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By Bill LaFayette, PhD, owner, Regionomics® LLC

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Ohio Manufacturing Update

Summary

- While manufacturing is not Ohio's largest industry sector, its employment is half again as high as would be expected in an economy Ohio's size. Thus, more than any other sector, differences between Ohio and U.S. manufacturing growth translate to differences in total employment growth.
- Manufacturing provides 701,500 jobs in Ohio and generated \$111.5 billion in gross domestic product in 2018 – 13% and nearly 17% of total Ohio employment and output.
- Ohio manufacturing employment growth between January 2010 and December 2019 totaled 88,400 jobs (14.4%). U.S. employment grew 12.2%. However, Ohio growth since 2016 has lagged the national average.
- Employment in durable goods manufacturing (goods expected to last at least three years) is 471,000, while nondurable goods employment is 231,000. Durable goods employment growth has lagged the national average in recent years, while nondurables growth has generally kept pace with U.S. growth.
- Many manufacturing industries have employment concentrations greater than average, especially in durable goods – whose overall concentration is greater than that of nondurable goods. Many durable goods industries have underperformed, while nondurables growth has been better than average.
- There have been large disparities in employment growth among Ohio's regions.
- Inflation-adjusted total GDP growth in Ohio has been 27.7%, better than the 21.8% U.S. average. Durable goods GDP growth has lagged recently in Ohio, which has brought overall growth below the national average. Nondurable goods GDP has markedly outperformed the U.S. average, however.
- National and statewide productivity has increased steadily but slowly in recent years. This is a positive sign for the sustainability of manufacturing employment and operating income.

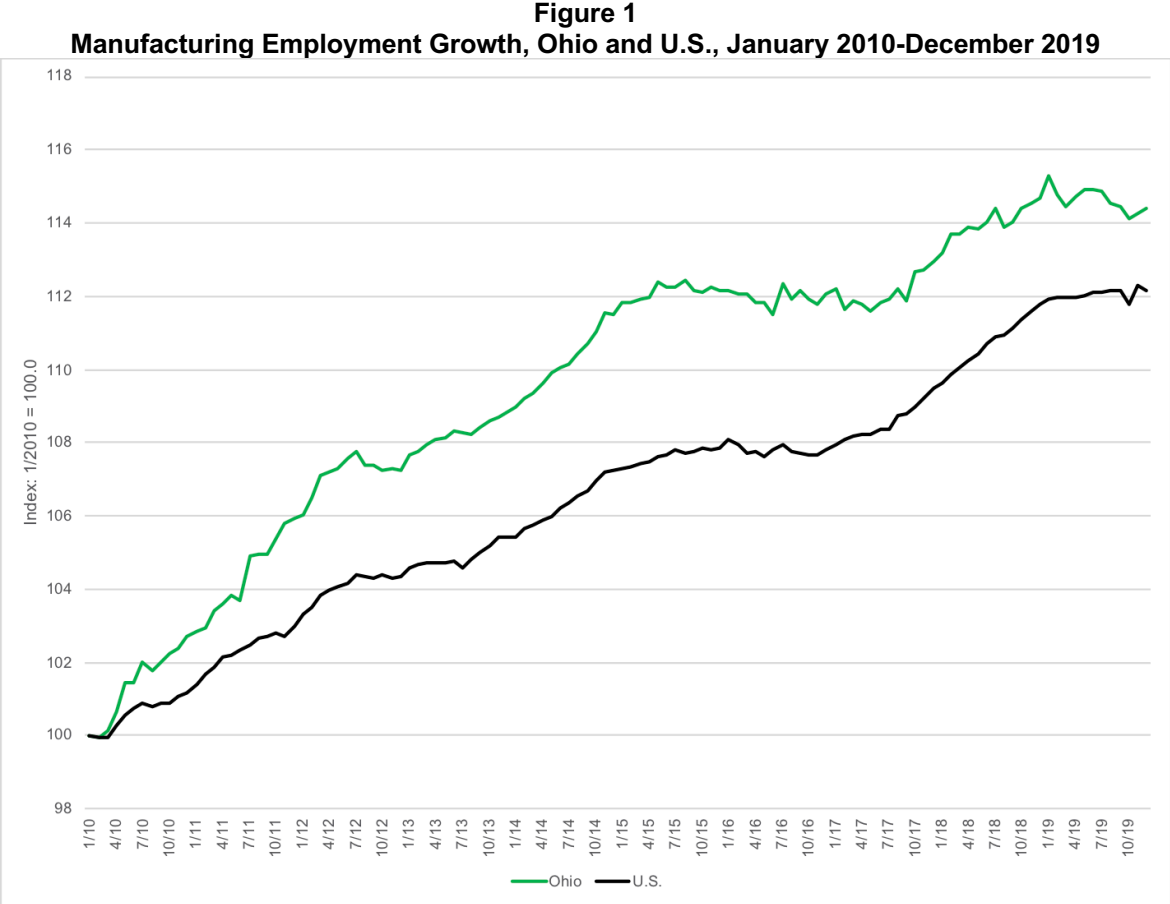
The Role of Manufacturing in Ohio's Economy

This article is the latest in a periodic status update of Ohio manufacturing. *On the Money* most recently focused on manufacturing in the October 13, 2017, issue (Vol. 132, No. 19). While manufacturing is not the state's largest industry sector, its employment is half again the total that would be expected in an economy Ohio's size. It is thus the single greatest reason why Ohio's economic performance differs from that of the U.S.

Manufacturing provides 701,500 jobs in Ohio and generated \$111.5 billion in Gross Domestic Product (GDP) in 2018 – 13% and nearly 17% of the respective totals. The 2017 article noted that employment and GDP growth had at that time been at a long standstill. Growth resumed not long after, but growth seems to have stalled again in recent months.

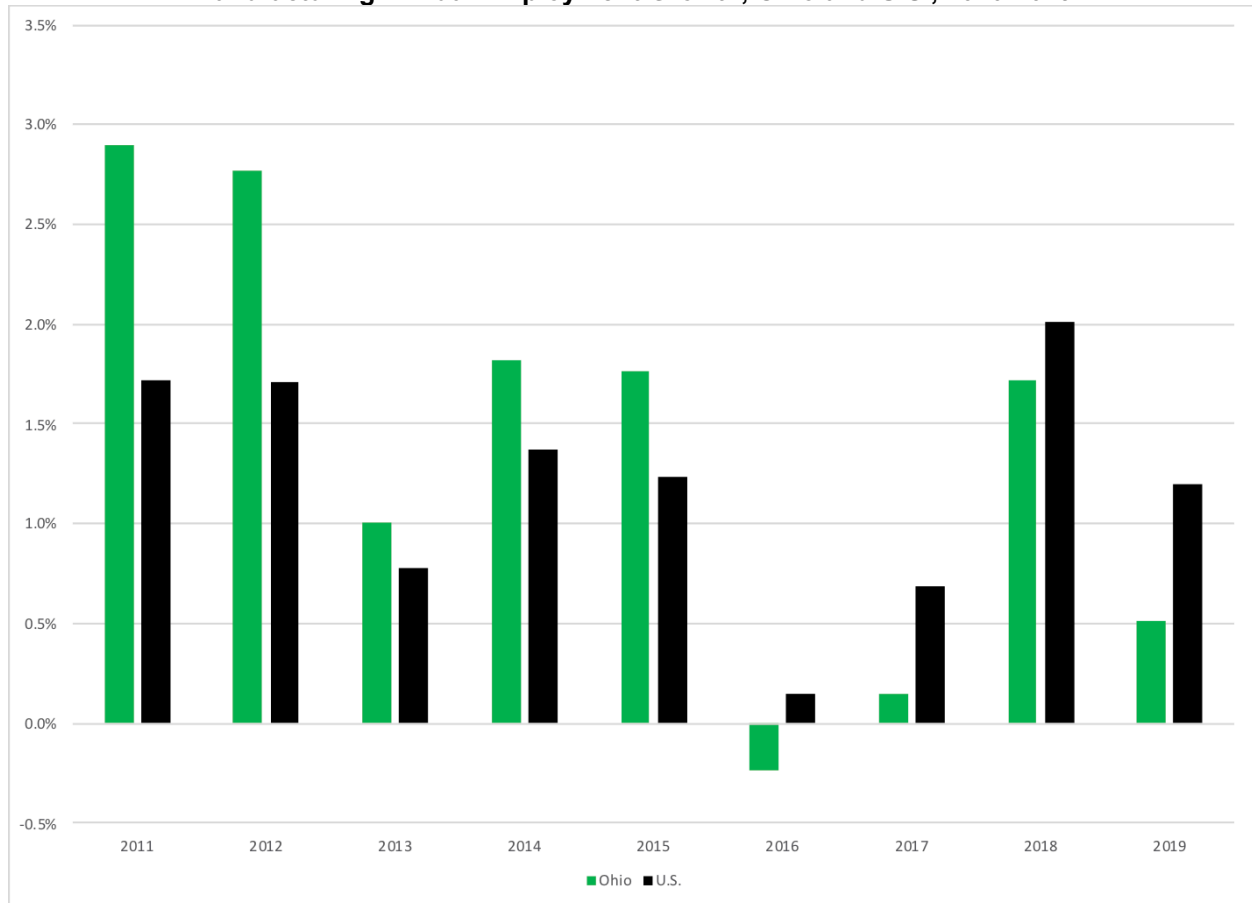
Employment Trends

Figure 1 compares monthly Ohio manufacturing employment growth to the U.S. average from January 2010 (the beginning of the employment recovery) through December 2019. The chart shows employment on an index basis, with state and national employment in January 2010 set to 100. Over this ten-year period, Ohio manufacturing employment increased 14.4% (88,400 jobs) while U.S. employment increased 12.2%. However, Figure 2 shows that Ohio's trend is less positive: Ohio's annual employment growth exceeded the national average only through 2015. Since then, Ohio has lagged.



Source: Current Employment Statistics, U.S. Bureau of Labor Statistics.

Figure 2
Manufacturing Annual Employment Growth, Ohio and U.S., 2010-2019

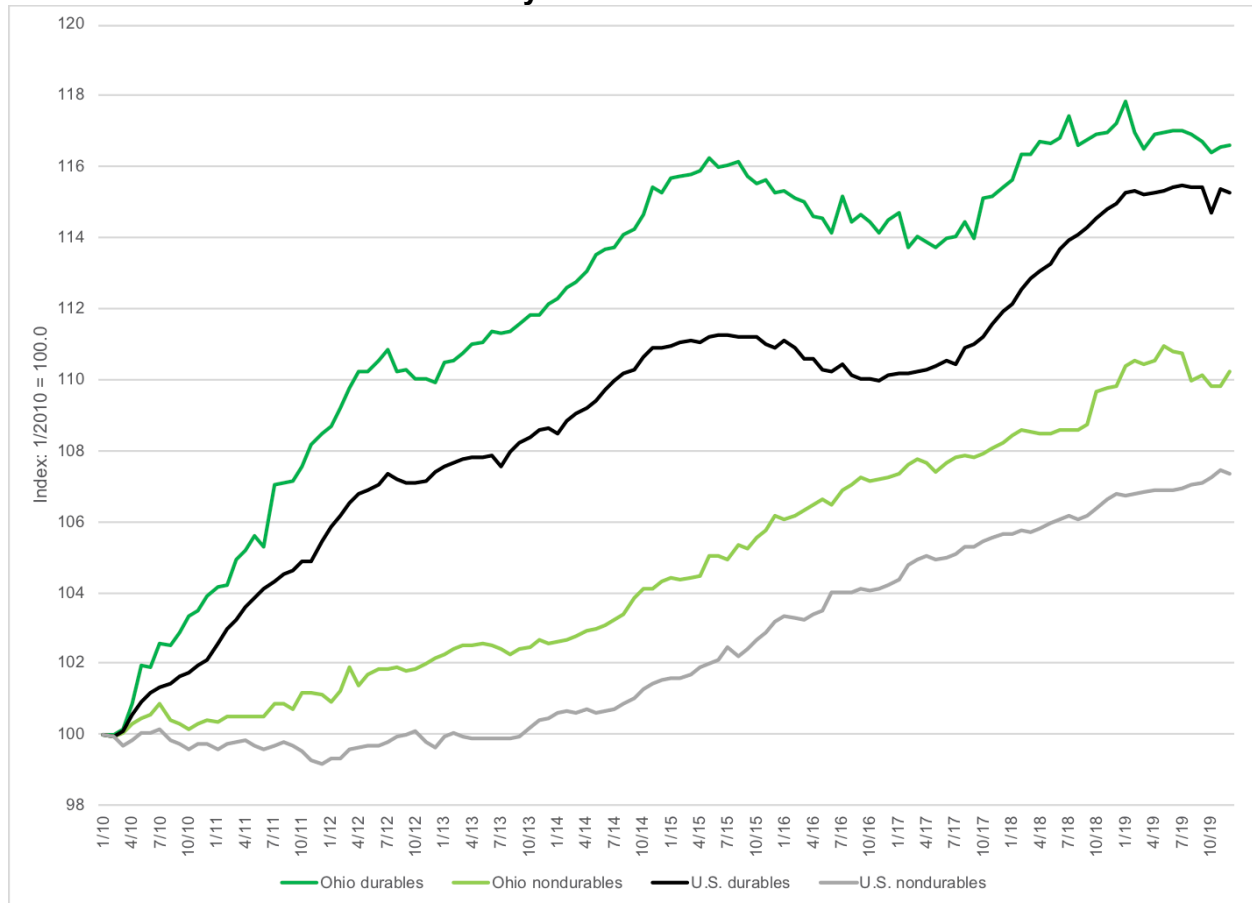


Source: Current Employment Statistics, U.S. Bureau of Labor Statistics.

The manufacturing sector is made up of two primary components: durable goods, which are expected to have a life of at least three years, and nondurable goods, which generally have a shorter life span. Durable goods employment is significantly larger than employment in nondurable goods, both nationally and in Ohio. Ohio durable goods manufacturers employ 471,000, while nondurable goods employment is 231,000. Figure 3 compares indexed employment growth of durable and nondurable goods producers since January 2010. Ohio durable goods employment has increased 16.6% compared to 15.3% nationally. Nondurable employment growth has amounted to 10.2% versus the national average of 7.3%

The insight here is that the accelerations and decelerations in manufacturing employment growth are due to the durable goods segment. Although nondurable goods employment growth is less than that of durable goods, it is much more stable. This stands to reason: many durable goods are high-cost items whose purchase can often be delayed. Consequently, they are much more susceptible to changes in consumer sentiment, business investment, and financing rates than are nondurables.

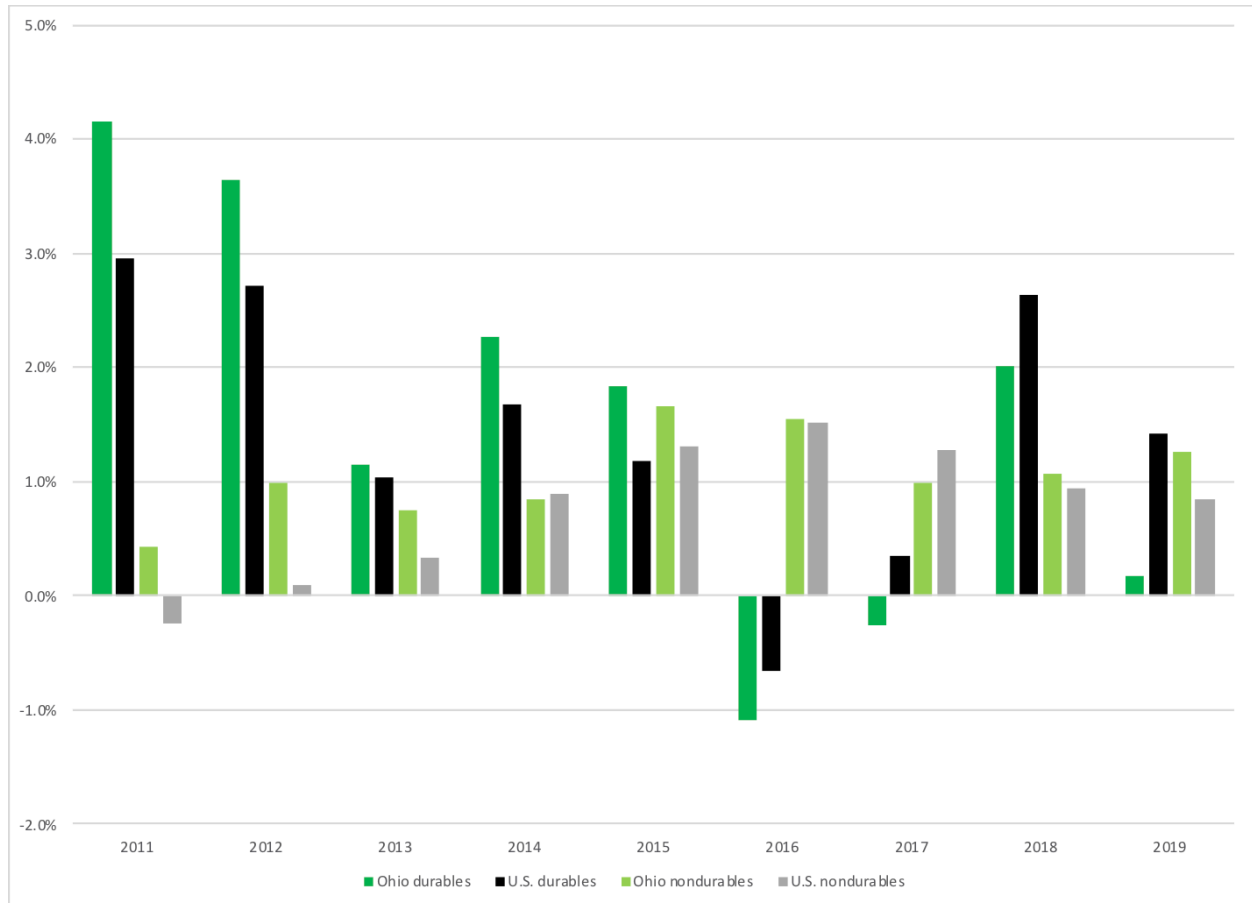
Figure 3
Durable and Nondurable Goods Employment Growth, Ohio and U.S.
January 2010-December 2019



Source: Current Employment Statistics, U.S. Bureau of Labor Statistics.

Annual employment growth trends over this period for durable and nondurable goods are charted in Figure 4. This graph confirms the pattern in Figure 3. Ohio durable goods employment growth after 2015 has been substantially less than the national average, while nondurables employment growth has been less than the national average in only two years, 2014 and 2017.

Figure 4
Durable and Nondurable Goods Annual Employment Growth, Ohio and U.S.
2010-2019



Source: Current Employment Statistics, U.S. Bureau of Labor Statistics.

Subsector Employment and Employment Growth

The manufacturing sector as defined by the North American Industry Classification System (NAICS) consists of 21 subsectors. Table 1 lists these durable and nondurable sectors. The first data column provides 2018 employment. (Employment for 2019 is not yet available at this level of detail.) The following column lists location quotients. Location quotient is the percentage of total Ohio employment in manufacturing or the subsector divided by the total U.S. percentage in manufacturing or the subsector. Thus, a location quotient greater than 1.00 indicates a larger-than-average share of total employment in the state. The manufacturing location quotient of 1.494 implies that Ohio manufacturing employment is 49.4% greater than average, or 49.4% than one would expect in an economy Ohio's size. The following columns indicate the eight-year and one-year employment changes.

Table 1
Manufacturing Subsector Employment, Concentration, and Net Change
2010-2018 and 2017-2018

Subsector	Empl., 2018	Location quotient	Change, 2010-18		Change, 2017-18	
			Ohio	U.S.	Ohio	U.S.
Manufacturing	698,974	1.494	12.7%	10.1%	1.9%	1.9%
Durable goods manufacturing	471,352	1.607	14.6%	12.6%	2.2%	2.6%
Wood products manufacturing	12,925	0.862	15.9%	19.4%	-0.6%	2.3%
Nonmetallic mineral products mfg.	27,301	1.776	11.3%	12.9%	0.5%	1.4%
Primary metals manufacturing	35,764	2.547	-3.5%	5.1%	-0.4%	2.8%
Fabricated metal products	102,072	1.886	8.5%	14.6%	3.4%	3.1%
Machinery manufacturing	79,907	1.945	20.2%	12.1%	2.7%	3.5%
Computer and electronic products mfg.	20,872	0.534	3.6%	-3.6%	2.7%	1.5%
Electrical equipment and appliance mfg.	26,604	1.810	4.3%	11.6%	-1.0%	3.0%
Transportation equipment mfg.	128,116	2.039	33.0%	28.0%	3.1%	3.4%
Furniture and related products mfg.	16,146	1.112	8.2%	10.2%	0.4%	-0.1%
Miscellaneous manufacturing	21,645	0.964	3.4%	7.2%	2.8%	2.6%
Nondurable goods manufacturing	227,598	1.304	8.8%	6.1%	1.3%	0.8%
Food manufacturing	61,441	1.033	14.6%	11.5%	1.1%	1.2%
Beverage and tobacco products mfg.	9,612	0.941	46.6%	50.6%	5.1%	5.0%
Textile mills	1,795	0.436	-2.3%	-6.8%	-0.4%	-1.1%
Textile product mills	2,444	0.571	-24.9%	-2.8%	-0.7%	0.4%
Apparel manufacturing	1,704	0.407	0.9%	-28.3%	2.8%	-5.8%
Leather and allied products mfg.	873	0.846	82.6%	-0.8%	-8.1%	-1.0%
Paper products manufacturing	20,101	1.492	-0.1%	-7.3%	0.6%	-0.8%
Printing and related support activities	21,375	1.344	-8.6%	-11.4%	-0.8%	-2.0%
Petroleum and coal products mfg.	4,692	1.126	8.8%	1.5%	0.4%	-0.2%
Chemical products manufacturing	45,680	1.487	5.9%	5.8%	2.9%	1.2%
Plastics and rubber products mfg.	57,881	2.145	14.0%	17.1%	0.9%	2.2%

Source: Quarterly Census of Employment and Wages, U.S. Bureau of Labor Statistics.

Many manufacturing industries have concentrations greater than average, especially in durable goods – whose overall concentration is greater than that of nondurable goods. Many durable goods industries have underperformed their counterparts elsewhere. The heavily concentrated primary metals manufacturing subsector has been particularly weaker than average. In contrast, the key transportation equipment subsector has outperformed, and is a primary reason for the overall strength of manufacturing earlier in the expansion. Its 2018 performance was slightly below average, however.

Nondurable goods' employment growth has been better than average. The large food manufacturing subsector has outperformed the national average since 2010 and tied the U.S. average from 2017 to 2018. Paper products and printing have also outperformed, although both have suffered declines. Employment in the leather and allied products subsector increased 83%, although from a very small base. The 2017-2018 performance of this subsector was far less positive, however.

Manufacturing Characteristics and Trends in Ohio's Regions

The regional diversity of Ohio's economy makes a study of manufacturing at the regional level important. Manufacturing employment accounts for a larger-than-average share of total employment in 77 of Ohio's 88 counties. Manufacturing employment shares range from a low of 0.9% of wage and salary employment in Monroe County to a high of 47.2% in Shelby County. Among the six large metro counties, manufacturing is 9.4% of total employment in Cuyahoga

County, 5% in Franklin County, 9.8% in Hamilton County, 10.6% in Lucas County, 11.1% in Montgomery County, and 10.8% in Summit County. Each of these employment shares is less than that of the corresponding Metropolitan Statistical Area (MSA). Eight of the ten counties with the smallest manufacturing employment shares are in southern and southeastern Ohio. The fact common to these two observations is that the large tracts of low-cost, developable land that manufacturing plants require are less common in these counties. Land is more expensive nearer to large cities. Although land is relatively inexpensive in the south and southeast, the hilly terrain makes the cost of development high. In contrast, the flat terrain of rural northwestern Ohio is certainly one reason why manufacturing is more heavily concentrated there.

Table 2 lists the 10 counties with the highest employment percentages and the 10 counties with the lowest percentages.

Table 2
Ohio Counties with the Highest and Lowest Manufacturing Percentage of Total Employment, 2018

County	Percentage	County	Percentage
Shelby	47.2%	Jefferson	6.8%
Williams	40.3%	Scioto	6.2%
Auglaize	40.0%	Gallia	5.8%
Fulton	37.3%	Franklin	5.0%
Wyandot	37.0%	Greene	5.0%
Sandusky	36.5%	Lawrence	4.7%
Holmes	36.5%	Meigs	4.5%
Champaign	34.9%	Belmont	3.2%
Mercer	34.7%	Athens	2.7%
Henry	31.2%	Monroe	0.9%

Source: Quarterly Census of Employment and Wages, U.S. Bureau of Labor Statistics.

This analysis makes use of the familiar 13 regions that have been used consistently in these articles. These include the six largest MSAs and seven other areas encompassing smaller MSAs and rural areas, and designated on the basis of some level of economic similarity among adjacent counties – primarily based on manufacturing and agriculture. These regions are mapped in Figure 5.

**Figure 5
Ohio Regions**



Northwest Toledo MSA West North Central Cleveland MSA Akron MSA
 Northeast West Columbus MSA East North Central Dayton MSA
 Cincinnati MSA South Southeast

Table 3 provides 2018 employment totals, concentrations, and growth from 2010 and 2017 for these 13 regions. The highest concentration among these regions is in the Northwest, whose manufacturing employment is nearly 3.5 times what would be expected in an economy that size. Concentrations in the West and East North Central regions are also more than 3 times average. However, concentration in the Southeast region is close to average, and is 18% below average in the Columbus MSA. However, a particularly low manufacturing percentage in Franklin and Delaware Counties (5% and 6.9%, respectively) offsets higher-than-average percentages in the region's other eight counties. Manufacturing employment in Union County in particular is 24.9% of the county total, 23rd highest in the state. Madison County is not far behind at 24.2%.

**Table 3
Regional Manufacturing Employment, Concentration, and Growth**

	Employment	Pct. of total	Location quotient	Percentage change	
				2010-2018	2017-2018
U.S.	12,646,288	8.7%	1.000	10.1%	1.9%
Ohio	698,974	12.9%	1.494	12.7%	1.9%
Northeast	69,526	15.4%	1.781	5.8%	2.2%
Southeast	11,242	8.9%	1.032	-9.2%	-2.6%
South	19,398	13.1%	1.514	-0.1%	1.9%
West	75,942	26.9%	3.108	26.9%	0.9%
Northwest	21,521	29.8%	3.447	16.8%	0.2%
West North Central	50,122	23.2%	2.686	11.7%	1.1%
East North Central	32,608	27.8%	3.209	23.7%	1.0%
Akron MSA	39,200	12.2%	1.408	5.0%	0.5%
Cincinnati MSA*	93,482	11.2%	1.294	13.1%	2.6%
Cleveland MSA	123,334	12.1%	1.402	5.9%	2.2%
Columbus MSA	73,357	7.1%	0.821	13.5%	1.8%
Dayton MSA	42,851	11.5%	1.333	19.9%	2.2%
Toledo MSA	45,121	15.3%	1.772	26.9%	5.2%
Total non-MSA	280,359	19.8%	2.293	13.5%	1.1%
Total MSA	417,345	10.8%	1.245	12.0%	2.4%

*Ohio counties only.

Source: Quarterly Census of Employment and Wages, U.S. Bureau of Labor Statistics.

Employment growth since 2010 exceeded the national average in many of these regions, with the West region and the Toledo MSA tied for strongest growth at 26.9%. Eight-year growth in the Northwest region and the Akron and Cleveland MSAs was positive but below average. Employment was flat in the South and declined 9.2% in the Southeast. The Southeast was also the one region to suffer a decline between 2017 and 2018.

Ohio Manufacturing Output Trends

GDP growth in manufacturing is much less closely linked to employment growth than it was in earlier decades, thanks to the widespread adoption of first machines, more recently robotics, and soon artificial intelligence. This was particularly true during the expansion of 2001-2007. During that time, Ohio manufacturing employment declined 184,400 (19.3%) while manufacturing GDP increased by an inflation-adjusted 13.4%.

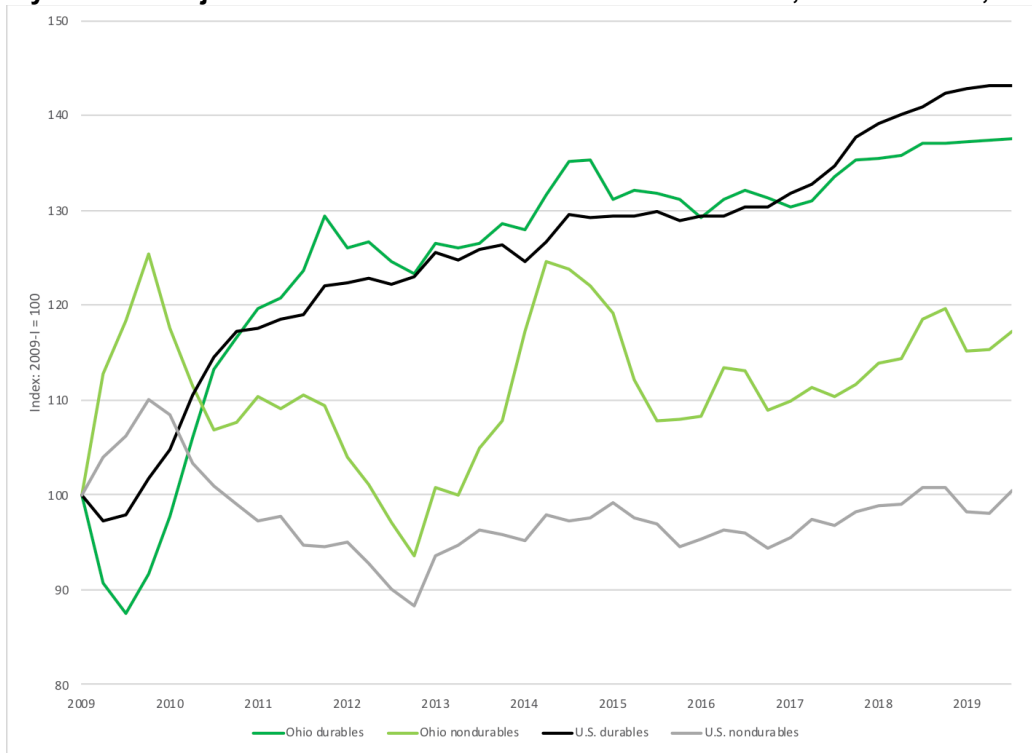
Figure 6 compares quarterly GDP growth in Ohio and nationally between the first quarter of 2009 and the third quarter of 2019, while the allocation of GDP between durables and nondurables is in Figure 7. It is clear that the volatility in GDP is due to nondurables. For the 10-year period, inflation-adjusted total GDP growth in Ohio has been 27.7% and 21.8% nationwide. Durable goods GDP growth has lagged recently in Ohio, which has brought overall growth below the national average. Durable goods growth has totaled 37.5% in Ohio and 43.2% nationally. In contrast, Ohio's nondurable goods GDP has markedly outperformed the U.S. average for the entire period. The national average GDP has been below its initial level for most of the 10 years. Ohio growth has been 17.2% versus U.S. growth of 0.5%.

Figure 6
Quarterly Inflation-Adjusted Manufacturing GDP Growth, Ohio and U.S., 2009-2019



Source: Regional Economic Accounts, U.S. Bureau of Economic Analysis.

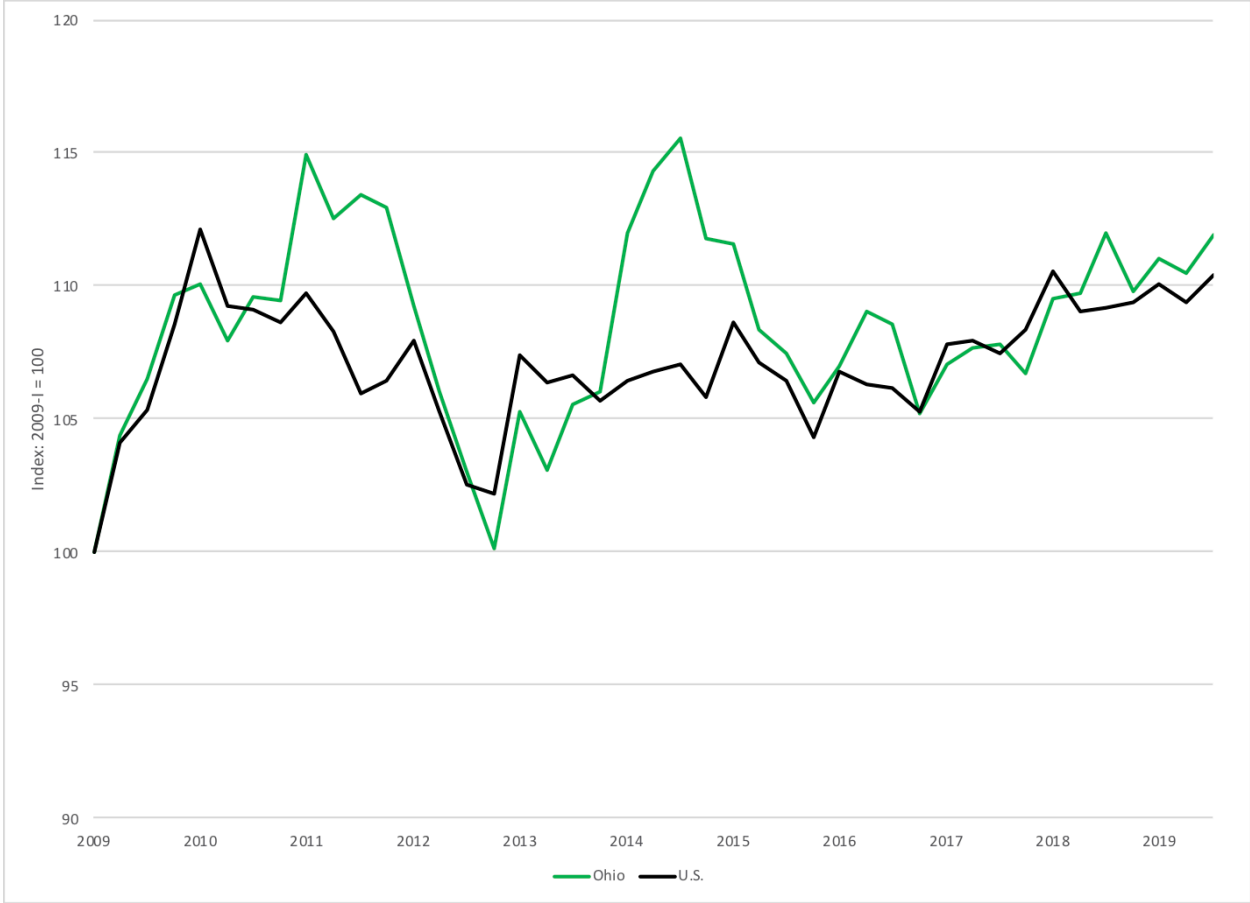
Figure 7
Quarterly Inflation-Adjusted Durables and Nondurables GDP Growth, Ohio and U.S., 2009-2019



Source: Regional Economic Accounts, U.S. Bureau of Economic Analysis.

Productivity is measured as total quarterly inflation-adjusted manufacturing GDP per hour of manufacturing labor. Figure 8 tracks the U.S. and Ohio trends. These are charted on an index basis. U.S. GDP per hour has averaged nearly 15% more for the U.S. than for Ohio, but this is likely a function of differences in industry makeup rather than less productive Ohio workers. As shown in Figure 8, Ohio productivity growth has generally tracked that of the U.S. Productivity surged nationally and in Ohio coming out of the recession but pulled back through the end of 2012. In more recent years, however, national and statewide productivity has increased steadily but slowly. This is a positive sign for the sustainability of employment and operating income.

Figure 8
Manufacturing Productivity (GDP per hour), Ohio and U.S., 2009-2019



Source: Regional Economic Accounts, U.S. Bureau of Economic analysis, and Current Employment Statistics, U.S. Bureau of Labor Statistics.

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