ON THE MONEY

A Hannah News Service Publication

Vol. 132, No. 47 By Bill LaFayette, PhD, owner, Regionomics® LLC December 7, 2018

The General Motors Layoffs and the Motor Vehicle Industry in Ohio

Introduction

General Motors Corporation announced on November 26 the closure of as many as five of its North American assembly plants. Among these are the 52-year-old Lordstown Assembly plant in Trumbull County, a crucial component of the Youngstown Metropolitan Statistical Area (MSA) economy. This edition of *On the Money* will discuss the impact of proposed shutdown of the plant on the regional and state economy, its underlying causes, and the broader role of vehicle production industries in the Ohio economy.

GM ranked 53rd among Ohio's employers as of May 2018, with total headcount of 6,800, according to the Ohio development Services Agency (ODSA). In addition to the Lordstown plant, a 2016 ODSA report identifies major GM plants in Parma, Defiance, and Toledo. In addition, the DMAX engine plant in Moraine is owned jointly by GM and Isuzu.

The Lordstown Layoffs

GM's November 26 announcement identified five plants for closure. In addition to Lordstown, these include the Detroit-Hamtramck Assembly Plant, the Oshawa Assembly Plant outside of Toronto, and powertrain plants in Baltimore and Warren, Michigan. Layoffs will total 14,700, including 8,100 white-collar workers and 6,600 factory workers, or more than 8 percent of GM's global workforce. The Lordstown plant employs 1,600. It is currently running one shift, after losing two shifts since the beginning of 2017. The plant began 2017 with 4,500 workers. The end of the third shift that January cost 1,245 jobs. The second shift was eliminated June 18, 2018, which reduced employment from 3,000 to its current 1,600.

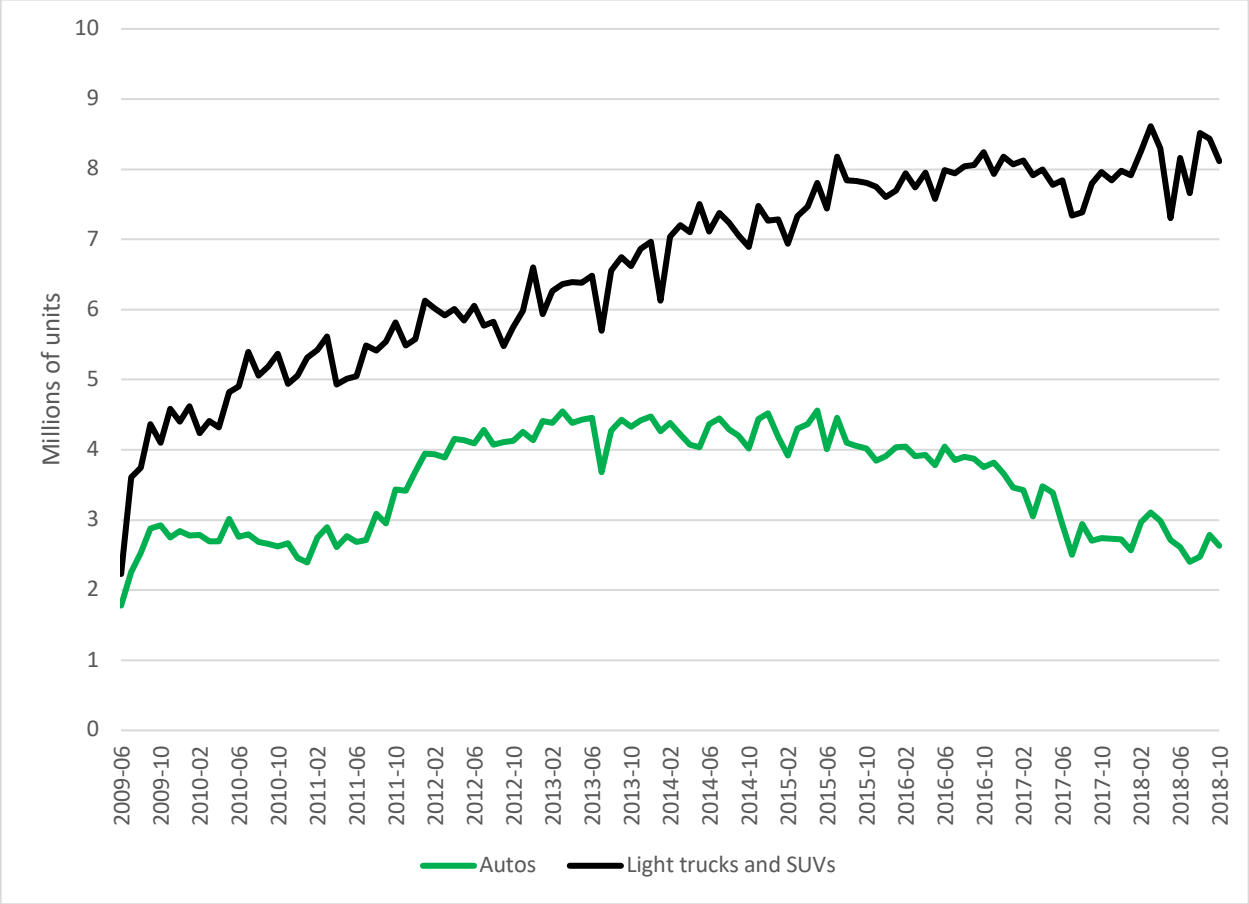
The closures still must be negotiated with the United Auto Workers, which has vowed to fight them legally and in collective bargaining. Indeed, the Lordstown plant was slated for closure in 2009 when GM stopped making the Chevrolet Cobalt there, but negotiated with the union to start producing the Cruze. Another alternative is for the plant to be acquired by another manufacturer. Fuyao Glass America bought a GM plant in Moraine after its 2008 closure and now produces auto glass.

Negotiations notwithstanding, the GM layoffs are driven by larger market trends, which have seen a sharp decline in sedans to SUVs and light trucks as gasoline prices have remained low. GM is responding to this trend by shifting production to SUVs and trucks, while continuing its focus on the development of electric and autonomous vehicles. The Chevrolet Cruze, a sedan, is the only vehicle manufactured at the plant. Workers assembled about 180,000 Cruzes in 2017, nearly 70,000 fewer than five years ago. Also in response to this market shift, Ford Motor

Company recently announced that it would end production of sedans entirely by 2022, except for the Mustang and the Focus Active. That shift could have an impact on Ohio employment as well.

The magnitude of the market shift is graphed in Figure 1, which shows the production of autos compared to light trucks and SUVs since the end of the recession in June 2009. The totals are seasonally-adjusted annual rates. These are shown as three-month moving averages in order to smooth out some of the month-to-month variability. At the beginning of 2013, autos comprised 42 percent of the auto and light truck total, but by the fall of 2018 their share had declined to 24 percent. Note, however, that the growth in production of trucks and SUVs has flattened over the past three years.

Figure 1
Assembly of Autos and Light Trucks, June 2009 – October 2018
Seasonally-adjusted annual rates, three-month moving averages



Source: Industrial Production and Capacity Utilization (G.17), Board of Governors of the Federal Reserve.

The closure will create impacts beyond the plant itself that will be felt statewide. Automotive assembly plants rely on a network of suppliers of parts, equipment, and other goods and services. Many of these are not owned by the automakers, and are located elsewhere in Ohio and throughout North America. But as will be discussed in the next section, auto parts suppliers are particularly heavily concentrated in Ohio. Workers in the motor vehicle industry averaged more than $75,000 in wages and salaries in 2017. They used this income to buy everything

from cars and washing machines to lunch and movie tickets. They paid mortgages and sent their children to college. The jobs and in some cases the businesses of the people who sold the Lordstown plant and its workers these goods and services will disappear along with the plant itself.

It is possible to use economic impact analysis to quantify the scale of these broader impacts on other businesses and workers. The impacts are appropriately measured on the overall northeastern Ohio economy (including the Akron, Cleveland, and Canton MSAs). Using RIMS II multipliers from the U.S. Bureau of Economic Analysis, the region will lose about $4.3 billion in total annual production, $900 million in annual household earnings, 17,000 jobs, and $1.6 billion in regional gross domestic product.

There will also be substantial fiscal impacts. The shutdown will be a serious financial blow for the village of Lordstown, which will lose $1 million in income tax revenue from its budget of between $4 million and $5 million. (This does not include the indirect losses from workers elsewhere, which will affect Lordstown and other municipalities in the region and across the state.) The direct and indirect losses will impact sales tax revenues in Trumbull and neighboring counties as well. Declines in property values will affect primarily school districts throughout the region, and the state will lose commercial activity taxes and income and sales taxes from the direct and indirect workers' income and spending.

Automotive Industries in Ohio

The automotive industry has been a key component of the Ohio economy and of regional economies statewide for decades. This section will explore that industry.

Table 1 breaks down the broad transportation equipment manufacturing subsector into its component industry groups. The North American Industry Classification System (NAICS) code is shown in the first column. Each industry group is composed of several detailed industries. These are shown by larger indents and also by additional digits in the NAICS code. For instance, motor vehicle manufacturing (3361) is an industry group within the transportation equipment manufacturing subsector (336). In turn, the automobile manufacturing industry (336111) is a detailed industry within motor vehicle manufacturing. Please note that the transportation equipment subsector includes several industry groups that are not relevant for the motor vehicle and parts manufacturing analysis. These include aerospace products, railroad rolling stock, ship and boat building, and other transportation equipment manufacturing. Accordingly, the second line of Table 1 combines motor vehicles, motor vehicle bodies and trailers, and motor vehicle parts into motor vehicle and parts manufacturing. The industries are not shown for the irrelevant industry groups. Motor home manufacturing (336213) and travel trailer and camper manufacturing (332614) are combined because recent years' Ohio employment totals are suppressed for confidentiality reasons. Together, however, those two industries' employment represents the balance of the motor vehicle body and trailer manufacturing industry group.

The Location Quotient (LQ) is a measure of relative concentration, and is the percentage of total Ohio employment in the industry divided by the percentage of total U.S. employment in the industry. Transportation equipment manufacturing has an LQ of 2.03, meaning that the subsector's Ohio employment concentration is double the concentration nationwide – equivalently, Ohio employment is double the level that one would expect in an economy Ohio's size. Motor vehicle and parts manufacturing is even more highly concentrated, as indicated by

the LQ of 2.87. One out of every ten jobs in this industry is in Ohio. Although Ohio's total transportation equipment manufacturing subsector has outperformed the national average since 2009 (the employment trough as the recession was ending), the more detailed grouping of motor vehicle and parts manufacturing has underperformed.

Table 1
Ohio Transportation Equipment Manufacturing Employment

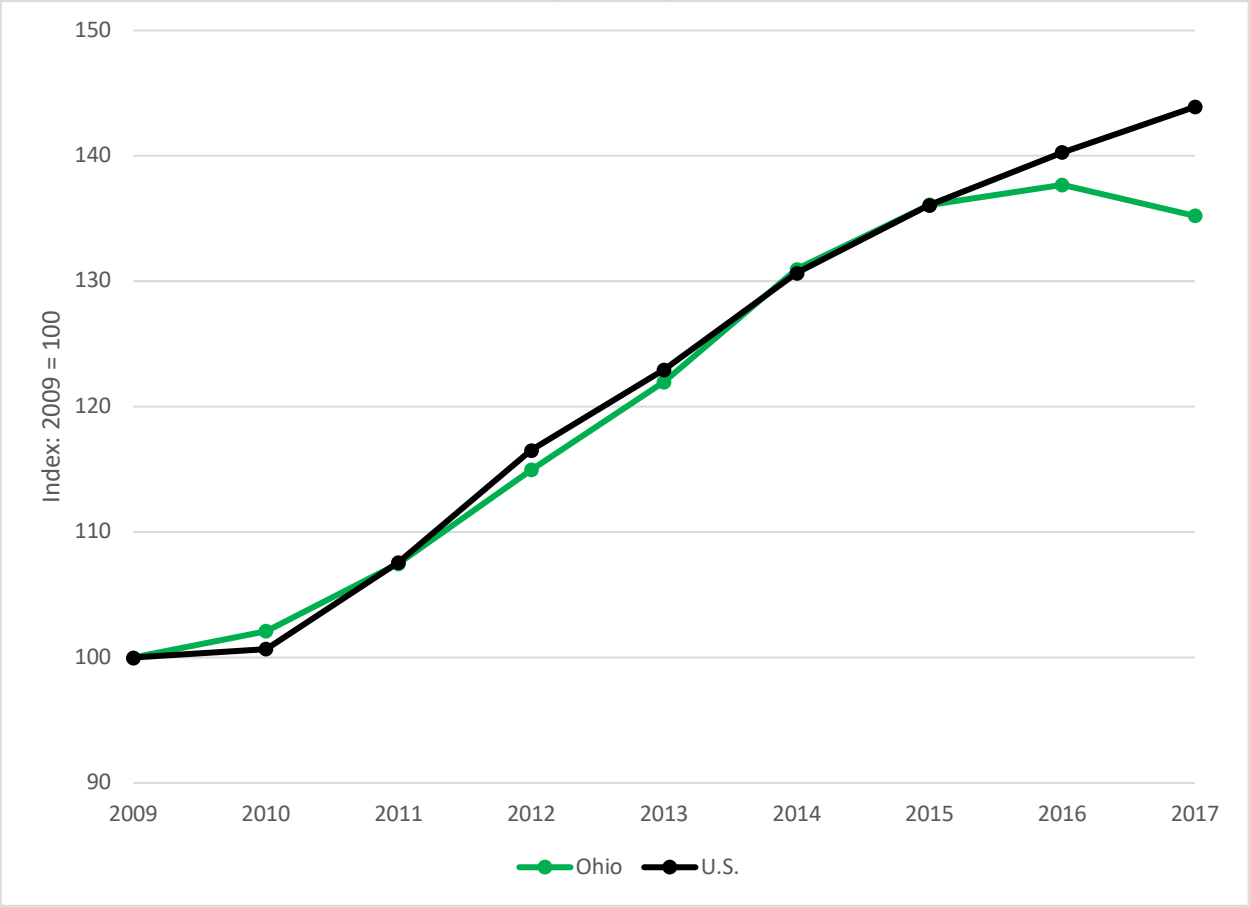
NAICS code	Industry	Emplmt. 2017	Location quotient	Change, 2009-17	
				Ohio	U.S.
336	**Transportation equipment manufacturing**	**124,299**	**2.028**	**29.4%**	**21.5%**
3361-63	**Motor vehicle and parts manufacturing**	**103,514**	**2.868**	**35.2%**	**43.9%**
3361	Motor vehicle manufacturing	19,307	2.321	15.5%	43.5%
336111	Automobile manufacturing	9,299	1.995	-14.5%	32.3%
336112	Light truck and utility vehicle mfg.	5,831	2.273	64.5%	87.0%
336113	Heavy duty truck manufacturing	4,177	3.817	82.2%	21.2%
3362	Motor vehicle body and trailer manufacturing	8,748	1.505	68.2%	48.5%
336211	Motor vehicle body manufacturing	4,395	2.118	56.8%	8.8%
336212	Truck trailer manufacturing	2,137	1.581	115.9%	69.1%
336213-14	Motor home and travel trailer mfg.	2,216	0.929	57.3%	97.6%
3363	Motor vehicle parts manufacturing	75,459	3.436	38.1%	42.9%
33631	Motor vehicle gasoline engine & parts	10,355	4.380	30.8%	38.0%
33632	Motor vehicle electric equipment mfg.	6,708	2.880	57.8%	14.2%
33633	Motor vehicle steering & suspension parts	4,542	3.309	-5.6%	38.0%
33634	Motor vehicle brake system manufacturing	2,716	2.796	-1.1%	5.9%
33635	Motor vehicle brake system manufacturing	9,605	3.132	58.4%	54.1%
33636	Motor vehicle power train components	7,579	2.708	93.6%	86.8%
33637	Motor vehicle metal stamping	13,500	4.044	28.2%	62.0%
33639	Motor vehicle seating and interior trim	20,453	3.576	42.0%	37.6%
3364	Aerospace product and parts manufacturing	19,332	1.070	20.9%	-1.5%
3365	Railroad rolling stock manufacturing	201	0.243	-23.9%	-0.9%
3366	Ship and boat building	267	0.053	15.1%	3.8%
3369	Other transportation equipment mfg.	985	0.761	-67.4%	-5.8%

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

The underperformance of motor vehicle and parts manufacturing was largely due to motor vehicle manufacturing. The eight-year employment growth of 15.5 percent was barely more than one-third the national average. Consistent with the earlier discussion, the performance of automobile manufacturing was far weaker than that of light trucks and utility vehicles (SUVs) both in Ohio and nationally – although both segments were weaker in Ohio than elsewhere. Heavy duty truck employment growth, however, was much stronger. The parts manufacturing industry group also underperformed the national average. As shown in Table 1, however, some parts industries did very well, and all are very highly concentrated in Ohio.

Figure 2 compares the Ohio motor vehicle and parts manufacturing employment trend to the national average. The two trends were nearly identical through 2015, with Ohio employment growth slowing in 2016 and reversing in 2017. Last year's net loss was 1,890 jobs; the Lordstown layoff at the beginning of 2017 was responsible for 1,245 of those jobs.

Figure 2
Motor Vehicle and Parts Manufacturing Employment Growth, 2009-2017, Ohio and U.S.



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

It is possible to focus this analysis on the Youngstown MSA to some extent. The Quarterly Census of Employment and Wages data include the employment totals for the overall transportation equipment subsector, although data for most industry groups and industries are suppressed. Figure 3 compares the subsector's employment growth for the Youngstown MSA, Ohio, and the U.S. (Recall that this total includes the industries outside of motor vehicles and parts.) Youngstown's transportation equipment employment nearly doubled between 2009 and 2011, increasing almost 2,800. Employment growth continued in the Youngstown MSA in the following years, but much more slowly. Employment growth between 2011 and 2015 was 7.7 percent in Youngstown versus 23 percent in Ohio and 16 percent nationwide. Youngstown employment then suffered a decline of 1,900 (30 percent) between 2015 and 2017. The majority of this decline was the layoff of the 1,245 Lordstown workers at the beginning of 2017.

Figure 3
Transportation Equipment Manufacturing Employment Growth
Youngstown MSA, Ohio, and U.S., 2009-2017

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

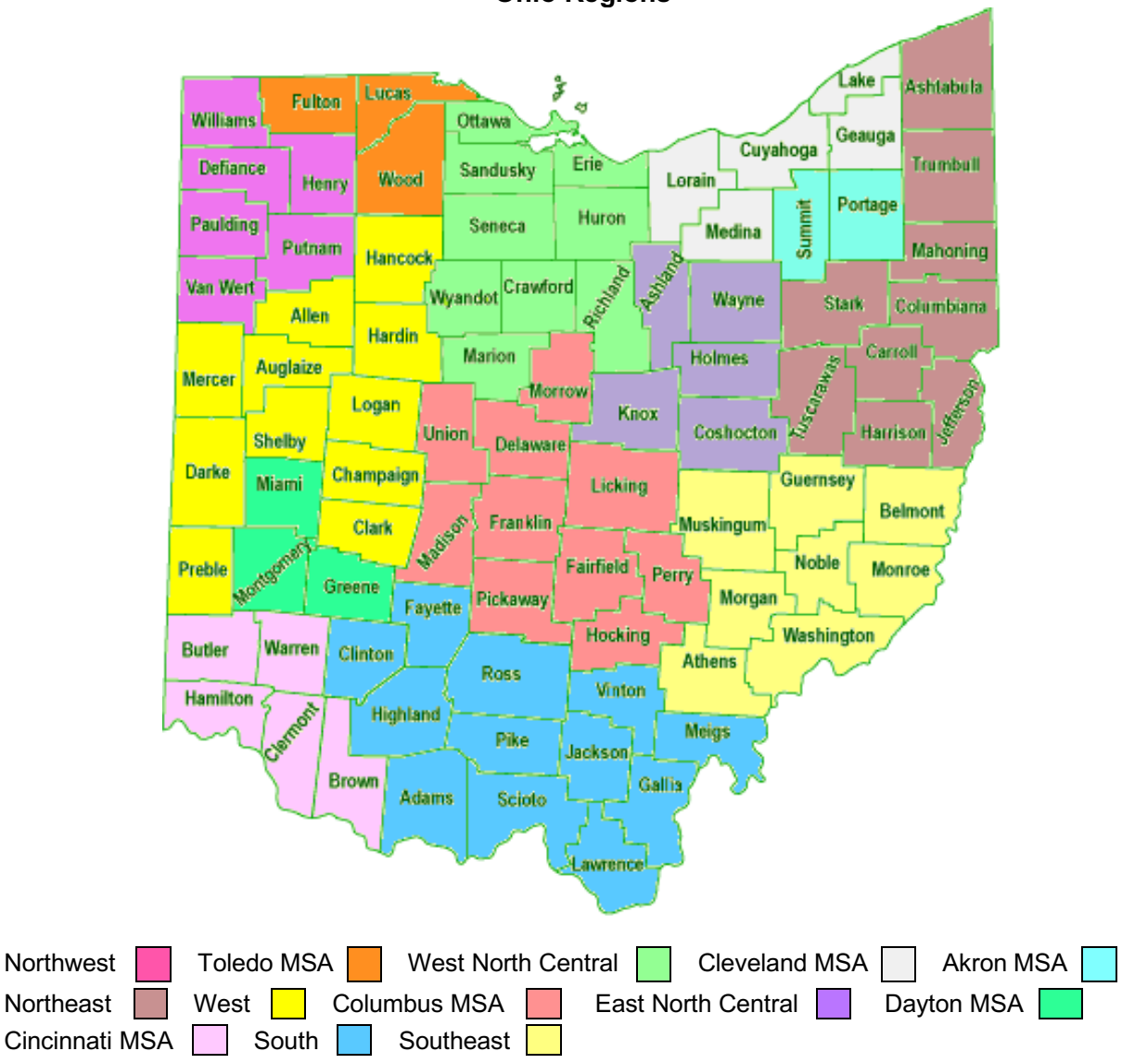
Regional Employment Concentrations

As readers of these articles are well aware, Ohio's regional economies differ markedly from one another. It is possible to derive estimates of employment and employment concentrations for transportation equipment industry groups at the regional level. The regions are the 13 that are customarily used in these articles: the six largest MSAs plus seven other regions including smaller MSAs and rural counties. These are mapped in Figure 4. (Note that Lordstown's Trumbull County is in the Northeast region.)

Estimating the employment of these regions requires the use of a different database: the Census Bureau's County Business Patterns. This database is only available annually and only for mid-March; 2016 is the most recent release. The database is subject to the same problem as the Quarterly Census of Employment and Wages used in the analysis so far: employment totals are suppressed whenever providing them would allow the employment total of an individual employer to be deduced. However, County Business Patterns also includes a count of establishments by employment level ranges, along with the range of total employment in the industry. Assuming that employment of all the establishments in a given range within an industry group is equal to the midpoint of the range gives a first-pass estimate for suppressed

employment totals. Using the employment totals that are provided, the 88 counties' estimates are balanced across counties and industry groups to equal the Ohio total for the industry group and also the transportation equipment total for the county in the many cases for which this total is provided. The resulting estimates are not exact, but they are probably close to the actual totals. The resulting estimates and associated location quotients are in Table 2.

Figure 4
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 2
Estimated Regional Transportation Equipment Manufacturing Employment
March 2016

Geography	NAICS codes								
	336	3361-63	3361	3362	3363	3364	3365	3366	3369
Ohio	110,540	98,126	20,785	6,135	71,206	10,674	581	168	991
MSA	61,526	51,186	12,735	2,378	36,073	9,436	486	107	311
Northeast	7,387	7,357	3,227	1,658	2,472	0	15	15	0
Southeast	1,004	1,004	0	0	1,004	0	0	0	0
South	4,380	3,931	2,014	17	1,900	375	35	39	0
West	20,285	19,102	2,794	900	15,408	750	0	0	433
Northwest	3,974	3,873	15	467	3,391	0	0	0	101
W. North Central	7,772	7,628	0	150	7,478	38	45	7	54
E. North Central	4,212	4,045	0	565	3,480	75	0	0	92
Non-MSA Total	49,014	46,940	8,050	3,757	35,133	1,238	95	61	680
Akron MSA	3,058	1,967	0	723	1,244	1,036	0	0	55
Cincinnati MSA*	10,535	6,978	159	351	6,468	3,447	0	0	110
Cleveland MSA	12,387	9,187	1,535	149	7,503	2,920	65	94	121
Columbus MSA	13,115	13,023	5,276	721	7,026	0	75	4	13
Dayton MSA	7,635	5,441	0	59	5,382	1,846	346	0	2
Toledo MSA	14,796	14,590	5,765	375	8,450	187	0	9	10
Location quotients									
Ohio	1.967	2.912	2.809	1.143	3.402	0.712	0.536	0.032	0.825
MSA	1.532	2.126	2.409	0.620	2.413	0.882	0.627	0.029	0.363
Northeast	1.543	2.563	5.119	3.626	1.386	0.000	0.162	0.034	0.000
Southeast	0.756	1.261	0.000	0.000	2.030	0.000	0.000	0.000	0.000
South	2.828	4.233	9.877	0.115	3.294	0.908	1.171	0.270	0.000
West	6.853	10.763	7.169	3.184	13.977	0.950	0.000	0.000	6.846
Northwest	5.261	8.552	0.151	6.474	12.055	0.000	0.000	0.000	6.258
W. North Central	3.481	5.698	0.000	0.703	8.993	0.064	1.045	0.034	1.132
E. North Central	3.421	5.479	0.000	4.805	7.589	0.228	0.000	0.000	3.497
Non-MSA Total	3.302	5.274	4.119	2.650	6.355	0.313	0.332	0.044	2.144
Akron MSA	0.904	0.970	0.000	2.238	0.987	1.149	0.000	0.000	0.761
Cincinnati MSA*	1.221	1.349	0.140	0.426	2.013	1.499	0.000	0.000	0.597
Cleveland MSA	1.166	1.443	1.098	0.147	1.897	1.031	0.317	0.095	0.533
Columbus MSA	1.248	2.066	3.813	0.718	1.795	0.000	0.370	0.004	0.058
Dayton MSA	1.963	2.333	0.000	0.159	3.715	1.780	4.611	0.000	0.024
Toledo MSA	4.746	7.806	14.047	1.260	7.279	0.225	0.000	0.031	0.150

*Ohio counties only.
NAICS codes: 336: Transportation equipment manufacturing. 3361-63: Motor vehicle and parts manufacturing. 3361: Motor vehicle manufacturing. 3362: Motor vehicle body and trailer manufacturing. 3363: Motor vehicle parts manufacturing. 3364: Aerospace product and parts manufacturing. 3365: Railroad rolling stock manufacturing. 3366: Ship and boat building. 3369: Other transportation equipment manufacturing.
Source: County Business Patterns, U.S. Census Bureau, and Regionomics estimates.

Not every industry group is present in every region, but transportation equipment manufacturing (336) and motor vehicle and parts manufacturing (3361-63) employment is represented in all regions to some extent. Indeed, only 10 of Ohio's 88 counties have no transportation equipment manufacturing, and only 12 have no motor vehicle and parts manufacturing. Many LQs are very high, with the highest concentrations of motor vehicle and parts manufacturing employment in the West, the Northwest, and the Toledo MSA. The only region for which the motor vehicle and parts manufacturing LQ is less than one is the Akron MSA, although the transportation

equipment LQ is also less than one in the Southeast. The concentrations are higher in the small MSA and rural counties than in the large MSA counties, as is true of manufacturing in general. Previous articles have commented that this is likely due to the lower land prices and larger tracts that are available outside of cities; these make developing large manufacturing plants easier and less costly. The exception is the Southeast, where the terrain makes large, flat parcels relatively uncommon.

The employment totals and LQs for motor vehicle manufacturing (3361) suggest that this industry group is concentrated in relatively few areas. Only 13 counties have one or more motor vehicle assembly plants, and in most cases they are quite large. This, coupled with the fact that most of them are in relatively less-populated counties, creates a major impact when these plants close or reduce their activity level, as is evident in the Lordstown layoffs.