



**Department of
Job and Family Services**

TO STRENGTHEN OHIO'S FAMILIES WITH SOLUTIONS TO TEMPORARY CHALLENGES

Manufacturing in Ohio



A Post-Recession Employment Outlook

April 2013

Table of Contents

Preface.....	2
Executive Summary	3
Overview: Picture of Manufacturing in Ohio.....	4
Long-Term Forces Impacting Manufacturing Decline	5
Resiliency of Manufacturing: Positive Outlook	6
Significant Output and Share of the Ohio Economy	6
<i>GDP</i>	7
<i>Share of Nonfarm Employment</i>	7
<i>Dispersion of Manufacturing Industries and Jobs</i>	9
Positive Projected Industry Growth	12
Positive Occupational Growth and Large Number of Annual Openings	13
Hiring Demand	16
Conclusion	18
Appendix A	20
Appendix B	22

Preface

Annually, the Ohio Department of Job and Family Services (ODJFS), Bureau of Labor Market Information, publishes at least one economic analysis, study or special workforce information report. This year, the focus is a post-recession assessment of the manufacturing industry in Ohio.

It is widely known that the manufacturing industry has been shrinking nationally, and the same decline is occurring in Ohio. However, manufacturing is still a major part of both economies, and in Ohio several factors point to a positive outlook and resiliency in the industry. For example, manufacturing output continues to grow and remains a significant sector of the economy. Several manufacturing industries and occupations are projected to have increasing employment over the next 10 years. In addition, several declining industries and occupations are expected to have hiring needs as workers who retire or move on to other occupations are replaced.

By taking a closer look at the manufacturing industry in Ohio and occupations highly concentrated in that industry, individuals, businesses, economic development agencies, educational institutions and training providers can develop policy and training to address the industry's changing needs.

Executive Summary

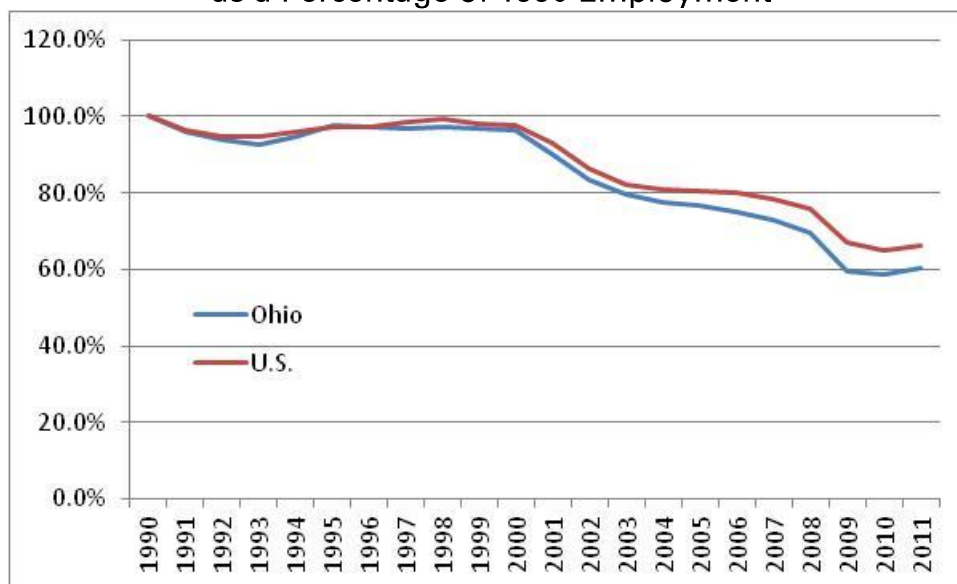
- In 2011, the Ohio manufacturing sector's gross domestic product (GDP) was \$80.7 billion, accounting for 16.7 percent of the state's total GDP. That year, Ohio ranked 10th in the nation for manufacturing's share of the state GDP.
- In 2011, Ohio's manufacturing sector employed an average of 637,625 workers, accounting for 12.8 percent of total covered employment in the state. That year, Ohio ranked sixth in the nation for manufacturing's percentage of the state's total employment.
- Manufacturing accounted for the largest share of all private wages paid in Ohio in 2011, at 19.7 percent.
- Since 2010, annual manufacturing employment in Ohio has increased by 2.8 percent and is projected to grow in eight industries from 2010 to 2020. The largest growth is expected to be in fabricated metal products, followed by transportation equipment.
- Within the "production" occupation group, which is highly concentrated in manufacturing, the highest projected growth is for metal and plastic computer-controlled machine tool operators.
- Significant annual job openings are expected in manufacturing occupations, even for industries that are expected to have modest growth or employment declines.
- When compared to all industries, manufacturing has a high percentage of workers over age 55. As these workers retire, many will need to be replaced.
- New technologies are increasing manufacturing productivity, resulting in fewer workers producing more products. However, new technologies often require new skills, and manufacturers may experience difficulty in hiring qualified workers.
- Manufacturing ranks 14th out of 20 industry sectors in the percentage of workers with at least some college education.

Overview: Picture of Manufacturing in Ohio

Manufacturing is a major part of Ohio's economy. In 2011, Ohio's manufacturing sector GDP was \$80.7 billion. This accounted for 16.7 percent of Ohio's total GDP.¹ This is a higher portion of GDP than at the national level, where manufacturing accounted for 12.3 percent of GDP in 2011. In that same year, Ohio ranked 10th for manufacturing's share of the state GDP.

The manufacturing sector is a major employer, as well. In 2011, the Ohio manufacturing sector employed an average of 637,625 workers over the year, accounting for 12.8 percent of total covered employment in the state.² Ohio ranked sixth in the nation that year in percentage of manufacturing employment. Nationally, the manufacturing sector accounted for 9 percent of total covered employment that year.³ However, the manufacturing sector is changing. Nationally, manufacturing employment peaked in 1979 and has been shrinking ever since. Figure 1 shows annual manufacturing employment as a percentage of the 1990 employment level. From 1990 to 2001, Ohio closely followed the national manufacturing trend. Since 2001, however, Ohio's manufacturing employment has declined faster than the U.S. as a whole.

Figure 1. U.S. and Ohio Manufacturing Employment, 1990 to 2011, as a Percentage of 1990 Employment



Source: U.S. Bureau of Labor Statistics

¹ U.S. Bureau of Economic Analysis (BEA)

² Ohio Department of Job and Family Services

³ U.S. Bureau of Labor Statistics (BLS)

Long-Term Forces Impacting Manufacturing Decline

Although the recessions of 2001 and 2007-2009 hastened the decline of manufacturing employment, much of the decrease was caused by long-term forces reshaping the face of manufacturing. Some of these forces are detailed below.

- *Changing product demand.* As new products and services are developed, demand for older products and services may decline. For example, digital communication is reducing the demand for paper, which results in fewer paper-producing facilities and workers.
- *Foreign competition.* In some industries, foreign competitors have gained significant market share against American companies. For example, the “Big Three” American auto manufacturers have been losing U.S. market share since 1993.⁴ Although foreign competitors have production facilities in the United States, they tend to build them in the southern and western states.
- *Off-shoring.* Some American firms are moving facilities or processes to other countries. For example, American auto manufacturers have decreased auto production in the U.S. and increased production in Mexico.⁵ Off-shoring tends to be most harmful to workers without a college degree.⁶
- *Facility consolidation.* Firms with multiple facilities or merging firms may consolidate into fewer facilities. Although Ohio has been on both the gaining and losing sides of consolidation, manufacturing activity typically has been shifting to states in the west and south.⁷
- *Non-competitive cost structures.* Rising costs – including wages, health care benefits and retirement contributions – have led many businesses to look for more efficient ways to remain competitive. High costs in the Midwest have caused some high-tech manufacturers to move to Texas, Arizona and California.⁸
- *Outsourcing.* Many manufacturers have cut their payrolls by outsourcing service activities such as cleaning, accounting and research to other companies.⁹ Such outsourced jobs do not disappear; they simply are shifted from manufacturing to other industries. Some economists argue that this trend has led to overstating the decline of manufacturing employment.¹⁰

⁴ Center for Automotive Research, *Beyond the Big Leave: The Future of U.S. Automotive Human Resources*. (2008)

⁵ Scott, Robert E. *When giants fall: Shutdown of one or more U.S. automakers could eliminate up to 3.3 million U.S. jobs*. Economic Policy Institute Briefing Paper # 227, 3 December 2008.

⁶ Liu, Runjuan & Treffer, Daniel. *Much Ado about Nothing: American Jobs and the Rise of Service Outsourcing to China and India*. National Bureau of Economic Research Working Paper No. 14061, June 2008.

⁷ *Ibid.*

⁸ *Ibid.*

⁹ Testa, William, A.; Klier, Thomas; & Mattoon, Richard H. *Challenges and prospects for Midwest manufacturing: Report on the 2003-2004 Chicago Fed Manufacturing Project*. Chicago Fed Letter. February 2005.

¹⁰ Testa, Bill & Wang, Norman. *Manufacturing as Midwest Destiny*. Federal Reserve Bank of Chicago blog, “Bill Testa on the Midwest Economy,” February 3, 2012.

- *Increased productivity.* Higher-skilled workers and new technologies allow manufacturers to produce more goods with fewer workers. Most industries have seen productivity increases, but the increases for manufacturing have been larger. At the national level, manufacturing productivity increased at an average of 3.3 percent per year from 1980 to 2009, while total nonfarm productivity increased about 2.0 percent per year.¹¹

Resiliency of Manufacturing: Positive Outlook

The declines in manufacturing employment, especially the declines since 2001, may have convinced many people there is no future in manufacturing employment. However, this view is shortsighted and overlooks the broader economic picture. The pages that follow present evidence of a positive outlook for manufacturing. This is based on an examination of the following factors:

- *Significant Output and Share of Ohio Economy.* Manufacturing output continues to grow, and manufacturing remains a significant sector of Ohio's economy.
- *Positive Projected Industry Growth.* Not all manufacturing industries are expected to have declining employment over the next 10 years.
- *Positive Projected Occupational Growth and Large Number of Annual Openings.* Some manufacturing occupations have a positive growth outlook. In addition, even industries projected to need fewer manufacturing workers still will have replacement needs as workers retire.
- *Hiring Demand.* Many manufacturing occupations demand higher skill levels than in the past, and some manufacturers are reporting difficulty in hiring qualified workers.

Significant Output and Share of the Ohio Economy

It may be easy to assume that declines in manufacturing employment mean the sector is not important to the economy, but this simply is not the case. Manufacturing remains a significant sector and impacts Ohio's economy in several ways, including:

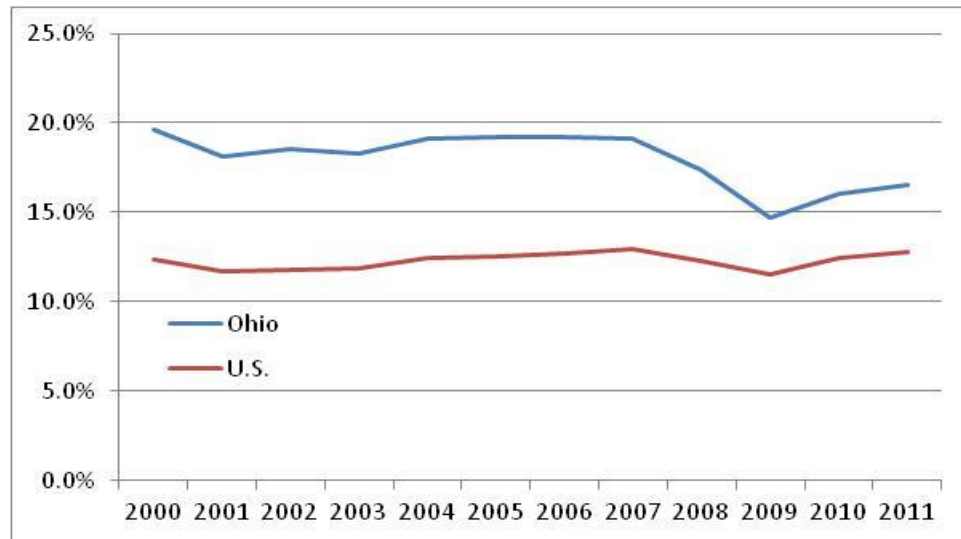
- GDP
- Share of nonfarm employment and total wages,
- Dispersion of manufacturing industries and jobs.

¹¹ Strauss, William. *Is U.S. Manufacturing Disappearing?* Federal Reserve Bank of Chicago blog, "Bill Testa on the Midwest Economy," August 19, 2010.

GDP

Figure 2 shows manufacturing as a percentage of total GDP, with the dollar fixed at its 2005 value to reduce the effect of inflation. Although there have been clear declines in output, manufacturing still represents a significant portion of the U.S. and Ohio economies.

Figure 2. U.S. and Ohio Manufacturing Share of GDP (in constant dollars), 2000 to 2011



Source: U.S. Bureau of Economic Analysis

The recessions of 2001 and 2007-2009 affected Ohio manufacturing output more strongly than total U.S. manufacturing output. One reason may be Ohio's high concentration of employment in the auto industry. In 2010, Ohio was third in employment and output for motor vehicle production and parts manufacturing. U.S. auto production was declining prior to the recession of 2007-2009, and production dropped very steeply during the recession. By 2009, U.S. auto production was only 53.6 percent of the 2005 production level.¹² Because Ohio is a major auto industry state, the pre-recession decline in production and the recession itself hit Ohio harder than states with fewer people employed in the auto industry. Yet, as stated earlier, in 2011 Ohio's manufacturing GDP accounted for 16.7 percent (\$80.7 billion) of Ohio's total GDP.

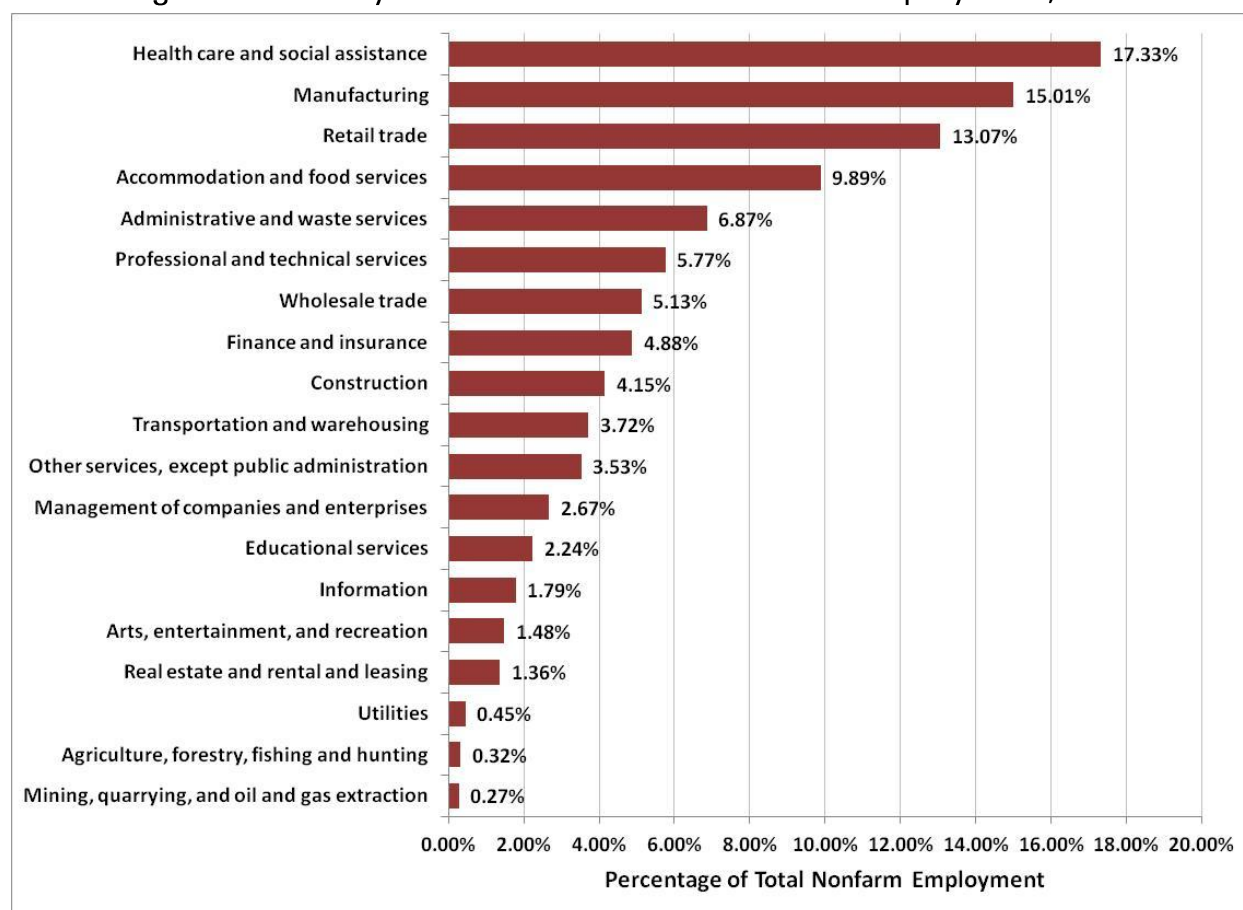
Share of Nonfarm Employment and Total Wages

The manufacturing sector accounts for a significant share of employment, compared to other sectors. Figure 3 on the next page shows the percentage share of Ohio private employment for 19 industry sectors. The sectors are based on the

¹² WardsAuto (www.wardsauto.com)

North American Industry Classification System (NAICS) two-digit level of classification.

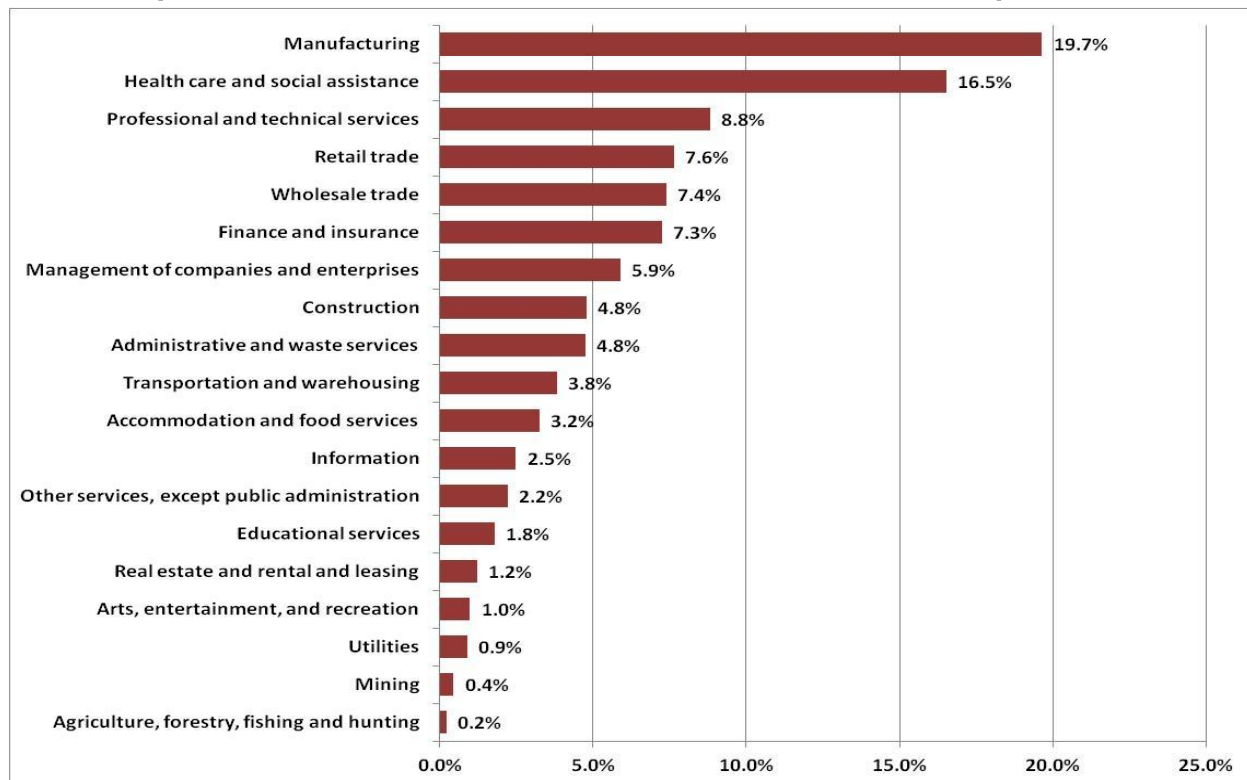
Figure 3. Industry Sector Shares of Ohio Private Employment, 2011



Source: Quarterly Census of Employment and Wages

Manufacturing accounted for 15.0 percent of private employment in Ohio in 2011, second to the health care and social assistance sector. Although the manufacturing sector was second in shares of private employment, it had the largest share of the total private wages in 2011. As seen in Figure 4 on the next page, the manufacturing sector accounted for 19.7 percent of all private wages paid in Ohio in 2011. Although the manufacturing sector does not have the highest average annual wages, the sector's wages are above the state average. The combination of above-average wages and a large workforce means that the manufacturing sector led private industries in total wages paid in 2011.

Figure 4. Industry Sector Shares of Ohio Private Total Wages, 2011



Source: Quarterly Census of Employment and Wages

Dispersion of Manufacturing Industries and Jobs

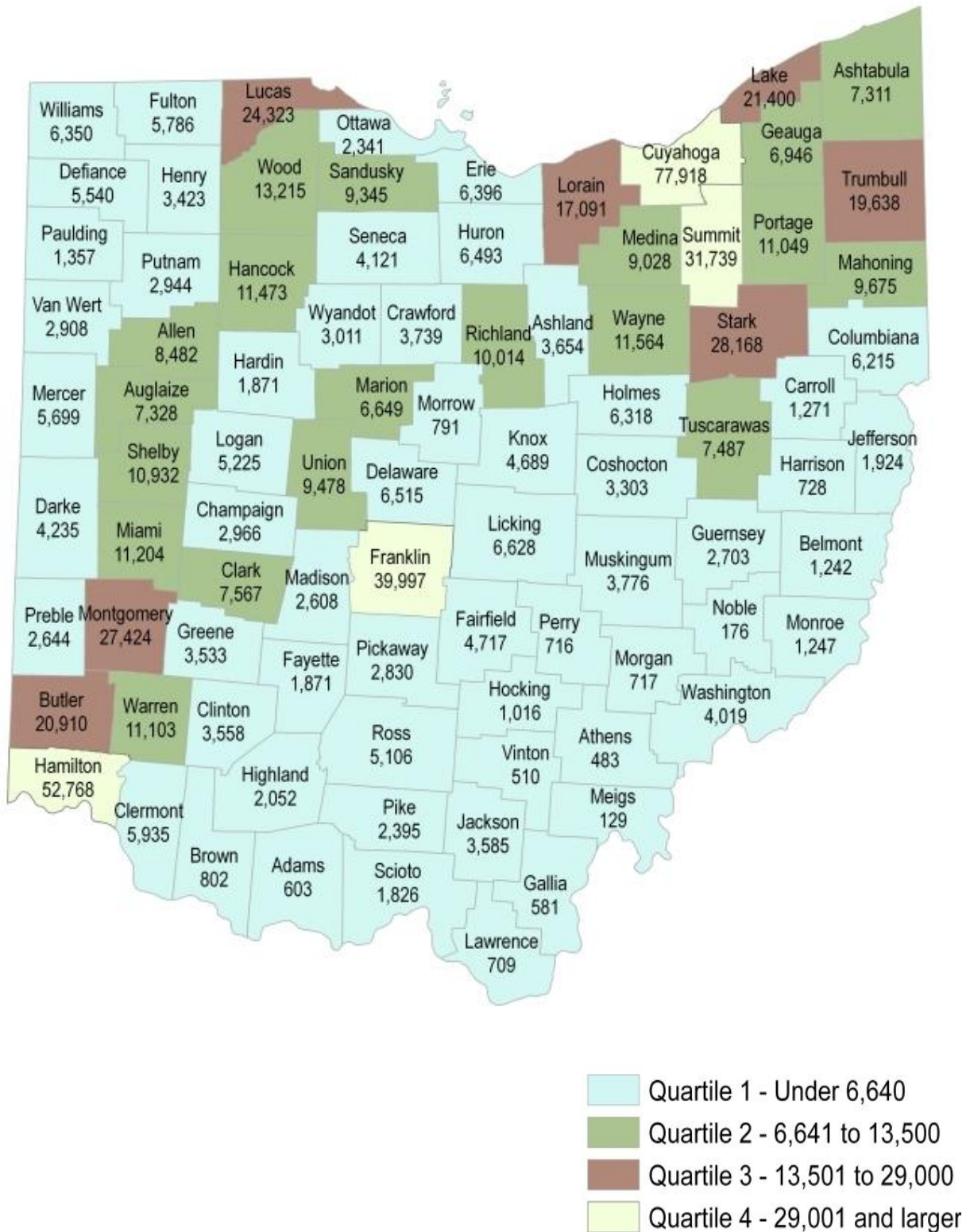
Manufacturing is not distributed evenly around the state. Figure 5 shows the manufacturing sector's share of total employment in Ohio and the six JobsOhio regions. (A map of the JobsOhio regions is in Appendix A.) At 18.2 percent, the Regional Growth Partnership region had the highest percentage of employment in manufacturing, followed by the Dayton Development Coalition region (15.5 percent).

Figure 5. Manufacturing Share of Total Employment

JobsOhio Region	Manuf. Empl.	Manuf. Share
Ohio Statewide	719,760	12.4%
Appalachian Business Council	47,135	13.5%
Cincinnati USA Partnership	91,518	10.4%
Columbus 2020!	90,127	7.9%
Dayton Development Corporation	88,961	15.5%
Regional Growth Partnership	110,229	18.2%
Team NEO	291,786	13.2%

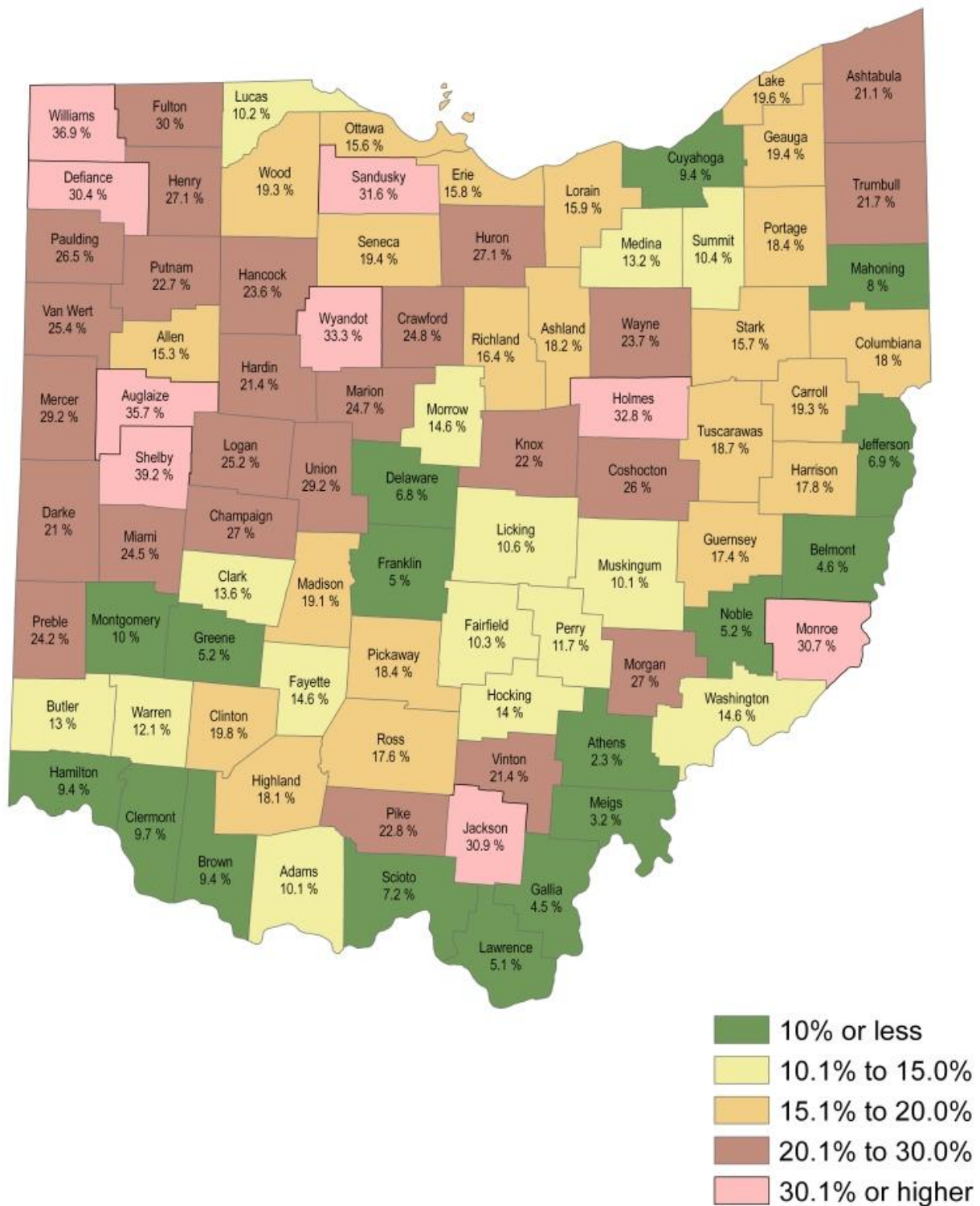
Source: U.S. Census Quarterly Workforce Indicators, 2011 Q4

Figure 6. Manufacturing Employment by County



Source: U.S. Census Quarterly Workforce Indicators, 2011 Q4

Figure 7. Manufacturing's Share of Total Employment by County



Source: U.S. Census Quarterly Workforce Indicators, 2011 Q4

Figure 6 on page 10 shows total manufacturing employment by county in the fourth quarter of 2011. The 58 counties in the first quartile account for about 25 percent of manufacturing employment. The 19 counties in the second quartile account for another 25 percent. The third quartile—only seven counties—accounts for about 22 percent of manufacturing employment. Finally, about 28 percent of manufacturing employment is in the four counties of the fourth quartile. These also are the four most-populated counties in Ohio. Many counties in the first quartile are rural or have relatively small populations. While their total manufacturing employment levels are not high, many counties in the first quartile have a higher concentration of manufacturing employment than those in the fourth quartile.

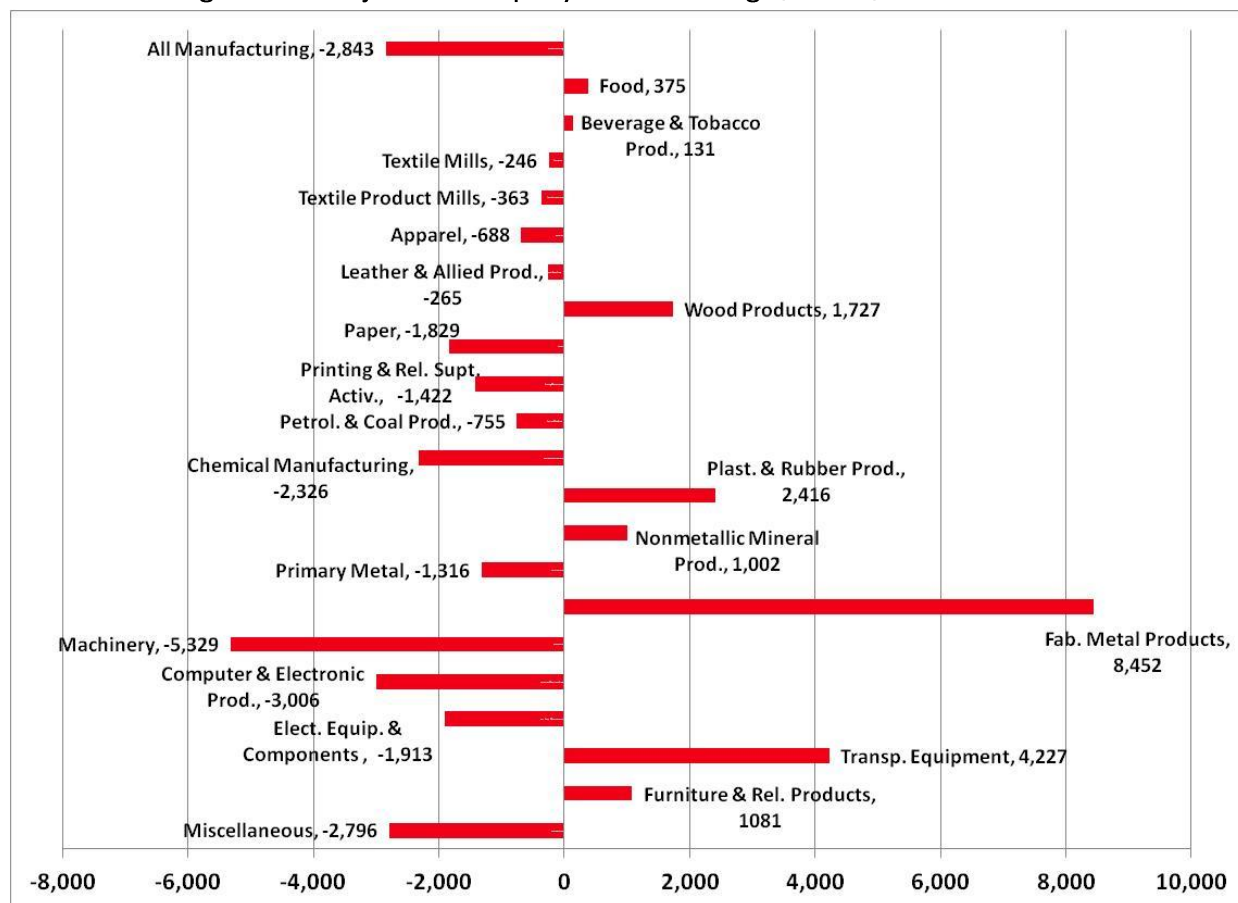
Figure 7 on the previous page shows manufacturing's share of total employment by county in the fourth quarter of 2011. The percentage of county employment in manufacturing ranged from 39.2 percent in Shelby County to only 2.3 percent in Athens County. In nine counties, manufacturing's share of employment was greater than 30 percent, and in 34 counties manufacturing's share was greater than 20 percent. Many of the counties with high concentrations of manufacturing employment are in western and northwestern Ohio. Many counties along or close to the Ohio River have low levels of manufacturing employment. These counties appear to have above-average concentrations of employment in other industries, such as mining, quarrying, and oil and gas extraction; health care and social assistance; and accommodation and food services.

Positive Projected Industry Growth

The 2007-2009 recession was the largest economic contraction the U.S. has experienced since the Great Depression, and the recovery has been slow but steady. Since the recovery began in 2010, annual employment in the manufacturing sector has increased by 2.8 percent, and employment is projected to grow in several manufacturing industries. Figure 8 on the next page shows the projected employment change from 2010 to 2020 for the major manufacturing subsectors. During this period, total employment for the manufacturing sector is projected to shrink by 2,843 jobs, or a modest 0.5 percent of the 2010 manufacturing workforce. However, not all manufacturing industries are expected to shrink over the next 10 years; eight manufacturing subsectors are expected to grow over the 2010-2020 period. These subsectors include food manufacturing, beverage and tobacco products, wood products, plastic and rubber products, nonmetallic mineral products, fabricated metal products, transportation

equipment, and furniture and related products. The largest growth is expected in fabricated metal products, followed by transportation equipment.

Figure 8. Projected Employment Change, Ohio, 2010 to 2020



Source: Ohio Bureau of Labor Market Information

Positive Occupational Growth and Large Number of Annual Openings

Figure 9 on the next page shows the projected growth and expected annual openings for the 25 largest occupations across the manufacturing sector. The occupations are sorted according to their prominence in manufacturing, beginning with team assemblers, which has the largest presence. Twenty of these occupations are expected to grow between 2010 and 2020, and several occupations are expected to see growth rates of 10 percent or more. It should be noted that few occupations are limited to only one industry, and an occupation's growth or decline is affected by all industries that employ the occupation. This list has some occupations that are common across many sectors and industries. However, 12 occupations are in the production occupation group (those with a

Standard Occupation Classification, or SOC, code starting with “51”), and these occupations are concentrated in manufacturing industries. Within the production occupations group, the highest projected growth is for metal and plastic computer-controlled machine tool operators (SOC 51-4011).

Figure 9. 25 Largest Occupations in Manufacturing

SOC Code	Occupation Title	Projected Growth	Annual Openings	Average Hourly Wage
51-2092	Team Assemblers	4.9%	1,513	\$14.83
51-4041	Machinists	6.5%	62	\$18.70
51-1011	First-Line Sup., Prod. & Operating Workers	-0.2%	402	\$26.25
51-9061	Inspectors, Testers, Sorters, Samplers and Weighers	5.5%	590	\$17.36
49-9071	Maintenance and Repair Workers, General	6.3%	1,404	\$17.29
51-2099	Assemblers and Fabricators, All Other	10.5%	538	\$15.84
51-9198	Helpers--Production Workers	7.4%	503	\$12.27
53-7062	Laborers & Freight, Stock, & Material Movers, Hand	11.8%	4,231	\$12.00
41-4012	Sales Reps., Wholesale and Manufacturing, except Technical and Scientific Products	6.2%	1,537	\$28.04
51-4031	Cutting, Punching, & Press Mach. Setters, Operators and Tenders, Metal and Plastic	1.6%	125	\$14.37
51-9111	Packaging and Filling Machine Operators and Tenders	1.4%	275	\$14.61
53-7064	Packers and Packers, Hand	10.0%	1,530	\$10.90
51-4011	Computer-Controlled Mach. Tool Operators, Metal and Plastic	18.0%	350	\$17.65
43-5071	Shipping, Receiving, and Traffic Clerks	-4.1%	810	\$14.39
53-7051	Industrial Truck and Tractor Operators	6.9%	812	\$15.10
11-3051	Industrial Production Managers	7.6%	317	\$53.38
51-4121	Welders, Cutters, Solderers, and Brazers	5.0%	425	\$17.28
51-4072	Molding, Coremaking, & Casting Mach. Setters, Operators and Tenders, Metal and Plastic	1.5%	166	\$14.51
51-9023	Mixing and Blending Machine Setters, Operators and Tenders	-3.6%	272	\$17.36
49-9041	Industrial Machinery Mechanics	18.4%	529	\$22.34
17-2112	Industrial Engineers	5.2%	290	\$34.82
43-9061	Office Clerks, General	11.4%	3,294	\$13.71
51-4111	Tool and Die Makers	-3.0%	35	\$22.77
43-4051	Customer Service Representatives	8.7%	2,916	\$15.67
11-1021	General and Operations Managers	-1.3%	829	\$45.91

Source: Ohio Department of Job and Family Services, 2010-2020 Occupational Employment Projections

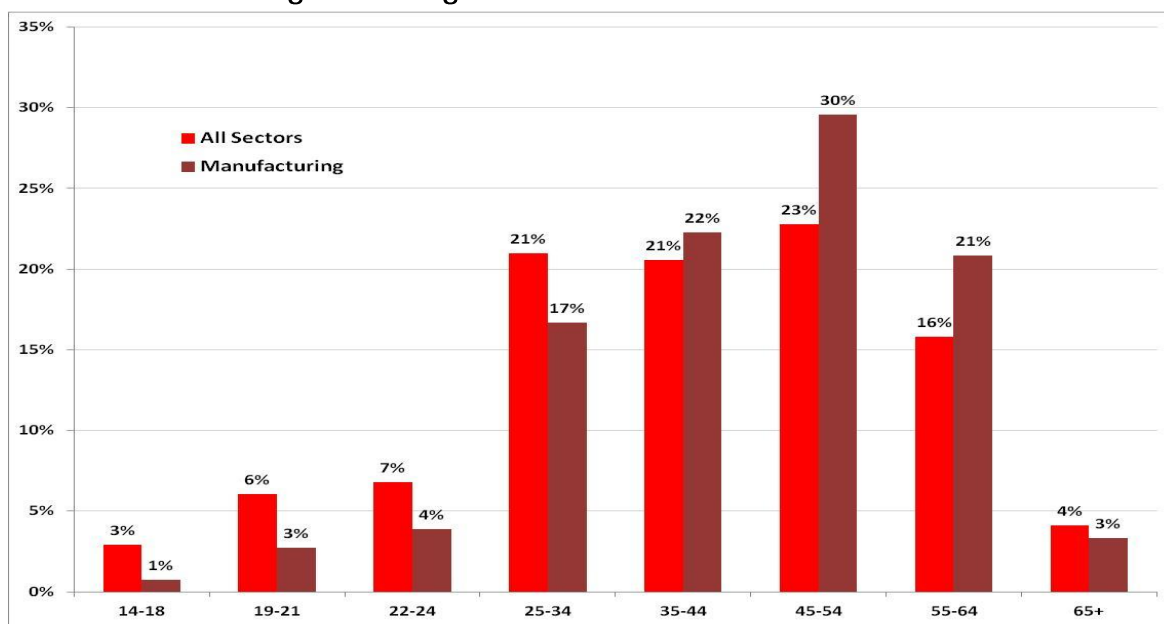
Many people focus on expected occupational growth when evaluating potential occupations. Growth projections show how much an occupation’s workforce is expected to grow or shrink over time, but they don’t take into account the need for replacement workers. When workers leave their jobs, often for retirement, this

often creates job openings. Consequently, many manufacturing occupations still will have employment opportunities even if, overall, the number of those job opportunities is shrinking.

The U.S. Bureau of Labor Statistics estimates that approximately 70 percent of all annual job openings are due to replacement needs, not growth. Figure 8 on the previous page includes a data column titled “Annual Openings.” The annual openings data combines projected openings from growth and replacement needs. The 25 occupations in Figure 9 are expected to have 23,750 annual job openings, most of them to replace workers who retire or otherwise leave the occupations.

To further break down the potential replacement needs for the industry, Figure 10 shows the age distribution of the Ohio manufacturing workforce compared to all private employment. As seen below, manufacturing has high percentages of workers in the 45-to-54 and 55-to-64 age groups. As workers in these groups retire, many will need to be replaced.

Figure 10. Age Distribution of Ohio Workers

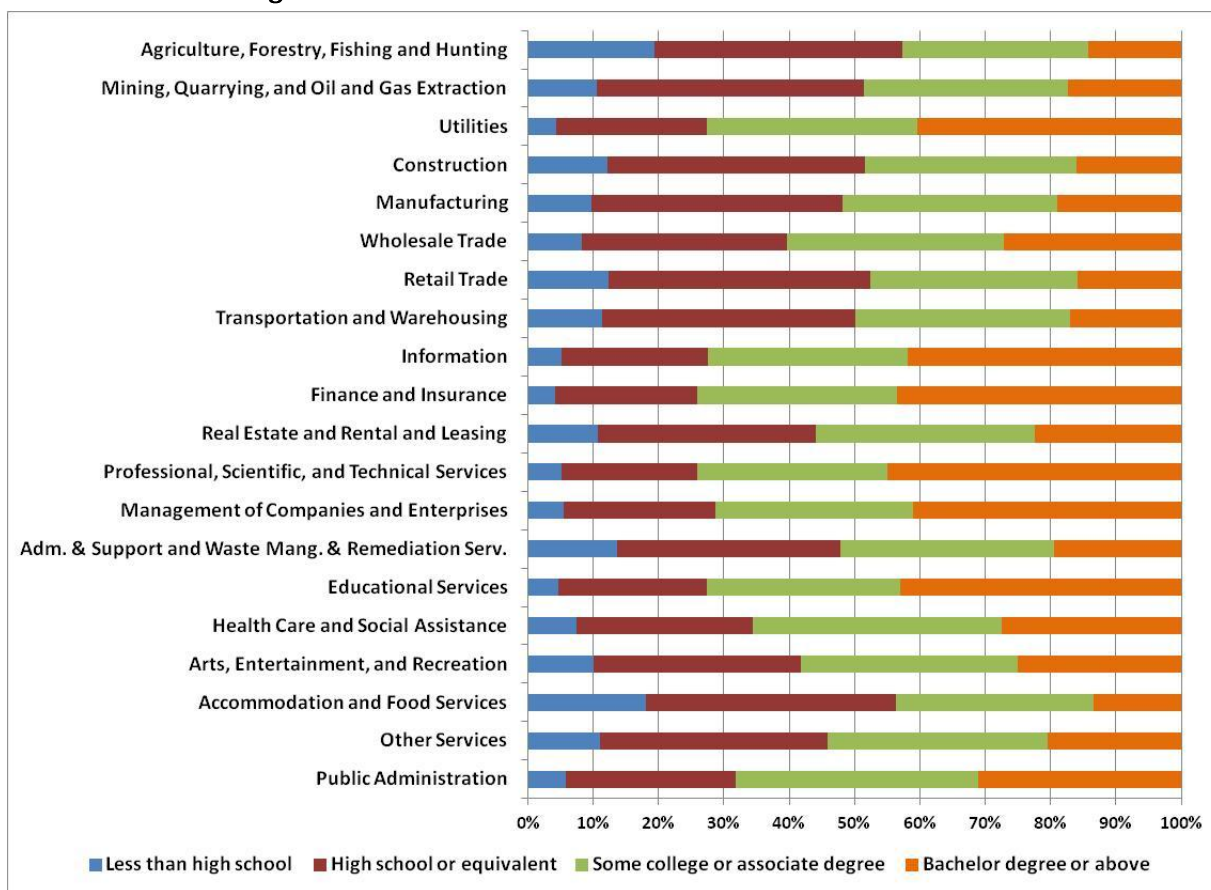


Source: U.S. Census Quarterly Workforce Indicators, 2011 Q4

Hiring Demand

Manufacturing is changing, and the need for higher-skilled manufacturing workers is increasing.¹³ Educational attainment levels have been increasing, and so have skill levels. At the same time, new technologies have been introduced to the workplace, and global competition has presented new challenges. New technologies in manufacturing increase productivity, but they can lead to less-skilled workers being replaced by a smaller number of higher-skilled workers using computer-controlled equipment. Global competition means businesses operating in other countries can sometimes pay less-skilled workers lower wages than would be paid in the U.S. Both new technologies and increased global competition may negatively affect low-skilled workers in the U.S.

Figure 11. Education Attainment of Ohio Workers



Source: U.S. Census Quarterly Workforce Indicators, 2011 Q4

¹³ This section is based on three articles by Testa and Lombardi of the Federal Reserve Bank of Chicago. A) Testa, Bill & Lombardi, Britton. *Upskilling in Manufacturing*. Federal Reserve Bank of Chicago blog, "Bill Testa on the Midwest Economy," April 9, 2009. B) Testa, Bill & Lombardi, Britton. *Understanding Manufacturing Labor and Wage Trends*. Federal Reserve Bank of Chicago blog, "Bill Testa on the Midwest Economy," February 22, 2012. C) Lombardi, Britton & William A. Testa, *Why are manufacturers struggling to hire high-skilled workers?* Federal Reserve Bank of Chicago, Chicago Fed Letter, August 2011, # 289.

Figure 11 shows the educational attainment levels of Ohio workers by industry sector. Manufacturing ranks 14th out of 20 sectors in the percentage of workers with at least some college education. Figure 12 below shows the typical education levels associated with entry into the top 25 manufacturing occupations. Eighteen of the top 25 occupations usually require a high school diploma (or the equivalent) or less.

Figure 12. Typical Entry Education Levels for the Top Manufacturing Occupations

SOC Code	Occupational Title	Typical Education Required for Entry
51-2092	Team Assemblers	High school diploma or equivalent
51-4041	Machinists	High school diploma or equivalent
51-1011	FL Sup/Mgrs of Production/Operating Workers	Postsecondary non-degree award
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	High school diploma or equivalent
49-9071	Maintenance and Repair Workers, General	High school diploma or equivalent
51-2099	Assemblers and Fabricators, All Other	High school diploma or equivalent
51-9198	Helpers--Production Workers	Less than high school
53-7062	Laborers/Freight/Stock/Material Movers, Hand	Less than high school
51-4031	Cutting/Punching/Press Machine S/O/T, M/P	High school diploma or equivalent
53-7064	Packers and Packagers, Hand	Less than high school
51-4011	Computer-Controlled Machine Tool Oper., M/P	High school diploma or equivalent
43-5071	Shipping, Receiving, and Traffic Clerks	High school diploma or equivalent
53-7051	Industrial Truck and Tractor Operators	Less than high school
11-3051	Industrial Production Managers	Bachelor's degree
51-4121	Welders, Cutters, Solderers, and Brazers	High school diploma or equivalent
51-4072	Molding/Coremaking/Casting Mach. S/O/T, M/P	High school diploma or equivalent
49-9041	Industrial Machinery Mechanics	High school diploma or equivalent
17-2112	Industrial Engineers	Bachelor's degree
43-9061	Office Clerks, General	High school diploma or equivalent
51-4111	Tool and Die Makers	High school diploma or equivalent
43-4051	Customer Service Representatives	High school diploma or equivalent
11-1021	General and Operations Managers	Associate's degree

Recently, some manufacturers have complained about a shortage of highly skilled or specialized workers, even though post-recession labor market conditions suggest that plenty of workers are available. There may be several reasons for this. First, the demand for skilled workers has been increasing across industries, and manufacturers must compete with non-manufacturers for skilled workers. At the same time, wage gains in manufacturing have not kept pace with non-manufacturing wages for workers with similar levels of educational attainment, so

manufacturers may have a harder time attracting skilled workers. Second, the manufacturing sector has image problems that may work against it in the labor market. Prospective workers may discount employment in manufacturing because they perceive the sector to be in decline and employment to be less stable than other industries. Manufacturing also has a reputation for employing those with lower educational attainment levels, and those with higher skill levels may not consider manufacturing as an option. Finally, traditional manufacturing training programs have become more costly to operate. Fewer training programs reduces an avenue for recruiting qualified workers.

A recent report by the Boston Consulting Group suggests that shortages of skilled manufacturing workers are small and localized.¹⁴ Smaller communities are more affected by a lack of skilled workers because their labor pools are small. However, the report predicts that shortages of skilled workers could increase over the next 10 years and argues for increased investment in training and skills development.

Conclusion

Manufacturing employment has been declining, and the sector suffered steep losses during the 2007-2009 recession. Focusing only on the sector's employment losses, however, ignores the more positive aspects of the manufacturing employment situation:

- Manufacturing still is an important sector of the economy.
- Some manufacturing industries and occupations are expected to expand somewhat over the next 10 years.
- Even industries and occupations that are shrinking can have substantial needs to replace retiring workers.
- New technologies and global competition are increasing the need for manufacturing workers with higher skill levels.

This last point may be the most important. From the 1950s to about 2000, the manufacturing sector increased its production output without significantly increasing its labor needs.¹⁵ The rapid proliferation of new technologies may enable the sector to continue increasing output using fewer workers, and increasing global competition may pressure the sector to use fewer workers, as well. This smaller group of workers may require higher skill levels than workers of the past. Manufacturing may have to compete with other industries for skilled workers. The need for workers with higher skill levels, and competition for those workers, could lead to shortages.

¹⁴ Boston Consulting Group. "Skills Gap in U.S. Manufacturing Is Less Pervasive than Many Believe," Press release, October 15, 2012.

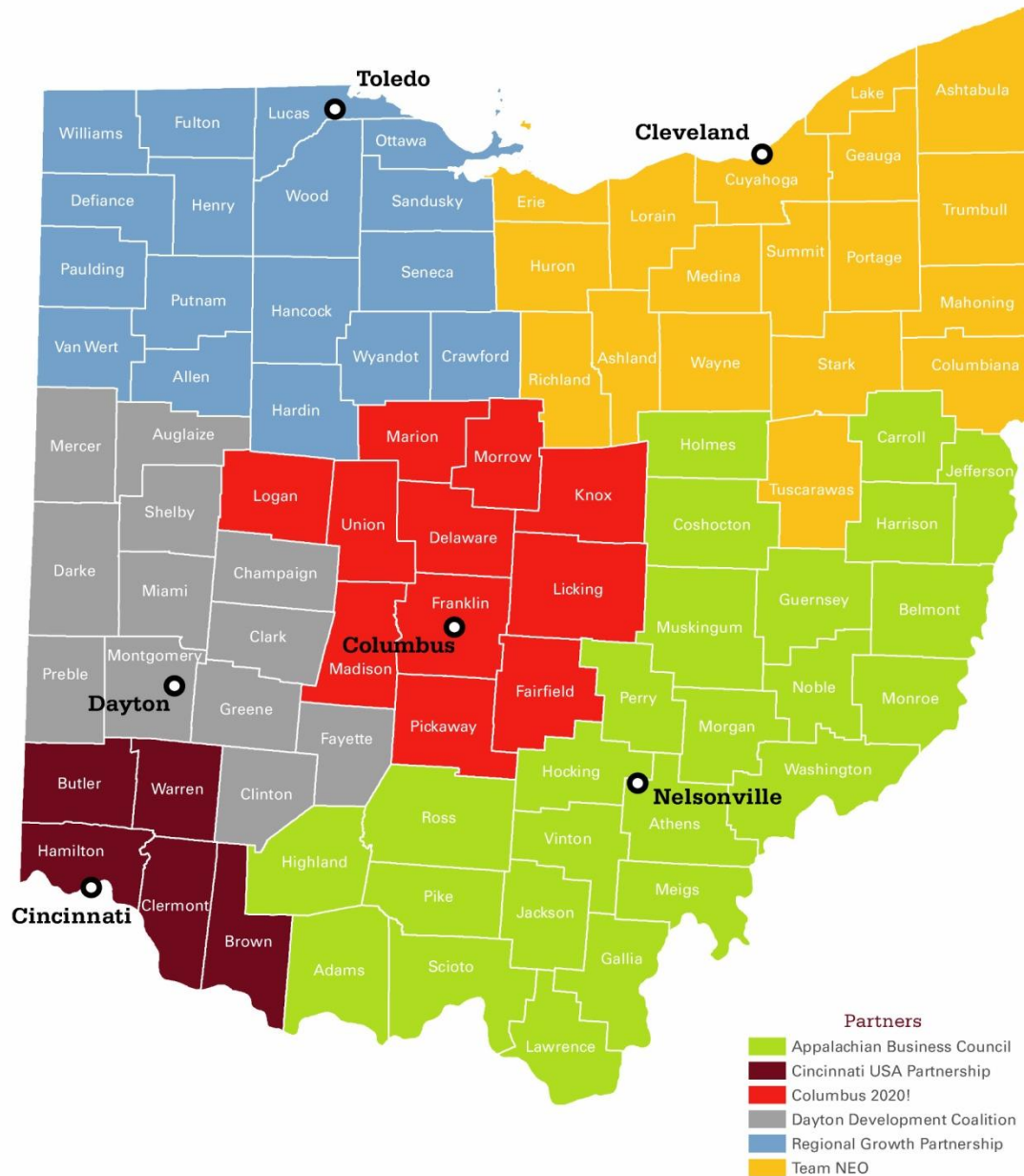
¹⁵ Testa, Bill. *Manufacturing: Been down so long it looks like up?* Federal Reserve Bank of Chicago blog, "Bill Testa on the Midwest Economy," July 13, 2012.

Therefore, one of the challenges facing manufacturers—as well as the education and workforce and economic development communities—will be to ensure an adequate supply of workers. Understanding an industry’s workforce needs is a starting point for this task. Although the workforce needs of individual employers vary, occupational patterns for employers in the same industry can be discerned. Labor market research can show industry staffing patterns and occupational distribution. This can be combined with other information, such as online job posting trends, to develop a better picture of employer needs within an industry. With this knowledge, stakeholders can work together to ensure an adequate supply of workers in these occupations. Appendix B shows the staffing pattern for one manufacturing industry.

Appendix A

Figure 13. JobsOhio Regions

**JobsOhio
Network**



R020411A

Appendix B

Industry Staffing Patterns

A challenge often facing workforce and economic development professionals working with employers is understanding the employers' staffing needs. For example, what occupations might a potential employer need if they move into a community? Do local education and training programs produce enough workers appropriate to local employer needs?

Although individual business establishments may employ unique sets of occupations, there tend to be patterns of occupational employment among establishments engaged in the same business practices. We expect hospitals to employ registered nurses, bakeries to employ bakers, and auto repair shops to employ automotive service technicians. The BLS' Occupational Employment Statistics program produces industry occupational distribution ratios, commonly referred to as staffing patterns. These show which occupations are commonly employed in an industry and in what proportions. Industry staffing patterns can give workforce and economic professionals a starting point in thinking about the needs of prospective employers.

Figure 14 on the next page is an example of a staffing pattern for a manufacturing industry. It is for the bakeries and tortilla makers industry (NAICS 3118), which is in the food manufacturing sector (NAICS 311). The staffing pattern shows the statewide industry employment levels and percentage of total industry employment for the occupations that account for at least one percent of the industry's total employment. As might be expected, bakers (SOC 513011) are the largest occupation, and in 2010 they accounted for 16.6 percent of the industry's employment. Packing and filling machine operators and tenders (SOC 5191111) accounted for 7.4 percent and food matchmakers (SOC 513092) accounted for 6.9 percent of the industry's employment. The 26 occupations in the staffing pattern accounted for about 87 percent of 2010 total employment in the bakeries and tortilla makers industry, so there are other occupations in this industry that are less common. This staffing pattern could be used by workforce and economic development professionals to explore the availability of workers who could fill these occupations. Local occupational training and education programs could use these staffing patterns to determine whether they produced enough graduates for occupations in this industry.

Staffing patterns for manufacturing and other industries at the NAICS three- and four-digits levels can be downloaded using the staffing pattern tool at: <http://ohiolmi.com/asp/Staffing/Staffing.htm>.

Figure 14. Ohio Staffing Pattern for Bakeries and Tortilla Makers (NAICS 3118)

SOC Code	SOC Title	2010 Industry Employment	Percent Total Industry Employment
513011	Bakers	2050	16.6%
519111	Packaging and Filling Machine Operators and Tenders	920	7.4%
513092	Food Batchmakers	860	6.9%
519198	Helpers--Production Workers	720	5.8%
537064	Packers and Packagers, Hand	570	4.6%
499071	Maintenance and Repair Workers, General	500	4.0%
519023	Mixing and Blending Machine Setters, Operators, and Tenders	440	3.6%
511011	First-Line Supervisors of Production and Operating Workers	390	3.1%
412031	Retail Salespersons	380	3.0%
519192	Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders	360	2.9%
435081	Stock Clerks and Order Fillers	340	2.7%
412011	Cashiers	320	2.6%
352021	Food Preparation Workers	310	2.5%
533032	Heavy and Tractor-Trailer Truck Drivers	280	2.2%
537062	Laborers and Freight, Stock, and Material Movers, Hand	270	2.2%
533031	Driver/Sales Workers	250	2.1%
537051	Industrial Truck and Tractor Operators	230	1.9%
372011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	230	1.8%
435071	Shipping, Receiving, and Traffic Clerks	220	1.8%
512092	Team Assemblers	210	1.7%
353022	Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	190	1.5%
353021	Combined Food Preparation and Serving Workers, Including Fast Food	180	1.5%
499041	Industrial Machinery Mechanics	170	1.4%
533033	Light Truck or Delivery Services Drivers	170	1.4%
439061	Office Clerks, General	140	1.1%
537061	Cleaners of Vehicles and Equipment	120	1.0%

Office of Workforce Development
P.O. Box 1618
Columbus, OH 43216-1618



Bureau of Labor Market Information
Business Principles for Workforce Development

Partner with the workforce and economic development community.

Develop and deploy new information solution tools and systems for the workforce and economic development community.

Provide products and services that are customer and demand driven.

Be known as an important and reliable source for information solutions that support workforce development goals and outcomes.

Acknowledgement: This report was prepared by Lewis Horner, Section Chief of the Workforce Research Section, under the direction of Bureau Chief, Coretta Pettway. To view other publications, access data or provide feedback, visit <http://OhioLMI.com> or contact the Ohio Bureau of Labor Market Information at 1-888-296-7541 or contactlmi@jfs.ohio.gov.

John R. Kasich, Governor
State of Ohio
<http://Ohio.gov>

Michael B. Colbert, Director
Ohio Department of Job and Family Services
<http://jfs.ohio.gov>

Office of Workforce Development
<http://jfs.ohio.gov/owd/>

Bureau of Labor Market Information
<http://OhioLMI.com>

(4/2013)

An Equal Opportunity Employer and Service Provider