

# ON THE MONEY

---

**A Hannah News Service Publication**

Vol. 133, No. 23

By Bill LaFayette, PhD, owner, Regionomics® LLC

December 6, 2019

## **Ohio's Agricultural Economy**

### **Summary**

- Ohio agriculture is at the heart of a broader agribusiness cluster employing 933,500 in 2018, 17 percent of total statewide employment.
- U.S. farm employment peaked in 1916, and declined nearly 90 percent between the mid-1930s and the mid-2000s. Much of this decline was driven by technological advances that allow a small workforce to produce substantially greater output than was possible even 10 years ago.
- Nearly half of Ohio's \$9.3 billion in agricultural output in 2017 consisted of grain and seed crops, primarily soybeans and corn.
- Between 1997 and 2018, Ohio agricultural GDP increased 47 percent, about one-quarter less than the 64 percent U.S. gain. However, Ohio's gain of 58 percent since the 2008 recession trough was more than double the 27 percent national increase.
- Output per Ohio farm worker was one-quarter less than the national average – possibly as a result of differences in the composition of crop and animal production. Output per worker increased 62 percent between 1997 and 2018.
- Export markets are vital to Ohio farmers. Of the \$9.3 billion in agricultural sales in 2017, \$1.9 billion was exported. The Chinese tariffs on agricultural imports from the U.S., particularly soybeans, have had a measurable impact on both commodity prices and Ohio's agricultural exports.
- Most farms are small. Two-thirds of all farms in Ohio and nationwide generate less than \$25,000 in receipts before expenses, and 70 percent of Ohio farms are less than 100 acres.
- The average price of Ohio farmland per acre is double the national average. Land prices both nationally and in Ohio more than doubled over the past 24 years, but have leveled off since 2015.
- The state is divided into 13 regions. Employment totals, relative concentration, and 10-year growth are presented for each of these regions. Farm employment has increased in each of these regions – in some cases, substantially greater than the total employment increase.

## **Agriculture in Context**

This issue of *On the Money* revisits a vital sector of Ohio's economy: agriculture. Agriculture was last discussed in this series more than six years ago (November 8, 2013, Vol. 130, No. 21). This update is timely given recently-released results of the 2017 Agricultural Census – conducted every five years.

As the 2013 article made clear, farming, fishing, and forestry lies at the heart of an agribusiness economy including the entire crop and livestock supply chain from food manufacturers and distributors to retailers and restaurants. The agribusiness economy also includes manufacturing and distribution of agricultural equipment and supplies, as well as industries such as nurseries, landscaping services, parks, golf courses, and agriculture-related business and trade associations and government agencies.

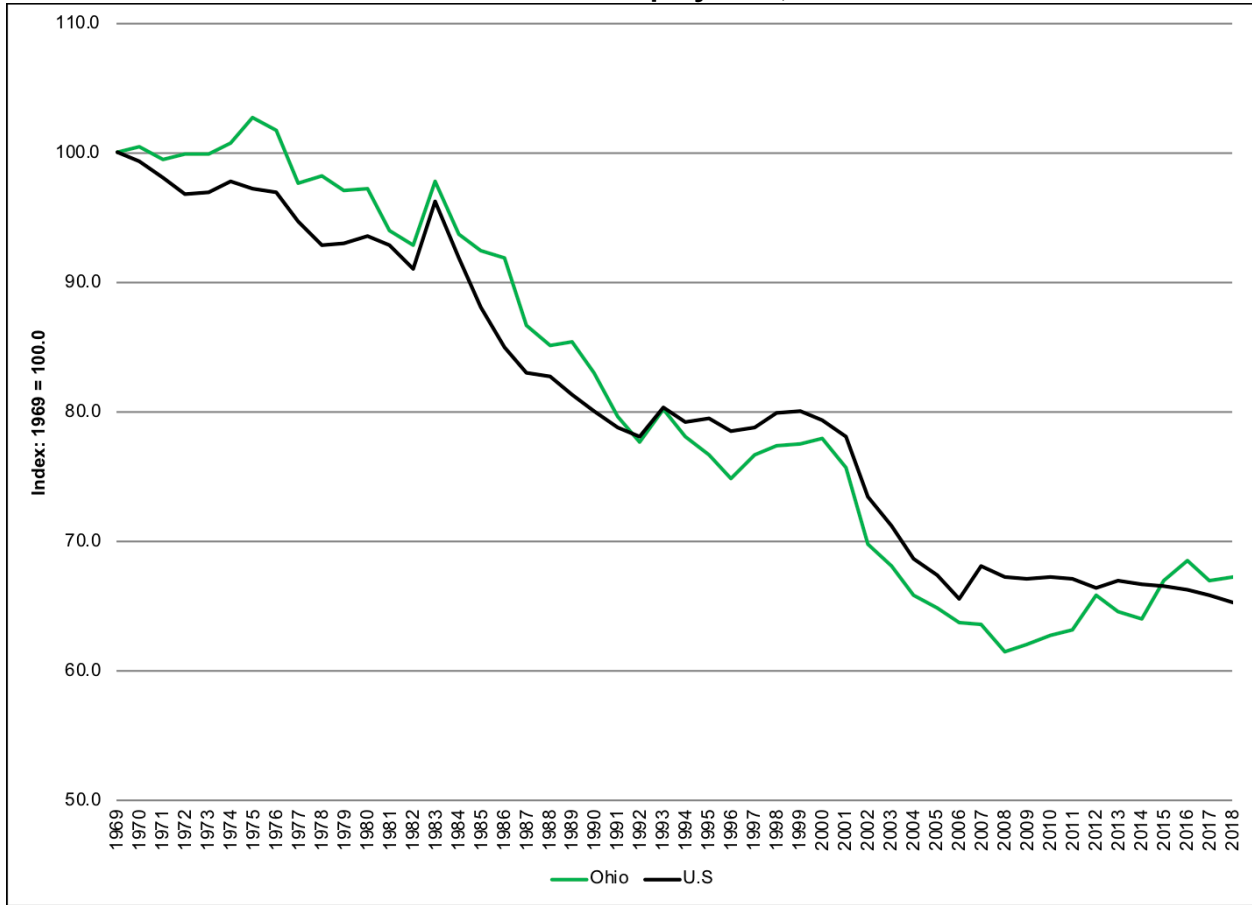
Regionomics recently completed a comprehensive study and workforce projections of agribusiness in Ohio for the Ohio Farm Bureau Foundation. This study found that employment in these industries in 2018 was 933,500 out of total state employment of 5.4 million – 17 percent of Ohio's total wage and salary employment. This broader agribusiness cluster will be the subject of an upcoming issue of *On the Money*. The current issue's focus is on the agriculture segment of the overall cluster.

### **Employment, Production, and Productivity**

Farm employment nationwide peaked at 13.6 million in 1916, more than 30 percent of total U.S. employment. A sharp employment decline began in the mid-1930s and continued through the mid-2000s. This decline was the result first of the Depression-driven collapse in agricultural prices and the Dust Bowl period, and then of technological innovations that vastly increased the productivity of agricultural workers. As a result, farm employment declined nearly 90 percent. Technology has enabled this small workforce to produce much more output than was possible even 10 years ago. Technology now in use on Ohio farms includes combines guided by GPS, laser-guided planters, real-time crop monitoring by drones and in-field sensors, and much more.

Figure 1 compares Ohio and U.S. farm employment (both employees and owners) from 1969 through 2018. The chart is on an index basis, so it shows cumulative percentage changes. The initial years are marked by the final portion of the 70-year decline. During the last decade, however, Ohio farm employment increased 9.5 percent while U.S. employment remained flat.

**Figure 1**  
**Ohio and U.S. Farm Employment, 1969-2018**



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

Ohio farms provide a wide range of crop and animal products to national and international markets. As reported in Table 1, grain and seed crops accounted for nearly half of the \$9.3 billion in agricultural sales in 2017. In turn, soybeans accounted for slightly more than half of the grain and seed total, with corn comprising the bulk of the other half.

**Table 1**  
**Market Value of Agricultural Products Sold from Ohio Farms, 2017**

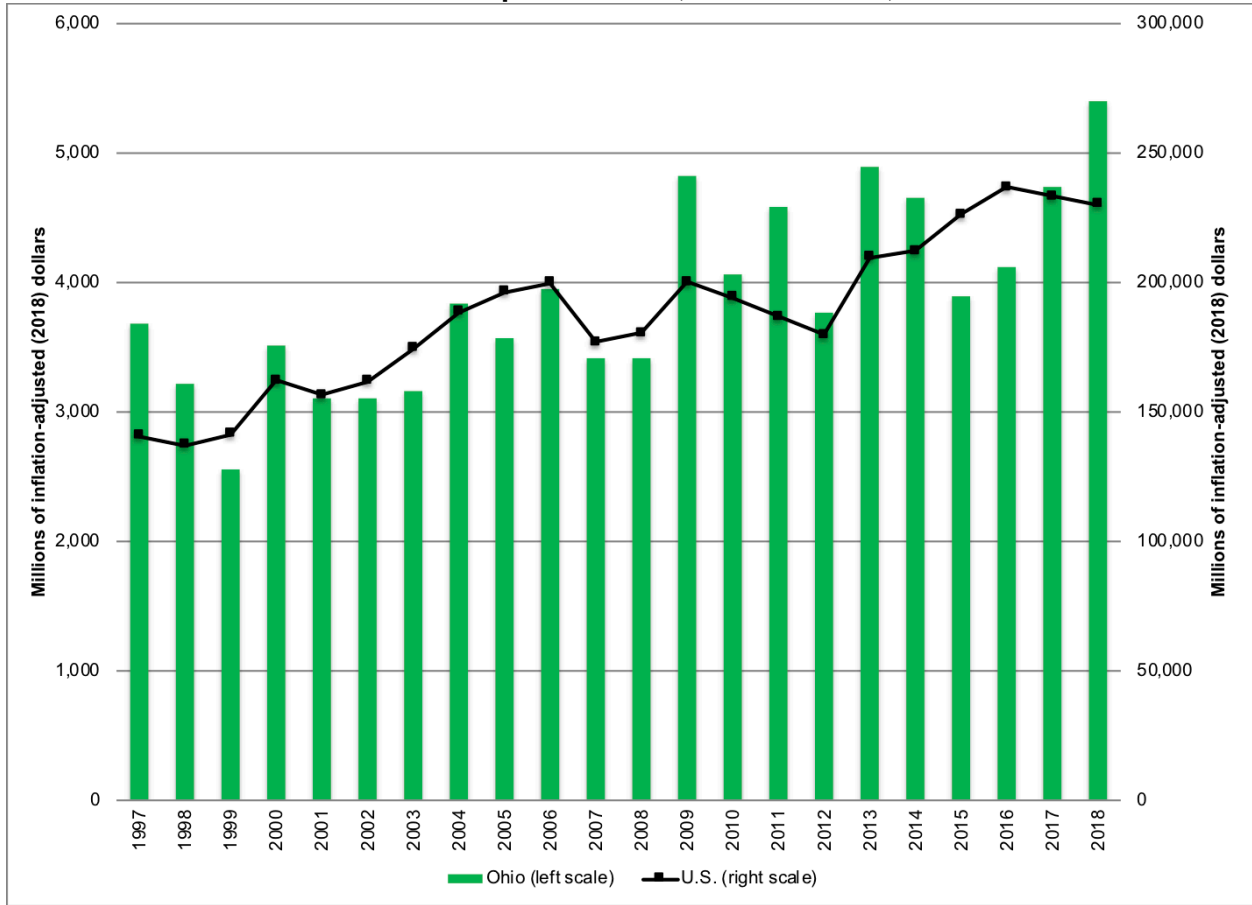
Item	Farms	Sales (millions)
<b>Total sales</b>	<b>77,805</b>	<b>\$ 9,341.2</b>
Grains, oilseeds, dry beans, and dry peas	31,299	4,553.2
Poultry and eggs	7,409	1,082.1
Hogs and pigs	3,951	1,010.8
Milk from cows	2,400	1,001.5
Cattle and calves	19,588	681.4
Nursery, greenhouse, floriculture, and sod	1,780	485.2
Other crops and hay	23,517	186.0
Vegetables, melons, potatoes, and sweet potatoes	2,956	148.8
Other animals and other animal products	2,474	58.5
Horses, ponies, mules, burros, and donkeys	3,334	48.4
Fruits, tree nuts, and berries	1,958	44.5
Sheep, goats, wool, mohair, and milk	5,298	23.1
Aquaculture	130	9.3
Cultivated Christmas trees and short rotation woody crops	447	4.9
Tobacco	82	3.6

**Source:** "2017 Ranking of Market Value of Ag Products Sold, Ohio," U.S. Department of Agriculture. Retrieved from

[https://www.nass.usda.gov/Publications/AgCensus/2017/Online\\_Resources/Rankings\\_of\\_Market\\_Value/Ohio/](https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/Rankings_of_Market_Value/Ohio/)

Farm output has increased both in Ohio and nationally over the past decade. Figure 2 graphs inflation-adjusted agricultural Gross Domestic Product (GDP) of Ohio (green bars) and the U.S. (black line). Between 1997 and 2018, Ohio agricultural GDP increased 47 percent after inflation, about one-quarter less than the 64 percent U.S. gain. However, Ohio's gain of 58 percent since the 2008 recession trough was more than double the 27 percent national increase.

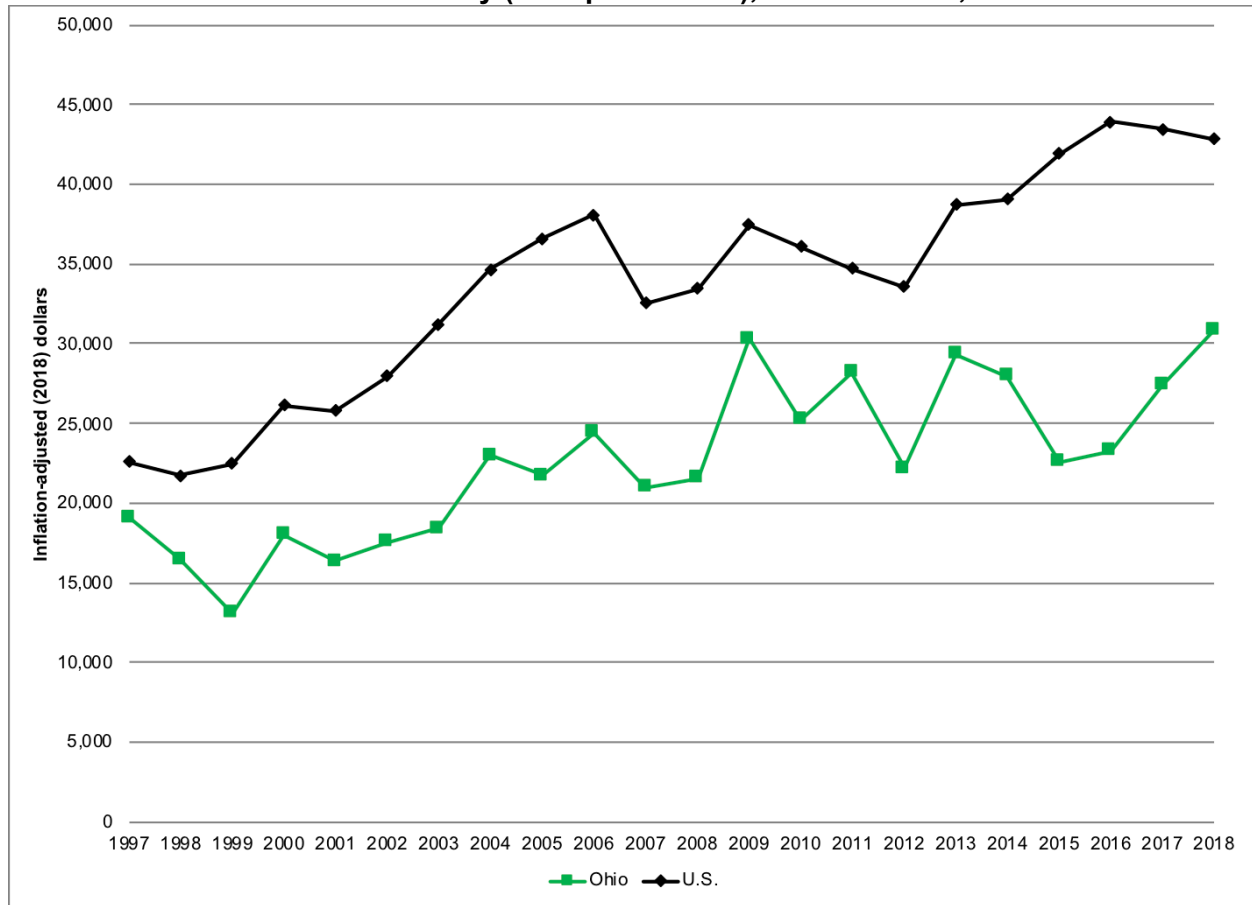
**Figure 2**  
**Gross Domestic Output of Farms, Ohio and U.S., 1997-2018**



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

Dividing GDP by employment (both owners and employees) provides a rough measure of worker productivity. This trend is graphed in Figure 3. Output per worker is less in Ohio than elsewhere, but this could be a function of differences in the composition of crop and animal production. The \$30,900 of output per Ohio worker was one-quarter less than the \$42,800 national average. The Ohio trend is much choppy than the national trend – in part because of factors such as weather that average out in the national totals – but Ohio output per worker in 2018 was 62 percent higher after inflation than in 1997. The national increase was 90 percent.

**Figure 3**  
**Farmworker Productivity (GDP per Worker), Ohio and U.S., 1997-2018**

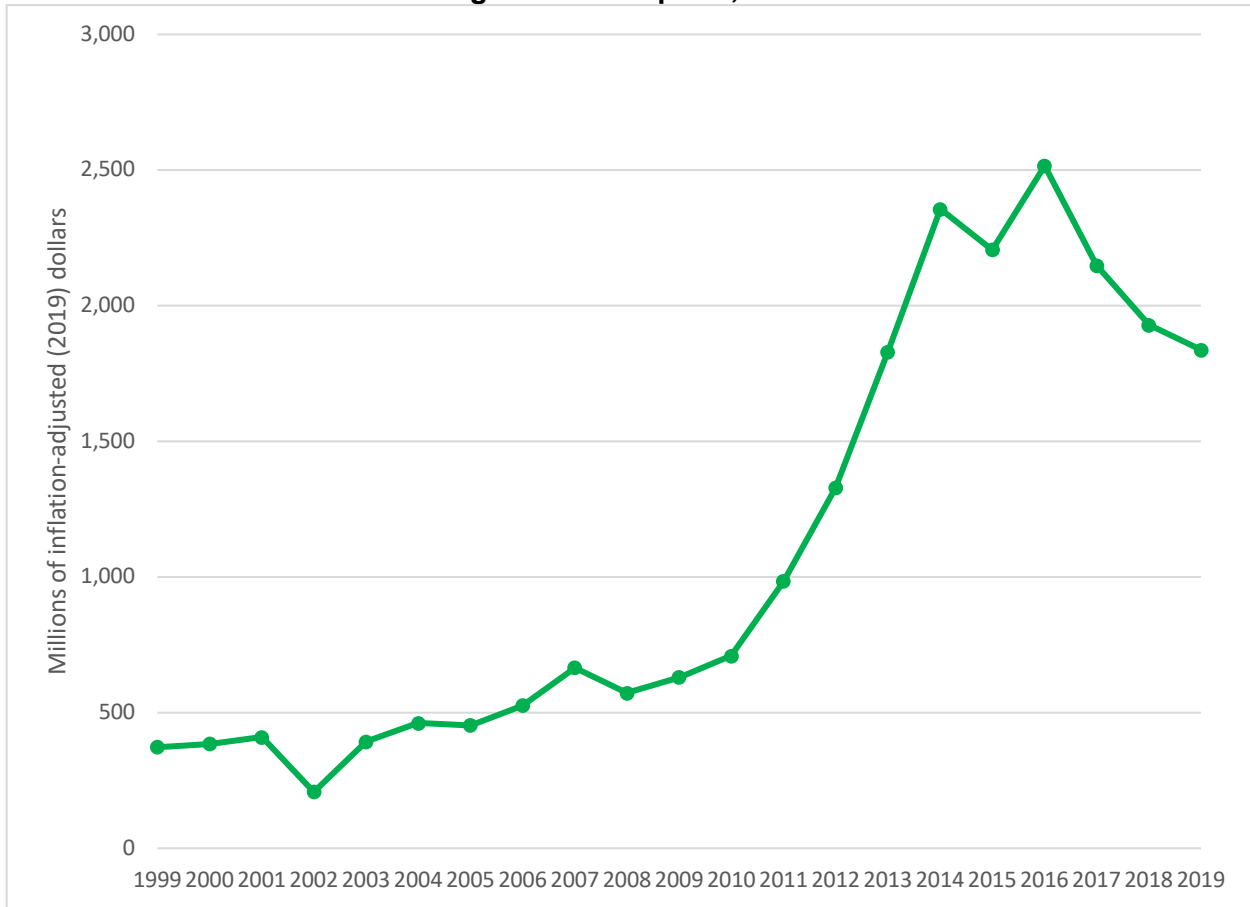


**Source:** Calculated from Regional Economic Accounts data, U.S. Bureau of Economic Analysis.

### Ohio Farm Exports and Tariff Impacts

Export markets are vital to Ohio farmers. Of the \$9.3 billion in agricultural sales in 2017, \$1.9 billion was exported. This included a substantial fraction of Ohio’s soybean and wheat production. But as shown in Figure 4, after a dramatic increase in the early 2010s, Ohio agricultural exports declined an inflation-adjusted 27 percent between 2016 and 2019.

**Figure 4**  
**Ohio Agricultural Exports, 1999-2019**



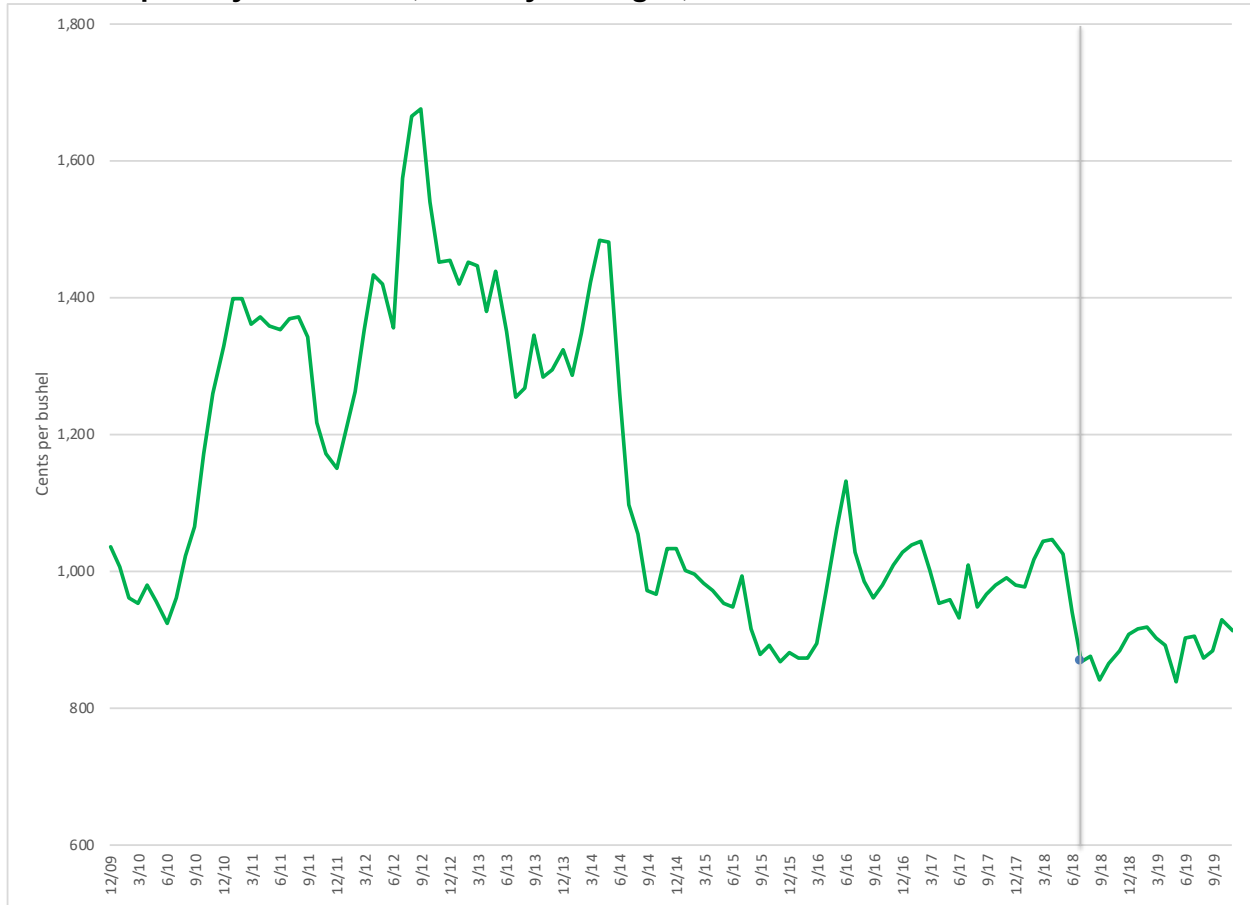
**Note:** The 2019 value is an annualized total through September.

**Source:** Foreign Trade Statistics, U.S. Census Bureau.

Part of this decline in export value was due to lower commodity prices and part was due to the impact of tariffs. In response to the Trump Administration’s tariffs on iron and steel, China on July 6, 2018, imposed a 25 percent tariff on U.S. soybeans, pork, and other agricultural products. In 2017, American soy growers sold one-third of their production to China. In dollar terms, only aircraft are a more valuable Chinese export. China has been somewhat successful in shifting their purchases to other suppliers, such as those in South America. Thus, the tariff resulted in a significant decline in demand, leading to lower prices.

Figure 5 shows both a sharp drop in spot soybean prices in 2014 and the impact of the tariff on spot prices in recent months. Soybean prices declined 34 percent between May and September 2014 as a result of a much better growing season than was forecast. Soybean prices remained in this range until the Chinese tariff hit. The vertical gray line in Figure 5 marks the July 2018 imposition of the tariff. There have been recent signs of a thaw, including a large Chinese purchase of soybeans in September. Substantial differences remain, though, and as Figure 5 makes clear, soybean prices have not recovered. The average price of \$8.88 per bushel between July 2018 and November 2019 is 9 percent less than the \$9.76 average between September 2014 and June 2018.

**Figure 5**  
**Spot Soybean Prices, Monthly Averages, December 2009-November 2019**



Source: Nasdaq.com.

**Characteristics of Ohio Farms**

Table 2 compares the sales of Ohio farms to those throughout the U.S. Two-thirds of all farms in Ohio and nationwide generate less than \$25,000 in receipts before expenses, so it is clear that most of these represent a side business rather than the owner’s primary means of income. In any case, it is clear from Table 2 that the vast majority of farms meet the standard definition of a small business. Less than 3 percent of farms in Ohio and 4 percent of farms nationally earned receipts of \$1 million or more in 2017.



**Table 2**  
**Ohio and U.S. Farms by Value of Agricultural Products Sold, 2017**

Total sales	Number	Percentage of total	
	Ohio	Ohio	U.S.
Total	77,805	100.0%	100.0%
Less than \$1,000	15,091	19.4%	23.1%
\$1,000 - \$2,499	8,973	11.5%	10.6%
\$2,500 - \$4,999	9,125	11.7%	10.3%
\$5,000 - \$9,999	8,952	11.5%	11.5%
\$10,000 - \$24,999	9,853	12.7%	12.4%
\$25,000 - \$49,999	6,114	7.9%	7.6%
\$50,000 - \$99,999	5,565	7.2%	6.2%
\$100,000 - \$249,999	6,094	7.8%	6.6%
\$250,000 - \$499,999	3,575	4.6%	4.4%
\$500,000 - \$999,999	2,434	3.1%	3.5%
\$1,000,000 - \$2,499,999	1,617	2.1%	2.7%
\$2,500,000 - \$4,999,999	283	0.4%	0.7%
\$5,000,000 or more	129	0.2%	0.4%

**Source:** Agricultural Census, U.S. Department of Agriculture.

Table 3 categorizes the subset of Ohio and U.S. farms with crop harvests by their total acreage. Again, small farms comprise the majority of all farms, with 70 percent of farms in Ohio and 67 percent of farms nationwide consisting of less than 100 acres. On the other hand, farms of 500 acres or more account for 12.6 percent of those nationwide but only 9.2 percent of farms in Ohio. This difference may be impacted by the large ranches in the Western U.S.

**Table 3**  
**Ohio and U.S. Crop-Producing Farms by Acreage**

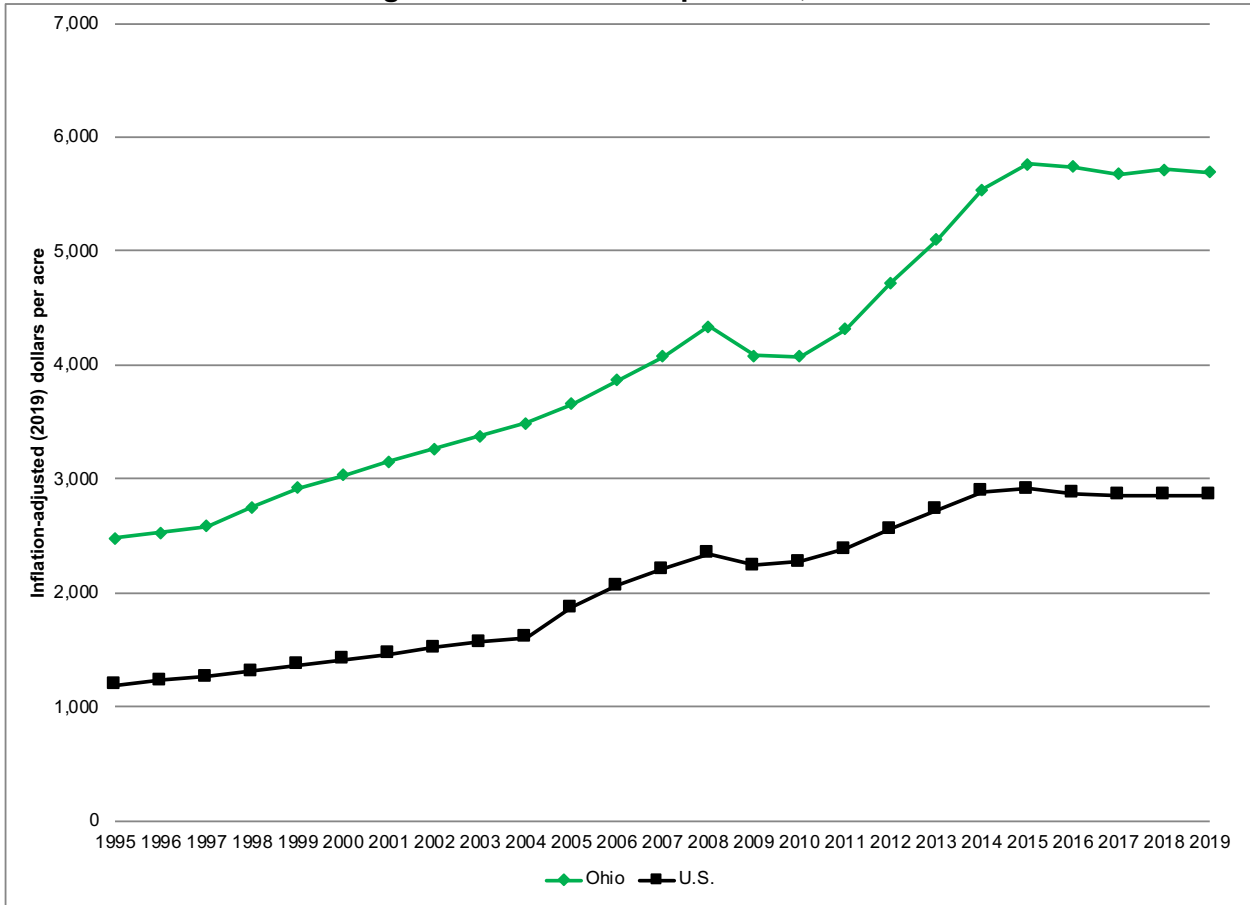
Total acreage	Number	Percentage of total	
	Ohio	Ohio	U.S.
Total	58,802	100.0%	100.0%
1 - 9 acres	13,015	22.1%	21.5%
10 - 19 acres	9,115	15.5%	13.2%
20 - 29 acres	5,319	9.0%	8.8%
30 - 49 acres	6,455	11.0%	10.9%
50 - 99 acres	7,584	12.9%	12.5%
100 - 199 acres	5,896	10.0%	10.2%
200 - 499 acres	6,032	10.3%	10.3%
500 - 999 acres	3,089	5.3%	5.8%
1,000 - 1,999 acres	1,671	2.8%	4.1%
2,000 acres or more	626	1.1%	2.7%

**Source:** Agricultural Census, U.S. Department of Agriculture.

### Farmland

Figure 7 charts the trend of inflation-adjusted Ohio and U.S. farmland prices per acre since 1995. The current Ohio average of \$5,693 per acre is double the national average of \$2,860, thanks to the fertility of Ohio soil and possibly greater competition from other types of development, such as manufacturing plants. Land prices both nationally and in Ohio more than doubled over the past 24 years, but have leveled off since 2015.

**Figure 7**  
**Average Price of Farmland per Acre, 1995-2019**



**Source:** U.S. Department of Agriculture.

Table 4 lists the 15 Ohio counties with at least 80 percent of their total land area in farms, and compares farm acreage in 2017 to that in 2007. Many of these counties are in western and northwestern Ohio. Farm acreage increased in Highland County, increasing its farmland percentage from 76 percent to 81 percent. Conversely, three counties, Marion, Preble, and Fayette, lost sufficient acreage to drop their farmland percentage below 80 percent.

**Table 4**  
**Ohio Counties with 80 Percent or More of Total Land in Farms**

County	2017			2007		
	Farms	Acreage	Pct. of total	Farms	Acreage	Pct. of total
Putnam	1,335	304,862	98.4%	1,316	303,751	98.1%
Van Wert	772	248,341	94.6%	696	246,497	93.9%
Crawford	719	238,233	92.5%	682	219,566	85.3%
Pickaway	805	296,988	92.4%	832	288,905	89.9%
Mercer	1,231	268,958	90.7%	1,302	293,026	98.8%
Darke	1,658	343,774	89.5%	1,772	350,450	91.3%
Henry	841	234,876	88.1%	881	232,238	87.1%
Hardin	726	261,744	87.0%	847	256,822	85.3%
Defiance	907	228,465	86.8%	1,141	233,213	88.6%
Wyandot	649	224,603	86.5%	632	219,631	84.6%
Madison	789	252,392	84.8%	718	247,913	83.3%
Paulding	622	219,663	82.4%	754	255,564	95.9%
Shelby	947	214,966	82.1%	1,050	217,969	83.2%
Auglaize	976	210,018	81.8%	1,059	213,296	83.0%
Highland	1,254	287,973	81.3%	1,497	269,803	76.2%
Clinton	747	212,769	80.9%	799	218,493	83.1%

**Source:** Agricultural Censuses, 2007 and 2017, U.S. Department of Agriculture.

### **Levels and Trends in Regional Ohio Farm Employment**

The final task is to explore Ohio farm employment at a regional level. The regions mapped in Figure 8 should be familiar to regular readers of this column; they have been repeatedly used to analyze various sub-state economic trends. These regions include each of Ohio's six largest Metropolitan Statistical Areas (MSAs) and seven other regions composed of the remaining 60 counties including Ohio's smaller MSAs and rural areas. These regions combine roughly similar counties based on employment concentrations primarily in farming and manufacturing.

**Figure 8  
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 5 presents 2018 employment of farm proprietors (owners) and employees in each of these 13 regions and the percentage of total regional employment that this farm employment represents. The following column is the employment location quotient. This is the percentage of total local employment in farming divided by the percentage of total national employment in farming. Thus, a location quotient greater than 1.0 indicates an employment concentration greater than average. The final column reports the percentage growth from 2008. As shown in Figure 1, 2008 was the year in which Ohio employment reached its low point.

**Table 5  
Agricultural Employment, Concentration, and Ten-Year Change, Ohio Regions, 2018**

Region	Proprietors	Employees	Total farm employmt.	% of region total	Location quotient	Change, 2008-18
Northeast	7,002	8,719	15,721	2.5%	0.99	7.4%
Southeast	7,236	7,839	15,075	7.9%	3.09	20.0%
South	8,921	9,930	18,851	8.6%	3.37	4.4%
West	9,432	11,717	21,149	6.0%	2.32	5.5%
Northwest	5,103	6,108	11,211	11.2%	4.39	4.4%
West North Central	5,427	7,195	12,622	4.8%	1.85	9.7%
East North Central	7,001	8,766	15,767	9.0%	3.50	18.2%
<b>Non-MSA Total</b>	<b>50,122</b>	<b>60,274</b>	<b>110,396</b>	<b>5.7%</b>	<b>2.24</b>	<b>9.4%</b>
Akron MSA	1,029	1,371	2,400	0.6%	0.22	4.8%
Cincinnati MSA*	3,994	4,995	8,989	0.8%	0.32	5.9%
Cleveland MSA	2,690	4,999	7,689	0.6%	0.22	7.6%
Columbus MSA	6,587	8,546	15,133	1.1%	0.43	13.0%
Dayton MSA	3,478	4,489	7,967	1.6%	0.62	9.9%
Toledo MSA	2,645	3,647	6,292	1.6%	0.61	11.9%
<b>MSA Total</b>	<b>20,423</b>	<b>28,047</b>	<b>48,470</b>	<b>0.9%</b>	<b>0.37</b>	<b>9.7%</b>
<b>Ohio</b>	<b>70,545</b>	<b>88,321</b>	<b>158,866</b>	<b>2.2%</b>	<b>1.02</b>	<b>9.5%</b>

\*Ohio counties only.

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

All non-MSA regions have location quotients significantly greater than 1.0 except the Northeast. This region is relatively more urbanized, including the Canton, Steubenville, and Youngstown-Warren MSAs. The Northwest has the highest concentration of farming employment in the state; the only one of the region's six counties with less than 80 percent of land area in farms is Williams (which is 78 percent farmland). The Columbus MSA has the highest farming employment concentration of the three largest MSAs, with total employment comparable to the that in the non-MSA regions. Madison and Pickaway Counties each have more than 80 percent of their land area in farms, while farmland is 78 percent of the land area of Union County, and 58 percent of that in Fairfield County.

Farm employment has increased in each of the metropolitan and non-metropolitan regions over the past 10 years. In fact, the percentage increase in farm employment in several of the regions was substantially greater than the total employment increase. These include the Southeast, West North Central, and East North Central regions, as well as the Dayton and Toledo MSAs.

"On The Money" (c) 1995-2019 Hannah News Service Inc., 21 West Broad Street, Suite 1000,  
Columbus, Ohio 43215.

All Rights Reserved. Phone Number (614) 227-5820