Monthly Labor Review

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The relative weakness in earnings of production workers in manufacturing, 1990–2018

Although manufacturing industries had a reputation for stable, well-paying jobs for much of the 20th century, shifts within the industry in the last several decades have considerably altered that picture. Since 1990, average hourly earnings trends in the various manufacturing industries have been disparate, with a few industries showing strong growth but many others showing growth rates that are lower than those of the total private sector. In fact, average hourly earnings of production and nonsupervisory workers in the total private sector have recently surpassed those of their counterparts in the relatively high-paying durable goods portion of manufacturing.

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Until recently, the U.S. economy has been defined by its manufacturing capabilities. Manufacturing had historically been the dominant sector in terms of value of the output produced, and the pay earned by production workers in manufacturing has long served as a marker for what constitutes middle-class status in the United States.[1] But that status has changed over the last several decades, as the service-providing sector has grown to replace manufacturing as the dominant driver of employment growth. Despite some recent job gains, most manufacturing industries have shed workers at high rates since 1990, and many employers in the industry have substantially reduced the growth rate of their workers' earnings—or, in some cases, they have even reduced the wages paid to their remaining workers. As a result, average hourly earnings of production workers in manufacturing have fallen below those of total private sector workers.[2] (See table 1.)

Table 1. Employment and average hourly earnings of production and nonsupervisory workers in total private and production workers in manufacturing, not seasonally adjusted, 1990 and 2018 annual averages

Industry	Employment	Percent of total private employment	Average hourly earnings (AHE)	Percent of total private AHE
1990				
Total Private	73,721,000	—	$10.20	—
Manufacturing	12,669,000	17.2%	10.78	105.7%
Durable goods	7,397,000	10.0	11.40	111.8
Nondurable goods	5,272,000	7.2	9.87	96.8
2018				
Total Private	104,319,000	—	22.71	—
Manufacturing	8,899,000	8.5	21.54	94.8
Durable goods	5,463,000	5.2	22.51	99.1
Nondurable goods	3,436,000	3.3	19.96	87.9

Note: Dash = not applicable.

Source: U.S. Bureau of Labor Statistics.

In 1990, average hourly earnings of production workers in manufacturing ($10.78) were about 6 percent greater than those of production or nonsupervisory workers in the total private sector ($10.20). By 2018, however, manufacturing workers were earning approximately 5 percent less ($21.54) than their total private sector counterparts ($22.71). Over this same period, manufacturing production workers' share of total private sector employment fell by half, from 17.2 percent in 1990 to 8.5 percent in 2018. This article analyzes earnings trends in manufacturing since 1990 and examines some of the component industries that have driven these broader trends. All earnings data cited in this article are from the U.S. Bureau of Labor Statistics (BLS) Current Employment Statistics (CES) survey and exclude all forms of benefits and other compensation employees may receive (other than their pay).[3]

Earnings of production and nonsupervisory employees

Production workers made up 70.1 percent of all manufacturing workers in 2018—down slightly from 71.6 percent in 1990.[4] Within manufacturing, production workers make up an array of workers, including "working supervisors or group leaders who may be 'in charge' of some employees, but whose supervisory functions are only incidental to their regular work."[5] In this article, earnings for production workers in manufacturing are compared with earnings for construction workers in construction, production workers in mining and logging, and nonsupervisory workers in private service-providing industries. Although the definitions of these worker categories differ slightly, the workers are analytically comparable and together constitute all production and nonsupervisory employees in the total private sector.[6]

Long-term analysis is particularly well-suited for earnings of production and nonsupervisory employees because these data are available over a much longer period than earnings for all employees. Although earnings measures for all employees within manufacturing are currently available, the data series only goes back to March 2006.

Average hourly earnings of production and nonsupervisory employees by industry

In 1990, average hourly earnings for production workers in manufacturing as a whole were above those of production and nonsupervisory employees in the total private sector, but this was not true across all component industries within manufacturing. Production workers in durable goods manufacturing earned 12 percent more, on average, than their counterparts in the total private sector, while workers in nondurables goods manufacturing earned 3 percent *less* than comparable workers in the total private sector. Moreover, the spread in earnings among workers in the various manufacturing industries was quite large, with those in petroleum and coal products earning $17.00 per hour, on average, and apparel workers earning $6.22 per hour, a difference of $10.78. (See table 2.)

Table 2. Employment and average hourly earnings of production and nonsupervisory workers, total private, manufacturing, and selected other industries, not seasonally adjusted, 1990 and 2018 annual averages

Industry	1990		2018		Annualized percent change, 1990 to 2018	
	Employment	Average hourly earnings	Employment	Average hourly earnings	Employment	Average hourly earnings
Total private	73,721,000	$10.20	104,319,000	$22.71	1.2%	2.9%
Manufacturing	12,669,000	10.78	8,899,000	21.54	-1.3	2.5
Durable goods	7,397,000	11.40	5,463,000	22.51	-1.1	2.5
Wood products	451,500	8.82	319,000	17.88	-1.2	2.6
Nonmetallic mineral products	413,200	11.11	309,900	21.41	-1.0	2.4
Primary metals	525,100	12.97	293,600	23.31	-2.1	2.1
Fabricated metal products	1,190,100	10.64	1,084,900	20.55	-0.3	2.4
Machinery	938,900	11.73	718,200	23.06	-1.0	2.4
Computer and electronic parts	980,200	10.89	613,100	25.09	-1.7	3.0
Electrical equipment and appliances	465,200	10.00	260,500	20.59	-2.0	2.6
Transportation equipment	1,473,400	14.44	1,188,300	26.32	-0.8	2.2
Motor vehicles and parts	869,500	15.00	778,700	22.77	-0.4	1.5
Furniture and related products	475,200	8.53	291,500	17.86	-1.7	2.7
Miscellaneous durable goods	484,200	8.87	384,100	19.14	-0.8	2.8
Nondurable goods	5,272,000	9.87	3,436,000	19.96	-1.5	2.5
Food manufacturing	1,165,000	9.04	1,271,500	17.49	0.3	2.4
Textile mills	417,900	8.17	87,700	16.46	-5.4	2.5
Textile product mills	194,900	7.37	85,600	15.31	-2.9	2.6

See footnotes at end of table.

Table 2. Employment and average hourly earnings of production and nonsupervisory workers, total private, manufacturing, and selected other industries, not seasonally adjusted, 1990 and 2018 annual averages

Industry	1990		2018		Annualized percent change, 1990 to 2018	
	Employment	Average hourly earnings	Employment	Average hourly earnings	Employment	Average hourly earnings
Apparel	805,200	6.22	80,900	15.32	-7.9	3.3
Paper and paper products	493,200	12.06	276,100	21.88	-2.1	2.2
Printing and related support activities	597,600	11.11	294,900	18.74	-2.5	1.9
Petroleum and coal products	97,500	17.00	77,400	40.32	-0.8	3.1
Chemicals	620,300	12.85	547,700	25.46	-0.4	2.5
Plastics and rubber products	646,700	9.76	548,100	18.49	-0.6	2.3
Miscellaneous nondurable goods	233,800	10.28	165,700	20.11	-1.2	2.4
Mining and logging	538,000	13.40	544,000	28.30	0.0	2.7
Construction	4,115,000	13.42	5,438,000	27.74	1.0	2.6
Wholesale trade	4,167,500	11.55	4,698,000	25.18	0.4	2.8
Retail trade	11,311,000	7.71	13,529,200	15.91	0.6	2.6
Transportation and warehousing	2,943,200	12.50	4,721,000	21.84	1.7	2.0
Utilities	584,900	16.14	444,700	36.77	-1.0	3.0
Information	1,866,000	13.40	2,278,000	31.93	0.7	3.1
Financial activities	4,973,000	9.98	6,637,000	26.94	1.0	3.6
Credit intermediation and related services	1,808,100	9.06	2,015,000	23.72	0.4	3.5
Real estate	849,100	8.71	1,255,800	21.69	1.4	3.3
Rental and leasing	415,000	8.49	458,400	20.45	0.4	3.2
Professional and business services	8,915,000	11.15	17,123,000	26.81	2.4	3.2
Professional and technical services	3,499,800	14.00	7,255,900	35.41	2.6	3.4
Management of companies and enterprises	1,279,900	11.11	1,540,200	28.86	0.7	3.5
Administrative and waste services	4,135,100	8.48	8,326,700	18.32	2.5	2.8
Education and health services	9,784,000	9.98	20,788,000	23.65	2.7	3.1
Healthcare	7,344,400	10.42	14,121,200	25.92	2.4	3.3
Social assistance	966,900	6.99	3,478,400	14.84	4.7	2.7
Leisure and hospitality	8,299,000	6.02	14,382,000	13.87	2.0	3.0
Other services	3,555,000	9.08	4,839,000	20.78	1.1	3.0

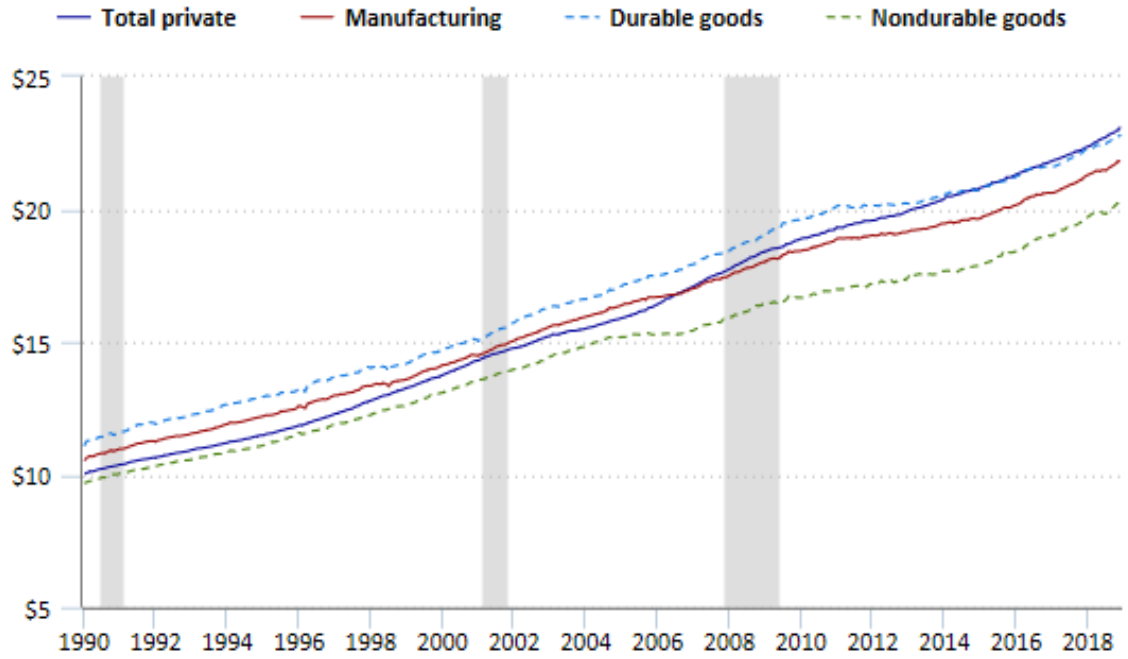
Source: U.S. Bureau of Labor Statistics.

In 1990, workers in seven nonmanufacturing sectors earned more per hour than workers in manufacturing, while workers in five nonmanufacturing sectors—leisure and hospitality, retail trade, financial activities, education and health services, and other services—earned less than workers in manufacturing. By 2018, hourly earnings in manufacturing exceeded those of only three other major industries: leisure and hospitality, retail trade, and other services. In that same year, workers in financial activities and in private education and health services earned more than manufacturing workers. Furthermore, the spread in hourly earnings among the various manufacturing industries remained large nearly three decades later, with workers in petroleum and coal products earning $40.32 per hour, $25 more than workers in textile product mills.

Average hourly earnings of production and nonsupervisory workers, total private and manufacturing

On an annualized basis, hourly earnings of manufacturing workers rose by 2.5 percent per year from 1990 to 2018, while private sector average earnings rose by 2.9 percent. As a result of this disparity in the rate of growth over the period, the level of the two data series converged in July 2006. Since then, earnings in manufacturing have remained below those of private sector workers, on average. Several factors contributed to this change. First, as previously noted, hourly earnings in manufacturing rose more slowly over the period than total private hourly earnings. Second, hourly earnings are weighted by employment. Thus, because workers in durable goods industries generally earn more per hour than those in nondurable goods, the loss of 98,000 more jobs in durable goods than in nondurable goods over the period pulled the hourly earnings average for manufacturing down further.[7] In fact, hourly earnings of workers in the durable goods industries fell below those of total private sector workers in 2015, and they have remained below them since then. (See figure 1.)

Figure 1. Average hourly earnings of production and nonsupervisory workers, total private, manufacturing, durable goods, and nondurable goods, seasonally adjusted, 1990–2018



Click legend items to change data display. Hover over chart to view data.
Shaded areas represent recessions as determined by the National Bureau of Economic Research.
Source: U.S. Bureau of Labor Statistics.

Average weekly earnings of manufacturing workers and total private workers

In January 1990, average weekly earnings of manufacturing workers were 24.7 percent higher than those of private sector workers, and by the close of 2018, that figure had fallen to 18.4 percent.[8] (See table 3.)

Table 3. Average weekly earnings in manufacturing and percent difference from total private, annual averages, not seasonally adjusted

Industry	1990	Percent difference	2018	Percent difference
Total private	$349.63	—	$767.08	—
Manufacturing	436.13	24.7%	908.08	18.4%
Durable goods	468.43	34.0	956.88	24.7
Nonduarble goods	390.65	11.7	830.08	8.2

Note: Dash = not applicable.

Source: U.S. Bureau of Labor Statistics

Over the 1990–2018 period, weekly earnings of total private production and nonsupervisory workers grew at an annualized rate of 2.8 percent per year, while weekly earnings of manufacturing workers grew by just 2.7 percent over that period. Thus, although *hourly* earnings in manufacturing have been eclipsed by hourly earnings in total private, *weekly* earnings in manufacturing continue to be substantially higher than weekly earnings in the private sector as a whole. Average weekly earnings for any industry are the product of average hourly earnings and average weekly hours, so any differences in the trends over time between various industries' average weekly earnings and average hourly earnings stem from changes in average weekly hours.[9]

Average weekly hours of production workers in manufacturing increased from 40.5 to 42.2 over the 1990–2018 period, while weekly hours in the total private sector decreased from 34.3 to 33.8. (See table 4.)

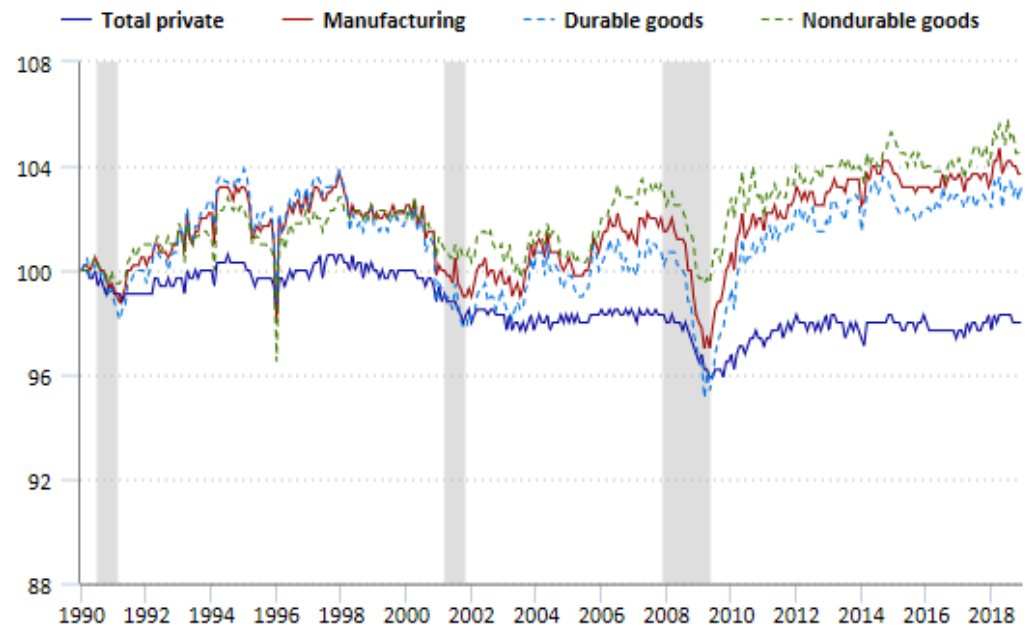
Table 4. Average weekly hours of production workers in manufacturing and production and nonsupervisory workers in total private, not seasonally adjusted, 1990 and 2018 annual averages

Industry	1990	2018
Total Private	34.3	33.8
Manufacturing	40.5	42.2
Durable Goods	41.1	42.5
Nondurable Goods	39.6	41.6

Source: U.S. Bureau of Labor Statistics.

Whereas more hiring in industries with lower average weekly hours—such as retail trade and leisure and hospitality—has driven down the average workweek for production and nonsupervisory workers in the total private sector, weekly hours have increased in manufacturing, while employment has declined. In addition, compared with private sector hours, manufacturing hours show greater volatility from month to month. (See figure 2.)

Figure 2. Index of average weekly hours of production and nonsupervisory workers, seasonally adjusted, 1990–2018 (1990 = 100)



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Shaded areas represent recessions as determined by the National Bureau of Economic Research.
Source: U.S. Bureau of Labor Statistics.

Average weekly hours in manufacturing have consistently been 6 to 8 hours higher than average weekly hours in total private. The longer workweek has kept weekly earnings in manufacturing above weekly earnings in total private, despite hourly earnings moving in the opposite direction—in 2018, average hourly earnings ($22.71) in total private were slightly higher than average hourly earnings in manufacturing ($21.54). Thus, workers in manufacturing have had to work more hours per week to make up for their relative weakness in hourly pay. In addition, employment has declined across virtually all of the component industries in manufacturing since 1990, and hourly earnings for many production workers in manufacturing have declined to below those of production and nonsupervisory workers in the total private sector. Nevertheless, the expanding workweek in manufacturing has kept average weekly earnings in the industry above average weekly earnings in the total private sector through 2018.

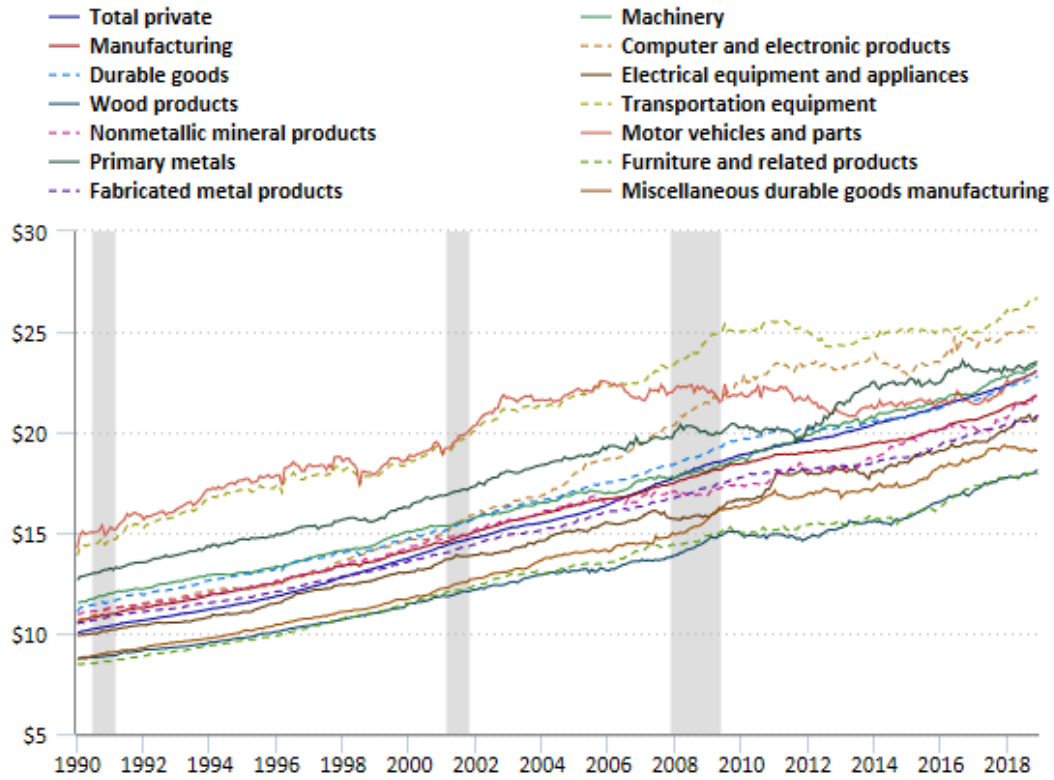
Durable goods and nondurable goods

Since 1990, hourly earnings in manufacturing's two major components, durable goods and nondurable goods, have risen more slowly than earnings in the total private sector. The relatively high average hourly earnings of production workers in durable goods manufacturing consistently kept hourly earnings higher in manufacturing than in the private sector as a whole until they converged in July 2006. Then, around 2011, hourly earnings growth in durable goods slowed to such an extent that they were relatively equal to those of the average private sector job for much of the period from 2014 to 2016. Since then, hourly earnings in durable goods have fallen slightly below

those of total private. In 1990, hourly earnings in durable goods were 12 percent higher than those in the private sector. By 2018, earnings in durable goods were 1 percent lower than earnings in the total private sector.

Hourly earnings in nondurable goods have consistently been below those in the total private sector, and they have grown more slowly as well. In 1990, hourly earnings in the total private sector were 3 percent higher than those in nondurable goods. By 2018, earnings in the total private sector were 14 percent higher than earnings in nondurable goods. Similarly, hourly earnings grew more slowly in nearly all industries within durable goods than in total private over the 1990–2018 period. The motor vehicles and parts industry stands out as having the slowest rate of growth in hourly earnings among all manufacturing industries, both durables and nondurables. Within durable goods, the largest rise and the most rapid growth rate in hourly earnings over the period occurred in computer and electronic products. (See figure 3.)

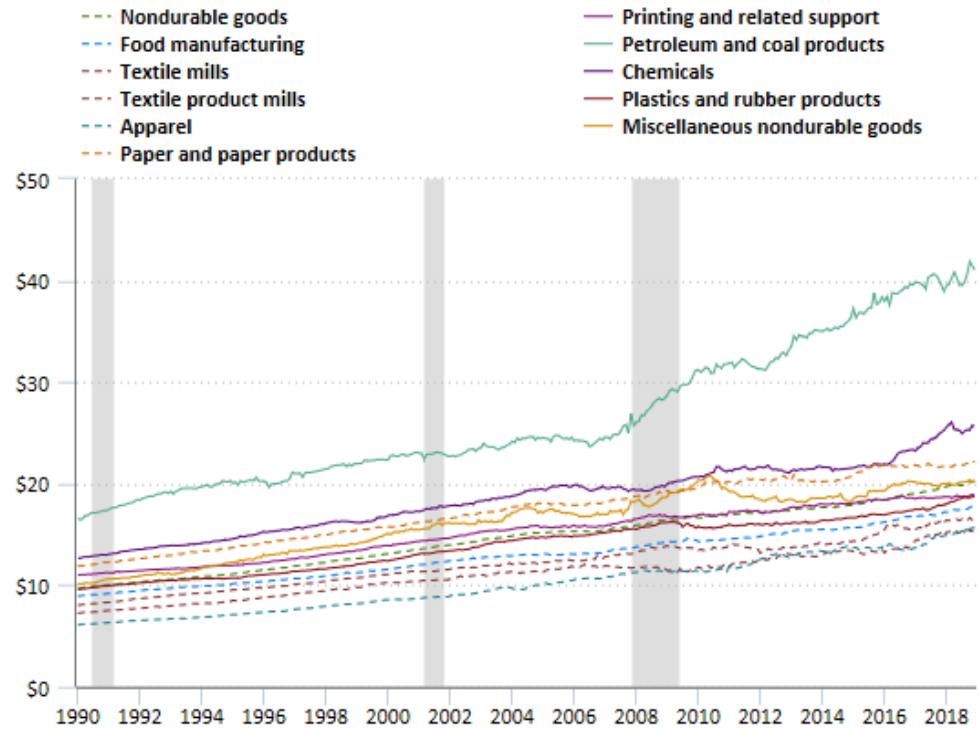
Figure 3. Average hourly earnings of production workers, total private, manufacturing, and durable goods industries, seasonally adjusted, 1990–2018



Click legend items to change data display. Hover over chart to view data.
Shaded areas represent recessions as determined by the National Bureau of Economic Research.
Source: U.S. Bureau of Labor Statistics.

Hourly earnings in most nondurable goods industries in manufacturing also grew more slowly than those of the private sector. Printing and related activities experienced the weakest earnings growth, while two industries—apparel and petroleum and coal products—had above-average growth. (See figure 4.)

Figure 4. Average hourly earnings of production workers, nondurable goods, seasonally adjusted, 1990–2018



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Shaded areas represent recessions as determined by the National Bureau of Economic Research.
Source: U.S. Bureau of Labor Statistics.

Motor vehicles and parts

As shown in table 2, hourly earnings in motor vehicles and parts, at $15.00, were the highest of all durable goods industries in 1990. By 2018, that figure stood at $22.77, which is a 1.5-percent annualized increase, the slowest growth rate of all industries in manufacturing over the 1990–2018 period. Meanwhile, total private hourly earnings grew by 2.9 percent per year over the same period, or nearly twice the rate of growth in motor vehicles and parts.

Although hourly earnings growth in the motor vehicles and parts industry was relatively slow over the period, average weekly hours in the industry increased by 10 percent. In fact, as of December 2018, motor vehicles and parts had the highest average weekly hours of all durable goods industries. As a result of the growth in the industry's workweek, weekly earnings rose from $621.58 in 1990 to $1,017.37 in 2018, an annualized 1.8-percent growth rate, which was still slower than the 2.8-percent rate for the private sector as a whole.

The relatively small gains in hourly and weekly earnings over the period did not keep pace with inflation. As a result, for the motor vehicles and parts industry, both inflation-adjusted average hourly earnings and inflation-adjusted average weekly earnings declined over the 1990–2018 period. (See table 5.)

Table 5. Real average hourly earnings and real average weekly earnings of production and nonsupervisory workers. total private and motor vehicles and parts, annual averages, not seasonally adjusted, 1990–2018

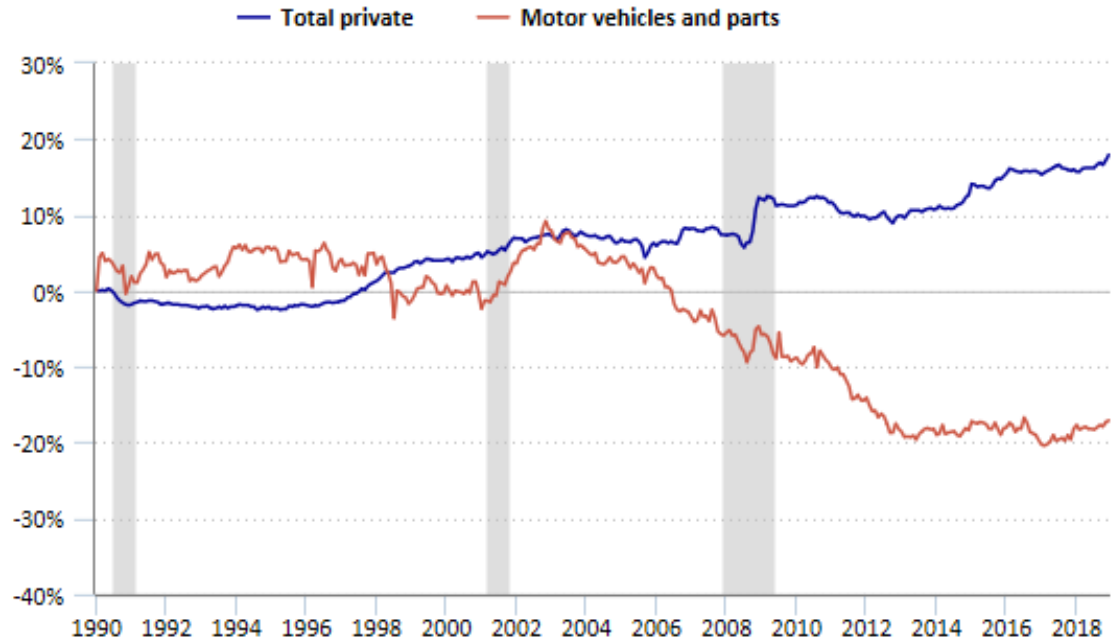
Industry	Real hourly earnings			Real weekly earnings		
	1990	2018	Percent change	1990	2018	Percent change
Total private	$7.91	$9.26	17.1%	$271.03	$312.91	15.5%
Motor vehicles and parts	11.63	9.29	-20.1	481.84	415.01	-13.9

Note: Real earnings are earnings adjusted for inflation.

Source: U.S. Bureau of Labor Statistics

The decline in earnings represents a decline in the purchasing power of these workers. By contrast, inflation-adjusted hourly and weekly earnings in the total private sector increased over the period. (See figure 5.)

Figure 5. Percent change since 1990 in real average hourly earnings of production and nonsupervisory workers, total private and motor vehicles and parts, seasonally adjusted, 1990–2018



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Shaded areas represent recessions as determined by the National Bureau of Economic Research.
Source: U.S. Bureau of Labor Statistics.

The driving force behind the stagnation in earnings was contract negotiations and concessions agreed to by the United Automobile Workers (UAW) and the automobile manufacturers. Negotiations between labor and management throughout much of the second half of the 20th century led to the establishment of pension plans and certain standard-of-living guarantees at Detroit's three major automobile manufacturers.

Nevertheless, recessionary pressures and competition from foreign automobile manufacturers began to exert downward pressure on earnings of workers in the industry during the 1990–2018 period.

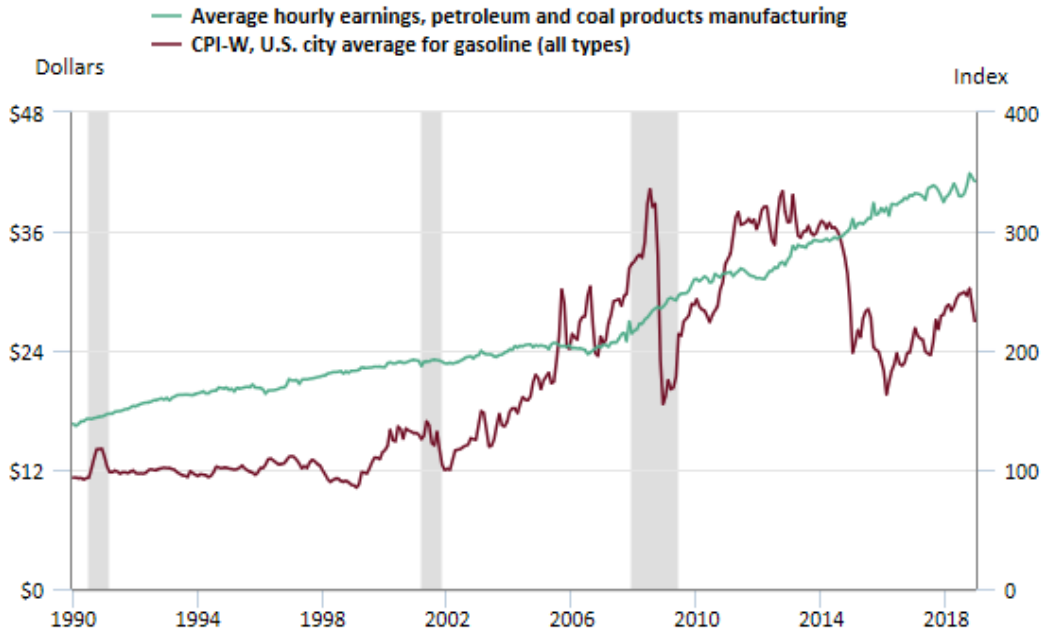
As sales of imported vehicles increased in the late 1970s and early 1980s, the dominance of domestic manufacturers in the U.S. automobile market declined. To address the impact of weak sales and to help ensure the survival of the industry, automakers and the UAW agreed to several concessions affecting autoworkers' pay:

- In 2007, a contract between the UAW and the three major U.S. automakers eliminated pay increases, while allowing signing bonuses, cost-of-living adjustments, and certain lump-sum bonus payments to continue. According to the Center for Automotive Research, the effect of these concessions by autoworkers was to lower average hourly labor costs from an estimated $72 to $78 per hour to approximately $50 to $58 per hour.[10]
- In 2009, following the hardships brought on by the Great Recession (December 2007 to June 2009), the 2007 agreement was modified to suspend the cost-of-living adjustments and certain bonus payments while tightening overtime and break-time allowances.[11]
- In 2011, the job banks for idled workers were eliminated and cost-of-living adjustments remained suspended.[12]

Petroleum and coal products

Production workers in petroleum and coal products manufacturing experienced the largest increase in hourly earnings among all manufacturing workers over the 1990–2018 period, with their hourly wages rising from $17.00 to $40.32. A driving force behind the strong earnings growth in the industry has been the price of oil and, by extension, gasoline. Figure 6 shows average hourly earnings of production workers in petroleum and coal products manufacturing over the 1990–2018 period, as well as the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W), U.S. city average for gasoline (all types). As the figure shows, for much of the period, earnings in the industry have increased with the rising price of gasoline. However, there tends to be a lag in this effect—the sharp increase in gasoline prices that occurred from 2002 to 2008 resulted in a steep increase in average hourly earnings from 2007 to 2011. As the price of gas oscillated substantially during the 2008–18 period (within a range well above pre-2002 levels), hourly earnings continued to increase steadily during the period from about 2012 to 2018.

Figure 6. Average hourly earnings of production workers in petroleum and coal products manufacturing and CPI-W, U.S. city average for gasoline (all types), 1990–2018, seasonally adjusted



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Shaded areas represent recessions as determined by the National Bureau of Economic Research.
Note: CPI-W = Consumer Price Index for Urban Wage Earners and Clerical Workers (1982-84 = 100).
Source: U.S. Bureau of Labor Statistics.

Computer and electronic products

In 1990, average hourly earnings in computer and electronic products manufacturing were 4 percent below those of all durable goods industries combined. By 2018, they exceeded durable goods earnings by 11 percent and became the second-highest earning industry in durables behind transportation equipment. This growth in earnings is consistent with increased demand for technology across all areas of the economy.

Printing and paper manufacturing

In contrast to earnings growth in computer and electronic products, some of the weakest earnings growth between 1990 and 2018 occurred in printing and related support activities (1.9 percent annually) and paper and paper products (2.2 percent). In addition, employment in printing and paper has declined steadily since 1990. The job losses and weakness in earnings growth can be attributed to falling circulations and revenues of newspapers and other printed media with the advent and growing dominance of digital media.[13]

Apparel and textiles

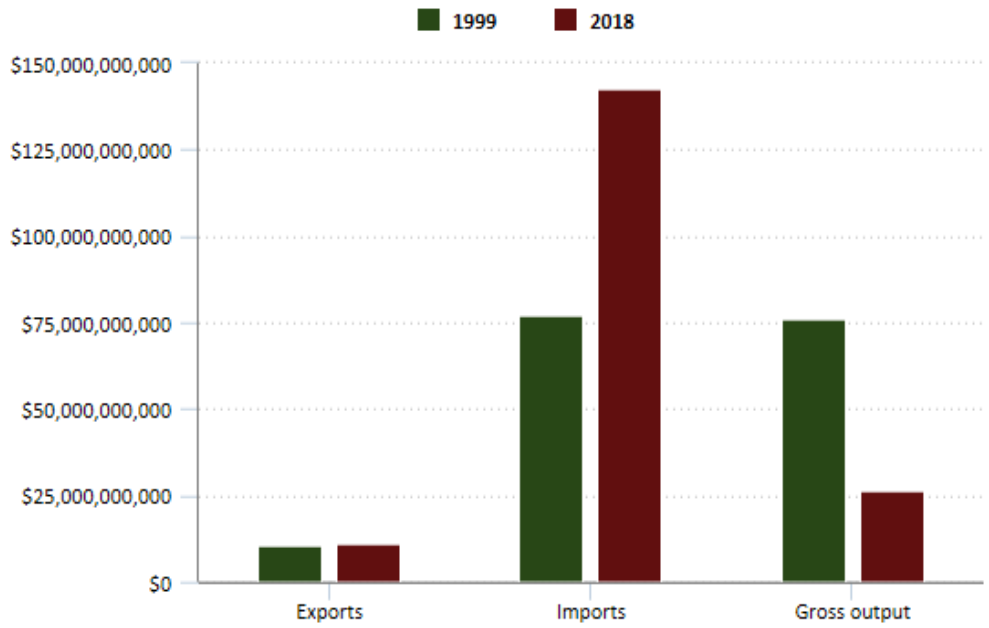
Over the 1990–2018 period, hourly earnings in apparel, textile mills, and textile product mills have ranked the lowest among all of manufacturing's component industries. Both the textile mills and textile product mills industries saw below-average earnings growth; and while apparel manufacturing earnings showed the strongest percentage

growth among all manufacturing industries since January 1990, the level of hourly earnings for apparel workers joined those of textile product mill workers at the bottom of all manufacturing industry earnings.

Employment in each of the apparel and textile industries fell dramatically from January 1990 through the 2007–09 recession. Employment has leveled off in textile product mills since then, and employment losses in textile mills and apparel have decelerated through 2018. Apparel experienced the largest decrease in employment among all manufacturing component industries over the 1990–2018 period, falling by 91 percent. The substantial loss of jobs in apparel manufacturing over the period more than offset gains made in hourly earnings, with aggregate weekly payrolls of apparel workers in 2018 representing just 27 percent of 1990 pay levels.[14]

Rising competition from apparel imports has driven down both employment and the number of apparel manufacturers in the United States. Over the 2001–2018 period, the number of apparel manufacturers declined from more than 15,000 establishments to fewer than 7,000.[15] In addition, the trade deficit for apparel, footwear, and household goods doubled over the period, to $132 billion, and domestic output of apparel fell from $76 billion in 1999 to $27 billion in 2018.[16] (See figure 7.)

Figure 7. Annual value of apparel, footwear, and household goods exports, imports, and gross output, 1999 and 2018



Click legend items to change data display. Hover over chart to view data.
Source: U.S. Bureau of Economic Analysis.

Summary

Although manufacturing industries held a reputation for stable, well-paying jobs for much of the 20th century, shifts within the industry in the last several decades have altered that picture considerably. Since 1990, trends in average hourly earnings across manufacturing industries have been disparate. While a few industries have shown strong earnings growth, many others have shown earnings increasing at a much slower rate than the overall private sector, with motor vehicles and parts demonstrating the most notable slowing. In fact, despite a long history

of surpassing private sector earnings, average hourly earnings in durable goods have recently been eclipsed by the overall private sector average.

While employment and earnings in most industries within manufacturing are susceptible to changes in forces such as trade and the U.S. business cycle, others may be more directly affected by movements in other measures, such as the price of oil and the growing use of technology. Therefore, whether more recent improvements in employment and earnings in specific manufacturing industries endure over the long term may depend on a confluence of developments outside the control of manufacturers.

SUGGESTED CITATION

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NOTES

1 See, for example, Louis Uchitelle, “The wage that meant middle class,” *The New York Times*, April 20, 2008, https://www.nytimes.com/2008/04/20/weekinreview/20uchitelle.html.

2 Throughout this article, “average hourly earnings” and “hourly earnings” are used interchangeably.

3 For more information on benefits, see the National Compensation Survey page on the U.S. Bureau of Labor Statistics (BLS) website at https://www.bls.gov/ncs/.

4 Unless otherwise indicated, employment, hours, and earnings data are from the BLS Current Employment Statistics (CES) survey. For more information, see the CES page of the BLS website at https://www.bls.gov/ces.

5 The CES data collection form for manufacturing defines production employees as workers engaging in assembling, fabricating, janitorial activities, maintenance or repair, materials handling, processing, product development, recordkeeping related to production, shipping or receiving, storage or warehousing, and trucking. For more information, see the CES data collection form at https://www.bls.gov/ces/idcf/formc_sp.pdf.

6 Production employees in manufacturing and production and nonsupervisory employees in other industries are referred to as “workers” or “employees,” and average hourly earnings, average weekly earnings, and average weekly hours discussed throughout this article pertain to production workers in manufacturing and production and nonsupervisory workers in other industries (including total private).

7 For more information, see Angela Clinton, “An average mystery in hours and earnings data entails a weighty explanation,” *Beyond the Numbers*, vol. 7, no. 9, June 2018, https://www.bls.gov/opub/btn/volume-7/mystery-in-average-of-hours-and-earnings.htm#ednref1.

8 Throughout this article, “average weekly earnings” and “weekly earnings” are used interchangeably.

9 Average weekly hours are based on hours paid during the reference period, which is the pay period that includes the 12th day of the month, including any paid leave.

10 See Kristin Dziczek, “Bob Fish memorial automotive and economic outlook luncheon,” *2011 Detroit 3—UAW labor contracts*, Center for Automotive Research, January 19, 2012, https://www.chicagofed.org/forms/rss/~/media/1ca75a4a11c341fa877776a07e0cb501.ashx.

[11] See Jane Slaughter, "UAW agrees to givebacks at Ford," *Labor Notes*, February 20, 2009, https://labornotes.org/2009/02/uaw-agrees-givebacks-ford.

[12] See Sean McAlinden, Kristin Dziczek, and Art Schwartz, "CAR breakfast briefing," *2011 Detroit 3—UAW labor contracts*, Center for Automotive Research, November 29, 2011, http://www.cargroup.org/wp-content/uploads/2017/02/2011-Detroit-3_UAW-Labor-Contract-Negotiations.pdf.

[13] See Michael Barthel, "Despite subscription surges for largest U.S. newspapers, circulation and revenue fall for industry overall," *Fact Tank: News in the Numbers*, June 1, 2017, https://www.pewresearch.org/fact-tank/2017/06/01/circulation-and-revenue-fall-for-newspaper-industry/.

[14] Aggregate weekly payrolls are the product of employment and average weekly earnings.

[15] The number of establishments is from the BLS Quarterly Census of Employment and Wages (QCEW); see the QCEW page on the BLS website at https://www.bls.gov/cew/.

[16] For more information on the U.S. trade balance, see "U.S. international trade in goods and services, September 2019," U.S. Bureau of Economic Analysis, https://www.bea.gov/data/intl-trade-investment/international-trade-goods-and-services.

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