



Inside This Issue

Current Commodity Situation and Outlook for Ohio.....	1
Agricultural Risk Coverage Payments Expected Lower in 2018.....	3
As Chinese Trade Tensions Build, Do Ohio Producers Need to Worry?.....	5
Ohio CAUV Projections for 2018.....	8
Ohio Land Values and Cash Rent Outlook.....	10

Commodity Situation and Outlook for Ohio- May 31, 2018

Ben Brown, brown.6888@osu.edu

Agriculture is an uncertain industry, where the only certainty is a guarantee that there will indeed be uncertainty and risk. Already in 2018, frequent rains have delayed spring planting and increased the risk of disease and pest pressure. International trade disputes have increased the volatility in grain and livestock markets and international oil supply forecasts have led to unexpected increases in farm input costs. While the drivers of risk fall outside the hands of producers, individuals respond, react, and makes decisions based on the best information available. This report summarizes several of the commodities important to Ohio producers and provides an outlook of supply and demand given current policies and expectations. Unless otherwise specified, the volatility caused by the renegotiation of the North American Free Trade Agreement (NAFTA) and the trade dispute with China are not considered due to their highly fluid situations at the time this article went to press. Supply and demand estimates for the 2018 Marketing Year (MY 2018) are published by the World Agricultural Outlook Board while Ohio inventory estimates are compiled by the National Agricultural Statistics Service. Understanding the balance sheet for many of Ohio's commodities is important when making short and long-term decisions affecting farming and ranching operations.

Cattle Expansion Enters Fifth Year

The U.S. cattle herd on January 1, 2018 was larger than the count a year earlier, making 2017 the fifth consecutive year of herd expansion. Expansions in beef typically last four to six years. The U.S. appears poised for the possibility of at least one more expansion year in 2018 that would push beef production increases into the early part of the next decade. With constant demand for beef products, increases in beef production put downward pressure on the price received by producers. A cow that would have brought \$2,000 in January 2015 brought about \$1,200 in April 2018. As beef becomes cheaper, it starts to compete with other goods like pork for market share.

The inventory for all cattle including calves in the U.S. on January 1, 2018 was at 94.4 million head, up 0.7% from

the previous year. Ohio's inventory sits at 1.2 million head, a 0.8% increase. The average lifespan for a beef cow is 8 to 12 years meaning that 9.4 million replacement heifers are needed to maintain the current herd size. At almost 11 million replacement heifers at the start of the year, it is likely that 2018 will also be an expansion year in the national herd. In Ohio, dairy replacement heifers were up 0.8%, however it is likely that these heifers will leave Ohio for larger operations in Texas and Idaho where costs of production are lower. Cattle on feed decreases in Ohio by 6.7% while the national average increased 7.2%. Lower feed costs in Oklahoma, Kansas and Nebraska pull calves off farms earlier and out of Ohio. The outlook for cattle appears slight bearish as higher expected feed costs and dry weather in the southwest will move cattle into the market early. The number of cows and replacement heifers sold for slaughter will be important in determining if a herd expansion happens again in 2018.

Low to Negative Margins Drive Hog Industry

Rallies in grain markets, especially soybean meal, have increased feed costs for hog producers that did not lock in contracts when prices were low. Higher input costs along with a decline in pork prices erased many of the margins hog producers experienced in the first quarter of 2018, but prices rebounded in May. Large increases in hog production in Missouri, Ohio, Oklahoma, and Nebraska have contributed to the low prices. The national average for fed hog prices was \$52.50 in January but fell to \$45.30 by April. Prices have rallied in recent weeks, but are still below 2017 levels during this similar period. Prices reached a peak in July of 2017 at \$67.30. Markets for the nearby July futures contract signal horizontal movements in price. Current prices would suggest a per head return of \$2-\$5 as a national average for 2018. With higher feed costs expected in 2019, negative margins could return.

Exports to international markets will be a large factor in the hog outlook. Exports of U.S. pork were lowered 35 million pounds in the May WASDE report on concerns around Chinese demand. With the implementation of a 25% tariff on U.S. pork, exports to China have lagged.

Increased exports to emerging markets like South Korea and the Dominican Republic will be important in offsetting decreases to China and increased domestic supply. Exports make up roughly 22% of U.S. pork production with the largest markets being Mexico and Japan. However, U.S. pork exports to Mexico decreased in the first quarter of 2018, substituted by large amounts of turkey imports. The USDA forecasts even higher pork production in 2018. The key question will be levels of domestic and international consumption of pork with competition from potential substitutes like beef and poultry. If China backs away from U.S. pork, negative margins could return as early as next month.

Corn Acreage Continues to Decline

Three supply shocks have increased corn prices and brightened the outlook for corn producers. A drought in South America, reducing both the Argentina and Brazilian corn crop, gave corn prices their first positive outlook. Then in March, U.S. producers indicated that they were going to plant 2 million fewer acres in 2018 than in 2017. Even with the reduction in acres, a trend corn yield would make the 2018 crop the fourth largest crop recorded. Frequent rains throughout the central and eastern regions of the Corn Belt have delayed spring plantings and increased prices. With three supply side adjustment to annual production, the corn market has been bullish with December 2018 futures contracts trading well above \$4. Dealing with large supplies will continue to be a focus for grain merchandisers. Total supply in 2018 is expected to be 4% lower in 2018 than 2017.

Demand for corn (represented by the shaded area) continues to be strong. Feed and residual is expected slightly higher throughout the remainder of the year but lower in the next marketing year on the adjustments to the national herd size. If the national herd size continues to grow, this number will also increase. Ethanol continues to show growth and is up 1% from 2017 and up 8% since 2014. Changes in Chinese ethanol policy will drive international ethanol demand in the coming years. China announced in 2017 that it would mandate that all fuel for vehicles contain 10% ethanol. Their policy was three fold in that they wanted to reduce their large supplies of domestic stock, clean up air pollution, and create jobs. Whether China imports more raw corn or ethanol, the shock is expected to increase demand for corn on the world market. Only 2% of corn production is exported to China as raw exports. It is possible that it will take China a few years to increase their imports of U.S. corn. Even with the positive signals for demand for U.S. corn, total use is reduced in 2018 mostly a result of lower exports.

The outlook for corn looks favorable to producers as both supply and demand shocks suggest upward pressure on prices moving forward. Lower ending stocks for U.S. corn will increase the magnitude of price shifts due to weather-related events in the coming months.

The stocks to use ratio of 19% is lower than 25% in 2017, but above the five-year average of 16%. The U.S. corn crop is mostly planted, and weather will be the largest variable driving U.S. supply through the summer months. December futures prices are currently above cost of production for most producers and potentially a strong option for those that have on-farm storage.

US Corn Balance Sheet- May 10, 2018

Marketing Year	Sep-Aug	2014	2015	2016	2017*	2018**	2018 as % of 2017
Area Planted	(mil. Acres)	90.6	88	94	90.2	88	97.6%
Yield	(bu./acre)	170.9	168.4	174.6	176.6	174	98.5%
Production	(mil. Bu.)	14,216	13,602	15,148	14,604	14,040	96.1%
Beg. Stocks	(mil. Bu.)	1,232	1,731	1,737	2,293	2,182	95.2%
Imports	(mil. Bu.)	32	67	57	50	50	100.0%
Total Supply	(mil. Bu.)	15,480	15,400	16,942	16,947	16,272	96.0%
Feed & Residual	(mil. Bu.)	5,284	5,114	5,463	5,500	5,375	97.7%
Ethanol	(mil. Bu.)	5,200	5,224	5,432	5,575	5,625	100.9%
Food, Seed, & Other	(mil. Bu.)	1,401	1,422	1,450	1,465	1,490	101.7%
Exports	(mil. Bu.)	1,867	1,898	2,293	2,225	2,100	94.4%
Total Use	(mil. Bu.)	13,752	13,658	14,638	14,765	14,590	98.8%
Ending Stocks	(mil. Bu.)	1,728	1,742	2,304	2,182	1,682	77.1%
Stocks/Domestic Use Ratio		14.5%	14.8%	18.7%	17.4%	13.5%	77.4%
Season-Average Price	(\$/bu.)	\$3.70	\$3.61	\$3.36	\$3.35	\$3.57	106.6%

*Estimate **Projection

Source: World Agriculture Outlook Board

Soybean Price will rely on Demand

For the last few years, soybeans have provided a per acre return to producers greater than corn. Thus, acreage shifts to soybeans have ensued across the Midwest. The ratio of new crop soybean to corn prices from November 2017 to April 2018 traded at 2.5:1. Historically a ratio of 2.5:1 or greater signaled that acres would continue to move from corn to soybeans and that the expectation was for more soybean acres in 2018. However, in March, producers signaled that they intended to plant 1 million fewer acres than 2017. With a trend yield of 48.5 bushels/acre, the expected soybean crop would be the third largest crop on record behind the record set in 2017 and the third straight year over 4 billion bushels. Weather will be the largest factor over the summer months to the final production value, but expectations are for another large crop. The carry-over from 2017 was also high, creating an expectation that the 2018 supply will be 2.5% higher than a year ago.

US Soybean Balance Sheet- May 10, 2018

Marketing Year	Sep-Aug	2014	2015	2016	2017*	2018**	2018 as % of 2017
Area Planted	(mil. Acres)	83.3	82.7	83.4	90.1	89.0	98.8%
Yield	(bu./acre)	47.6	48	51.9	49.1	48.5	98.8%
Production	(mil. Bu.)	3,927	3,926	4,296	4,392	4,280	97.4%
Beg. Stocks	(mil. Bu.)	92	191	197	302	530	175.5%
Imports	(mil. Bu.)	33	24	22	25	25	100.0%
Total Supply	(mil. Bu.)	4,052	4,141	4,515	4,719	4,835	102.5%
Crush	(mil. Bu.)	1,873	1,886	1,901	1,990	1,995	100.3%
Seed & Residual	(mil. Bu.)	146	122	139	133	135	101.5%
Exports	(mil. Bu.)	1,842	1,942	2,174	2,065	2,290	110.9%
Total Use	(mil. Bu.)	3,861	3,950	4,214	4,188	4,420	105.5%
Ending Stocks	(mil. Bu.)	191	191	301	531	415	78.2%
Stocks/Domestic Use Ratio		9%	10%	15%	25%	19%	77.9%
Season-Average Price	(\$/bu.)	\$10.10	\$8.95	\$9.47	\$9.35	\$9.38	100.3%

*Estimate **Projection

Source: World Agriculture Outlook Board

Demand for soybeans and soybean products continues to be strong. Increases in livestock numbers, especially pigs, has driven demand for soybean meal. Increases in crude oil prices could encourage use of biodiesel and expand soybean crush further. Chinese per capita income is strengthening and the demand for pork

continues to grow internationally. Exports of U.S. soybeans to China have tripled in the last decade, but since 2012, Brazil has been the largest supplier of soybeans to China. Nearly 60% of U.S. soybean exports head to China, and the strength of that market will continue to influence U.S. soybean demand. Exports are projected higher in 2018, but Chinese tariffs would shrink Chinese demand of U.S. soybeans. The drought in South America weakened Chinese leverage over the U.S., as production in South America finished below expectations. Overall, the growth in soybean use appears strong at a 5.5% increase next year, but

international trade and weather provide large uncertainties looking forward.

Soybean prices in 2018 are expected to be similar to 2017 with the potential for a rally in late June, which would set up an opportunity for producers to contract grain. Trade uncertainty in the Chinese market could change the outlook for soybean profitability for both old and new crop soybeans. Weekly sales numbers will be an important indicator of the ending U.S. export value. Access the [entire report](#), with information on poultry, eggs and wheat: <https://tinyurl.com/yb5nkw3l>

Agricultural Risk Coverage Payments Expected Lower in 2018

Ben Brown, brown.6888@osu.edu

The Agricultural Adjustment Act of 2014 (more commonly known as the 2014 farm bill) reformed the safety net for U.S. row crop producers. Among several changes, direct decoupled payments were replaced with two countercyclical programs that targeted shallow losses in revenue and price. The Agriculture Risk Coverage program (ARC-CO) uses both a county's current and historical revenue to calculate payments. The Price Loss Coverage Program (PLC) allows the market to fluctuate, but triggers payments when the Marketing Year Average (MYA) price falls below a fixed reference price set by Congress. The two programs operate differently and are not substitute programs. The ARC-CO program uses a county's average yield to calculate both current and historical revenue allowing the program to account for weather events that negatively impact one county's yield but not another. Producers were allowed one-choice in 2015 between the two programs for the length of the farm bill. Participation rates in Ohio followed the national trend for corn and soybeans with the majority of producers electing ARC-CO. The national trend for wheat was to elect PLC, whereas Ohio producers favored ARC-CO. Nonetheless, there are producers in Ohio that are enrolled in either ARC-CO or PLC for corn, soybeans and wheat. The programs make payments at the end of the marketing year, which for wheat is May 31, and August 31 for corn and soybeans. Because the MYA price is one-half of the calculation, payments are made almost a full year after the crop has been harvested. Payments for the 2017 crop will be made in October of 2018. Estimating the size of the payments will be important information for Ohio producers and lenders that wish to plan for their autumn cash flow.

Payments in autumn of 2018, representing the 2017 crop, are expected smaller and less frequent than a year ago for corn and wheat, but triggered in more counties and larger for soybeans. For the 2016 crop, every Ohio county except Ashtabula triggered an ARC-CO corn payment, whereas the 2017 crop is expected to trigger a corn payment in only six counties. Nearly half of the counties are expected to trigger a soybean payment and

two thirds are expected to trigger a wheat payment. Total payments made in October 2018 are expected lower in Ohio than a year ago even with the higher soybean payments. Expected net cash farm inflow for the month of October is expected down from the three-year average on price and lower government payments.

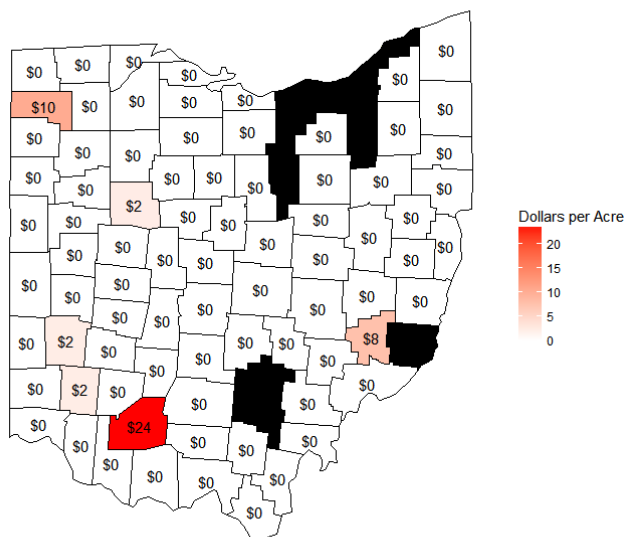
These calculations were made based on yields reported by the National Agricultural Statistic Service (NASS) in February of 2018. Actual payments made in October will be calculated using Farm Service Agency Yields. NASS does not provide county yields for all counties, partially due to a low survey response rate. Counties with a NASS yield are included. Price estimates are those published by the World Agricultural Outlook Board in the May World Agricultural Supply and Demand Estimates. Expected MYA prices are corn- \$3.40, soybean- \$9.35 and wheat- \$4.70. It is possible that price estimates could change between now and the end of the marketing year, but because of the position in the marketing year, it is going to take large shifts in the cash market to move the MYA price. Higher prices result in a smaller payment, similarly, a lower price results in a larger payment.

Established in the ARC-CO and PLC formulas is a restriction that payments be made on 85% of base acres. The estimates included have been adjusted to reflect both the 85% restriction and a federal sequestration of 6.8%, outlined in the Budget Control Act of 2011.

Expectations for corn payments made this October are for smaller payments than those distributed in October 2017. A lower historical revenue benchmark and above average yields lowered the probability of corn payments for many of Ohio's counties. Large quantities of corn base acreage exist across Ohio, and is a leading factor in total commodity payments. Payment variations across counties are a result of the yield component included in the ARC-CO formula. Highland county triggers the largest payment at \$24/ base acre with a yield of 167

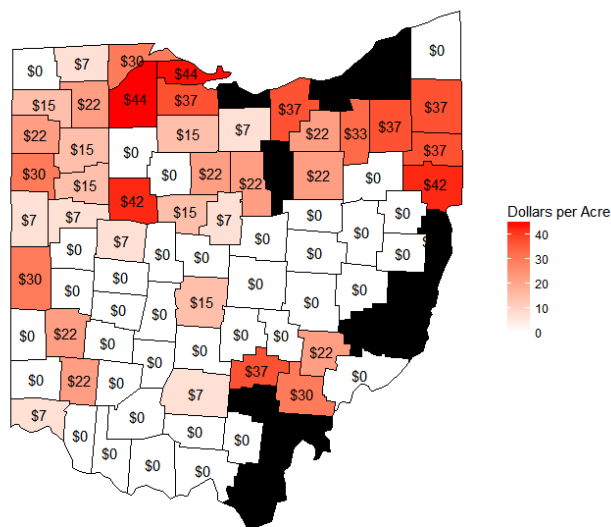
bushels/acre in 2017 vs a yield of 176 bushels/acre in 2016. The program is designed to smooth the differences in revenue from one year to the next, whereas crop insurance is designed to protect against revenue losses within the same year. The average estimated payment this year is expected to be \$8, whereas the 2017 average payment was \$57.

Ohio Corn ARC Payment Estimates: Program Year 2017
Rounded to Nearest Dollar



Data Source: Author Calculation

Ohio Soybean ARC Payment Estimates: Program Year 2017
Rounded to Nearest Dollar



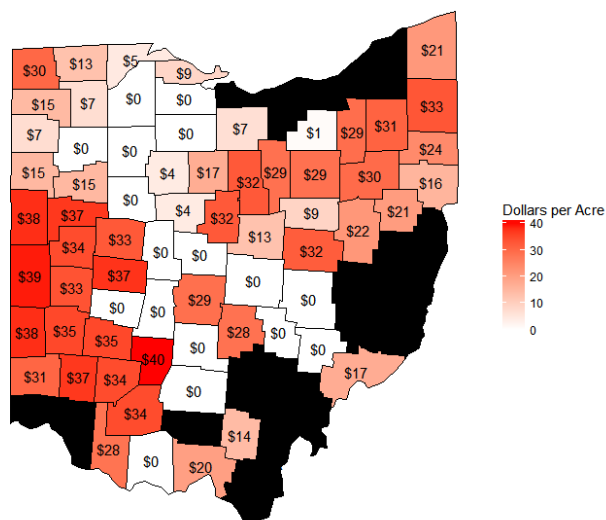
Data Source: Author Calculation

Smaller soybean yields across Ohio in 2017 increased the likelihood of ARC-CO payments in several of the state's 88 counties. While more counties are expected to trigger payments this October than last October, the size of the average payment is only slightly higher. The average soybean payment in 2017 was \$18/base acre whereas this year the expectation is for \$23/ base acre.

Payments are more frequent in the northern part of the state where yields lagged from late planting and large rains.

Fewer base acres of wheat exist in Ohio compared to corn and soybeans, but ARC-CO payments for wheat are expected in two-thirds of Ohio's counties. The average ARC-CO payment for wheat is expected to be \$24/base acre down from \$32 last year. Wheat acreage is up in Ohio this year, but because the field is planted to wheat does not mean that there will be a commodity payment. Only if the field contains historical wheat base acreage and enrolled in the wheat ARC-CO program, will the field be eligible.

Ohio Wheat ARC Payment Estimates: Program Year 2017
Rounded to Nearest Dollar



Data Source: Author Calculation

To use these estimates in cash flow planning, producers will need to know their base acreage and which of the two commodity programs they enrolled under. By multiplying the base acreage value by the county estimates above, producers can calculate their estimated commodity program payment. The federal government limits total payments per person (not entity) to \$125,000.

These estimates are based on current forecasts for MYA prices. Final prices and yields will be made by the Farm Service Agency in September, with payments expected in October. Large swings in cash prices could alter these estimates. PLC payments are expected higher for corn and lower for wheat in 2018, but apply to a small percentage of Ohio base acreage. Soybeans prices have to date not fallen below the reference price to distribute a PLC payment and the expectation is zero soybean PLC payments this year.

Access the complete [Agricultural Risk Coverage Payments Expected Lower in 2018](https://tinyurl.com/y6us5uyf) article at <https://tinyurl.com/y6us5uyf>

As Chinese Trade Tensions Build, Do Ohio Producers Need to Worry?

Ben Brown and Ian Sheldon, brown.6888@osu.edu; sheldon.1@osu.edu

The likelihood of a full-blown trade war between the U.S. and China has increased substantially in the past few months, with each country either implementing or proposing a range of tariffs against each other's imports. Tariffs, a protectionist tactic, raise the cost of exports to the importing country and lower the demand of goods from the exporting country as other countries compete for market share. Currently, the tariffs implemented by the U.S. include 25% on international steel and 10% on aluminum and a Chinese tariff of 25% on U.S. pork. However, both countries have a list of proposed tariffs covering a range of products including U.S. soybeans and corn. Such tariffs would result in higher machinery

costs, lower corn, soybean and pork prices for U.S. agricultural producers, and a decrease in the net income of Ohio farm families.

In 2017, Ohio exported about \$50 billion worth of goods, worldwide, making it the 10th largest exporting state at 3.2% of the U.S. total. The leading export from Ohio was industrial machinery at \$8.9 billion, with soybeans sixth at \$1.8 billion. Total agricultural trade accounted for \$3.9 billion in 2017, representing 7.8% of Ohio exports, down slightly from the 2016 percentage of 8.3.

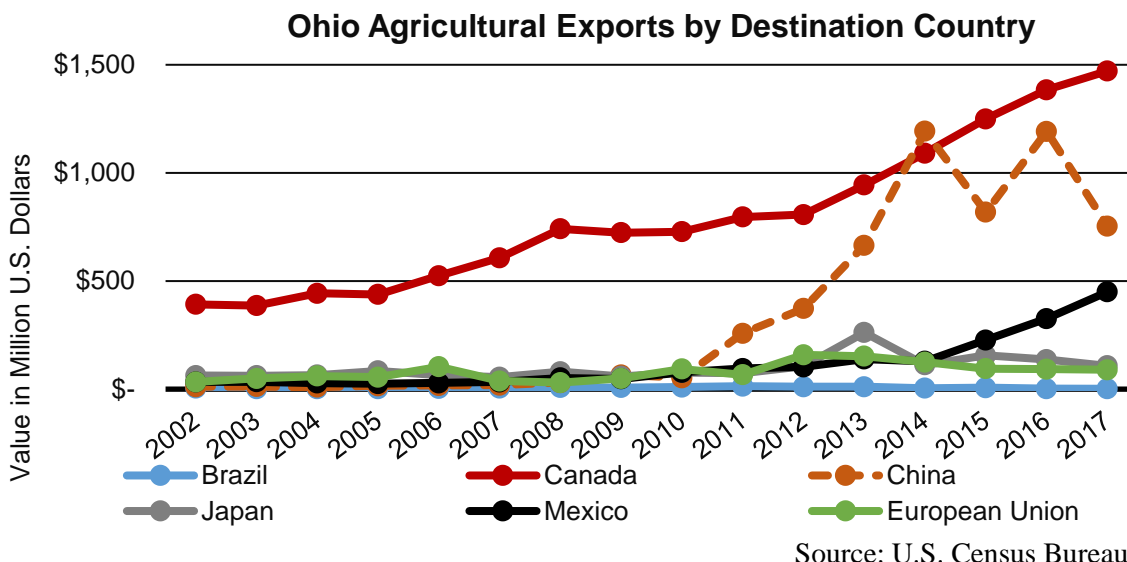


Figure 1: Ohio Agricultural Exports by Destination

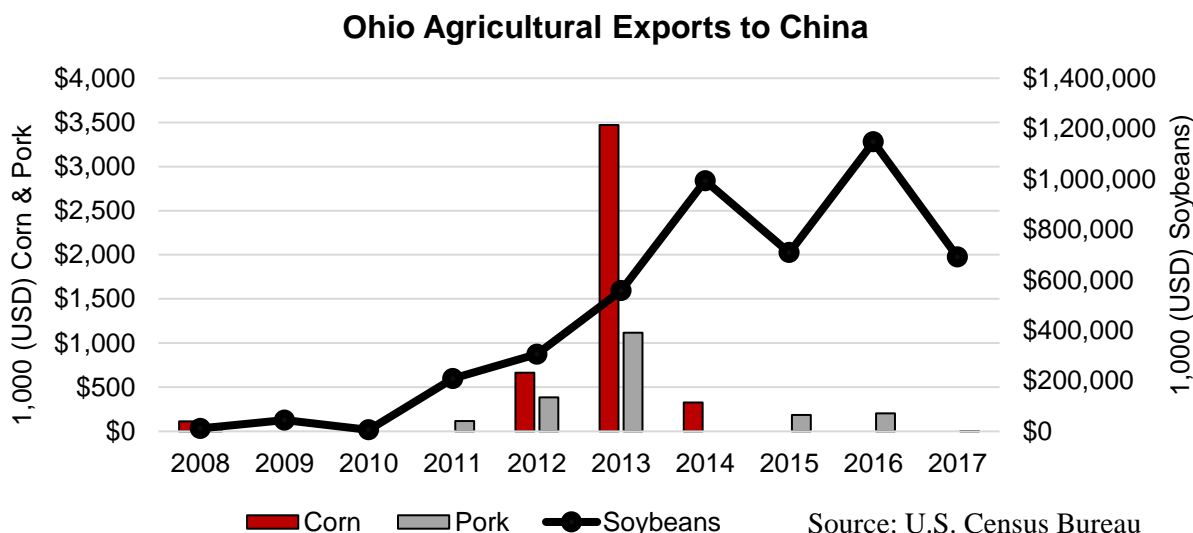


Figure 2: Value of Ohio Agricultural Trade to China

Considering only agricultural exports from Ohio, Canada remains the largest importer of goods at \$1.47 billion in 2017- see Figure 1. However, since 2010, China has emerged as the second largest buyer of Ohio's agricultural products, eclipsing Canada in 2014. Canada and Mexico, North America Free Trade Agreement (NAFTA) trading partners, together represent 49% of Ohio's agricultural trade, emphasizing the importance of NAFTA to Ohio's agricultural producers.

Ohio producers exported \$754 million to China in agricultural products in 2017, down from \$1.2 billion in 2016, a result of lower soybean prices. Figure 2 illustrates the value of Ohio agricultural exports to China for corn, pork and soybeans. In 2017, Ohio soybean exports to China totaled \$691 million, down from the high of \$1.14 billion in 2016. Strong domestic use of corn for feed and ethanol has limited the amount available for exports. In 2017, Ohio produced a soybean crop worth

\$2.4 billion. At \$691 million, exports to China would account for 29% of the value of the Ohio soybean crop, which is slightly less than the national average. The U.S. is not the only exporter of agricultural products to China. In terms of oilseed products, Brazil and Argentina are major soybean suppliers. In 2017, the U.S. exported 36.8 million metric tons to China representing 30% of total U.S. production. In contrast, Brazil exported 45.3 million metric tons to China, and Argentina exported 7.1 million metric tons, representing 40% and 12% of their production respectively. Since 2012, the U.S. has been the second largest supplier of soybeans to China behind Brazil- Figure 3. The growth in U.S. soybean exports to China has grown 209% over the past decade, but Brazil's growth has been 567% over the same period. The presence of a 25% tariff on U.S. soybeans will likely strengthen Brazil's market share of Chinese imports.

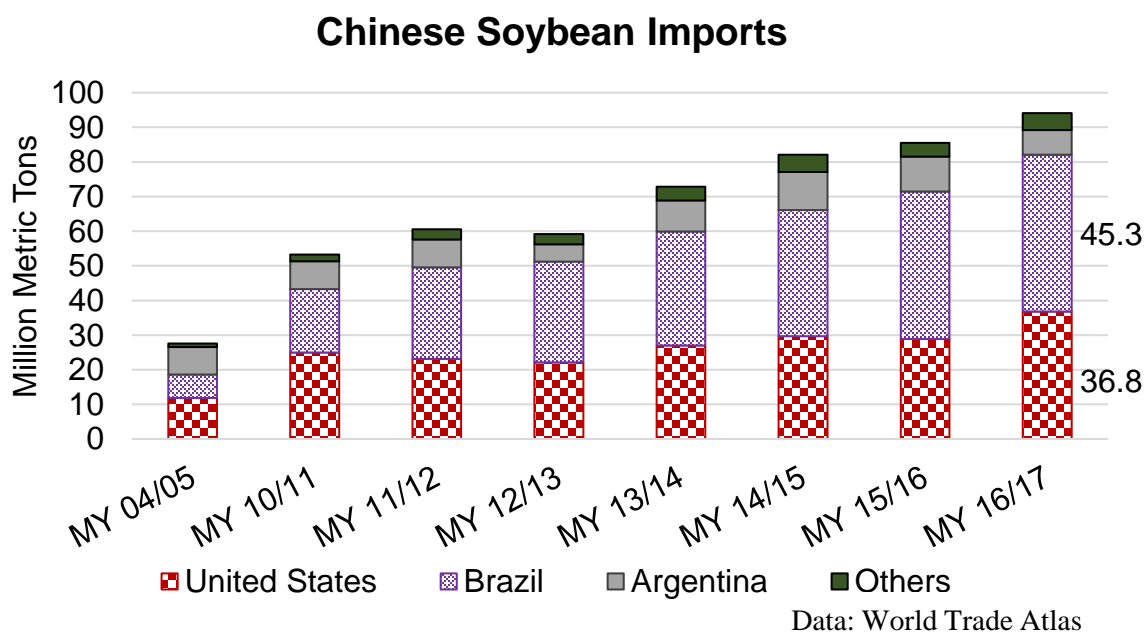


Figure 3: Chinese Soybean Imports

The U.S. is a net exporter of total agricultural commodities with exports of \$138 billion and imports of \$121 billion in calendar year 2017. However, commodities differ in the amount of domestic consumption and trade that make up their markets. The largest international market for raw U.S. corn is Mexico, while China is the largest market for U.S. soybeans. In 2017, the U.S. produced 4.2 billion bushels of soybeans of which 2.2 billion left the country as whole soybeans. China represents about 62% of U.S. soybean exports. Nearly one third of the total U.S. soybean crop leaves for China in the form of whole soybeans. A recent report from Purdue University projects that a 25% tariff could reduce China's imports of U.S. soybeans on average by

69%. A decrease this dramatic in soybean exports would calculate out to one fifth of the U.S. soybean crop being exported to China instead of one third. For Ohio, this would account for a decrease of roughly \$241 million in the value of soybean exports. The reduction in soybean exports would initially depress world prices on average by 4.4% and shift soybean acreage to other commodities, including corn. Corn prices would face downward pressure with higher acreage and production, assuming no change in demand.

Using the price declines published from Purdue University and information compiled from analysis from a fictional representative west central Ohio grain farm, the effects for Ohio corn and soybean producers shed light

on what producers can expect from a Chinese tariff on U.S. soybeans, corn and pork in the short term. Due to uncertainty about the extent to which China will substitute between U.S. and Brazilian soybeans in response to a tariff on U.S. soybean imports, the authors

of this report ran two scenarios. Details of the representative farm and the price substitution scenarios are included in the full report. The projected price inputs for the representative farm through 2024 are illustrated in Table 1.

Estimated Net Income per Year								
	2018	2019	2020	2021	2022	2023	2024	Average
Baseline	\$56,810	\$63,423	\$68,241	\$69,236	\$65,483	\$59,728	\$62,115	\$63,577
Chinese Tariff - Low Elasticity								
	\$42,711	\$32,751	\$37,286	\$37,998	\$33,998	\$29,779	\$31,902	\$35,199
Chinese Tariff- Average								
	\$39,963	\$22,841	\$27,281	\$27,897	\$23,766	\$19,486	\$21,513	\$26,107
Chinese Tariff- High elasticity								
	\$37,216	\$12,931	\$17,275	\$17,796	\$13,569	\$9,194	\$11,125	\$17,015

Table 1: Representative Farm Net Income

As shown in Table 1, the reduction in commodity prices results in lower net income per year through 2024. The average net income under the baseline is \$63,577, but falls to \$26,107 under the estimates from a 25% Chinese tariff. The drop in net income per year reduces the farm's projected net worth in 2024 by 6% and increases the debt to asset ratio to 34.7%, up from 32%. The expectation is that lower commodity prices will put downward pressure on land values, further reducing net worth. Under the scenario, the current ratio and debt coverage ratio fall to levels that would generate concern for the financial health of the operation. Farms with different ratios and financial structure will respond to the effects of tariffs differently, with larger impacts for farms with higher debt levels and smaller negative impacts from farms with lower debt levels. These results are based on a crop rotation that remains 50/50 with corn

and soybeans. Stronger returns for corn later in the projection period could encourage producers to alter the current crop rotation with either introduction of other crops such as wheat and barley, or a higher percentage of corn planted. The farm also has a low equipment replacement rate. A U.S. tariff on international steel will raise the price of U.S. steel and equipment. The representative farm accounts for capital depreciation and replacement costs based on an estimated lifespan, but the impact to cash flow and net worth is smaller than the impact to farming operations with higher machinery turnover.

These data should not be seen as a concrete prediction, as an analysis of external factors such as weather and shifts in demand could alter the outcomes. The [full report](#) with more detail can be downloaded at: <https://tinyurl.com/ycdv7jmb>

References

- Food and Agricultural Policy Research Institute. March 2018. [U.S. Baseline Outlook: Projections for Agricultural and Biofuel Markets](#), University of Missouri, Columbia.
- Taheripour, F., and Wallace, T. April 2018. "Impacts of Possible Chinese Protection of 25% on US Soybeans and Other Agricultural Commodities", unpublished working paper, Purdue University.
- U.S. Census Bureau. [US Export and Import Statistic-Foreign Trade](#).
- U.S. Department of Agriculture- National Agricultural Statistic Service. 2018 [State Production](#).
- U.S. Department of Agriculture- World Agricultural Outlook Board. April 2018. "[World Agricultural Supply and Demand Estimates](#)", WASDE-576

Ohio CAUV Value Projections for 2018

Robert Dinterman and Ani Katchova, dinterman.1@osu.edu; katchova.1@osu.edu

For landowners in Ohio, their farmland's property tax is not based on the market value of the land but instead through the Current Agricultural Use Value Program (CAUV). The stated intention of the program is to provide a value of agricultural farmland based on expected value from agricultural use and depends on soil type, yields, prices, non-land costs, and capitalization rate (derived from interest rates on farmland) that is used in place of the market value of land.

Ohio introduced CAUV in the mid-1970s as a way to reduce urbanization pressures on property tax values of farmland. CAUV reduced the property assessment value to 35% of market value in 1985 with a steady decline to below 14% of market value in 2006. However, since 2006 there has been a rapid increase in CAUV values, which has led to CAUV values being at least half of the market value since 2014. This rapid increase in CAUV values prompted lawmakers in Ohio evaluate the formula used in CAUV calculations and propose changes to the formula to reflect more modern appraisal techniques. The new changes, from House Bill 49, were signed into legislation on June 30, 2017 and will be phased-in over the next six tax years starting with 2017. Ohio Department of Taxation has already calculated the

CAUV values for 2017 and determined that the average CAUV value was \$1,153, which represented a 12% decline in average CAUV from 2016, which averaged \$1,310. Here in the Department of Agricultural, Environmental, and Development Economics at Ohio State, we are currently projecting the average CAUV value for 2018 to be \$1,023 which will result in an approximately 11% decrease in CAUV values. We anticipate this decline to continue as the phase-in process continues through the 2022 tax year.

CAUV values are assigned to each of the over 3,500 soil types in Ohio and based partly on the potential revenues from corn, soybeans, and wheat. Prior to 2006, the yields of corn, soybeans, and wheat for each soil type was based on its yields in 1984. This format did not account for any yield trends for the crops, which artificially reduced the expected revenues for soils in CAUV calculation. Beginning with 2007, yields have been adjusted by statewide trends for each crop, which partially explains the rise in CAUV values over time (seen in Figure 1). Even though the average CAUV value is expected to decline in 2018 by 11%, not all soil types will decline by 11% as some will see larger decreases and others smaller based on each soil types' expected yields.

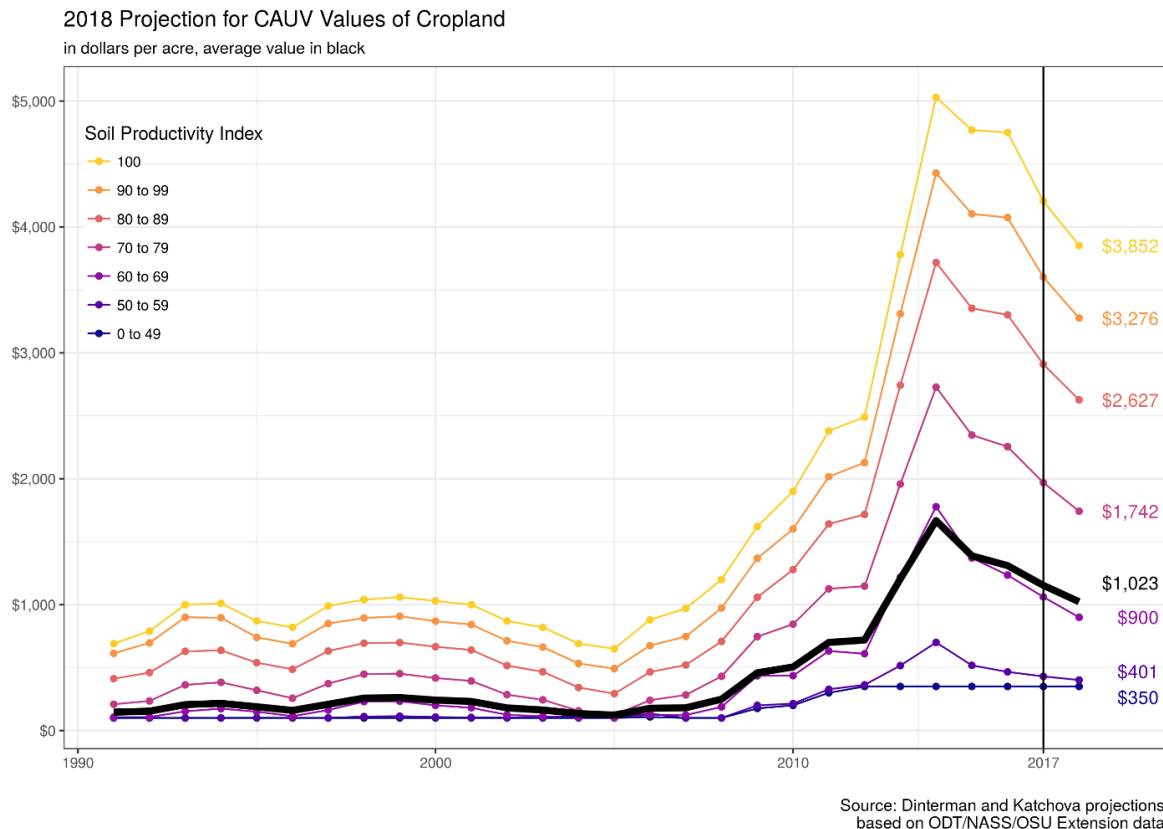


Figure 1: 2018 Projection for CAUV Values of Cropland

The largest adjustment to CAUV calculations in 2017 is the update to how the capitalization rate is determined. The capitalization rate is a mixture of interest rate on a 30-year mortgage on farmland along with the appreciation of the farmland. Previously, the appreciation of farmland was based on the Federal Funds rate but this has been replaced by official values from USDA on the average total rate of return on farm equity. The overall effect is to increase the capitalization rate, which further reduces the CAUV values. In order to help ease the transition to lower CAUV values, the changes in CAUV values are phased in at half of the difference of the previous year's CAUV value. For example, if a soil type had a CAUV value of \$1,000 in 2016 and would then have a 2017 value at \$900 under the new CAUV formula that is a difference of \$100. Then for the tax year of 2017, that soil type's CAUV value would officially be \$950 for calculating the tax bill -- a decline of \$50. The same process occurs for the 2018 CAUV calculations. If the new calculation of our hypothetical soil type ends up being \$850, then the official CAUV value in 2018 for that soil type would be \$900 -- a \$50 decrease from its official CAUV value in 2017. Figure 2 displays the expected phase-in for the 2018 CAUV values, if the phase-in was not in place then our estimates for the average 2018 CAUV values would be \$893 instead of the current \$1,023 estimate.

[illegible]

Figure 3: Schedule for Updating CAUV

In addition to the phase-in procedure of the new CAUV calculations, property taxes in Ohio are only adjusted once every three years. While CAUV values update every year, only counties, which are receiving an update to property taxes, will correspondingly see a change in their CAUV values. Changes in property tax calculation depends on what county one lives in with the most counties (41 of 88) receiving updates in 2017. In 2018, there will be 24 counties updating and the remaining 23 counties update in 2019.

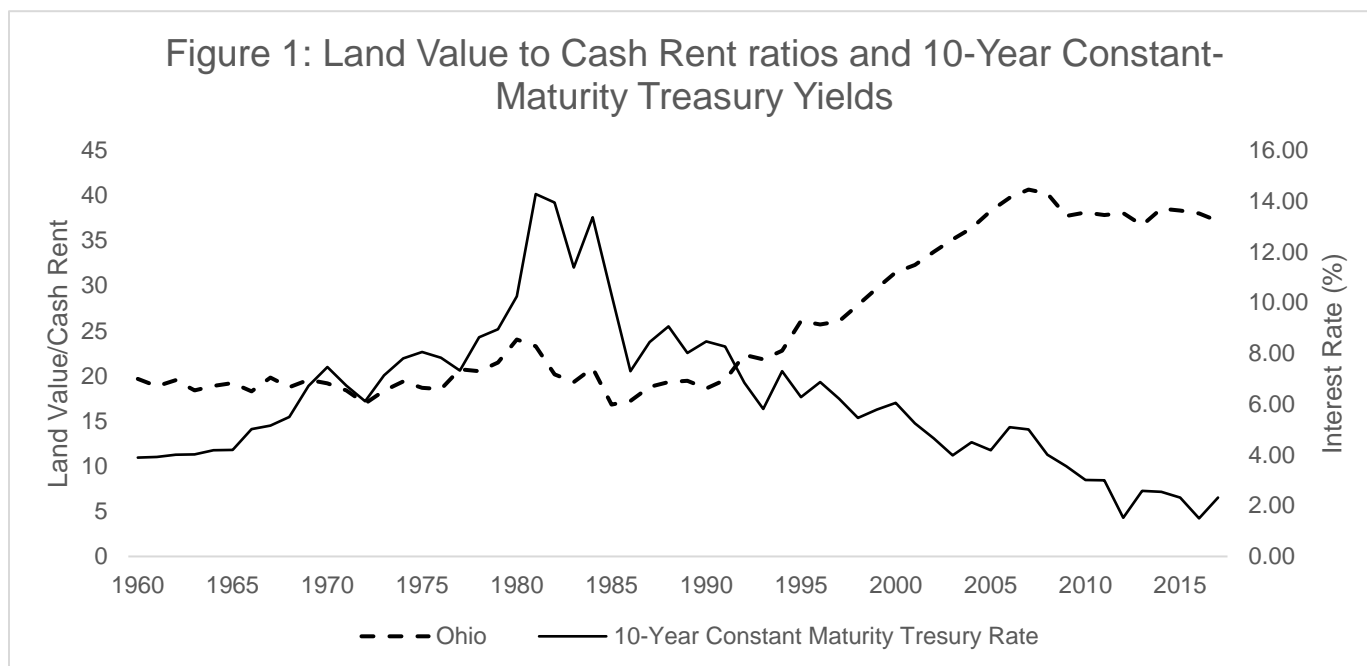
Overall, the new 2017 legislation related to CAUV should continue to put downward pressure on CAUV values over the next 5 cycles. Farmers can expect to see the reduction in their property tax bill throughout these years in part to the new CAUV calculations as well as the high commodity prices around 2012 being dropped from the CAUV calculations.

If you'd like to learn more about the changes in the CAUV calculations and/or how CAUV is calculated, please see the more detailed technical report at: https://aede.osu.edu/sites/aede/files/publication_files/2018CAUVProjectionsReport.pdf

Or view the projected CAUV values for each soil type here: <https://aede.osu.edu/file/cauvprojections2018xlsx>

Ohio Land Values and Cash Rent Outlook

Ana Claudia Sant'Anna and Ani Katchova, santana.3@osu.edu; katchova.1@osu.edu



Sources: Land values are from the USDA National Agricultural Statistics Service and the 10-year constant-maturity treasury yields are from the Federal Reserve Bank of St. Louis.

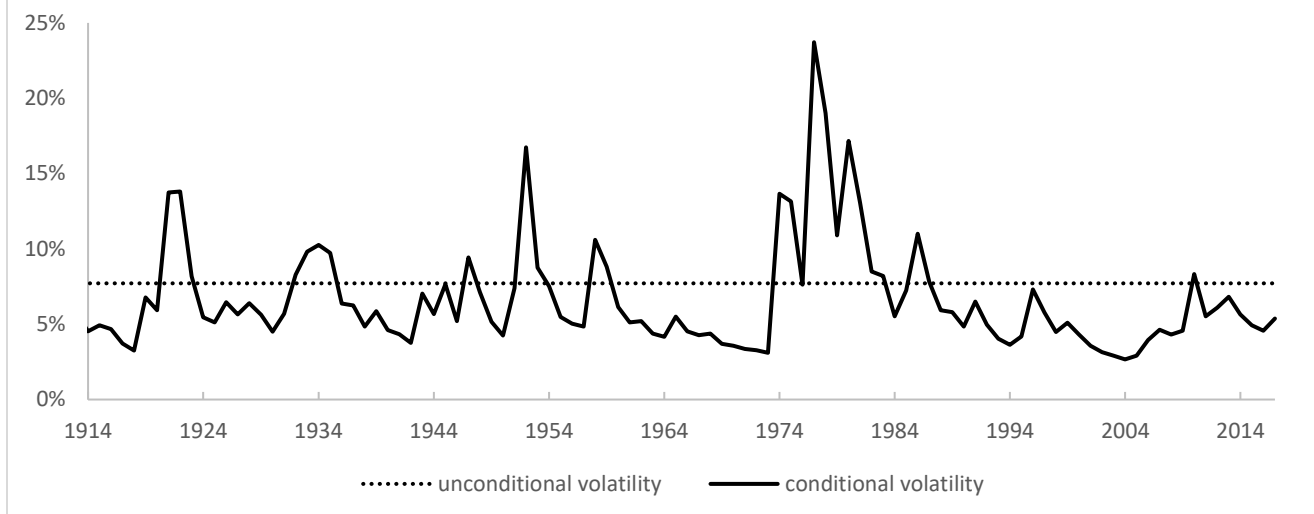
Over 80% of farm assets pertains to land, an agricultural input, an investment and even a collateral in loans. The Federal Reserve Bank of Chicago reports that agricultural land values for the Seventh Federal Reserve District (including Illinois, Indiana, Michigan, Wisconsin, and Iowa) showed signs of stabilizing in the first quarter of 2018, as farmland values were unchanged from a year ago. High quality farmland increased 1% in the first quarter of 2018 from the previous quarter in the District. Going forward into 2018, land values in Ohio are expected to continue to decline or remain stable. A major factor contributing to stagnant land values is lower farm incomes and grain prices, lower demand to purchase land, and tightened credit conditions. In turn, interest rates, although rising, remain low helping to boost land values.

Although cash rents in Ohio increased 1.3% from 2016 to 2017, declining farm incomes in Ohio may put downward pressure on cash rents. In 2018, reports from the Chicago Fed, show a decrease in cash rental rates for farmland in the District, though smaller than the 5% annual decrease in 2017. With farmers willing to bid up cash rents but with declining farm incomes, the expectation for Ohio is that cash rents will remain stable in 2018.

Interest rates in 2017 were the lowest since the 1960s. Lower interest rates imply lower opportunity costs, making investors willing to pay a higher amount for land for each dollar in current earnings from the land (Johnson 2016). An analysis of the land values to cash rent ratios (LV/CR), or that of land price relative to its earnings (Cai, Cosgrove and Paul 2018), show an average of 20 from 1960s to 1990s, increasing to the range of 35 to 40 from 2005 onwards (Figure 1). An increase in interest rates as planned by the Federal Reserve's Federal Open Market Committee (FOMC) could mean downward pressure on farmland values (Sherrick 2018).

Land value volatility, a measurement of periodic standard deviations of changes in prices, provides information on land values movements. Figure 2 shows the conditional and unconditional land value volatility for Ohio. Conditional volatility takes into account past events while unconditional volatility is an average of past variance. Ohio land value volatility exhibits clustering over time. High land value volatility is followed by high land value volatility (1974-1980). Low land value volatility is followed by low land value volatility (1997-2000). For the next years Ohio land value volatility is estimated to be in the range of 5% to 7%. Spikes in land value volatility, as those witnessed in the 1980s, are not expected.

Figure 2: Conditional and unconditional Ohio land value volatility



References

- Cai, X., A. Cosgrove, and J. Paul. 2018. "Assessing the Investment Prospect of Farmland: Evidence from California." *Journal of the ASFRMA*: 210–220.
- Johnson, B. 2016. "An Analysis of Historical Illinois Farmland Valuations." Southern Illinois University Carbondale. Available at: http://opensiuc.lib.siu.edu/cgi/viewcontent.cgi?article=2014&context=gs_rp [Accessed February 14, 2018].
- Sherrick, B. 2018. "Understanding Farmland Values in a Changing Interest Rate Environment." *Choices* (Quarter 1). Available at: <http://www.choicesmagazine.org/choices-magazine/theme-articles/will-rising-interest-rates-lead-to-intensifying-risks-for-agriculture/understanding-farmland-values-in-a-changing-interest-rate-environment> [Accessed June 7, 2018].
- Oppedahl, D., 2018. "Ag Letter: May 2018". AgLetter, No. 1980. Federal Reserve Bank of Chicago.
- USDA National Agricultural Statistics Service. 2017. "Land values 2017 Summary." USDA–NASS, Washington, DC.

This is the first issue of the "AEDE Agricultural Outlook" which will publish semi-annually by The Ohio State University's Department of Agricultural, Environmental, and Development Economics within the College of Food, Agricultural, and Environmental Sciences. This publication presents summarized information from larger bodies of research. Articles may be reproduced with permission and appropriate attribution. Contact the editor at trinoskey.1@osu.edu or call 614-688-1323.

CFAES provides research and related educational programs to clientele on a nondiscriminatory basis. For more information, visit cfaesdiversity.osu.edu. For an accessible format of this publication, visit cfaes.osu.edu/accessibility



THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL,
AND ENVIRONMENTAL SCIENCES

aede.osu.edu

Have a topic you would like AEDE to research? Email trinoskey.1@osu.edu or aede@osu.edu

Save the Date: 2018 Agricultural Policy and Outlook Conference

**November 2, 2018 – 8:30am - 2:30pm
Nationwide & Ohio Farm Bureau 4-H Center**



THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL,
AND ENVIRONMENTAL SCIENCES



Conference Speakers:

Ben Brown, Program Manager, Farm Management Program – “Ohio Commodity Outlook”

Chris Hurt, Professor, Agricultural Economics, Purdue University – “US Livestock Outlook”

Ani Katchova, Chair, Farm Income Enhancement Program – “Ohio Farm Financial Conditions and Outlook”

Ian Sheldon, Professor and Andersons Chair of Agricultural Marketing, Trade and Policy – “Trade and Policy”

Barry Ward, Director, OSU Extension Income Tax School Program – “Farm Management Update”

Carl Zulauf- Professor Emeritus, The Ohio State University- “Agriculture Policy”

Register at go.osu.edu/2018AGOutlook