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Exploring Midwest manufacturing employment from 1990 to 2019

Using data from the Current Employment Statistics program, this article explores manufacturing employment dynamics between 1990 and 2019 in the Midwest region of the United States. The article compares and contrasts employment trends for both the region as a whole and the individual states that comprise it. Additionally, the article presents an examination of selected detailed industries. For context, the article uses periods within historical business cycles to frame analysis of manufacturing employment trends.

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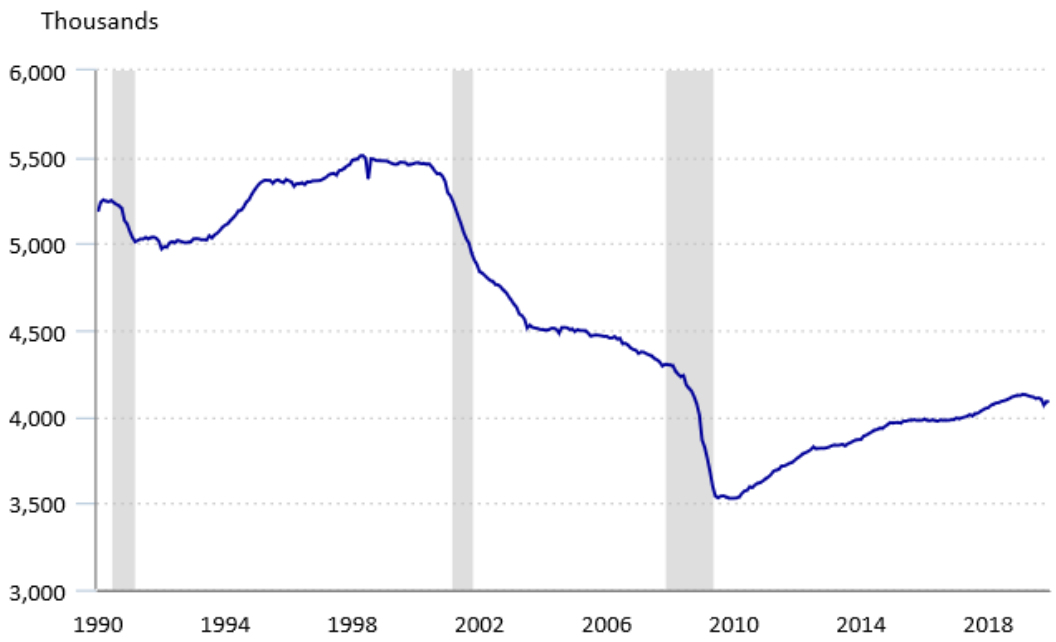
Since the peak of 19.4 million jobs in June 1979, manufacturing employment has declined throughout the United States, as both a relative share of total employment and in absolute terms. This article is one in a four-part series that uses Current Employment Statistic program data to examine long-term trends in regional manufacturing employment.[1] In this article, we explore data trends in the Midwest region of the United States. The data span three decades, from 1990—the earliest available date of the state-level manufacturing employment data under the North American Industry Classification System (NAICS)—through 2019, just before the recession that was ushered in by the coronavirus disease 2019 pandemic.

For this article, we define the Midwest region using the U.S. Census Bureau designation of 12 states: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. This region has a history as the backbone of manufacturing in the United States, accounting for roughly one-third of all manufacturing jobs in the country. Factory employment trends in the Midwest have been similar to the nation as a whole. However, the region has a unique mix of industries within the manufacturing sector. Within the industries and subindustries across the region, the employment dynamics over time show an evolving manufacturing landscape.

Regional trends

The recent history of Midwest manufacturing can be broken down by decade, with distinct trends during business cycle expansions, as shown in chart 1. The 1990s began with a brief recession, resulting in a modest dip. Throughout the rest of the decade, manufacturing employment in the Midwest remained relatively flat with moderate growth. In January 1990, there were 5.2 million manufacturing jobs in the Midwest region of the United States. Through the end of 2000, the region added roughly 278,000 additional manufacturing jobs (growing the industry by 5.4 percent). During the same period, total nonfarm employment in the region grew by 5.1 million jobs (18.9 percent). This modest growth in the manufacturing sector during a period of economic expansion reveals a major shift in the industrial composition of the region and nation. From the end of 2000 and over the next decade, manufacturing jobs would decline greatly, despite the region experiencing periods of economic expansion.

Chart 1. Manufacturing employment in the Midwest region of the United States, seasonally adjusted, 1990–2019



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.

The 2000s were a period of near continuous manufacturing job loss in the Midwest. The decade began with a sharp decline before and during the 2001 recession, with 561,000 jobs lost from an employment peak in January 2000 to the end of the recession in November 2001. As the economy as a whole was expanding from November 2001 to December 2007 (the business cycle peak before the Great Recession), the decline in Midwest manufacturing employment slowed. In this period, the manufacturing industry shed roughly 604,000 jobs, 12.3 percent of its November 2001 level. Although factory job loss in the early 2000s has no single explanation, the decade saw a major change in international competition after China was granted permanent normal trade relations with the United States in 2000. This change in trade relations has often been cited as a key factor in the manufacturing employment decline of the 2000s.[2] After the expansion of the 2000s ended, the ensuing Great Recession resulted in the single largest drop in manufacturing jobs for the region. From the business cycle peak of December 2007 to the trough of June 2009, the Midwest region lost 761,000 manufacturing jobs. Employment for the industry contracted by over 17 percent in less than 2 years.

Postrecession manufacturing employment bottomed out in February 2010 at 3.5 million. Since that low, employment in the manufacturing sector has experienced sustained growth, adding 554,000 jobs through the end

of 2019. As of December 2019, jobs in manufacturing had grown to 4.1 million, a 17.1-percent increase since the trough of the recession in February 2010.

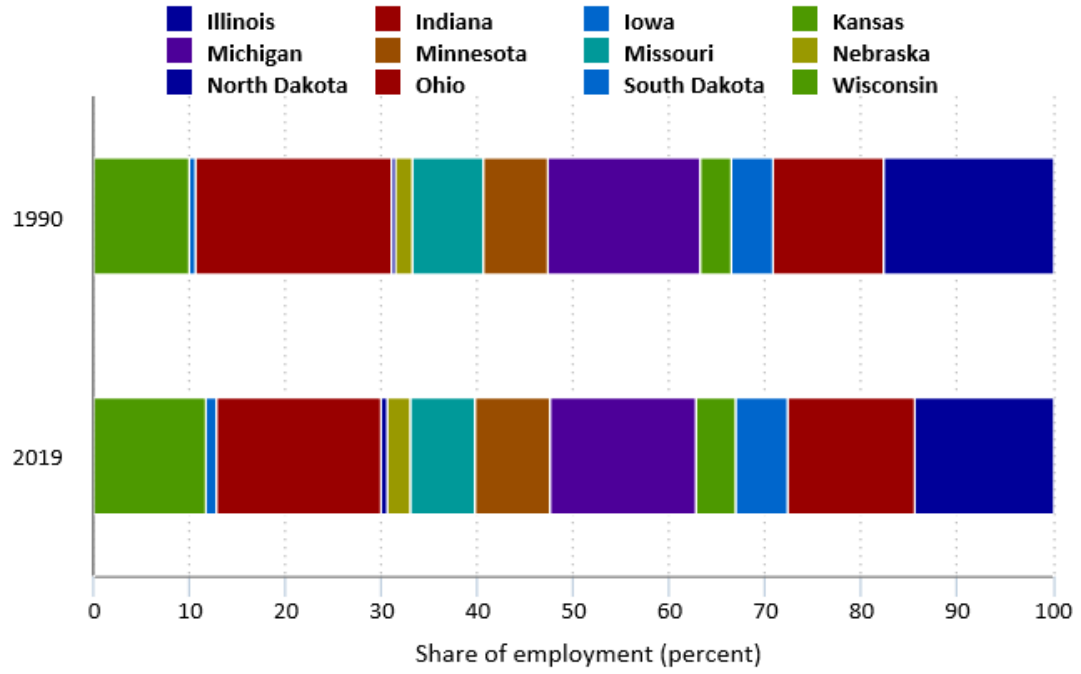
Although manufacturing employment declined in the Midwest and elsewhere, output did not decline in the same way, because a corresponding increase occurred in labor productivity.[3] That is, companies needed fewer workers to produce the same level of output. Labor productivity in manufacturing increased by 101.8 percent from 1990 to 2019, although it fell slightly after 2013.[4] Total measured output grew substantially in the 1990s but showed little net growth in the 2000s and 2010s, with variation around the business cycle.[5] Manufacturing also saw an increase in capital intensity, becoming more dependent on capital and less reliant on labor.[6] The division between durable and nondurable goods provides context for those employment declines and the industry concentrations of Midwestern states.

Despite the large decline in manufacturing jobs in recent decades, the region maintained its share of national manufacturing employment. In 1990, manufacturing employment in the Midwest region accounted for 29.1 percent of the national employment in the manufacturing sector. While the industry shrank both nationally and regionally, the Midwest's share grew by 2.8 percentage points to 31.9 percent in 2019, since national employment in manufacturing declined at a greater rate than in the Midwest region. Between 1990 and 2019, the number of jobs in the manufacturing sector in the Midwest shrank by 1.1 million, 21.2 percent. Over that same period, nationally, 5.0 million manufacturing jobs were lost, 28.0 percent of the 1990 level. In addition, the manufacturing industries on which the region depended most, such as transportation equipment manufacturing and fabricated metals manufacturing, saw the greatest declines as the global economy took shape in the late 20th century.[7]

State manufacturing dynamics

As shown in chart 2, while the Midwest region has experienced a substantial decline in manufacturing since 1990, the relative employment by state has remained somewhat stable. In 1990, Ohio accounted for 20.3 percent of all manufacturing employment in the region, followed by Illinois with 17.6 percent. By 2019, both states experienced the largest declines in share of regional manufacturing employment: –3.2 percentage points and –3.3 percentage points, respectively. Between 1990 and 2019, two other states saw their share of regional employment decline, Missouri (–0.8 percentage points) and Michigan (–0.7 percentage points), which by 2019 had more factory jobs than Illinois. Each of the remaining eight states—North Dakota, Indiana, Minnesota, Iowa, South Dakota, Kansas, Nebraska, and Wisconsin—represented a modestly greater proportion of regional manufacturing employment in 2019 than in 1990.

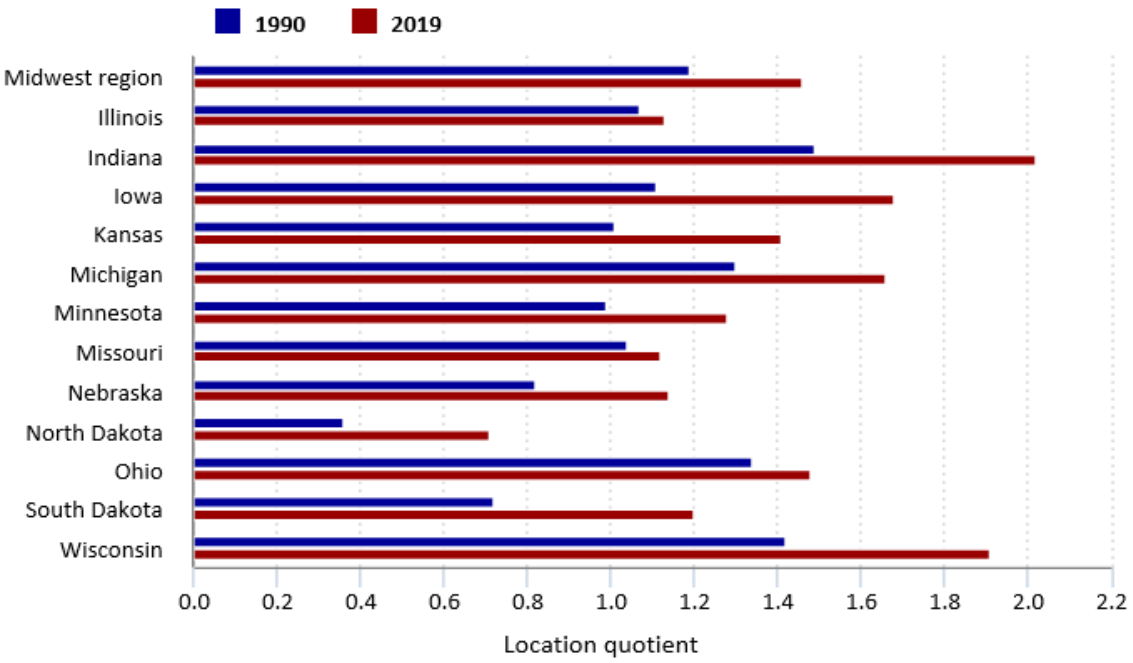
Chart 2. State share of manufacturing employment in the Midwest region, 1990 and 2019



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

We use location quotients to examine the change in industrial concentration of manufacturing employment in the states of the Midwest region.[8] We calculate the location quotients by taking the manufacturing industry's share of total nonfarm employment for that state and dividing it by the share of manufacturing employment at the national level. A location quotient greater than 1.0 indicates that a state's concentration of manufacturing employment is greater than the national proportion. Location quotients for all Midwestern states and the region as a whole are displayed for each state for 1990 and 2019 in chart 3. The increase in the concentration of manufacturing employment in the Midwest region since 1990 is due to the combination of slower regional nonfarm employment growth as well as the slower rate of decline in manufacturing jobs in the region relative to the rest of the nation. Between 1990 and 2019, the location quotients for all states in the Midwest region increased, indicating that manufacturing employment has become more concentrated in the region. Indiana, Iowa, and Wisconsin experienced the greatest growth in concentration of manufacturing employment relative to the national average. Indiana has the highest location quotient in the region at roughly 2.02, indicating that in 2019, manufacturing employment accounted for twice the share of employment in the state as it did nationally. Of the 12 states in the region, 8 were more concentrated than the national average in 1990. In 2019, the four states with the highest manufacturing concentration were in the Midwest—Indiana, Iowa, Michigan, and Wisconsin—and all states in the region except North Dakota had a quotient greater than 1.

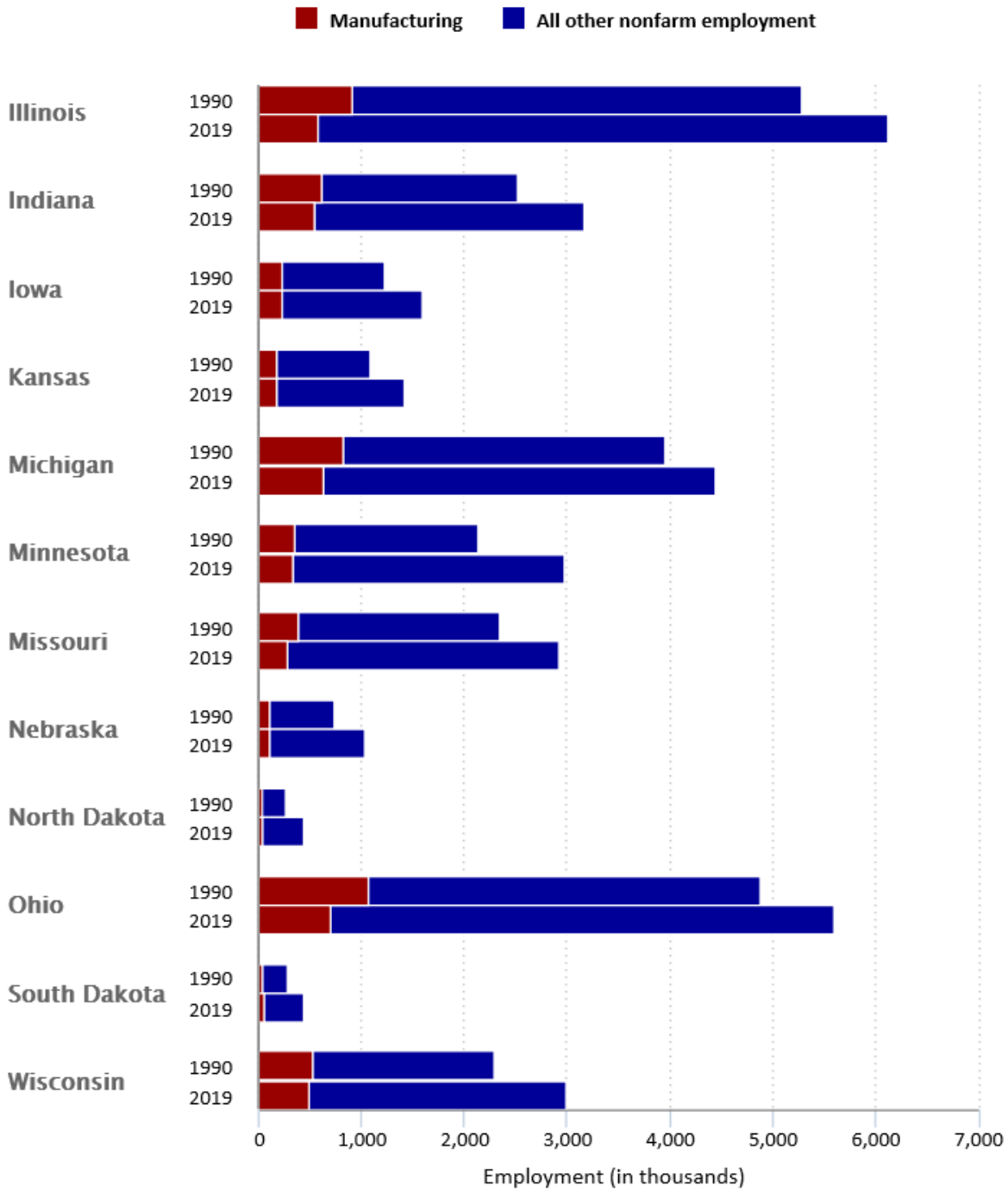
Chart 3. Location quotients for manufacturing employment in the Midwest region, by state, 1990 and 2019



Click legend items to change data display. Hover over chart to view data.
Source: Authors' calculations based on U.S. Bureau of Labor Statistics data.

While manufacturing grew more concentrated in the Midwest than the nation as a whole, manufacturing employment still fell as a share of payroll jobs in most Midwestern states. Chart 4 displays manufacturing employment as a proportion of total nonfarm employment for each state in the Midwest region for 1990 and 2019. Examining the changes of employment in manufacturing with respect to total nonfarm employment reveals how much the industrial landscape has changed. Over these three decades, the total number of manufacturing jobs has increased in four of the smallest states in the region: Iowa (+4,300), Nebraska (+4,100), North Dakota (+11,900) and South Dakota (+12,000). However, North Dakota was the only state where employment in the manufacturing industry increased as a percentage of total nonfarm employment, up 0.2 percentage points. The remaining eight states in the region—Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, Ohio, and Wisconsin—witnessed a decline in both the number of manufacturing jobs and their proportion relative to total nonfarm. The greatest decline in manufacturing employment as a percentage of total nonfarm employment occurred in Ohio. In 1990, manufacturing accounted for roughly 21.7 percent of all employment in the state. In 2019, manufacturing accounted for 12.5 percent of all jobs in Ohio, after the industry shed roughly 359,000 jobs. Other states in the region where the concentration of employment in manufacturing declined notably include Illinois (–7.7 percentage points), Indiana (–6.9 percentage points), Michigan (–6.9 percentage points), Missouri (–7.2 percentage points), and Wisconsin (–6.7 percentage points).

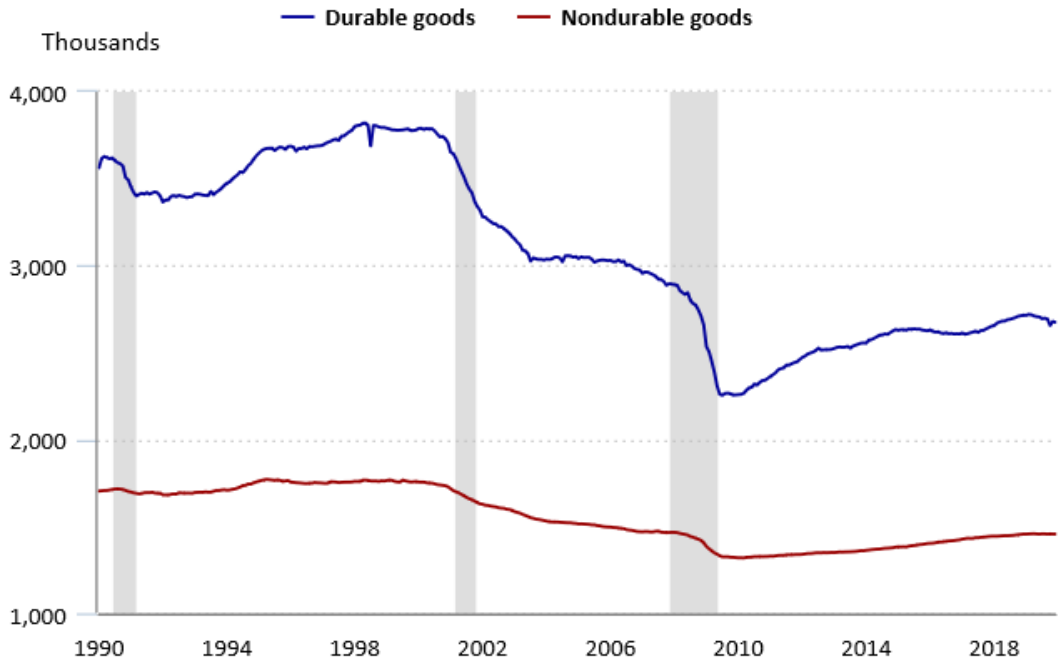
Chart 4. Manufacturing share of total nonfarm employment in the Midwest region, by state, 1990 and 2019



Hover over chart to view data.
Source: U.S. Bureau of Labor Statistics.

To better show the manufacturing trends of the Midwest, the next section explores what happened in more detailed industries. A breakdown between employment in durable and nondurable goods is available for all 12 Midwestern states. (See chart 5.)

Chart 5. Durable and nondurable goods employment in the Midwest region of the United States, seasonally adjusted, 1990–2019



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.

Durable goods

Of the 1.1 million jobs lost in manufacturing between January 1990 and December 2019, 78.0 percent were in durable goods, with 880,000 jobs vanishing over this period. Between December 2007 and June 2009, 634,000 jobs were lost. Between June 2009 and December 2019, durable goods manufacturing saw modest gains in employment, adding 414,200 jobs, but failed to reach prerecession levels.

Transportation equipment

Ten Midwestern states account for almost two-fifths of nationwide transportation equipment employment, and transportation equipment (NAICS 336) is a core part of Midwest manufacturing, with nearly a fourth of the region's durable goods manufacturing employment.[9] Transportation equipment in the region includes a large share of the domestic automotive industry—centered in Detroit and extending into Indiana, Ohio, and other states—as well as other industrial hubs. Wichita, Kansas, has been dubbed the "Air Capital of the World," and anchors the aerospace industry in that state, while Elkhart, Indiana, is known as the "RV Capital of the World." Of recreational vehicles sold in the United States, 80 percent are manufactured in Indiana, with Elkhart County making up 65 percent of that production.[10] Transportation equipment is also important since much of the output of other industries serves as intermediate goods in producing cars, trucks, and airplanes. Nationwide, transportation equipment uses 27 percent of the commodity output of primary metals (NAICS 331), 17 percent of fabricated metal products (NAICS 332), 13 percent of plastics and rubber products (NAICS 326), and 15 percent of computer and electronic products (NAICS 334).[11]

Michigan, Ohio, and Missouri are home to a substantial concentration of U.S. employment in motor vehicle manufacturing—which is engaged in the final assembly of light vehicles and chassis. These three states had 146,100 jobs in motor vehicle manufacturing in 1990, 54 percent of the national total. In 2019, this number dropped to 72,000, just 30 percent of the national total. The drop of approximately 74,000 jobs in these three

states more than accounts for the 34,000 jobs lost nationwide. As of 2019, motor vehicle manufacturing employment in Michigan reached just 42 percent of its 1990 level, while Missouri and Ohio reached 70 percent and 58 percent of their 1990 levels, respectively.

From 1990 to 2019, motor vehicle manufacturing grew more geographically diverse, with the South accounting for a growing proportion of this industry's employment. For example, between 1990 and 2019, Alabama's share of motor vehicle employment rose from 0.1 percent to 5.2 percent, Kentucky's share rose from 3.9 percent to 8.1 percent, and Texas' share rose from 1.6 percent to 4.5 percent.

Machinery

In the 11 Midwestern states where data are available (all except South Dakota), employment in machinery (NAICS 333) fell by 136,000 (–22.3 percent) from 1990 to 2019, representing almost half the nationwide decline of 283,200 jobs (–20 percent). Nearly half the Midwest losses were in Illinois, which saw its employment drop by 61,600 jobs (–46 percent). Other states with large losses include Michigan (–23 percent), Ohio (–32 percent), and Wisconsin (–12 percent). Employment in North Dakota's machinery industry remains small, even after it nearly doubled from 1990 (3,100) to 2019 (6,000). Since 2009, these 11 Midwestern states have gained 12.9-percent employment on average. Indiana, Iowa, Kansas, Michigan, Minnesota, Ohio, and Wisconsin have all seen double-digit percentage gains since 2009, while Illinois lost 6.4 percent over the same period.

Computer and electronic products

Another industry that has seen notable losses across the Midwest is computer and electronic products (NAICS 334). Six states have data available back to 1990. These states lost a collective 127,200 jobs between 1990 and 2019, a 50-percent aggregate decline.[12] Of these states, Minnesota experienced the smallest percentage decline (–31.2 percent), whereas Indiana had the largest percentage decline (–62.4). Ohio, Michigan, and Missouri have seen employment gains since 2009. Ohio's employment has risen by 3 percent, Michigan's by 16 percent, and Missouri's by 72 percent.

In Minnesota, computer and electronic products lost 20,700 jobs (–31.2 percent) from 1990 to 2019, but electronic instruments (NAICS 3345) gained 7,500 jobs (38.5 percent). Minnesota has shown a trend counter to the industry nationwide, which has lost 212,800 jobs (–33.5 percent) in electronic instruments employment since 1990.

Furniture

Furniture (NAICS 337) has also seen steep declines across the Midwest since 1990, particularly in Michigan, where employment in the industry has declined by 16,100 (–41 percent). Furniture manufacturing in Michigan saw a substantial decline in employment between 2000 and 2003, when 12,100 jobs were lost. Michigan's decline in furniture manufacturing is highlighted because its city of Grand Rapids is known as "Furniture City," as it had been home to major furniture manufacturers since the mid-1800s. Since 2009, the industry has recovered 3,500 jobs in Michigan, but employment continued to decline, however, in Ohio and Illinois. Combined job losses in Illinois and Ohio totaled 15,700 (–36 percent) between 1990 and 2019.

Nondurable goods

Between January 1990 and December 2019, nondurable goods employment in the Midwest fell by 247,300 jobs (–14.5 percent). Nationally, employment in nondurable goods manufacturing declined by 2.2 million jobs (–31.7 percent) over the same period. The Midwest lost relatively fewer jobs in this industry than the rest of the country, with other regions accounting for 88.9 percent of the job losses in nondurable goods. Nationally, 61 percent of the decline in nondurable goods employment was in textiles, textile product mills, and apparel. Midwestern states lack major employment in these industries, explaining, at least partially, the divergence between the Midwest and national trends. Midwest nondurable goods manufacturers lost 134,700 jobs between December 2007 and June 2009 but recovered 125,000 between June 2009 and December 2019. This 9.3-percent growth rate was higher than the national rate of 5.5-percent growth over the same period.

Printing and related support activities

Illinois and Ohio have seen substantial losses in printing and related support activities (NAICS 323) losing over 68,000 jobs between 1990 and 2019. These losses represent 26.9 percent of the overall decline in Midwest nondurable goods manufacturing during this period. Printing has not recovered in Illinois or Ohio since the end of the Great Recession, shedding 11,900 jobs (–20 percent) from 2009 to 2019. Illinois and Ohio largely reflect national industry trends, which had a loss of an additional 96.8 thousand jobs (–18.5 percent) in the same period.

Paper and paper products

A related industry experiencing a similar national decline is paper and paper products (NAICS 322). Establishments in this industry lost 281,900 jobs (–43.5 percent) nationally between 1990 and 2019, 12.9 percent of total nondurable job losses. Illinois alone lost 14,500 jobs (–43.9 percent) over the same period, mirroring the national trend. These losses represent 16 percent of the nondurable job losses for the state and followed a steady downward trend after a peak in 1995.

Plastics and rubber products manufacturing

Ohio employment in plastics and rubber products (NAICS 326) fell by over 20,000 jobs (–25.9 percent) from 1990 to 2019. Rubber products employment in Ohio saw a decline of over 52 percent in employment, highlighting the struggles for cities like Akron. Akron once hosted corporate offices for four of the “Big Five” tire companies and 68.4 percent of total wage earners in the industry, hence the title “Rubber Capital of the World.”[13] Other states in the Midwest bucked the downward trend in plastics and rubber manufacturing: Wisconsin and Michigan added a combined 12,100 jobs from 1990 to 2019, representing 23.5-percent and 15.7-percent increases, respectively.

Illinois saw similar but smaller declines in this industry. Employment in the industry steadily increased from 47,500 in 1990 to a high of 59,300 jobs in 1998, before declining to 39,700 in 2009. From 2009 through 2019, the industry regained 3,600 jobs, reaching a level of 43,300 in 2019, 1,400 jobs short of the 2007 level. Between 1990 and 2019, Illinois saw a cumulative decline of 8.8 percent in plastics and rubber products manufacturing employment.

Food manufacturing

One industry, in particular, has grown steadily since 1990: food manufacturing (NAICS 311). Midwestern states for which data go back to 1990 have seen an average increase of 14.3 percent in employment through 2019.[14] Kansas has seen the largest percentage growth, expanding employment by just over 40.7 percent. Indiana has grown by 23.2 percent since January 2002. Illinois and Michigan are the only states that have lost employment, with Michigan declining by 8.4 percent and Illinois losing 1.0 percent.

Conclusion

Midwest manufacturing underwent significant changes from 1990 to 2019. While manufacturing employment declined across the nation, including most of the Midwestern states, the reallocation in the share of employment from manufacturing to other industries was not as rapid in the region. That is, the location quotient for manufacturing increased in every Midwestern state from 1990 to 2019, and by 2019, manufacturing represented a larger share of payroll employment than the national average for every state in the region except North Dakota. The net declines in Midwest manufacturing employment are evident across NAICS industries, with food manufacturing being an outlier in this respect. These employment changes occurred against a backdrop of a more competitive global manufacturing marketplace and increasing capital intensity and labor productivity in U.S. manufacturing.

SUGGESTED CITATION

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NOTES

1 Seasonally adjusted monthly data are used for overall manufacturing employment as well as durable and nondurable goods manufacturing. Seasonally adjusted data are not available at a more detailed level for some industries, so annual averages of not seasonally adjusted data are presented.

2 Justin R. Pierce and Peter K. Schott, "The surprisingly swift decline of US manufacturing employment," *American Economic Review*, vol. 106, no. 7, July 2016, pp. 1632–62, https://www.aeaweb.org/articles?id=10.1257/aer.20131578.

3 Teresa C. Fort, Justin R. Pierce, and Peter K. Schott, "New perspectives on the decline of US manufacturing employment," *Journal of Economic Perspectives*, vol. 32, no. 2, May 2018, pp. 47–72, https://doi.org/10.1257/jep.32.2.47.

4 "Index of labor productivity (output per hour) in manufacturing, 1990–2019," series I.D.: PRS30006093 (U.S. Bureau of Labor Statistics), https://data.bls.gov/cgi-bin/srgate.

5 "Index of labor output in manufacturing, 1990–2019," series I.D.: PRS30006043 (U.S. Bureau of Labor Statistics), https://data.bls.gov/cgi-bin/srgate. A substantial amount of the measured output growth has been attributed to the rapid product improvements in the computer and electronic products manufacturing industry (North American Industry Classification System 334). For more information, see Susan N. Houseman, "Understanding the decline of U.S. manufacturing employment," Working Paper 18-287 (Kalamazoo, MI: W. E. Upjohn Institute for Employment Research, June 8, 2018), https://ssrn.com/abstract=3192862.

6 For the data, see "Index of capital intensity in manufacturing, 1990–2019," series I.D.: MPU9900082 (U.S. Bureau of Labor Statistics), https://data.bls.gov/cgi-bin/srgate. For a relevant discussion, see Kerwin K. Charles, Erik Hurst, and Mariel Schwartz, "The transformation of manufacturing and the decline in US employment," *NBER Macroeconomics Annual*, vol. 33, June 2019, pp. 307–372, https://doi.org/10.1086/700896.

7 Benjamin Collins, Thomas McDonald, and Jay A. Mousa, "The rise and decline of auto parts manufacturing in the Midwest," *Monthly Labor Review*, October 2007, pp. 14–20, https://www.bls.gov/opub/mlr/2007/10/art2full.pdf.

8 The general formula for location quotients is represented as

$$\text{Location Quotient} = \frac{\text{local concentration of specific industry's employment}}{\text{national concentration of specific industry's employment}}$$

$$= \frac{\text{local specific industry's employment level} / \text{local total nonfarm employment}}{\text{national specific industry's employment level} / \text{national total nonfarm employment}}.$$

9 States with available transportation equipment manufacturing data include Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, Ohio, and Wisconsin.

10 Alexendria Burris, "Recession fears are rising. Here's the status of economic bellwether Elkhart, Indiana," *IndyStar*, August 19, 2019, https://www.indystar.com/story/money/2019/08/18/recession-elkhart-indiana-rv-recreational-vehicle-shipments-economy/2021354001/.

11 Transportation equipment's share of industry commodity output was calculated based on 2019 industry use of various commodities by industries after redefinitions (producers' prices) data from the U.S. Bureau of Economic Analysis, https://www.bea.gov/data/industries/input-output-accounts-data.

12 Employment in computer and electronic products is available starting in 1990 for Illinois, Indiana, Michigan, Minnesota, Missouri, Nebraska, and Ohio. The time series for this industry in Michigan begins in 2001.

13 Irvin Sobel, "Economic impact of collective bargaining upon the rubber tire industry" (Ph.D. diss., University of Chicago, 1951); and Irvin Sobel, "Collective bargaining and decentralization in the rubber-tire industry," *Journal of Political Economy*, vol. 62, no. 1, February 1954, pp. 12–25, http://www.jstor.org/stable/1824984.

14 The U.S. Bureau of Labor Statistics publishes food manufacturing employment beginning in 1990 for all Midwestern states except Indiana and South Dakota. Indiana data are available beginning in 2002, while employment data for this industry are not available for South Dakota.

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