ON THE MONEY

A Hannah News Service Publication

Vol. 130, No. 27 By Bill LaFayette, PhD, owner, Regionomics® LLC February 14, 2014

Ohio Manufacturing Update

The December 7, 2012, edition of *On the Money* (Vol. 129, No. 50) offered an in-depth survey of the manufacturing sector and its component industries in Ohio both at the state and regional level. The key message of that article was that productivity gains impact employment growth in manufacturing more than in any other sector. As discussed in that article, despite substantial increases in output throughout the 2002-2007 economic expansion, employment declined significantly. Indeed, the tremendous productivity growth of that period was the key factor underlying the employment declines – contrary to the common view that the shifting of production outside the United States was the cause of the declines.

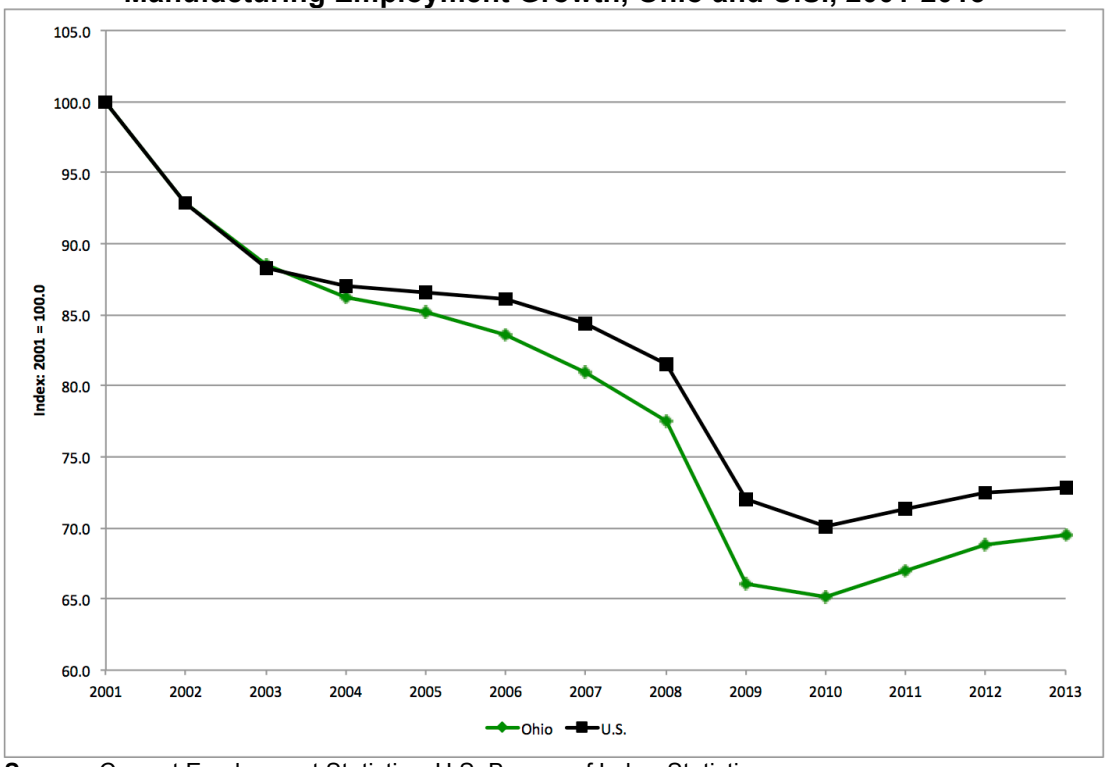
The article also documented the growth of manufacturing employment during the recovery – its first sustained increase since the early 1990s. This growth was much stronger in Ohio than elsewhere, and was a primary cause of Ohio's larger-than-average job gains in the recovery's initial stages. The article warned, however, that this growth could not be expected to last. Indeed, it is now clear that the employment growth trend broke decisively both nationally and in Ohio in the months immediately before that article was published. Since mid-2012, employment growth has continued at a much slower pace nationally, and even more slowly in Ohio. Is this merely a manifestation of productivity growth, or are less favorable factors at work?

This analysis uses a different data set from that used in the earlier article – a data set that tracks employment as recently as December 2013. Although the employment estimates are much more current, they are not without problems. First, the recent estimates are preliminary and will be revised next month. (The April 11 issue of *On the Money* will discuss these revisions for Ohio and its metropolitan areas.) Second, they do not allow a comprehensive regional breakdown of trends as is customary in these articles. Thus, this analysis will be limited to the state level.

National and State Manufacturing Employment and Output Growth

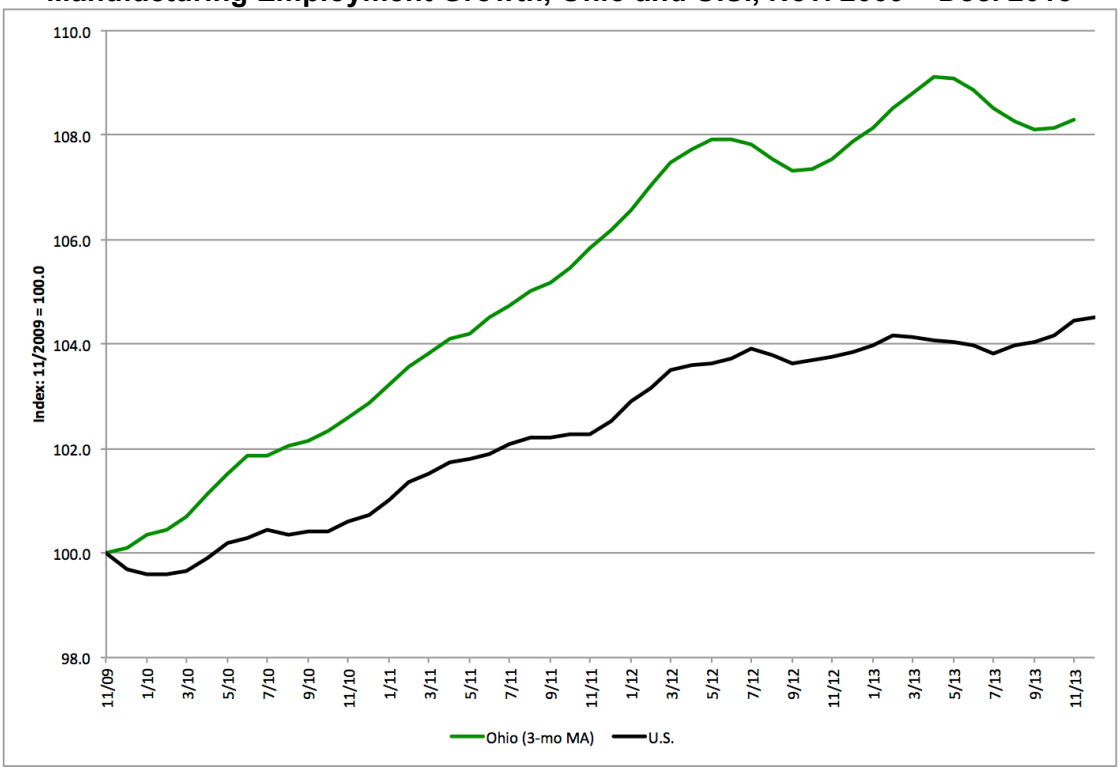
Exhibit 1 updates the annual employment trends from the previous article to include 2012 and 2013. This shows the sharp employment decline through 2010 and the recent increase – proportionally greater in Ohio. Also apparent is the 2013 deceleration in growth. Exhibit 2 takes advantage of the availability of seasonally-adjusted monthly employment estimates to show the monthly post-recession trend. The chart begins in November 2009, the manufacturing employment trough in Ohio – two months before the national trough, and shows the slowing trend more clearly. The volatility of recent Ohio employment is likely due to the preliminary nature of the estimates (which are graphed as a three-month moving average to dampen that volatility). The break in the trend is less clear than in the national totals, but still apparent.

Exhibit 1
Manufacturing Employment Growth, Ohio and U.S., 2001-2013



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

Exhibit 2
Manufacturing Employment Growth, Ohio and U.S., Nov. 2009 – Dec. 2013



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

Exhibit 3 updates a comparable chart in the 2012 article. This shows state and national cumulative growth in manufacturing output (gross domestic product). Ohio growth mirrored that of the U.S. until mid-decade, when it stagnated. The recession cost Ohio manufacturers $25 billion in output over two years – 30 percent of the 2007 total. Ohio output increased 27 percent in the recovery versus a 16 percent U.S. gain, but the fact remains that the inflation-adjusted value of manufacturing output nationwide is 27 percent greater than it was a decade ago while Ohio output is 1.4 percent less.

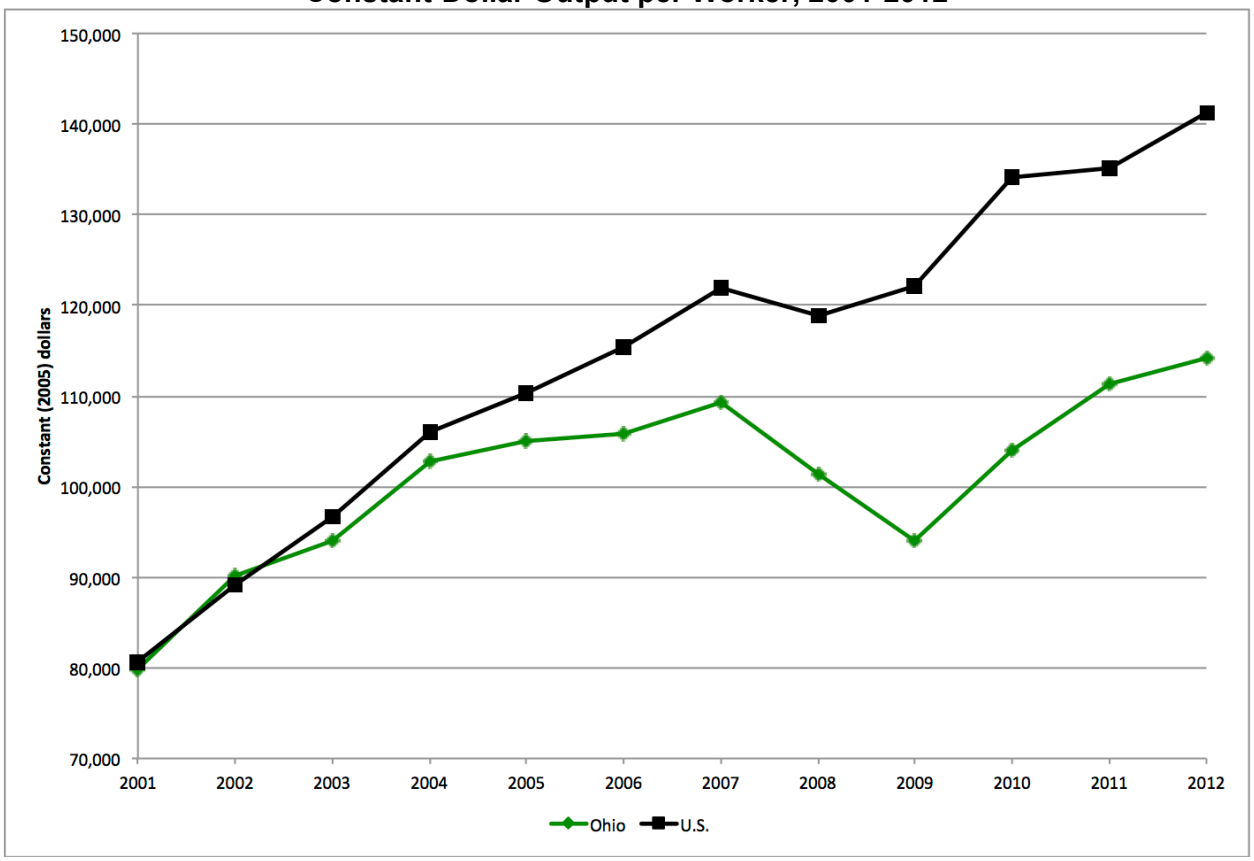
Exhibit 3
Manufacturing Output Growth in Constant Dollars, Ohio and U.S., 2001-2012

Source: Gross Domestic Product by State, U.S. Bureau of Economic Analysis.

Exhibit 4 combines the information in Exhibits 1 and 3 by calculating output per worker, a key measure of productivity. The typical U.S. and Ohio worker in 2001 each produced about $80,000, but the trend weakened after 2004 along with the weaker output trend. The sharp decline in Ohio output in the recession is mirrored in a two-year, 14 percent decline in output per worker. In contrast, U.S. manufacturers adjusted to the decline in demand by cutting staff to the point that output per worker remained nearly intact. The full decline was only 2.5 percent in 2008; productivity actually improved in the recession year of 2009. As a result of the widening productivity gap, Ohio output per worker in 2012 was 19 percent less than the national average. These comparisons should be approached with caution, however. Output per worker can vary significantly among individual manufacturing industries because of the nature and value of the good produced and the ability to automate the production process. Thus, a lower level of productivity in manufacturing overall can be caused by differences in the concentration of industries, while a lower growth rate can result from shifting concentrations of individual

industries. The next section examines the productivity growth of subsectors, which are more homogeneous and thus less subject to these criticisms.

Exhibit 4
Constant-Dollar Output per Worker, 2001-2012



Source: Calculated from Gross Domestic Product by State, U.S. Bureau of Economic Analysis and Current Employment Statistics, U.S. Bureau of Labor Statistics.

Manufacturing Employment and Output at the Subsector Level

Information is also available regarding the employment and output of some subsectors of Ohio manufacturing, which can offer additional insight into the trends discussed above. Exhibit 5 on the next page presents the employment, concentration, and post-recession growth of the subsectors for which employment data are available. Subsectors are classified between the two major categories of manufacturing: durable goods and non-durable goods. Durable goods are generally those that have an expected life of more than three years, but plastics and rubber products are defined as non-durable even though they are often expected to last longer than three years. The industries included in the remainder of each of these categories likely have employment that is too small to be reliably estimated. However, it is also possible that there may only be a handful of employers in the subsector statewide, and releasing estimates would violate confidentiality restrictions.

Concentration is measured via the location quotient. This is the percentage of total local employment in a given sector divided by the total U.S. percentage in that sector. Thus, a location quotient greater than 1.00 indicates a sector with a larger-than-average share of total

regional employment. Post-recession growth rates are calculated prior to and after June 2012, when the break in the employment growth trend occurred. These growth rates are annualized so that they can be compared between periods.

Exhibit 5
Manufacturing Subsector Employment, Concentration, and Employment Growth

Subsector	Empl., 2013 (000)	LQ* 2013	Compound annual growth rate			
			Ohio		United States	
			2/2010-6/2012	6/2012-12/2013	2/2010-6/2012	6/2012-12/2013
Manufacturing	662.7	1.447	3.1%	0.3%	1.8%	0.5%
Durable goods	448.1	1.558	4.3%	0.1%	2.9%	0.8%
Nonmetallic mineral products	24.4	1.705	2.5%	-3.4%	-0.8%	2.5%
Primary metals	37.9	2.505	5.9%	-6.8%	6.3%	-1.1%
Fabricated metal products	102.2	1.865	6.0%	-2.2%	5.2%	1.4%
Machinery	75.0	1.777	6.3%	1.0%	5.4%	0.2%
Computer & electronic prods.	20.2	0.495	1.7%	-2.4%	-0.1%	-2.0%
Electrical equipmt., appliances, and components	28.3	1.980	4.6%	2.1%	2.3%	0.2%
Transportation equipment	110.8	1.926	4.9%	2.2%	4.5%	2.7%
Furniture and related products	13.7	0.999	-4.0%	-1.5%	-1.2%	2.5%
Remainder**	35.7	1.024	-1.9%	9.9%	0.2%	0.6%
Non-durable goods	214.5	1.259	0.9%	0.6%	-0.1%	0.0%
Food	57.4	1.020	2.0%	1.7%	0.7%	0.5%
Printing and support activities	21.3	1.243	-2.7%	-2.7%	-2.7%	-2.8%
Chemicals	44.1	1.454	1.5%	-0.8%	-0.4%	1.1%
Plastics and rubber products	53.6	2.136	2.4%	-0.5%	2.0%	1.5%
Remainder***	38.1	0.917	-1.5%	4.1%	-1.0%	-1.3%

*Location Quotient. **Wood products and miscellaneous durable goods. ***Beverages and tobacco products, textiles, textile products, apparel, leather and allied products, paper, and petroleum and coal products.
Source: Current Employment Statistics, U.S. Bureau of Labor Statistics.

The concentration of manufacturing in total is far above average. The location quotient of 1.447 suggests that manufacturing employment is 44.7 percent greater than average or, equivalently, 44.7 percent more than what would be expected in an economy Ohio's size. Similarly, the concentration of every listed subsector except for computer and electronic products is greater than average. The state's manufacturing economy is somewhat more focused on durables than average, with double the national average share of electrical equipment and transportation equipment and two and a half times the average concentration of primary metal manufacturing. Among non-durables, plastics and rubber products also have an employment share double the national average.

Dividing the growth rates at June 2012 emphasizes the degree of the slowdown in recent growth – although, again, the recent estimates are preliminary. Ohio's manufacturing employment slowed from a rate nearly double the national average to one around 40 percent less. Non-durables fared much better than durables: although growth slowed, it remained far above the national average, which has been close to zero for the entire post-recession period. The deceleration of growth in durables manufacturing has been particularly severe, with growth going negative in a number of subsectors, including nonmetallic minerals, primary metals, fabricated metal products, and furniture. In contrast, the slowdown in the crucial transportation equipment subsector has been relatively mild at both the state and national levels, while growth

in Ohio electrical equipment manufacturing employment remains comfortably above the national average rate.

As noted earlier and as evident in the chart in Exhibit 4, Ohio's worker productivity decelerated significantly after 2004. (The sharp increase in productivity between 2010 and 2012 can be viewed as returning productivity levels to their long-run trend, the same purpose served by the greater-than-average increase in national productivity in 2010.) Exhibit 6 analyzes this trend in the same way as in Exhibit 5: calculating annualized productivity growth rates before and after the trend break (in this case, 2004). The later rates run through 2011 rather than 2012 because unlike manufacturing in total, subsector output estimates are not yet available for 2012.

Exhibit 6
Productivity and Productivity Growth in Manufacturing Subsectors

	Output per worker, 2011*		Compound annual growth rate**			
			Ohio		United States	
Subsector	Ohio	U.S.	2001-04	2004-11	2001-04	2004-11
Manufacturing	111,300	135,200	8.8%	1.1%	9.5%	8.5%
Durable goods	98,400	133,100	9.8%	0.1%	10.7%	13.3%
Nonmetallic mineral products	83,600	82,100	4.1%	-0.3%	3.9%	-3.2%
Primary metals	93,900	103,400	5.6%	-3.3%	8.9%	-7.1%
Fabricated metal products	86,400	78,000	6.9%	-0.3%	5.2%	-0.7%
Machinery	88,000	113,800	7.6%	2.3%	7.0%	8.2%
Computer & electronic prods.	156,800	327,700	36.0%	9.8%	34.8%	44.4%
Electrical equipmt., appliances, and components	111,800	109,500	10.1%	-0.2%	7.1%	7.2%
Transportation equipment	109,700	123,300	10.6%	-1.7%	5.8%	7.4%
Furniture and related products	64,900	64,300	6.0%	-0.8%	4.6%	4.4%
Non-durable goods	135,700	141,400	6.7%	2.4%	7.9%	2.8%
Printing and support activities	70,400	70,600	12.1%	1.4%	6.2%	7.2%
Chemicals	188,200	235,300	8.9%	1.1%	8.3%	2.6%
Plastics and rubber products	84,800	88,800	9.5%	1.3%	6.4%	2.5%

*In 2005 dollars. **Inflation-adjusted.
Source: Calculated from Gross Domestic Product by State, U.S. Bureau of Economic Analysis and Current Employment Statistics, U.S. Bureau of Labor Statistics..

Note first that output per worker in Ohio is less than the national average in virtually all subsectors just as it is in total. This likely results in Ohio manufacturers being less competitive than their counterparts elsewhere. Again, durables have fared much worse than non-durables, both in the decline in productivity growth after 2004 and in comparison to national averages. While worker productivity growth has turned negative in nonmetallic minerals, primary metals, and fabricated metal products, current growth rates are less negative than they are elsewhere. In contrast, productivity growth of electrical equipment and transportation equipment workers became negative in Ohio while accelerating at the national level.

The trends shown in Exhibits 4 and 6 bear watching. It is certainly possible that the recent rapid improvement in productivity in Ohio will continue, breaking the trend once again. But if productivity growth slows again to its longer-run, post-2004 trend, action to improve the trend will be necessary – and critical, given the central role that manufacturing plays in the Ohio economy. Determining the appropriate action to take – if action becomes necessary – will require engagement with industry leaders in each individual subsector. In some cases, assistance with modernizing plant and equipment will be called for; in other cases, incumbent

and new worker training assistance will be most impactful. In any case, review of these trends will be a continuing focus of this column as new employment and output data become available.