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PRODUCTIVITY AND COSTS BY INDUSTRY: MANUFACTURING AND MINING INDUSTRIES – 2017

Labor productivity declines were widespread among manufacturing industries in 2017, with decreases in 54 of the 86 four-digit NAICS industries. Of the 51 industries in durable manufacturing, 34 experienced productivity decreases in 2017 led by a decline in the other transportation equipment industry of 11.5 percent. Nondurable manufacturing also experienced widespread declines in 2017 with productivity falling in 20 of 35 industries, led by the sugar and confectionery products industry with a decrease of 8.0 percent. Of the 4 industries in the mining sector, 3 had productivity gains in 2017 led by the oil and gas extraction industry with an increase of 32.6 percent. (See chart 1.)

Chart 1. Manufacturing and mining industries with the largest change in productivity, 2017
(NAICS 4-digit industries)

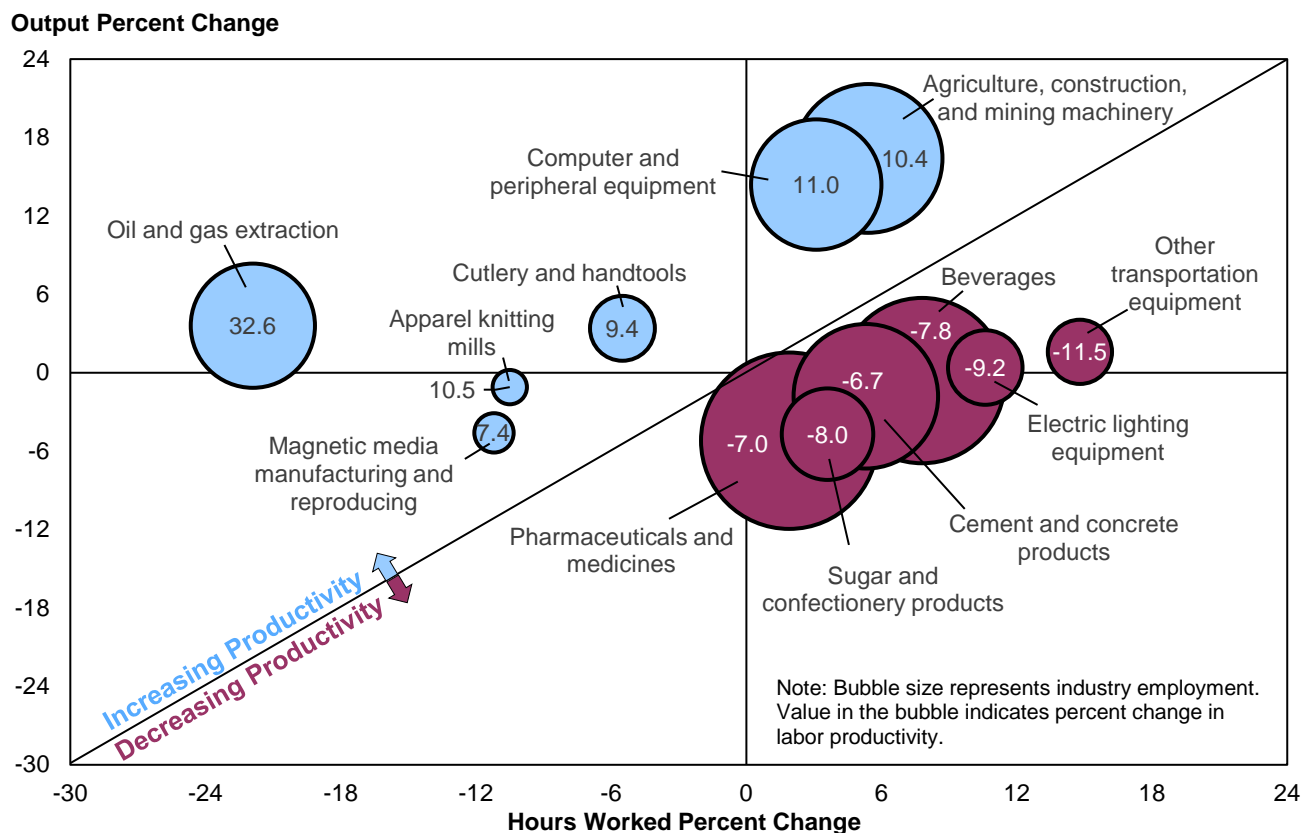


Chart 1 shows the industries with the largest changes in productivity in 2017. Change in productivity is approximately equal to the change in output minus the change in hours worked. In the six industries with declining productivity (below the diagonal line), all experienced growth in hours worked but the majority had declining output. Of the six industries with productivity gains (those above the diagonal line), only two industries had growth in both output and hours worked.

Labor Productivity Trends in 3-Digit Industries, 2017

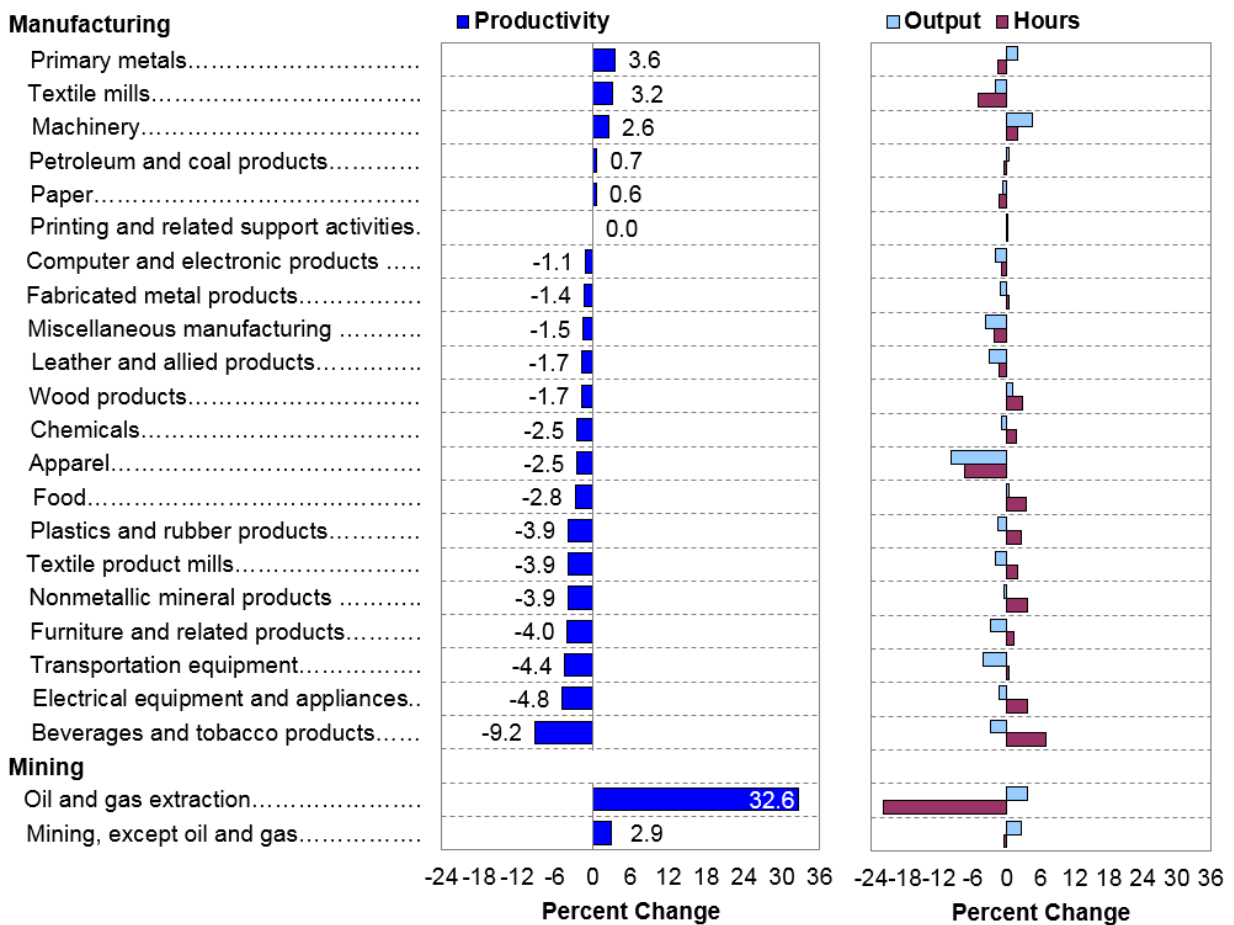
Manufacturing

- Labor productivity decreased in 15 of the 21 NAICS 3-digit manufacturing industries in 2017, as output declined in 15 industries and hours worked rose in 13. (See chart 2.)
- The beverage and tobacco products industry had the fastest productivity decline of 9.2 percent, as output fell 2.9 percent and hours worked increased 6.9 percent.
- The primary metals industry had the largest productivity gain of 3.6 percent, as output increased and hours decreased.

Mining

- Labor productivity rose by 32.6 percent in the oil and gas extraction industry where a significant decline in hours worked outpaced modest growth in output. (See chart 2.)
- The mining, except oil and gas industry had productivity gains of 2.9 percent, as output increased and hours worked decreased.

Chart 2. Productivity growth in NAICS 3-digit manufacturing and mining industries, 2017



Trends in Unit Labor Costs in 2017

Unit labor costs, which reflect the total labor costs required to produce a unit of output, rose in 73 of the 86 NAICS 4-digit manufacturing industries. Of the 51 industries in durable manufacturing, 45 experienced rising unit labor costs led by the audio and video equipment manufacturing industry with an increase of 16.8 percent. Nondurable manufacturing also experienced widespread increases in unit labor costs with 28 of the 35 industries recording an increase, led by the apparel accessories and other apparel manufacturing industry with a rise of 13.0 percent. Of the 4 industries in the mining sector, 3 had decreases in unit labor costs led by the oil and gas extraction industry with a decline of 18.6 percent. (See table 1.)

Unit Labor Cost Trends in 3-Digit Industries, 2017

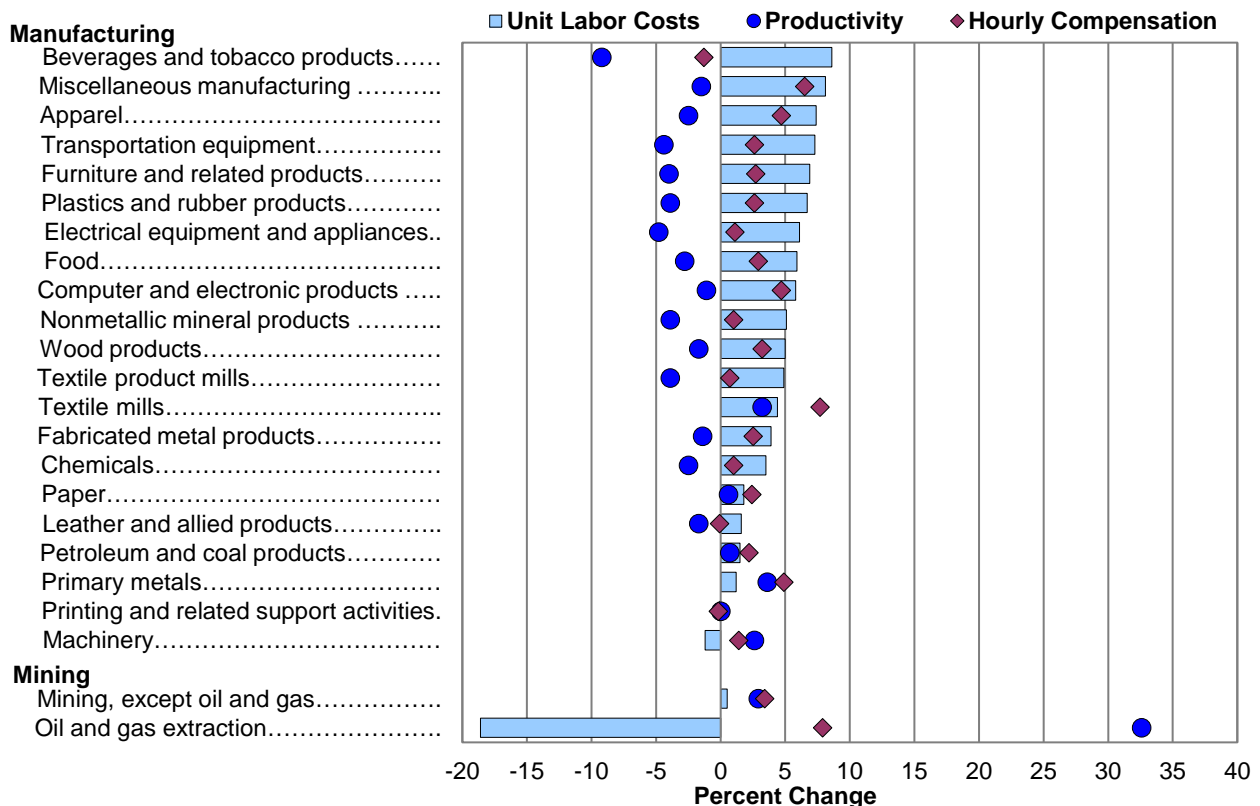
Manufacturing

- Employers experience increased unit labor costs when hourly compensation growth outpaces productivity growth. Unit labor costs increased in 19 of the 21 manufacturing industries, as hourly compensation growth outpaced that of productivity. (See chart 3.)

Mining

- Unit labor costs declined in the oil and gas extraction industry by 18.6 percent, as productivity and hourly compensation increased by 32.6 percent and 7.9 percent respectively. (See chart 3.)
- The mining, except oil and gas industry had an increase in unit labor costs, as hourly compensation rose faster than productivity.

Chart 3. Unit labor costs, productivity, and hourly compensation in NAICS 3-digit manufacturing and mining industries, 2017



Long-Term Trends in Labor Productivity and Unit Labor Costs

Chart 4 displays the number of NAICS 4-digit manufacturing and mining industries with increases in productivity, output, and hours worked for selected time periods through 2017.

Labor Productivity

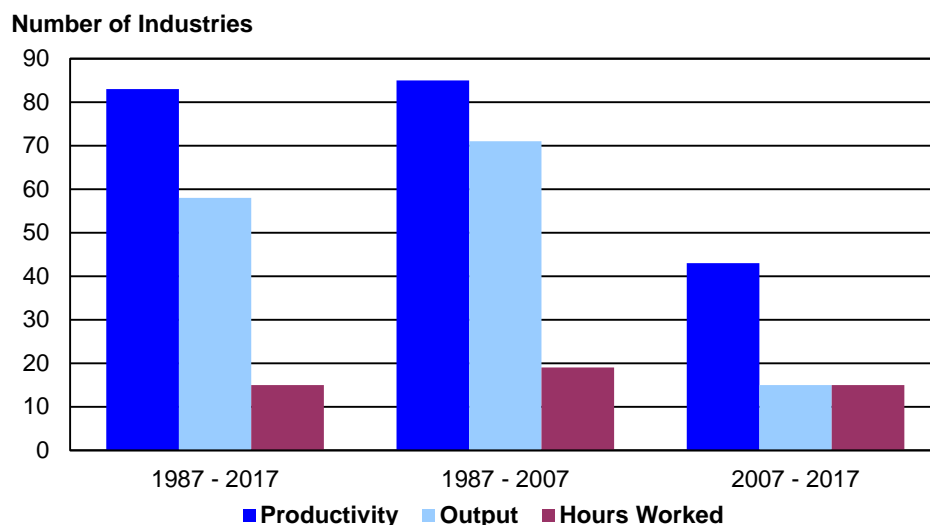
- Over the entire **1987-2017** period, labor productivity rose in 83 of the 90 manufacturing and mining industries. This was associated with output rising in 58 industries, while hours worked increased in only 15.
- During the more recent **2007-2017** period, which included the Great Recession, productivity increased in only 43 industries. These increases are predominantly the result of a decline in hours worked rather than an increase in output, as hours worked fell in 72 industries while output increased in only 15.

Unit Labor Costs

- During the **1987-2017** period, unit labor costs increased in 80 of the 90 manufacturing and mining industries. Among the NAICS 4-digit industries, unit labor costs increased in 76 of the 86 manufacturing industries. All of the 4 mining industries saw an increase in unit labor costs.
- From **2007 to 2017**, unit labor costs increased in 80 of the 86 manufacturing industries and in 3 of the 4 mining industries. The computer and peripheral equipment manufacturing industry was the only industry with declines in both labor productivity and unit labor costs, as hourly compensation fell faster than productivity.

The computer and peripheral equipment manufacturing industry recorded the largest productivity gain as well as the largest unit labor cost decline during both the 1987-2017 and 1987-2007 periods. However, between 2007 and 2017, this industry saw the sharpest drop in unit labor costs while the oil and gas extraction industry posted the greatest productivity growth.

Chart 4. Manufacturing and mining industries with increases in labor productivity, output, and hours worked



Additional Information

Manufacturing industry output for 2017 is constructed with data on industrial production from the Federal Reserve and BLS price indexes. These measures also incorporate data from the Census Bureau's 2016 Annual Survey of Manufactures.

Want to know more?

Find data at www.bls.gov/lpc for:

- Additional industries and sectors
- Detailed data series: indexes of productivity and related measures; rates of change; and levels of industry employment, hours worked, nominal value of production, and labor compensation
- Additional years and long-term data

Questions?

Additional information can be obtained by calling the BLS productivity program at (202) 691-5606 or by sending an email to productivity@bls.gov. Information in this release will be made available to sensory impaired individuals upon request. Voice phone: (202) 691-5200; Federal Relay Service: (800) 877-8339.

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Technical Note

Labor Productivity: Labor productivity describes the relationship between real output and the labor hours involved in its production. These measures show the changes from period to period in the amount of goods and services produced per hour worked. Although the labor productivity measures relate output in an industry to hours worked of all persons in that industry, they do not measure the specific contribution of labor to growth in output. Rather, they reflect the joint effects of many influences, including: changes in technology; capital investment; utilization of capacity, energy, and materials; the use of purchased services inputs, including contract employment services; the organization of production; the characteristics and effort of the workforce; and managerial skill.

Unit Labor Costs: Unit labor costs represent the cost of labor required to produce one unit of output. The unit labor cost indexes are computed by dividing an index of nominal industry labor compensation by an index of real industry output. Unit labor costs also describe the relationship between compensation per hour worked (hourly compensation) and real output per hour worked (labor productivity). When hourly compensation growth outpaces productivity, unit labor costs increase. Alternatively, when productivity growth exceeds hourly compensation, unit labor costs decrease.

Output: Industry output is measured as an annual-weighted index of the changes in the various products (in real terms) provided for sale outside the industry. Real industry output is usually derived by deflating nominal sales or values of production using BLS price indexes, but for some industries it is measured by physical quantities of output. Industry output reflects sectoral value of production, derived by adjusting shipments for changes in inventories and removing intra-industry transactions. Industry output measures are constructed primarily using data from the economic censuses and annual surveys of the Census Bureau, U.S. Department of Commerce, together with data on price changes primarily from BLS. Data from the Bureau of Economic Analysis at the U.S. Department of Commerce is used in part to construct intra-industry transactions. Other data sources include the Energy Information Administration at the U.S. Department of Energy and the U.S. Geological Survey at the U.S. Department of the Interior. Manufacturing industry output for 2017 is constructed with data on industrial production from the Federal Reserve and BLS price indexes.

Labor Hours: Labor hours are measured as 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 Current Population Survey (CPS). CES data on the number of total and production worker jobs held by wage and salary workers in nonfarm establishments are supplemented with CPS data on self-employed and unpaid family workers to estimate industry employment. Hours worked estimates are derived using CES and CPS employment, CES data on the average weekly hours paid of production workers, CPS data on hours of nonproduction, self-employed, and unpaid family workers, and ratios of hours worked to hours paid based on data from the 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.

Labor Compensation: Labor compensation, defined as payroll plus supplemental payments, is a measure of the cost to the employer of securing the services of labor. Payroll includes salaries, wages, commissions, dismissal pay, bonuses, vacation and sick leave pay, and compensation in kind. Supplemental payments include both legally required expenditures and payments for voluntary programs. The legally required portion consists primarily of federal old age and survivors' insurance, unemployment compensation, and workers' compensation. Payments for voluntary programs include all programs not specifically required by legislation, such as the employer portion of private health insurance and pension plans. Industry compensation measures are constructed primarily using data from the BLS QCEW and the economic censuses of the Census Bureau at the U.S. Department of Commerce.

Table 1. Recent labor productivity, unit labor costs, and related data

Industry	2012 NAICS code	2017 Employment (thousands)	Percent change, 2016-2017				
			Labor productivity	Unit labor costs	Output	Hours worked	Labor compensation
Mining							
Mining.....	21	640.9	2.4	-4.7	3.3	0.8	-1.6
Oil and gas extraction.....	211	146.7	32.6	-18.6	3.6	-21.9	-15.7
Oil and gas extraction.....	2111	146.7	32.6	-18.6	3.6	-21.9	-15.7
Mining, except oil and gas.....	212	185.6	2.9	0.5	2.5	-0.4	3.0
Coal mining.....	2121	51.9	0.0	-0.2	6.8	6.8	6.7
Metal ore mining.....	2122	38.7	6.2	1.3	-1.0	-6.8	0.3
Nonmetallic mineral mining and quarrying.....	2123	95.0	3.6	-0.2	2.0	-1.5	1.9
Nondurable Manufacturing							
Food.....	311	1,650.3	-2.8	5.9	0.4	3.4	6.4
Animal food.....	3111	60.2	4.8	5.2	2.8	-1.9	8.1
Grain and oilseed milling.....	3112	61.6	1.3	1.0	3.6	2.3	4.6
Sugar and confectionery products.....	3113	79.6	-8.0	7.5	-4.7	3.6	2.4
Fruit and vegetable preserving and specialty.....	3114	175.8	-4.5	-1.1	5.7	10.6	4.5
Dairy products.....	3115	145.1	-2.7	7.4	-1.1	1.6	6.2
Animal slaughtering and processing.....	3116	517.0	-4.2	8.8	0.1	4.5	8.9
Seafood product preparation and packaging.....	3117	40.0	4.2	2.2	-0.6	-4.6	1.6
Bakeries and tortilla products.....	3118	347.2	-2.3	6.9	-1.6	0.8	5.2
Other food products.....	3119	223.8	-4.3	8.3	-1.3	3.1	6.9
Beverages and tobacco products.....	312	272.8	-9.2	8.6	-2.9	6.9	5.5
Beverages.....	3121	259.9	-7.8	6.4	-0.6	7.8	5.7
Tobacco.....	3122	12.9	0.4	12.8	-9.0	-9.3	2.6
Textile mills.....	313	115.9	3.2	4.4	-1.9	-5.0	2.4
Fiber, yarn, and thread mills.....	3131	30.9	3.1	-0.5	4.5	1.4	4.0
Fabric mills.....	3132	54.0	4.0	6.8	-3.8	-7.5	2.8
Textile and fabric finishing mills.....	3133	31.0	2.8	4.6	-3.7	-6.4	0.6
Textile product mills.....	314	129.5	-3.9	4.9	-2.1	1.9	2.6
Textile furnishings mills.....	3141	55.6	-1.4	5.5	-3.4	-2.0	1.9
Other textile product mills.....	3149	73.9	-5.2	3.6	-0.3	5.1	3.3
Apparel.....	315	136.9	-2.5	7.4	-9.8	-7.4	-3.1
Apparel knitting mills.....	3151	11.2	10.5	-1.7	-1.1	-10.5	-2.8
Cut and sew apparel.....	3152	112.1	-4.0	7.8	-10.9	-7.2	-3.9
Accessories and other apparel.....	3159	13.6	-2.2	13.0	-8.4	-6.3	3.5
Leather and allied products.....	316	33.8	-1.7	1.6	-3.1	-1.4	-1.5
Leather and hide tanning and finishing.....	3161	5.5	-6.2	3.0	-5.6	0.7	-2.7
Footwear.....	3162	13.5	4.9	-1.3	0.8	-4.0	-0.5
Other leather products.....	3169	14.8	-6.2	3.6	-5.4	0.9	-2.0
Paper.....	322	371.0	0.6	1.8	-0.8	-1.3	1.1
Pulp, paper, and paperboard mills.....	3221	99.2	1.2	0.4	-0.3	-1.5	0.1
Converted paper products.....	3222	271.8	0.3	2.6	-1.0	-1.3	1.6
Printing and related support activities.....	323	463.5	0.0	-0.1	0.2	0.2	0.0
Printing and related support activities.....	3231	463.5	0.0	-0.1	0.2	0.2	0.0
Petroleum and coal products.....	324	114.9	0.7	1.5	0.3	-0.4	1.8
Petroleum and coal products.....	3241	114.9	0.7	1.5	0.3	-0.4	1.8
Chemicals.....	325	837.7	-2.5	3.5	-0.9	1.6	2.6
Basic chemicals.....	3251	150.8	1.1	2.6	0.5	-0.6	3.1
Resin, rubber, and artificial fibers.....	3252	95.9	-3.3	2.3	-0.4	3.1	2.0
Agricultural chemicals.....	3253	35.7	7.1	-10.1	14.8	7.2	3.2
Pharmaceuticals and medicines.....	3254	295.8	-7.0	7.7	-5.2	1.9	2.1
Paints, coatings, and adhesives.....	3255	61.7	-0.9	-0.4	4.5	5.4	4.1
Soaps, cleaning compounds, and toiletries.....	3256	113.0	-1.0	4.4	-2.0	-1.0	2.3
Other chemical products and preparations.....	3259	84.8	-3.0	6.2	-1.3	1.7	4.8
Plastics and rubber products.....	326	718.6	-3.9	6.7	-1.5	2.5	5.1

Table 1. Recent labor productivity, unit labor costs, and related data — Continued

Industry	2012 NAICS code	2017 Employment (thousands)	Percent change, 2016-2017				
			Labor productivity	Unit labor costs	Output	Hours worked	Labor compensation
Plastics products.....	3261	581.3	-3.7	6.7	-1.0	2.7	5.6
Rubber products.....	3262	137.3	-4.9	7.3	-3.6	1.3	3.4
Durable Manufacturing							
Wood products.....	321	425.1	-1.7	5.0	1.0	2.8	6.1
Sawmills and wood preservation.....	3211	97.3	-1.6	4.4	0.5	2.1	4.9
Plywood and engineered wood products.....	3212	78.0	1.3	8.3	-0.9	-2.1	7.3
Other wood products.....	3219	249.8	-2.5	3.8	2.3	4.8	6.2
Nonmetallic mineral products.....	327	430.5	-3.9	5.1	-0.5	3.6	4.6
Clay products and refractories.....	3271	47.2	-2.9	5.4	1.4	4.4	6.9
Glass and glass products.....	3272	90.0	2.2	0.4	0.5	-1.6	0.9
Cement and concrete products.....	3273	198.5	-6.7	7.7	-1.8	5.3	5.7
Lime and gypsum products.....	3274	14.8	-3.2	4.5	-0.2	3.1	4.2
Other nonmetallic mineral products.....	3279	80.0	-3.8	4.2	0.8	4.7	5.0
Primary metals.....	331	373.9	3.6	1.2	2.0	-1.5	3.3
Iron and steel mills and ferroalloys.....	3311	83.8	3.2	2.2	5.2	1.9	7.6
Steel products from purchased steel.....	3312	56.6	3.2	-3.0	5.2	2.0	2.1
Alumina and aluminum production.....	3313	58.1	0.0	3.1	-1.3	-1.3	1.7
Other nonferrous metal production.....	3314	59.3	2.8	3.6	-2.4	-5.1	1.1
Foundries.....	3315	116.1	4.4	1.5	0.3	-3.9	1.8
Fabricated metal products.....	332	1,457.0	-1.4	3.9	-1.1	0.3	2.8
Forging and stamping.....	3321	100.7	0.5	2.8	0.3	-0.2	3.1
Cutlery and handtools.....	3322	40.0	9.4	-0.5	3.4	-5.5	2.9
Architectural and structural metals.....	3323	378.1	-3.3	8.7	-4.0	-0.7	4.3
Boilers, tanks, and shipping containers.....	3324	91.7	-0.1	0.7	-1.0	-0.9	-0.2
Hardware.....	3325	25.0	-0.6	6.1	-2.4	-1.8	3.6
Spring and wire products.....	3326	43.8	-3.1	9.6	-2.3	0.8	7.1
Machine shops and threaded products.....	3327	363.0	-0.1	3.7	-0.6	-0.4	3.1
Coating, engraving, and heat treating metals.....	3328	138.0	-2.2	2.0	0.3	2.6	2.4
Other fabricated metal products.....	3329	276.7	-2.4	0.5	0.6	3.1	1.1
Machinery.....	333	1,091.0	2.6	-1.2	4.6	1.9	3.3
Agriculture, construction, and mining machinery.....	3331	210.4	10.4	-14.3	16.4	5.4	-0.2
Industrial machinery.....	3332	115.9	1.8	6.7	1.9	0.1	8.7
Commercial and service industry machinery.....	3333	91.5	-1.0	4.9	0.1	1.1	5.0
HVAC and commercial refrigeration equipment.....	3334	130.7	0.6	3.8	0.5	-0.1	4.3
Metalworking machinery.....	3335	182.3	-1.3	3.9	-0.2	1.1	3.7
Turbine and power transmission equipment.....	3336	96.3	-0.3	-1.0	0.9	1.2	-0.1
Other general purpose machinery.....	3339	263.9	0.7	0.9	2.8	2.1	3.8
Computer and electronic products.....	334	1,049.2	-1.1	5.8	-2.0	-0.9	3.8
Computer and peripheral equipment.....	3341	161.6	11.0	-10.9	14.4	3.1	1.9
Communications equipment.....	3342	86.7	-2.2	8.6	-5.0	-2.9	3.1
Audio and video equipment.....	3343	19.6	-0.4	16.8	-9.1	-8.7	6.2
Semiconductors and electronic components.....	3344	363.6	-0.7	10.4	-5.0	-4.3	4.9
Electronic instruments.....	3345	403.0	-3.8	5.8	-1.9	1.9	3.8
Magnetic media manufacturing and reproducing.....	3346	14.7	7.4	12.9	-4.6	-11.2	7.7
Electrical equipment and appliances.....	335	395.4	-4.8	6.1	-1.3	3.7	4.7
Electric lighting equipment.....	3351	52.8	-9.2	2.1	0.4	10.6	2.5
Household appliances.....	3352	63.1	-3.0	6.5	-1.4	1.7	5.0
Electrical equipment.....	3353	140.9	-6.2	8.6	-5.9	0.3	2.3
Other electrical equipment and components.....	3359	138.6	-4.0	6.8	1.4	5.6	8.2
Transportation equipment.....	336	1,649.7	-4.4	7.3	-4.1	0.3	2.9
Motor vehicles.....	3361	212.4	-4.1	10.3	-6.7	-2.7	2.8
Motor vehicle bodies and trailers.....	3362	156.0	-1.8	6.6	-0.5	1.4	6.0
Motor vehicle parts.....	3363	591.7	-1.3	4.3	-1.3	0.1	2.9
Aerospace products and parts.....	3364	487.0	-3.1	6.6	-3.4	-0.2	3.0
Railroad rolling stock.....	3365	22.4	3.2	-6.7	-8.2	-11.0	-14.3

Table 1. Recent labor productivity, unit labor costs, and related data — Continued

Industry	2012 NAICS code	2017 Employment (thousands)	Percent change, 2016-2017				
			Labor productivity	Unit labor costs	Output	Hours worked	Labor compensation
Ship and boat building.....	3366	141.0	-6.1	2.2	-0.2	6.3	2.0
Other transportation equipment.....	3369	39.2	-11.5	4.9	1.6	14.8	6.5
Furniture and related products.....	337	421.4	-4.0	6.9	-2.9	1.2	3.9
Household and institutional furniture.....	3371	271.1	-4.3	6.1	-1.3	3.1	4.7
Office furniture and fixtures.....	3372	112.2	-1.0	6.6	-3.4	-2.4	3.0
Other furniture related products.....	3379	38.1	-6.1	10.3	-7.7	-1.7	1.8
Miscellaneous manufacturing.....	339	646.9	-1.5	8.1	-3.7	-2.2	4.1
Medical equipment and supplies.....	3391	315.4	1.3	9.2	-4.3	-5.5	4.5
Other miscellaneous manufacturing.....	3399	331.5	-4.2	6.7	-2.9	1.4	3.6

Table 2. Long run labor productivity, unit labor costs, and related data

Industry	2012 NAICS code	2017 Employment (thousands)	Average annual percent change, 1987-2017				
			Labor productivity	Unit labor costs	Output	Hours worked	Labor compensation
Mining							
Mining.....	21	640.9	1.2	2.6	1.1	-0.1	3.7
Oil and gas extraction.....	211	146.7	2.5	2.8	1.2	-1.3	4.0
Oil and gas extraction.....	2111	146.7	2.5	2.8	1.2	-1.3	4.0
Mining, except oil and gas.....	212	185.6	1.5	1.4	0.0	-1.4	1.4
Coal mining.....	2121	51.9	1.8	0.8	-1.4	-3.1	-0.6
Metal ore mining.....	2122	38.7	0.9	2.8	0.9	0.0	3.8
Nonmetallic mineral mining and quarrying.....	2123	95.0	1.2	2.0	0.8	-0.5	2.8
Support activities for mining ¹	213	278.9	0.3	4.1	1.6	1.3	5.8
Support activities for mining ¹	2131	278.9	0.3	4.1	1.6	1.3	5.8
Nondurable Manufacturing							
Food.....	311	1,650.3	0.7	1.8	1.2	0.5	3.1
Animal food.....	3111	60.2	2.1	1.4	1.9	-0.2	3.3
Grain and oilseed milling.....	3112	61.6	1.7	1.0	1.2	-0.6	2.2
Sugar and confectionery products.....	3113	79.6	1.0	2.0	0.4	-0.6	2.4
Fruit and vegetable preserving and specialty.....	3114	175.8	1.0	1.6	1.1	0.1	2.8
Dairy products.....	3115	145.1	1.3	2.2	1.1	-0.2	3.3
Animal slaughtering and processing.....	3116	517.0	0.4	1.9	1.6	1.2	3.5
Seafood product preparation and packaging.....	3117	40.0	1.2	2.2	0.5	-0.7	2.7
Bakeries and tortilla products.....	3118	347.2	0.2	1.8	0.4	0.1	2.2
Other food products.....	3119	223.8	0.0	2.3	2.1	2.0	4.4
Beverages and tobacco products.....	312	272.8	-0.4	2.4	-0.2	0.2	2.2
Beverages.....	3121	259.9	0.5	1.6	1.3	0.8	2.9
Tobacco.....	3122	12.9	1.7	2.1	-3.2	-4.7	-1.1
Textile mills.....	313	115.9	3.0	0.0	-2.3	-5.1	-2.3
Fiber, yarn, and thread mills.....	3131	30.9	3.3	-0.9	-1.3	-4.4	-2.2
Fabric mills.....	3132	54.0	2.9	0.5	-2.9	-5.6	-2.4
Textile and fabric finishing mills.....	3133	31.0	1.8	0.9	-3.0	-4.7	-2.1
Textile product mills.....	314	129.5	0.5	2.3	-1.5	-2.1	0.7
Textile furnishings mills.....	3141	55.6	0.5	2.2	-2.2	-2.7	-0.1
Other textile product mills.....	3149	73.9	1.1	2.1	-0.4	-1.5	1.7
Apparel.....	315	136.9	-0.6	1.8	-6.8	-6.2	-5.1
Apparel knitting mills.....	3151	11.2	-0.5	2.0	-7.7	-7.3	-5.9
Cut and sew apparel.....	3152	112.1	-0.4	1.7	-6.7	-6.3	-5.1
Accessories and other apparel.....	3159	13.6	-2.9	2.9	-6.5	-3.7	-3.8
Leather and allied products.....	316	33.8	0.8	1.9	-4.1	-4.9	-2.3
Leather and hide tanning and finishing.....	3161	5.5	0.7	0.7	-3.0	-3.7	-2.4
Footwear.....	3162	13.5	1.2	2.0	-4.8	-5.9	-2.9
Other leather products.....	3169	14.8	0.0	2.5	-3.8	-3.8	-1.4
Paper.....	322	371.0	1.7	1.3	-0.2	-1.9	1.1
Pulp, paper, and paperboard mills.....	3221	99.2	2.6	0.8	-0.5	-3.0	0.3
Converted paper products.....	3222	271.8	1.4	1.6	0.1	-1.3	1.8
Printing and related support activities.....	323	463.5	1.2	1.2	-0.6	-1.8	0.6
Printing and related support activities.....	3231	463.5	1.2	1.2	-0.6	-1.8	0.6
Petroleum and coal products.....	324	114.9	2.3	2.4	1.2	-1.1	3.7
Petroleum and coal products.....	3241	114.9	2.3	2.4	1.2	-1.1	3.7
Chemicals.....	325	837.7	1.3	2.0	0.8	-0.5	2.9
Basic chemicals.....	3251	150.8	2.3	1.4	0.7	-1.5	2.2
Resin, rubber, and artificial fibers.....	3252	95.9	1.9	1.8	0.4	-1.5	2.3
Agricultural chemicals.....	3253	35.7	2.4	1.2	1.1	-1.2	2.3
Pharmaceuticals and medicines.....	3254	295.8	-0.4	3.7	1.2	1.6	5.0
Paints, coatings, and adhesives.....	3255	61.7	0.8	2.2	0.1	-0.7	2.3
Soaps, cleaning compounds, and toiletries.....	3256	113.0	1.4	1.1	1.1	-0.3	2.2

See footnotes at end of table.

Table 2. Long run labor productivity, unit labor costs, and related data — Continued

Industry	2012 NAICS code	2017 Employment (thousands)	Average annual percent change, 1987-2017				
			Labor productivity	Unit labor costs	Output	Hours worked	Labor compensation
Other chemical products and preparations.....	3259	84.8	1.8	1.2	-0.1	-1.8	1.2
Plastics and rubber products.....	326	718.6	1.5	1.4	1.2	-0.2	2.7
Plastics products.....	3261	581.3	1.4	1.5	1.5	0.1	3.1
Rubber products.....	3262	137.3	1.4	1.3	0.1	-1.3	1.4
Durable Manufacturing							
Wood products.....	321	425.1	1.0	2.0	-0.1	-1.1	1.9
Sawmills and wood preservation.....	3211	97.3	2.0	1.1	0.3	-1.6	1.4
Plywood and engineered wood products.....	3212	78.0	0.8	1.8	0.0	-0.8	1.8
Other wood products.....	3219	249.8	0.7	2.4	-0.2	-0.9	2.2
Nonmetallic mineral products.....	327	430.5	0.8	1.8	0.1	-0.6	1.9
Clay products and refractories.....	3271	47.2	0.9	1.5	-1.5	-2.3	0.0
Glass and glass products.....	3272	90.0	2.2	0.7	0.5	-1.7	1.2
Cement and concrete products.....	3273	198.5	-0.2	2.3	0.1	0.3	2.4
Lime and gypsum products.....	3274	14.8	1.4	2.9	-0.4	-1.8	2.4
Other nonmetallic mineral products.....	3279	80.0	0.9	1.8	0.8	-0.1	2.6
Primary metals.....	331	373.9	2.5	0.4	0.5	-1.9	1.0
Iron and steel mills and ferroalloys.....	3311	83.8	3.6	-0.6	1.1	-2.4	0.5
Steel products from purchased steel.....	3312	56.6	0.4	2.0	-0.3	-0.6	1.8
Alumina and aluminum production.....	3313	58.1	2.3	0.9	0.3	-1.9	1.3
Other nonferrous metal production.....	3314	59.3	2.1	1.7	0.1	-1.9	1.8
Foundries.....	3315	116.1	1.8	1.1	-0.4	-2.1	0.7
Fabricated metal products.....	332	1,457.0	0.8	1.8	0.6	-0.2	2.4
Forging and stamping.....	3321	100.7	1.9	0.8	1.0	-0.9	1.8
Cutlery and handtools.....	3322	40.0	1.5	1.4	-0.9	-2.4	0.5
Architectural and structural metals.....	3323	378.1	0.5	2.3	0.7	0.3	3.0
Boilers, tanks, and shipping containers.....	3324	91.7	0.6	1.4	0.2	-0.4	1.6
Hardware.....	3325	25.0	0.6	1.5	-2.3	-2.9	-0.8
Spring and wire products.....	3326	43.8	1.7	1.6	-0.2	-1.9	1.4
Machine shops and threaded products.....	3327	363.0	1.4	1.4	2.0	0.6	3.5
Coating, engraving, and heat treating metals.....	3328	138.0	1.7	1.1	1.8	0.1	2.9
Other fabricated metal products.....	3329	276.7	0.4	2.0	-0.1	-0.5	1.9
Machinery.....	333	1,091.0	1.7	1.0	1.0	-0.7	2.0
Agriculture, construction, and mining machinery.....	3331	210.4	1.7	0.8	1.6	0.0	2.5
Industrial machinery.....	3332	115.9	1.3	1.3	0.6	-0.7	1.9
Commercial and service industry machinery.....	3333	91.5	1.6	0.9	-0.1	-1.7	0.8
HVAC and commercial refrigeration equipment.....	3334	130.7	1.6	1.1	0.9	-0.7	2.0
Metalworking machinery.....	3335	182.3	1.6	1.1	0.3	-1.2	1.4
Turbine and power transmission equipment.....	3336	96.3	1.3	0.5	1.0	-0.3	1.5
Other general purpose machinery.....	3339	263.9	1.8	1.6	1.2	-0.5	2.8
Computer and electronic products.....	334	1,049.2	8.4	-5.0	6.1	-2.1	0.9
Computer and peripheral equipment.....	3341	161.6	14.9	-13.8	11.5	-3.0	-3.9
Communications equipment.....	3342	86.7	5.1	-0.7	1.6	-3.3	0.9
Audio and video equipment.....	3343	19.6	2.0	1.6	-1.8	-3.7	-0.2
Semiconductors and electronic components.....	3344	363.6	11.9	-7.9	10.1	-1.6	1.4
Electronic instruments.....	3345	403.0	2.8	0.6	1.2	-1.6	1.7
Magnetic media manufacturing and reproducing.....	3346	14.7	1.2	1.1	-2.1	-3.3	-1.1
Electrical equipment and appliances.....	335	395.4	1.6	1.3	0.0	-1.6	1.3
Electric lighting equipment.....	3351	52.8	1.1	1.3	-0.2	-1.4	1.0
Household appliances.....	3352	63.1	2.8	-0.3	0.3	-2.4	0.1
Electrical equipment.....	3353	140.9	1.2	1.7	-0.7	-1.9	0.9
Other electrical equipment and components.....	3359	138.6	1.3	1.8	0.3	-1.1	2.1
Transportation equipment.....	336	1,649.7	2.3	0.1	1.6	-0.8	1.7
Motor vehicles.....	3361	212.4	2.9	-0.1	1.8	-1.0	1.7
Motor vehicle bodies and trailers.....	3362	156.0	1.1	2.2	1.6	0.5	3.9
Motor vehicle parts.....	3363	591.7	2.8	-1.2	2.7	-0.1	1.5

See footnotes at end of table.

Table 2. Long run labor productivity, unit labor costs, and related data — Continued

Industry	2012 NAICS code	2017 Employment (thousands)	Average annual percent change, 1987-2017				
			Labor productivity	Unit labor costs	Output	Hours worked	Labor compensation
Aerospace products and parts.....	3364	487.0	2.0	1.1	0.3	-1.7	1.3
Railroad rolling stock.....	3365	22.4	3.6	-1.0	3.7	0.1	2.7
Ship and boat building.....	3366	141.0	1.5	1.8	0.7	-0.8	2.5
Other transportation equipment.....	3369	39.2	3.1	-0.7	3.4	0.2	2.7
Furniture and related products.....	337	421.4	1.3	1.7	-0.1	-1.4	1.5
Household and institutional furniture.....	3371	271.1	1.1	1.8	-0.5	-1.6	1.3
Office furniture and fixtures.....	3372	112.2	1.3	1.8	0.1	-1.2	1.9
Other furniture related products.....	3379	38.1	1.9	0.9	1.0	-0.8	1.9
Miscellaneous manufacturing.....	339	646.9	1.7	1.5	1.5	-0.2	3.0
Medical equipment and supplies.....	3391	315.4	2.1	1.2	3.1	0.9	4.3
Other miscellaneous manufacturing.....	3399	331.5	1.2	1.7	0.2	-1.0	1.9

¹ For NAICS industry 2131 average annual percent changes are for 1987-2016. Employment is for 2016.