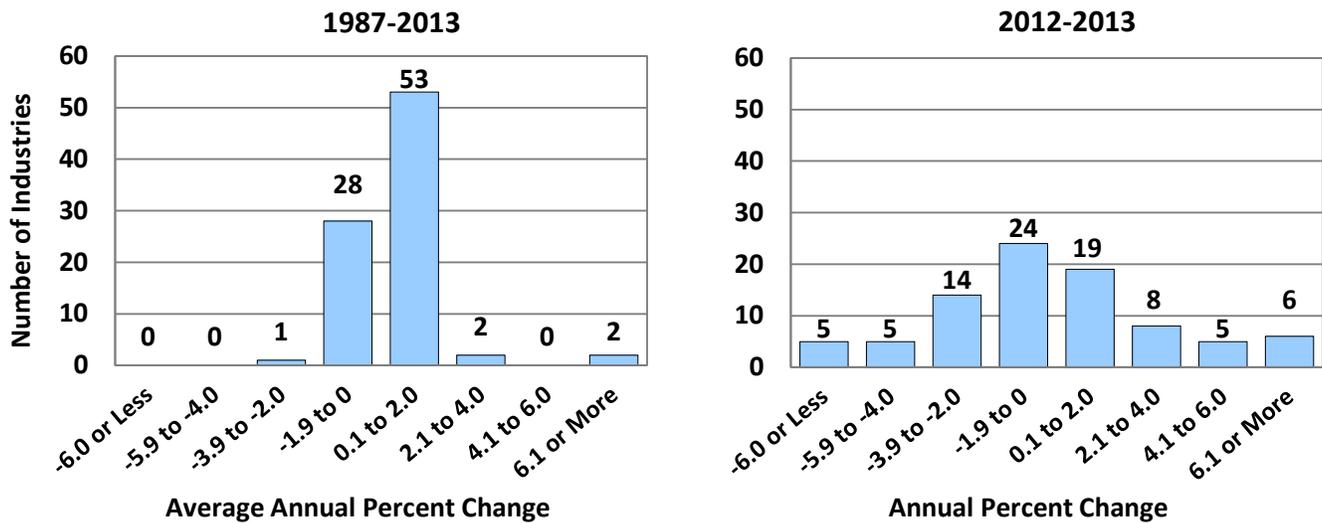
Long Term Trends in Multifactor Productivity

Year-to-year movements and long-term trends in industry multifactor productivity may both reflect cyclical changes in the economy. However, long-term average annual changes in multifactor productivity are more reliable indicators of historical trends in industry performance.

More industries experienced multifactor productivity growth over the long term than in the short term. From 1987 to 2013, 57 industries increased, compared to 38 in 2013. (See tables 1 and 2.) Average annual rates of change in multifactor productivity for nearly all manufacturing industries ranged between -2.0 and 2.0 percent over the long term. (See chart 3.)

In contrast, 2013 multifactor productivity growth rates varied. For example, multifactor productivity declined by 2.0 percent or more in 24 industries. However, only one industry (pharmaceuticals and medicines) experienced average annual decline of that magnitude.

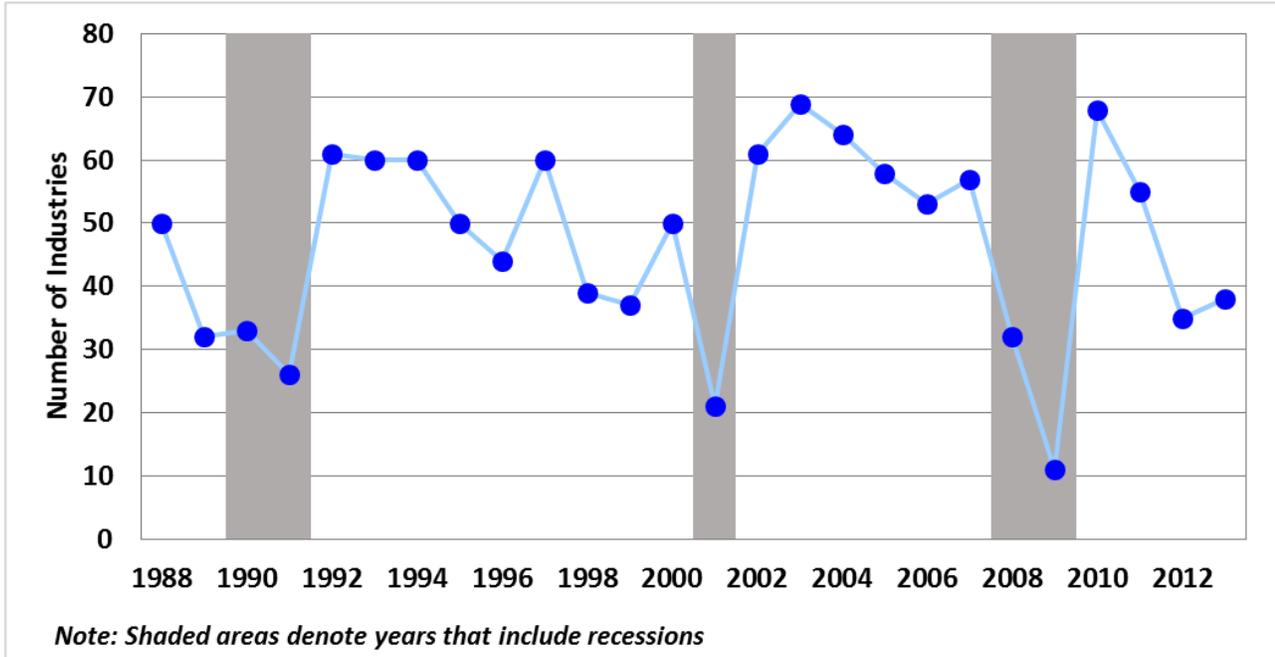
Chart 3. Distribution of percent change in multifactor productivity for manufacturing industries, 1987-2013 and 2012-2013



Between 1987 and 2013, the number of manufacturing industries with growth in multifactor productivity was highest in 2003 and 2010. These were years of economic growth following recessions. In contrast, relatively few manufacturing industries saw multifactor productivity growth in the recession years of 2001 and 2009. (See chart 4.)

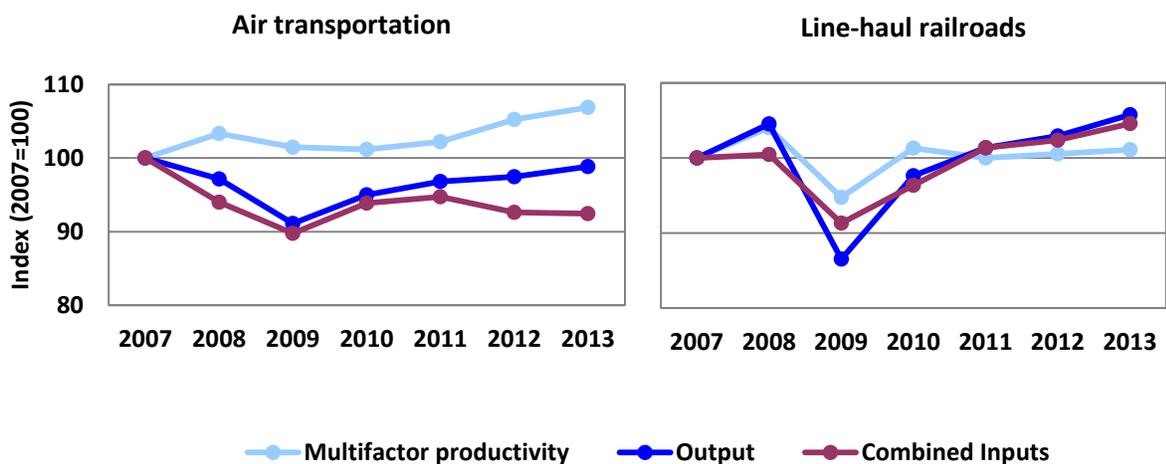
Table 3 displays the average annual percent changes in multifactor productivity by industry for sub periods between 1987 and 2013. The sub period 2000 to 2007 saw the greatest number of manufacturing industries experiencing multifactor productivity growth.

Chart 4. Number of manufacturing industries with increases in multifactor productivity, 1987-2013



From 1987 to 2013, multifactor productivity rose in both air transportation and line-haul railroads by 1.3 and 1.9 percent, respectively. While both industries experienced increases in output, productivity grew more in line-haul railroads because its combined inputs showed very slight long-term growth.

Chart 5. Changes in multifactor productivity, output, and combined inputs for transportation industries, 2007-2013



Source Data Revisions and Improvements

This news release incorporates 2013 and 2012 data, as well as revisions in earlier years, from the Annual Survey of Manufacturers and the 2012 Economic Census. It also incorporates the annual benchmark revisions of the BLS Current Employment Statistics (CES) survey published in February 2015. All measures in this release are subject to revision.

The capital services component of combined inputs for manufacturing industries includes for the first time benchmark capital investment data from the Census Bureau's Annual Capital Expenditures Survey (ACES). Capital structure assets have been expanded from two categories to ten by using the ACES benchmark data for 2008 and 2012. Capital equipment assets have been reduced from 25 categories to 24 by combining some obsolete or rare equipment types. Capital services measures for manufacturing and air transportation also incorporate changes from the 2013 Bureau of Economic Analysis (BEA) comprehensive data revision.

The intermediate purchases component of combined inputs incorporates the 2007 BEA benchmark input-output tables as well as revisions to the 1997 and 2002 tables. Intermediate purchases in this release are calculated using improved price deflators for purchased materials commodities.

For the first time, the industries included in this news release are classified according to the 2012 North American Industrial Classification System (NAICS). While the rates of change reported by BLS in this news release are rounded to one decimal place, all industry productivity percent changes are calculated using index numbers rounded to three decimal places.

Want to know more?

Find detailed data at www.bls.gov/mfp for:

- Additional years and annual rates of change
- Levels of industry employment, hours, nominal value of production, and labor compensation
- More detailed capital and intermediate purchases data available upon request

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Additional information can be obtained by calling the industry productivity program (202) 691-5618 or by sending a message via <http://data.bls.gov/cgi-bin/forms/ips?/lpc/contact.htm>. Information in this report will be made available to sensory-impaired individuals upon request. TDD message referral phone number: (800) 877-8339.

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Technical Note

Multifactor Productivity: Multifactor productivity measures are derived by dividing an index of real industry output by an index of the combined inputs of labor, capital, and intermediate purchases. The multifactor productivity indexes do not measure the specific contributions of capital, labor, and intermediate inputs. Rather, they reflect the joint influences on economic growth of a number of factors that are not specifically accounted for on the input side, including technological change, returns to scale, improved skills of the workforce, better management techniques, or other efficiency improvements.

Output: Manufacturing industry output is measured as annual sectoral output, the total value, in real terms, of goods and services produced for sale outside the industry. Industry value of production is derived by adjusting industry shipments for changes in inventories and subtracting intra-industry transfers and resales. For most manufacturing industries, real output is measured by deflating nominal value of production, but for some industries physical quantities of output are measured. For air transportation and line-haul railroads, output is measured by aggregating passenger-miles and freight ton-miles with weights based on revenues or operating expenses.

Output measures for manufacturing industries are constructed using data primarily from the economic censuses and annual surveys of the Bureau of the Census, U.S. Department of Commerce, together with information on price changes chiefly from the Bureau of Labor Statistics (BLS). Output measures for air transportation and line-haul railroads are constructed using data primarily from the Bureau of Transportation Statistics (BTS) and the Surface Transportation Board (STB), both in the U.S. Department of Transportation (DOT), together with information from the Association of American Railroads (AAR), AMTRAK, and several other sources.

Combined Inputs: The index of combined inputs is a Törnqvist index of separate quantity indexes of capital, labor, and intermediate purchases (including fuels, electricity, materials, and purchased services). The annual growth rates of the various inputs are aggregated using their relative cost shares as weights. The labor weight is based on labor compensation, including fringe benefits. The weight for intermediate purchases is based on the total cost of materials, fuels, electricity, and purchased services. The capital weight is based on total capital cost, which is calculated as the value of sectoral production minus the costs of labor compensation and intermediate purchases.

Capital Input: Capital input reflects the flow of services derived from the stock of physical assets. Capital services are estimated by calculating productive capital stocks and are assumed to be proportional to changes in these capital stocks for each asset. The capital index is a Törnqvist index of separate quantity indexes of equipment, structures, inventories, and land.

For manufacturing industries, physical capital is comprised of 24 categories of equipment, 10 categories of structures, 3 categories of inventories, and land. Measures of total capital services for each industry are estimated by aggregating the capital stocks of individual asset types. Estimates of investment by asset type for each industry are derived using annual capital expenditures for detailed industries from the economic censuses and annual surveys of the Bureau of the Census. Additional annual investment data comes from the fixed asset accounts from the Bureau of Economic Analysis (BEA). Annual investment data is supplemented with the 1997 benchmark capital flow table from the BEA as well as the 2008 and 2012 Annual Capital Expenditures Survey from the Bureau of the Census. Price changes are removed from the annual investment data before calculating stocks. Price deflators for each asset category are constructed by combining detailed price indexes (mostly BLS Producer Price Indexes) with weights that reflect each industry's use of individual asset commodities.

The capital stocks for the different assets are combined using weights based on estimated annual rental prices for each asset type, averaged between two time periods. Each rental price reflects the nominal rate of return to all assets within the industry and the rates of economic depreciation and revaluation of the specific asset. Rental prices are adjusted for the effects of taxes.

For air transportation, a weighted index of 44 types of airframes and 34 types of engines is derived from quantities and purchase prices from BTS. For assets other than airframes and engines, capital stocks are calculated similarly to manufacturing industries. For these assets, a more detailed breakdown of annual expenditures on equipment and structures from the BEA is used. Inventories of parts and supplies are also included; the current dollar series is deflated with a weighted cost index based on data from Airlines for America (A4A) and BTS. Indexes for aircraft and engines, non-aircraft assets, and parts and supplies inventories are aggregated using cost share weights to derive an overall measure of capital input.

For line-haul railroads, current dollar investment for 10 categories of equipment and 13 categories of structures, obtained from STB and AMTRAK, are deflated with BLS PPIs and deflators based on BEA data. The capital stocks for each of the items are calculated similarly to manufacturing industries. Inventories of materials and supplies are also included. Estimates of investments in land from STB and AMTRAK were deflated with price indexes from BEA.

Labor Input: For manufacturing industries, labor hours reflect annual hours worked by all employed persons in an industry. Data on industry employment and hours come primarily from the BLS Current Employment Statistics (CES) survey and the Current Population Survey (CPS). CES data on the number of total and nonsupervisory worker jobs held by wage and salary workers in nonfarm establishments are supplemented with CPS self-employed and unpaid family worker data to estimate industry employment. Hours worked estimates are derived using CES and CPS employment, CES data on average weekly hours paid of nonsupervisory workers, CPS data on hours of supervisory, self-employed, and unpaid family workers, and ratios of hours-worked to hours-paid based on data from the BLS National Compensation Survey (NCS). For some industries, employment and hours data are supplemented or further disaggregated using data from the BLS Quarterly Census of Employment and Wages (QCEW), the Census Bureau, or other sources. Hours worked are estimated separately for different types of workers and then are directly aggregated; no adjustments for labor composition are made.

For air transportation, annual labor input estimates are based on monthly employment data from DOT supplemented by employment and hours from the CES program and hours from the CPS. For line-haul railroads, labor input measures are derived primarily from DOT data and supplemented with data from AAR. For the railroad industry, the labor input measure includes an adjustment to remove capitalized labor hours in order to avoid double-counting because some capitalized labor costs are embedded in the railroad investment data.

Intermediate Purchases Input: The index of intermediate purchases is a Törnqvist index of separate quantities of materials, purchased services, fuels, and electricity consumed by each industry. Except for electricity consumed by manufacturing industries, for which direct quantity data are available, quantities are derived by deflating current-dollar values with appropriate price deflators.

For manufacturing industries, nominal values of materials, fuels and electricity, along with quantities of electricity consumed by each industry are obtained from economic censuses and annual surveys of the Bureau of the Census. To avoid double counting, an adjustment is made to the materials estimates to exclude the value of intra-industry commodity transfers. Purchased business services are estimated using annual industry data and benchmark input-output tables from BEA.

Constant-dollar materials consumed are derived by dividing annual current-dollar industry purchases by a weighted price deflator for each industry. Aggregate materials deflators are constructed for each industry by combining producer price indexes and import price indexes from BLS for detailed commodities. The deflators are combined using weights based on detailed commodity data from the BEA benchmark input-output tables. Aggregate price indexes to deflate purchased business services are constructed in a similar manner using consumer price indexes (CPIs), PPIs, and deflators developed by BEA. The value of fuels consumed by each industry is deflated with a weighted price deflator based on PPIs for individual fuel categories; the weights reflect fuel expenditures by industry from the Energy Information Administration (EIA), U.S. Department of Energy.

For air transportation, detailed cost of materials, services, fuels, and electricity from the BTS were deflated using cost indexes from A4A. For line-haul railroads, intermediate purchases data from STB were supplemented with data from other sources including AAR, AMTRAK, EIA, and the Edison Electric Institute. The nominal values were deflated with producer price indexes from BLS and implicit price deflators calculated from BEA investment data.

Table 1. Percent change in multifactor productivity and related data, 2012-2013

Industry	2012 NAICS code	2013 Employment (thousands)	Percent change					Intermediate purchases
			Multifactor productivity	Output	Combined inputs	Hours	Capital	
Manufacturing								
Animal food	3111	59.2	-3.4	1.7	5.3	0.8	2.1	6.5
Grain and oilseed milling	3112	60.3	0.6	3.2	2.6	-0.7	0.3	3.5
Sugar and confectionery products	3113	73.2	2.8	5.0	2.1	6.6	1.5	1.4
Fruit and vegetable preserving and specialty	3114	170.5	4.1	2.3	-1.7	-4.4	-0.2	-1.8
Dairy products	3115	135.0	-0.9	-0.3	0.6	-1.1	1.3	0.6
Animal slaughtering and processing	3116	483.4	3.0	1.5	-1.5	-0.1	1.6	-2.3
Seafood product preparation and packaging	3117	38.8	9.7	5.2	-4.1	-2.1	0.6	-5.4
Bakeries and tortilla products	3118	318.4	1.1	0.7	-0.4	0.6	-1.1	-0.3
Other food products	3119	184.1	0.7	2.1	1.3	3.0	0.4	1.6
Beverages	3121	190.7	0.4	2.0	1.6	10.7	1.0	0.6
Tobacco	3122	14.2	-1.3	0.7	2.0	2.0	-2.1	21.8
Fiber, yarn, and thread mills	3131	28.2	1.0	5.2	4.1	-2.4	-3.3	6.0
Fabric mills	3132	58.2	0.4	1.8	1.4	-4.5	-4.4	3.7
Textile and fabric finishing mills	3133	37.2	3.8	4.4	0.5	-5.6	-3.8	2.3
Textile furnishings mills	3141	56.2	-1.0	1.6	2.6	-2.1	-1.9	4.8
Other textile product mills	3149	71.9	2.9	4.6	1.6	-4.5	-2.9	5.5
Apparel knitting mills	3151	16.3	5.0	6.5	1.4	-18.4	-3.5	12.5
Cut and sew apparel	3152	136.8	-0.1	-4.9	-4.9	-0.4	-3.0	-7.3
Accessories and other apparel	3159	9.9	-1.0	-1.9	-0.9	1.5	-4.7	-2.1
Leather and hide tanning and finishing	3161	5.0	-5.9	9.9	16.8	-12.2	-3.9	21.1
Footwear	3162	13.9	-5.5	-12.7	-7.6	0.0	-2.8	-10.4
Other leather products	3169	15.2	1.4	-0.4	-1.8	-9.9	-4.4	2.7
Sawmills and wood preservation	3211	93.3	-3.3	3.3	6.8	6.9	-2.8	8.4
Plywood and engineered wood products	3212	68.0	-0.1	7.3	7.4	4.3	-3.3	10.0
Other wood products	3219	214.4	-2.1	5.0	7.3	5.4	0.2	8.5
Pulp, paper, and paperboard mills	3221	108.8	2.4	0.4	-2.0	0.5	-2.5	-2.3
Converted paper products	3222	271.4	4.1	0.8	-3.2	0.4	-0.9	-4.7
Printing and related support activities	3231	473.9	1.3	0.6	-0.7	-1.2	-5.1	0.9
Petroleum and coal products	3241	110.7	3.1	2.8	-0.3	-3.0	2.7	-0.6
Basic chemicals	3251	142.6	-1.2	2.1	3.3	-0.5	0.4	5.2
Resin, rubber, and artificial fibers	3252	92.3	-2.6	-0.8	1.8	0.2	-0.9	2.7
Agricultural chemicals	3253	38.8	6.4	16.1	9.1	12.2	4.2	12.5
Pharmaceuticals and medicines	3254	276.7	-6.0	-4.1	2.0	2.1	-0.5	4.7
Paints, coatings, and adhesives	3255	58.5	-0.2	4.4	4.6	9.0	-0.7	5.6
Soaps, cleaning compounds, and toiletries	3256	104.9	-3.8	-1.4	2.5	-4.6	-1.5	8.0
Other chemical products and preparations	3259	83.5	-0.1	-3.4	-3.4	0.3	-2.6	-4.4
Plastics products	3261	530.0	0.5	2.6	2.1	3.2	-0.4	2.8
Rubber products	3262	130.9	-0.5	-2.5	-2.0	-1.1	0.0	-2.7
Clay products and refractories	3271	46.5	3.1	1.4	-1.7	-9.0	-3.0	3.1
Glass and glass products	3272	89.1	1.2	0.1	-1.1	-1.1	-1.7	-0.7
Cement and concrete products	3273	169.8	0.3	3.3	3.0	-0.2	-2.7	5.9
Lime and gypsum products	3274	13.9	1.7	4.0	2.3	-2.4	-0.8	5.1
Other nonmetallic mineral products	3279	72.1	4.2	9.3	4.8	7.5	0.3	7.2
Iron and steel mills and ferroalloys	3311	92.7	6.5	3.5	-2.8	-3.5	-1.0	-3.0
Steel products from purchased steel	3312	60.3	-0.2	-0.2	0.0	0.7	1.8	-0.4
Alumina and aluminum production	3313	58.5	6.8	7.1	0.3	-2.7	-0.1	0.9
Other nonferrous metal production	3314	62.5	-0.8	4.2	5.0	1.0	1.3	6.7
Foundries	3315	125.7	1.6	0.4	-1.2	-2.8	-0.6	-0.6

Table 1. Percent change in multifactor productivity and related data, 2012-2013-Continued

Industry	2012 NAICS code	2013 Employment (thousands)	Percent change					
			Multifactor productivity	Output	Combined inputs	Hours	Capital	Intermediate purchases
Forging and stamping	3321	98.9	-0.2	1.1	1.4	-0.6	2.4	1.8
Cutlery and handtools	3322	42.2	-6.4	-2.3	4.4	-0.5	-1.4	9.9
Architectural and structural metals	3323	353.6	0.3	2.4	2.1	3.0	0.5	2.1
Boilers, tanks, and shipping containers	3324	97.8	-4.5	-0.6	4.1	3.5	0.1	5.6
Hardware	3325	23.6	1.2	6.7	5.3	0.0	-2.4	9.7
Spring and wire products	3326	43.1	-5.0	-4.3	0.8	5.0	-0.6	-0.7
Machine shops and threaded products	3327	380.3	-1.4	1.3	2.7	1.3	3.1	3.8
Coating, engraving, and heat treating metals	3328	142.0	-1.5	1.3	2.9	4.6	0.8	3.2
Other fabricated metal products	3329	281.3	-2.6	-0.6	2.0	2.8	1.2	2.1
Agriculture, construction, and mining machinery	3331	252.4	-9.0	-9.6	-0.7	-0.1	1.5	-1.8
Industrial machinery	3332	108.1	-2.1	0.0	2.2	1.1	-0.9	2.9
Commercial and service industry machinery	3333	86.9	-1.6	-2.1	-0.5	-3.4	-2.5	1.2
HVAC and commercial refrigeration equipment	3334	127.6	-1.7	0.5	2.3	-3.1	-1.2	5.3
Metalworking machinery	3335	183.8	-2.4	-1.1	1.4	-2.0	0.1	4.3
Turbine and power transmission equipment	3336	98.5	-5.4	-9.6	-4.4	3.0	0.6	-7.6
Other general purpose machinery	3339	257.3	-2.9	-2.4	0.5	-0.5	0.2	0.9
Computer and peripheral equipment	3341	158.8	2.3	-4.0	-6.2	2.6	-8.2	-8.0
Communications equipment	3342	101.1	17.3	11.3	-5.1	-10.4	-4.1	-2.4
Audio and video equipment	3343	19.4	6.9	4.8	-2.0	-2.1	-5.1	-0.4
Semiconductors and electronic components	3344	376.7	-11.9	-9.9	2.3	-3.3	2.1	5.9
Electronic instruments	3345	395.8	-3.9	-3.9	-0.1	-0.2	-0.3	0.1
Magnetic media manufacturing and reproducing	3346	19.4	-3.7	-11.2	-7.8	-11.0	-7.5	-5.5
Electric lighting equipment	3351	48.0	1.1	-0.1	-1.2	1.7	-1.9	-2.2
Household appliances	3352	57.7	-13.1	1.6	17.0	0.3	-0.8	35.9
Electrical equipment	3353	145.1	-1.6	-1.5	0.1	1.0	-0.8	0.1
Other electrical equipment and components	3359	126.9	-2.5	-0.4	2.2	4.7	-0.5	2.6
Motor vehicles	3361	181.7	-1.0	6.5	7.6	4.8	4.2	8.3
Motor vehicle bodies and trailers	3362	135.5	-0.5	8.3	8.9	4.1	5.7	10.2
Motor vehicle parts	3363	511.5	4.1	5.0	0.9	4.7	5.2	0.0
Aerospace products and parts	3364	498.0	-3.1	2.3	5.6	-1.5	1.4	11.0
Railroad rolling stock	3365	25.1	-1.8	14.1	16.2	7.6	2.8	18.8
Ship and boat building	3366	132.1	-3.1	4.5	7.8	4.1	0.5	12.2
Other transportation equipment	3369	32.3	-0.6	-4.4	-3.9	-2.9	-1.2	-4.7
Household and institutional furniture	3371	246.1	2.0	5.0	2.9	2.0	-2.2	4.4
Office furniture and fixtures	3372	105.2	-0.4	1.2	1.7	2.0	-1.3	3.0
Other furniture related products	3379	35.2	-0.7	3.4	4.1	6.9	-1.1	6.0
Medical equipment and supplies	3391	316.6	0.1	2.5	2.5	-0.6	1.6	5.0
Other miscellaneous manufacturing	3399	319.3	1.1	3.5	2.4	3.1	-0.6	2.9
Transportation								
Air transportation	481	417.7	1.6	1.4	-0.2	-4.2	-0.7	2.3
Line-haul railroads	482111	183.3	0.5	2.7	2.2	-0.3	2.6	3.3

Table 2. Average annual percent change in multifactor productivity and related data, 1987-2013

Industry	2012 NAICS code	Percent change					Intermediate purchases
		Multifactor productivity	Output	Combined inputs	Hours	Capital	
Manufacturing							
Animal food	3111	-0.2	1.8	2.0	-0.4	1.7	2.3
Grain and oilseed milling	3112	0.1	1.4	1.3	-0.6	0.5	1.7
Sugar and confectionery products	3113	0.0	0.5	0.5	-0.8	0.8	0.7
Fruit and vegetable preserving and specialty	3114	0.3	1.2	0.9	-0.3	1.0	1.1
Dairy products	3115	-0.1	1.5	1.5	-0.4	1.5	1.9
Animal slaughtering and processing	3116	0.6	1.9	1.3	0.9	1.9	1.2
Seafood product preparation and packaging	3117	0.2	0.0	-0.1	-0.9	1.0	-0.2
Bakeries and tortilla products	3118	-0.8	0.3	1.1	-0.1	1.0	1.8
Other food products	3119	0.3	2.0	1.7	1.5	1.2	2.0
Beverages	3121	0.5	1.5	1.0	0.1	0.5	1.4
Tobacco	3122	-0.4	-2.7	-2.4	-4.7	-2.4	-1.3
Fiber, yarn, and thread mills	3131	0.9	-1.9	-2.7	-5.0	-2.0	-2.2
Fabric mills	3132	0.8	-2.5	-3.3	-6.2	-2.2	-2.5
Textile and fabric finishing mills	3133	-0.1	-3.1	-3.0	-4.5	-2.1	-2.8
Textile furnishings mills	3141	-0.4	-2.5	-2.1	-3.1	-1.0	-2.3
Other textile product mills	3149	0.2	-0.6	-0.8	-2.4	0.6	-0.4
Apparel knitting mills	3151	-0.8	-6.7	-5.9	-7.3	-2.6	-5.9
Cut and sew apparel	3152	-1.9	-7.1	-5.3	-6.4	-2.5	-6.4
Accessories and other apparel	3159	-1.8	-6.8	-5.1	-5.4	-2.1	-5.2
Leather and hide tanning and finishing	3161	-1.1	-2.9	-1.8	-3.7	-2.3	-1.6
Footwear	3162	-0.8	-5.1	-4.4	-6.6	-3.3	-3.5
Other leather products	3169	-1.2	-3.9	-2.7	-3.5	-1.7	-3.3
Sawmills and wood preservation	3211	0.9	0.0	-0.9	-1.9	-1.3	-0.5
Plywood and engineered wood products	3212	0.0	-0.1	-0.1	-1.5	0.1	0.6
Other wood products	3219	-0.5	-0.4	0.0	-1.6	0.6	0.8
Pulp, paper, and paperboard mills	3221	0.7	-0.4	-1.1	-3.1	-1.0	-0.4
Converted paper products	3222	0.2	0.3	0.1	-1.4	0.6	0.4
Printing and related support activities	3231	0.1	-0.6	-0.7	-2.0	0.8	-0.3
Petroleum and coal products	3241	-0.2	1.2	1.4	-1.1	0.9	1.6
Basic chemicals	3251	-0.4	0.8	1.2	-1.9	0.3	2.3
Resin, rubber, and artificial fibers	3252	0.4	0.7	0.3	-1.8	0.1	0.7
Agricultural chemicals	3253	1.3	1.5	0.2	-0.9	-0.7	1.0
Pharmaceuticals and medicines	3254	-2.1	1.6	3.8	1.9	4.0	4.5
Paints, coatings, and adhesives	3255	-0.6	-0.4	0.2	-1.2	0.0	0.7
Soaps, cleaning compounds, and toiletries	3256	0.2	1.6	1.3	-0.6	1.6	1.6
Other chemical products and preparations	3259	0.2	0.1	-0.1	-2.1	-0.1	0.7
Plastics products	3261	0.5	1.7	1.2	-0.2	2.2	1.5
Rubber products	3262	0.4	0.4	0.0	-1.8	0.0	1.0
Clay products and refractories	3271	0.2	-1.6	-1.8	-2.4	-1.4	-1.5
Glass and glass products	3272	1.2	0.5	-0.7	-2.1	-0.3	-0.2
Cement and concrete products	3273	-0.3	-0.1	0.1	-0.4	0.1	0.3
Lime and gypsum products	3274	-0.4	-0.6	-0.3	-1.8	0.3	-0.1
Other nonmetallic mineral products	3279	1.1	1.1	0.1	-0.5	-0.2	0.6
Iron and steel mills and ferroalloys	3311	1.1	1.5	0.5	-2.4	-2.0	2.0
Steel products from purchased steel	3312	0.0	0.3	0.3	-0.3	-1.6	0.8
Alumina and aluminum production	3313	0.6	0.6	0.0	-2.3	-0.9	0.7
Other nonferrous metal production	3314	0.2	0.4	0.1	-2.0	-0.2	0.8
Foundries	3315	0.2	-0.1	-0.4	-2.1	-0.7	1.0

Table 2. Average annual percent change in multifactor productivity and related data, 1987-2013-Continued

Industry	2012 NAICS code	Percent change					
		Multifactor productivity	Output	Combined inputs	Hours	Capital	Intermediate purchases
Forging and stamping	3321	0.9	1.6	0.6	-1.1	1.2	1.5
Cutlery and handtools	3322	-0.2	-1.0	-0.9	-2.2	-0.5	0.0
Architectural and structural metals	3323	-0.3	0.7	1.0	0.2	0.7	1.5
Boilers, tanks, and shipping containers	3324	0.2	0.7	0.5	-0.2	-0.4	1.0
Hardware	3325	-0.8	-2.6	-1.8	-3.6	-1.1	-1.2
Spring and wire products	3326	0.3	-0.2	-0.5	-2.4	0.3	0.2
Machine shops and threaded products	3327	1.0	2.7	1.7	0.9	2.0	2.5
Coating, engraving, and heat treating metals	3328	1.3	2.4	1.2	0.2	1.3	1.7
Other fabricated metal products	3329	-0.3	0.2	0.5	-0.6	0.4	1.2
Agriculture, construction, and mining machinery	3331	0.7	3.2	2.5	0.7	0.6	3.6
Industrial machinery	3332	0.4	0.8	0.4	-1.1	1.1	1.1
Commercial and service industry machinery	3333	0.0	-0.2	-0.2	-2.2	-0.4	0.9
HVAC and commercial refrigeration equipment	3334	0.6	1.2	0.6	-1.0	0.9	1.1
Metalworking machinery	3335	0.7	0.6	-0.1	-1.4	0.0	1.1
Turbine and power transmission equipment	3336	0.1	1.8	1.7	-0.1	0.5	2.9
Other general purpose machinery	3339	0.4	1.6	1.3	-0.8	0.4	2.6
Computer and peripheral equipment	3341	13.7	13.5	-0.2	-3.9	1.2	0.4
Communications equipment	3342	3.0	3.0	0.0	-3.2	2.6	0.7
Audio and video equipment	3343	2.4	-1.4	-3.8	-4.3	-0.7	-4.1
Semiconductors and electronic components	3344	11.0	13.1	1.9	-1.6	6.0	0.5
Electronic instruments	3345	1.1	1.6	0.5	-1.9	0.8	2.3
Magnetic media manufacturing and reproducing	3346	1.8	-2.0	-3.8	-2.8	0.0	-5.4
Electric lighting equipment	3351	0.3	-0.5	-0.8	-2.2	0.0	-0.5
Household appliances	3352	1.6	0.0	-1.6	-3.2	-0.7	-1.3
Electrical equipment	3353	0.1	-0.4	-0.5	-2.0	-0.9	0.6
Other electrical equipment and components	3359	0.6	0.2	-0.4	-1.7	0.1	0.1
Motor vehicles	3361	0.3	1.8	1.6	-1.9	0.8	2.2
Motor vehicle bodies and trailers	3362	-0.4	1.5	1.9	0.1	1.2	2.5
Motor vehicle parts	3363	1.2	2.7	1.5	-0.6	0.0	2.4
Aerospace products and parts	3364	-0.1	0.8	0.9	-1.9	0.4	3.0
Railroad rolling stock	3365	0.8	5.7	4.9	0.1	0.2	6.8
Ship and boat building	3366	0.1	0.9	0.8	-1.0	0.0	2.3
Other transportation equipment	3369	1.4	3.7	2.3	-0.3	2.4	2.9
Household and institutional furniture	3371	0.1	-0.9	-0.9	-2.2	0.1	-0.5
Office furniture and fixtures	3372	0.3	0.2	0.0	-1.3	0.7	0.6
Other furniture related products	3379	0.9	1.4	0.6	-1.0	-0.2	1.4
Medical equipment and supplies	3391	1.0	4.0	3.0	0.8	4.1	3.7
Other miscellaneous manufacturing	3399	0.3	0.3	-0.1	-1.3	0.8	0.4
Transportation							
Air transportation	481	1.3	2.6	1.2	-0.8	3.4	1.9
Line-haul railroads	482111	1.9	2.0	0.1	-1.7	0.2	1.9

Table 3. Multifactor productivity, average annual rates of change, 1987-2013 and selected subperiods

Industry	2012 NAICS code	Percent change						
		1987-2013	1987-1990	1990-1995	1995-2000	2000-2007	2007-2013	2012-2013
Manufacturing								
Animal food	3111	-0.2	0.9	0.5	-1.0	1.8	-3.1	-3.4
Grain and oilseed milling	3112	0.1	-0.1	0.5	0.4	0.4	-0.6	0.6
Sugar and confectionery products	3113	0.0	0.4	0.5	1.7	0.0	-2.1	2.8
Fruit and vegetable preserving and specialty	3114	0.3	-2.1	1.2	0.8	1.1	-0.6	4.1
Dairy products	3115	-0.1	-1.1	0.3	-0.5	0.8	-0.7	-0.9
Animal slaughtering and processing	3116	0.6	-0.2	1.0	1.0	1.9	-1.1	3.0
Seafood product preparation and packaging	3117	0.2	-1.5	-0.2	0.8	2.4	-1.9	9.7
Bakeries and tortilla products	3118	-0.8	-4.0	0.4	-0.6	0.7	-2.1	1.1
Other food products	3119	0.3	0.2	1.0	-0.6	1.6	-1.0	0.7
Beverages	3121	0.5	1.0	1.4	-1.2	1.7	-0.4	0.4
Tobacco	3122	-0.4	2.0	1.4	0.5	-1.3	-2.6	-1.3
Fiber, yarn, and thread mills	3131	0.9	0.7	0.2	0.9	3.6	-1.5	1.0
Fabric mills	3132	0.8	0.2	1.4	0.7	2.7	-1.5	0.4
Textile and fabric finishing mills	3133	-0.1	-0.1	0.0	0.9	0.3	-1.6	3.8
Textile furnishings mills	3141	-0.4	-0.4	1.5	-1.2	0.5	-2.5	-1.0
Other textile product mills	3149	0.2	0.1	0.2	-0.7	1.7	-0.8	2.9
Apparel knitting mills	3151	-0.8	0.9	1.9	-2.2	-3.7	0.7	5.0
Cut and sew apparel	3152	-1.9	-1.2	0.7	-0.7	-3.4	-3.5	-0.1
Accessories and other apparel	3159	-1.8	0.8	0.5	-6.3	-3.9	1.4	-1.0
Leather and hide tanning and finishing	3161	-1.1	-3.5	-0.9	3.1	-3.4	-0.6	-5.9
Footwear	3162	-0.8	-2.0	-0.1	-0.8	-0.2	-1.5	-5.5
Other leather products	3169	-1.2	0.1	-2.3	2.7	0.7	-6.4	1.4
Sawmills and wood preservation	3211	0.9	1.2	-1.1	0.0	1.7	2.2	-3.3
Plywood and engineered wood products	3212	0.0	-1.1	-0.7	-0.2	0.5	0.5	-0.1
Other wood products	3219	-0.5	-0.8	-1.2	-0.8	0.4	-0.5	-2.1
Pulp, paper, and paperboard mills	3221	0.7	-1.8	-0.2	1.5	1.6	1.0	2.4
Converted paper products	3222	0.2	0.0	-0.1	-0.4	0.5	0.6	4.1
Printing and related support activities	3231	0.1	-0.2	-0.6	-1.2	0.9	0.8	1.3
Petroleum and coal products	3241	-0.2	-1.5	1.6	2.8	-1.5	-2.1	3.1
Basic chemicals	3251	-0.4	-1.0	-2.9	-0.6	3.2	-2.1	-1.2
Resin, rubber, and artificial fibers	3252	0.4	-1.7	0.6	0.3	1.9	-0.3	-2.6
Agricultural chemicals	3253	1.3	1.7	0.8	-0.1	2.9	0.8	6.4
Pharmaceuticals and medicines	3254	-2.1	-1.6	-2.7	-2.1	-0.4	-3.9	-6.0
Paints, coatings, and adhesives	3255	-0.6	-2.0	-0.7	-1.0	0.8	-1.3	-0.2
Soaps, cleaning compounds, and toiletries	3256	0.2	-1.2	0.2	-1.6	4.2	-2.0	-3.8
Other chemical products and preparations	3259	0.2	-1.2	0.5	0.8	-0.3	0.7	-0.1
Plastics products	3261	0.5	-0.7	1.0	0.8	0.7	0.0	0.5
Rubber products	3262	0.4	1.0	0.8	1.4	0.5	-1.1	-0.5
Clay products and refractories	3271	0.2	0.8	1.0	1.1	-0.4	-0.8	3.1
Glass and glass products	3272	1.2	-0.1	1.6	2.0	0.6	1.6	1.2
Cement and concrete products	3273	-0.3	0.8	0.3	0.4	0.0	-2.0	0.3
Lime and gypsum products	3274	-0.4	-1.4	-2.2	1.0	0.2	0.1	1.7
Other nonmetallic mineral products	3279	1.1	-0.8	2.2	-0.5	2.7	0.5	4.2
Iron and steel mills and ferroalloys	3311	1.1	1.1	1.9	1.6	0.7	0.4	6.5
Steel products from purchased steel	3312	0.0	1.4	2.4	-0.1	-0.5	-1.9	-0.2
Alumina and aluminum production	3313	0.6	-1.1	-0.3	0.8	1.2	1.2	6.8
Other nonferrous metal production	3314	0.2	-1.9	1.8	1.8	-3.3	2.9	-0.8
Foundries	3315	0.2	-0.2	1.6	0.0	1.2	-1.6	1.6

Table 3. Multifactor productivity, average annual rates of change, 1987-2013 and selected subperiods-Continued

Industry	2012 NAICS code	Percent change						
		1987-2013	1987-1990	1990-1995	1995-2000	2000-2007	2007-2013	2012-2013
Forging and stamping	3321	0.9	-0.7	0.9	0.4	3.5	-0.8	-0.2
Cutlery and handtools	3322	-0.2	-1.5	1.0	-0.4	0.5	-1.1	-6.4
Architectural and structural metals	3323	-0.3	-1.2	0.8	-0.7	1.4	-2.2	0.3
Boilers, tanks, and shipping containers	3324	0.2	0.4	1.2	0.2	1.4	-2.0	-4.5
Hardware	3325	-0.8	-2.3	0.7	-0.1	-0.7	-1.8	1.2
Spring and wire products	3326	0.3	0.1	1.5	0.1	1.7	-2.0	-5.0
Machine shops and threaded products	3327	1.0	0.9	3.2	0.2	1.5	-0.7	-1.4
Coating, engraving, and heat treating metals	3328	1.3	0.9	2.1	-0.7	3.6	-0.3	-1.5
Other fabricated metal products	3329	-0.3	-1.8	0.3	-1.1	1.8	-1.7	-2.6
Agriculture, construction, and mining machinery	3331	0.7	2.5	0.0	-1.0	2.0	0.2	-9.0
Industrial machinery	3332	0.4	0.2	1.6	0.0	1.4	-1.3	-2.1
Commercial and service industry machinery	3333	0.0	0.8	-0.2	-1.2	-0.2	0.8	-1.6
HVAC and commercial refrigeration equipment	3334	0.6	-0.1	0.7	0.3	1.7	0.0	-1.7
Metalworking machinery	3335	0.7	0.2	1.4	-1.1	2.5	-0.2	-2.4
Turbine and power transmission equipment	3336	0.1	-0.6	-0.1	0.6	-0.1	0.3	-5.4
Other general purpose machinery	3339	0.4	0.3	0.0	-0.1	1.9	-0.8	-2.9
Computer and peripheral equipment	3341	13.7	7.1	15.3	24.2	18.1	2.8	2.3
Communications equipment	3342	3.0	4.2	5.4	5.7	3.5	-2.1	17.3
Audio and video equipment	3343	2.4	3.3	2.7	1.7	3.2	1.5	6.9
Semiconductors and electronic components	3344	11.0	7.3	18.4	22.1	6.5	3.8	-11.9
Electronic instruments	3345	1.1	1.9	1.0	-0.5	1.2	2.1	-3.9
Magnetic media manufacturing and reproducing	3346	1.8	0.4	5.6	-3.3	3.4	2.1	-3.7
Electric lighting equipment	3351	0.3	-1.9	0.3	0.4	2.0	-0.8	1.1
Household appliances	3352	1.6	-0.2	2.8	0.9	3.5	0.1	-13.1
Electrical equipment	3353	0.1	0.6	2.1	-1.8	1.5	-1.7	-1.6
Other electrical equipment and components	3359	0.6	-1.7	1.2	0.7	0.8	1.0	-2.5
Motor vehicles	3361	0.3	0.5	-1.3	0.0	2.8	-1.2	-1.0
Motor vehicle bodies and trailers	3362	-0.4	-3.0	2.3	-1.5	0.6	-1.5	-0.5
Motor vehicle parts	3363	1.2	-0.7	2.5	0.9	1.9	0.4	4.1
Aerospace products and parts	3364	-0.1	-2.3	-0.9	-0.9	2.7	-0.9	-3.1
Railroad rolling stock	3365	0.8	2.0	-1.4	4.9	-1.7	1.7	-1.8
Ship and boat building	3366	0.1	0.0	-1.5	-0.1	0.3	1.5	-3.1
Other transportation equipment	3369	1.4	-2.8	4.7	-0.3	5.9	-2.8	-0.6
Household and institutional furniture	3371	0.1	-0.4	0.7	-0.5	1.1	-1.0	2.0
Office furniture and fixtures	3372	0.3	-2.7	0.4	1.8	1.0	-0.4	-0.4
Other furniture related products	3379	0.9	-0.1	0.8	-0.4	2.3	0.9	-0.7
Medical equipment and supplies	3391	1.0	2.4	0.4	1.5	1.1	0.4	0.1
Other miscellaneous manufacturing	3399	0.3	1.3	0.6	0.2	0.7	-0.8	1.1
Transportation								
Air transportation	481	1.3	-0.7	-0.2	-0.1	4.6	1.1	1.6
Line-haul railroads	482111	1.9	4.4	4.3	1.2	1.0	0.2	0.5