

The Feed

Farmer Mac's Quarterly Perspective on Agriculture

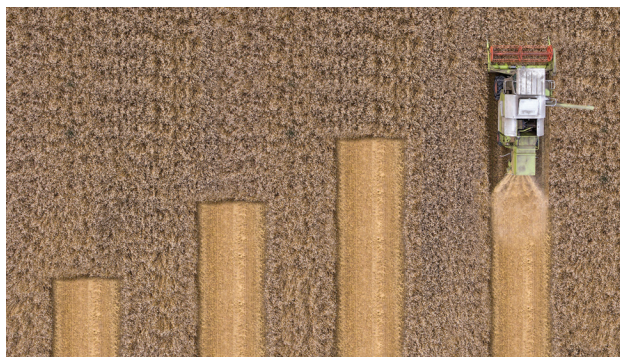
Fall 2018

FARMER  AC

FINANCING RURAL AMERICA

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ABOUT THE FEED

The Feed is a quarterly economic outlook for current events and market conditions within agriculture. The report is broad-based, covers multiple regions and commodities and incorporates data and analysis from numerous sources to present a mosaic of the leading industry information, with a focus on the latest information from the United States Department of Agriculture and their Economic Research Service. There are several regularly included sections like weather and major industry segments, but the authors rotate through other industries and topics as they become relevant in the seasonal agricultural cycle. Where the report adds value to readers is through its unique synthesis of these multiple sources into a single succinct report. Please enjoy.

ABOUT FARMER MAC

Farmer Mac is a vital part of the agricultural credit markets and was created to increase access to and reduce the cost of capital for the benefit of American agricultural and rural communities. As the nation's premier secondary market for agricultural credit, we provide financial solutions to a broad spectrum of the agricultural community, including agricultural lenders, agribusinesses, and other institutions that can benefit from access to flexible, low-cost financing and risk management tools. Farmer Mac's customers benefit from our low cost of funds, low overhead costs, and high operational efficiency. In fact, we are often able to provide the lowest cost of borrowing to agricultural and rural borrowers. For more than a quarter-century, Farmer Mac has been delivering the capital and commitment rural America deserves.

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A MESSAGE FROM CURT COVINGTON

KEEP YOUR EYES ON THE ROAD AHEAD

"Keep your eyes on the road," and "look out for the driver in front of you." Those were the first lessons I learned in my driver's education class almost 50 years ago. Having grown up in California where driving is a contact sport, you can't be too careful. Today, drivers are told, "don't text and drive!" but those text messages just keep coming.

The current state of the agricultural economy feels like a string of text messages coming at us in the fast lane; constant information, followed by immediate reaction, followed by the instant (and sometimes) emotional response. As an example, the monthly Purdue University Ag Economic Barometer measures the sentiments of members of the agricultural industry on the ag economy for the next 12 months. Since January of this year, producers' sentiments about the ag economy have been up and down, experiencing a record drop in July. In that same July report, farmers' outlooks for the next five years was up slightly from the prior month with 47 percent of respondents saying that they expect widespread good times compared to 45 percent in June. Pessimism for the short-term, optimism for the medium and long-term.

This past month, I led a trek through California's farm country with a dozen or so Farmer Mac employees. We visited with industry leaders in the nut, dairy, stone fruit, table grape, citrus, and vegetable sectors. When we brought up the topic of tariffs and trade, more often than not, the sentiment was that farmers and ranchers are certainly feeling the pain, but they are optimistic about the potential for better trade agreements down the road.

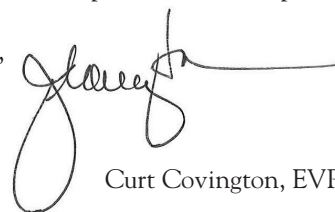
What does all this mean? As our crack economist at Farmer Mac, Jackson Takach, would say, "This is a marathon, not a sprint." The industry might do well to keep their eyes on the long-term horizon where fundamentals for agricultural supply and demand look firm. Long-term lenders who have learned from the past lean into cycles such as this, relying on consistent, conservative, and sound underwriting

practices. Furthermore, as difficult as it has been for specific sectors of agriculture in the current cycle, we still see good loans cross our desks every single day. Good farmers and good ag lenders rule the day.

I hope you enjoy this edition of *The Feed*. Our team of experts works long and hard on every edition to bring you a concise yet expansive compilation of market data and research to help you navigate the world of agricultural finance. By the way, this edition has two very informative articles on trade and tariffs.

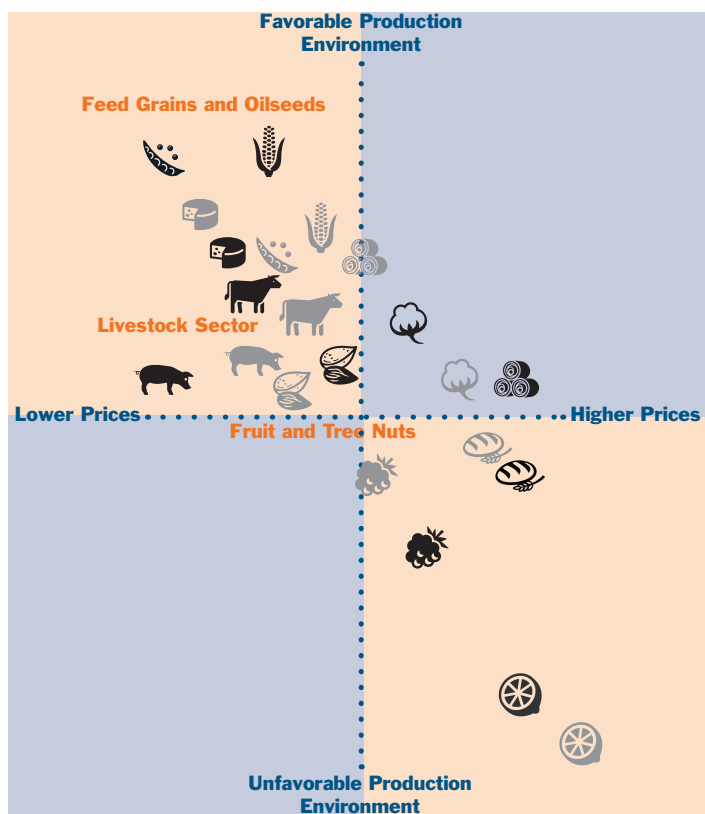
So, get off the highway, shut down the smartphone, take a deep breath and *read on!*

A happy harvest to all,



Curt Covington, EVP - Agricultural Finance

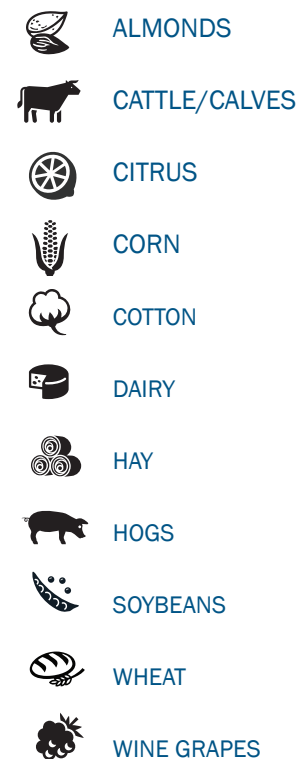
PRODUCTION AND MARKET PRICE PERCEPTUAL MAP



Summer 2018



Fall 2018



RETALIATORY TARIFFS AGAINST U.S. AGRICULTURE

(resource 1, 2, 3)

Key Highlights

Since June 2018, six trading partners have implemented new tariff regimes targeting U.S. agricultural products.

These trading partners are a market for 53 percent of all U.S. agricultural exports and targeted commodities represent approximately 20 percent of exported agricultural goods.

The USDA has created a \$12 billion assistance program to help offset lost revenue due to retaliatory tariffs.

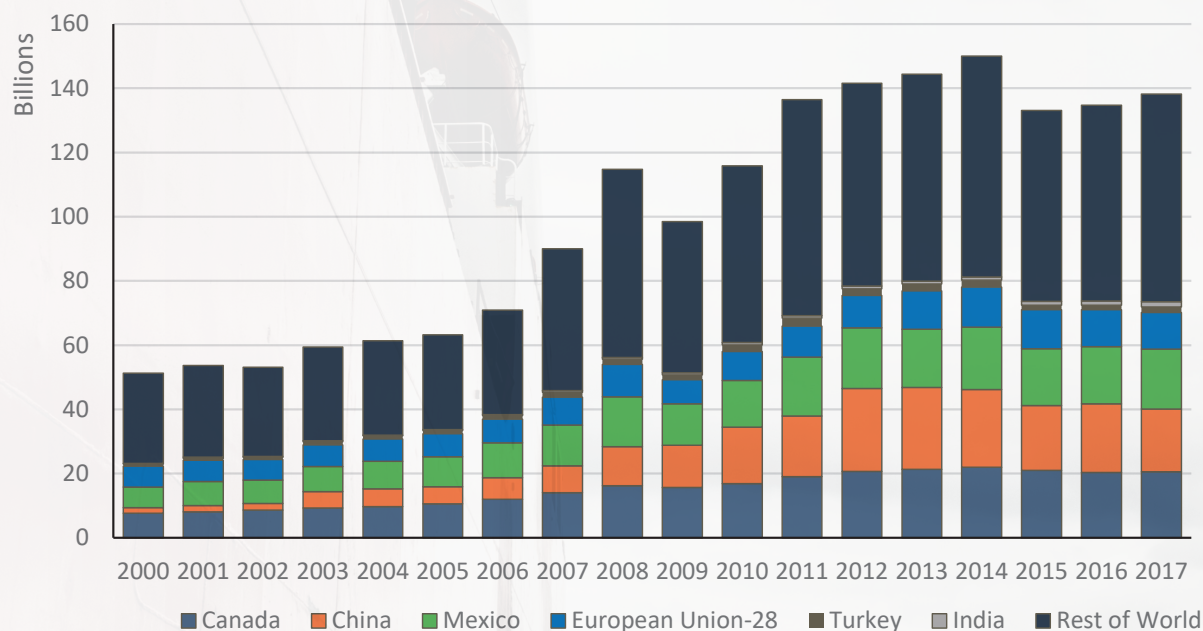
Since President Trump signed a proclamation imposing tariffs on imported steel and aluminum, many U.S. trading partners have responded with retaliatory tariffs against imported U.S. products. Mexico was the first to act, imposing tariffs on \$3 billion of U.S. exports, effective June 5. Turkey and the European Union (EU) were next to impose additional tariffs on June 21 and June 22, respectively. Canada also imposed new retaliatory tariffs on July 1. China is the largest trading partner to respond, with additional levies on \$34 billion of U.S. exports, effective July 6. Through mid-August, India was the last to impose new tariffs on agricultural goods, effective August 4.

Agricultural trade is a significant component of the agricultural economy. Between 20 and 25 percent of net farm income is derived from farm exports, so changes

in trade policy can be critical to the industry outlook. Figure 1 highlights just how important these six economic players are to U.S. ag trade; in 2017, 53 percent of all U.S. agricultural exports went to a country or economic bloc that has announced retaliatory tariffs in 2018. Before panic sets in, it is helpful to examine exactly what products these countries have tariffed and how important those products are to the total U.S. export picture. Figure 2 shows the top five categories of agricultural exports in 2017 to each of the five major U.S. trading partners. The categories with additional retaliatory tariffs are highlighted in gold. For Mexico, Canada, and the EU, most major U.S. agricultural exports are excluded from this round of tariffs. In each case, only one of the top five categories was affected by additional tariffs and less than 15 percent of the value of U.S. agricultural exports to the

partner is affected by new duties. India and China have targeted a higher percentage of U.S. agricultural goods imported to their countries. India has added additional duties on roughly 40 percent of its agricultural imports and China has added tariffs on a whopping 80 percent of its agricultural imports. The largest impacted commodity is soybeans to China (roughly \$12 billion in 2017 and 45 percent of all targeted commodities). Most U.S. exports were only impacted by one trading partner (303 of the 357 affected products); interestingly, whiskeys were affected by four of the trading partners. Dairy and pork products were impacted by tariffs imposed by both Mexico and China. Affected products total approximately 20 percent of the value of all U.S. ag exports and the average additional tariff is 22.2 percent.

Figure 1: Relative Size of U.S. Agricultural Export Markets with Retaliatory Tariffs

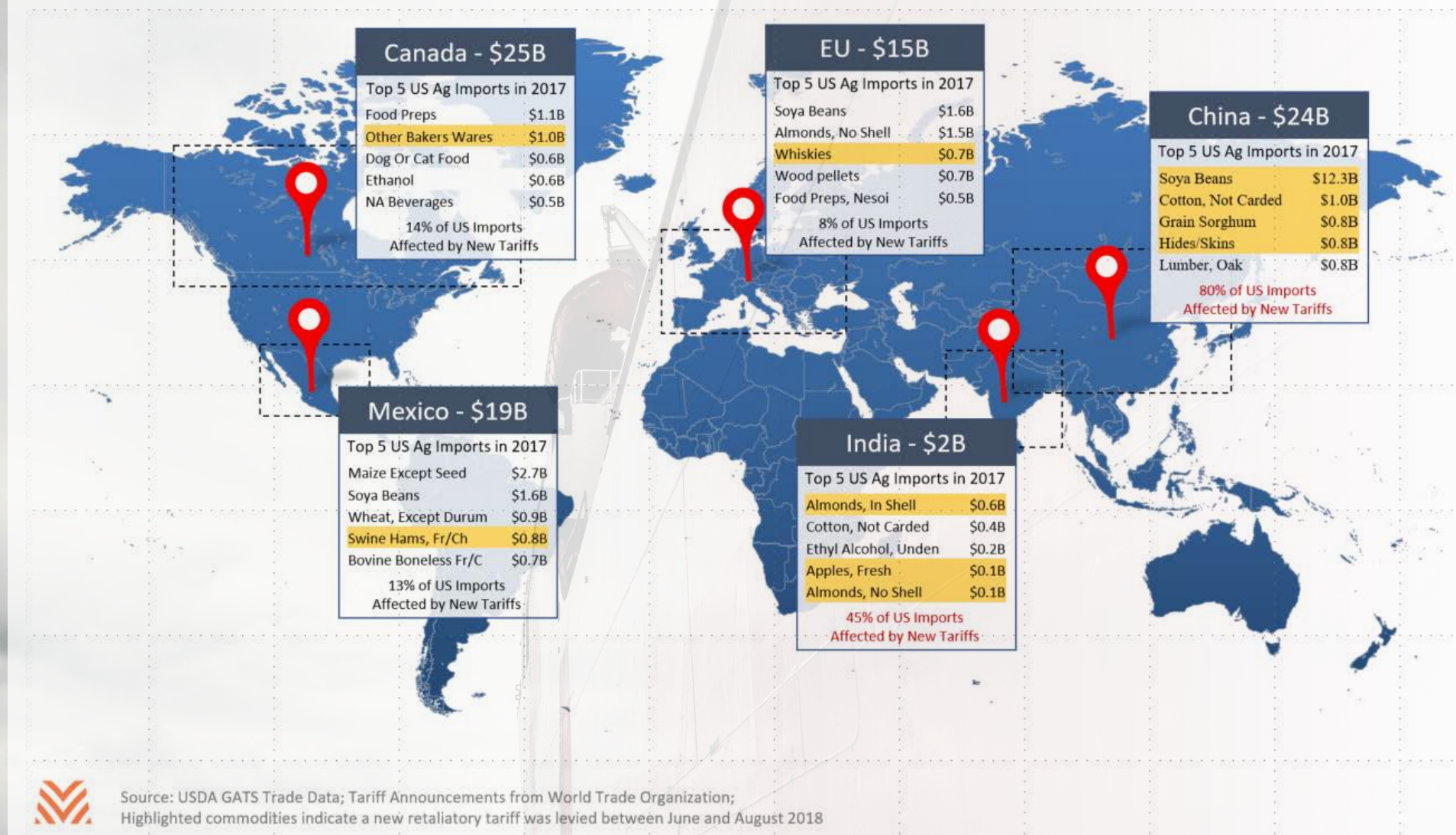


Source: USDA, Foreign Agricultural Service, GATS

The impacts from this trade friction are hard to generalize. Market prices typically are driven down by additional tariffs (see the Analyst's Corner), so operators producing commodities that are affected by new tariffs will likely see downward pressure on revenues. Soybeans are a prime example of this relationship, where national cash soybean prices fell more than 20 percent between early-June and mid-August of 2018. For other commodities with lower volumes affected, the impacts are likely to be more localized. On

July 24, 2018, the USDA announced a \$12 billion initiative to help offset any revenues lost from retaliatory tariffs, which is roughly 13 percent of net cash farm income projected in 2018. To date, the USDA has specified \$4.7 billion in initial payments through a Market Facilitation Program (MFP) based on 2018 acreage and commodity, the bulk of which are headed for soybean growers. Producers can apply for MFP payments at the USDA's website or at their local Farm Service Agency office.

Figure 2: U.S. Agricultural Export Markets and Retaliatory Tariffs



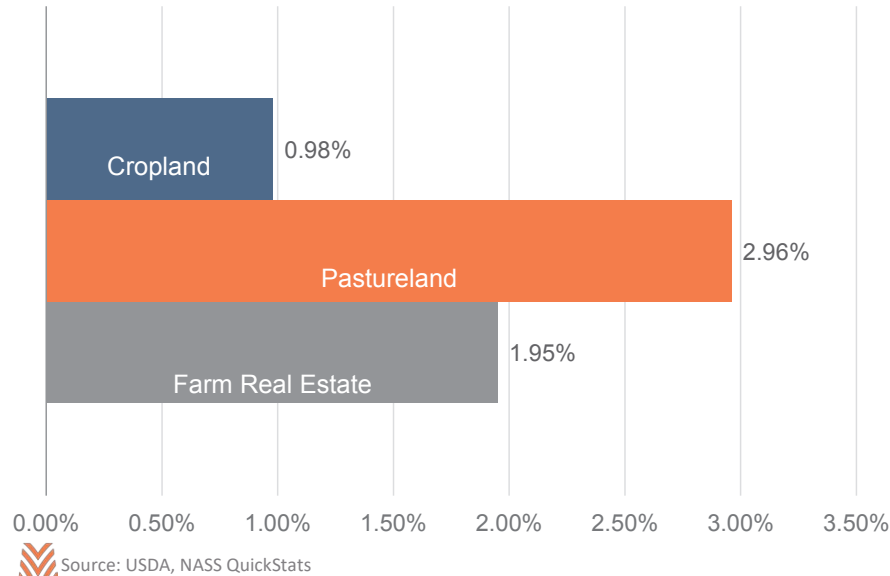
Key Highlights

National farm real estate values rose again in 2018, but price growth has remained sluggish in most Midwestern states.

States experiencing the fastest growth were concentrated in the Southern Plains and the western United States.

Lower profitability and rising interest rates could provide headwinds, but fundamentals in the long run remain favorable.

Figure 3: Pastureland and Farm Real Estate Appreciated Faster than Cropland this Year



Amid the ongoing uncertainty around agricultural trade, the U.S. farm economy recently received some positive news. On August 3, 2018, the USDA's National Agricultural Statistics Service (NASS) released its 2018 update on farmland values and the data shows the average value of farm real estate (including buildings) ticked up by 1.9 percent nationally to \$3,140 per acre compared to 2017. Like last year, that increase has been driven by rising prices for pastureland, which are up by 3 percent, and higher building values (Figure 3). Cropland prices rose by just 1 percent year-over-year. However, this is an improvement relative to 2017, when cropland prices were flat from the year before.

Although land prices have trended higher overall, this rising tide has not lifted all boats equally (Figure 4). The USDA's data shows that farm real estate appreciated by more than 10 percent in Missouri. Like the nation as a whole, Missouri saw strong pastureland value growth, but the state's overall farm real estate values increased

faster, suggesting that rising building values played a role. Farmland also appreciated relatively quickly in several nearby states throughout the Southern Plains and Delta region (TX, OK, AR, LA). Higher building values also supported overall appreciation in each of these states, but they additionally saw pastureland and cropland appreciate faster than the national average. Western states, led by Washington, Idaho, California, Oregon, and Arizona, also saw farm real estate values increase more quickly than the national average on the strength of higher cropland prices.

On the other hand, farmland price changes remain subdued in much of the upper Midwest. Overall farm real estate values rose in the 1 to 2 percent range throughout much of the Corn Belt, but they continued to trend downward in the Northern Plains (KS, NE, SD, ND) and were 1 percent lower in Minnesota. Despite many Midwestern states continuing to experience sluggish growth to slight declines, the USDA's data indicates the average price per acre of farm real estate in the Midwest

region has managed to trend higher overall. The average per acre price of pastureland and overall farm real estate both reached record high levels in the Midwest in 2018.

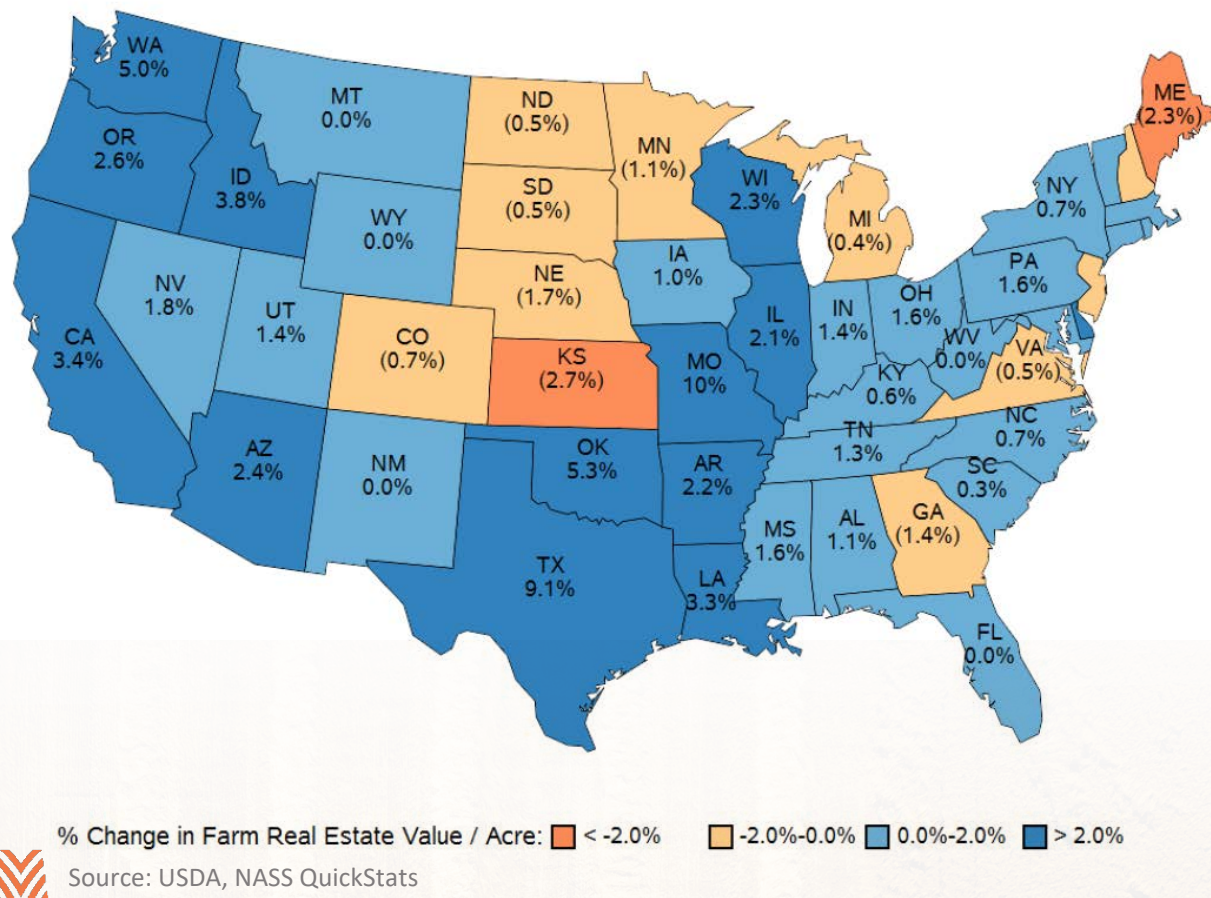
Stability in farmland markets has helped provide financial leeway to many farmers. In response to declining incomes, measures of farm financial risk like loan repayment and delinquency rates have increased. These movements have been muted compared to the 50 percent decline in net farm income from the 2012 to 2014 peak. Part of the story has been farmers' ability to tap into existing working capital, which the USDA projects farmers have drawn down by more than \$100 billion between 2012 and 2018. But continued strength in farmland markets has also helped to support the resiliency of farm financial conditions. Strengthening markets provide an adequate asset base for farms to borrow against and ensure that the sector's overall debt-to-asset ratio, a key measure of solvency, remains well below levels seen in the 1980s.

While farm financial conditions have benefitted from resilient farm real estate values for the past few years, farmland markets could face several headwinds in the near-term. Prices for important commodities like corn and soybeans trended higher this spring, but uncertainty over agricultural trade and the potential for another year of rising production have weighed on prices. Baseline projections by the USDA and the University of Missouri's Food and Agricultural Policy Research Institute suggest farm sector profitability is likely to remain range-bound over the next several years. If realized, this could mean a continuation of the past several years of tighter profitability.

The Federal Reserve has steadily increased its federal funds policy interest rates, and agricultural borrowing costs have moved higher, which could also cut into farmer profitability and make it costlier to purchase farmland. Higher interest rates could also put downward pressure on the price of farmland. According to the income capitalization model, rising interest rates could put downward pressure on the price of farmland by reducing the present value of its future income stream.

At the same time, as outlined in a March 2018 article in Choices Magazine, several characteristics of farmland could help temper these impacts. Returns to farmland have historically been positively correlated with inflation. If the Federal Reserve continues to adjust interest rates higher in response to stronger inflation signals, higher farmland returns may at least partially offset the downward pressure from rising interest rates. Farmland also tends to be thinly traded, with only an estimated 1 percent taken to market each year. Tight supplies of land available for sale, along with investment interest in the asset class, could help support prices.

Figure 4: Map of Percentage Change in Farmland Values



Source: USDA, NASS QuickStats



THE FUTURE OF LIBOR: FREQUENTLY ASKED QUESTIONS

(resource 7, 8, 9)

Referencing over \$300 trillion in financial contracts worldwide, the London Interbank Offered Rate (“LIBOR”) is one of the most widely-used reference rates. During the financial crisis, many banks manipulated their LIBOR submissions and regulators called into question LIBOR’s viability. Globally, regulators and market participants are working together to build robust replacements for LIBOR. This article is designed to help answer some of the most commonly asked questions that Farmer Mac fields on the topic.

WHAT IS LIBOR?

LIBOR is a benchmark rate produced daily for five currencies with seven maturities: Overnight, 1-week, 1-month, 2-month, 3-month, 6-month, and 12-month. LIBOR indicates the average rate at which a LIBOR contributor bank (see Figure 5) can obtain funding in the London interbank market for a given period, in a given currency.

HOW IS LIBOR USED?

LIBOR is a reference rate used in financial contracts, including loans, interest rate derivatives, and securities. In U.S. dollars alone, LIBOR is estimated to be referenced in \$199 trillion of financial contracts.

WHY IS LIBOR BEING REPLACED?

The main problem with LIBOR is the low volumes underlying the wholesale unsecured term bank funding markets. Due to the lack of applicable transactions, many banks submit LIBOR based on estimates of their wholesale unsecured funding costs. And because of fraudulent reporting before and during the financial crisis, global regulators have determined that LIBOR must be reformed.

WHAT WILL REPLACE LIBOR?

In the U.S., the Federal Reserve’s Alternative Reference

Figure 5: Banks Participating in LIBOR Rate Generation

LIBOR Participating Banks	
Bank of America N.A. (London Branch) Bank of Tokyo-Mitsubishi UFJ Ltd Barclays Bank plc BNP Paribas SA, London Branch Citibank N.A. (London Branch) Cooperatieve Rabobank U.A. Crédit Agricole Corporate & Investment Bank Credit Suisse AG (London Branch) Deutsche Bank AG (London Branch)	HSBC Bank plc JPMorgan Chase Bank, N.A. London Branch Lloyds TSB Bank plc Royal Bank of Canada Société Générale (London Branch) Sumitomo Mitsui Banking Corporation Europe The Norinchukin Bank The Royal Bank of Scotland plc UBS AG

Rates Committee is tasked with identifying potential alternative reference rates to LIBOR. In June 2017, the Committee recommended the Secured Overnight Financing Rate (“SOFR”), or a benchmark based on SOFR, as LIBOR’s successor. SOFR is calculated primarily based upon a variety of overnight repurchase agreement transactions on U.S. Treasuries. The Federal Reserve first published it in April 2018.

HOW IS SOFR DIFFERENT THAN LIBOR?

SOFR is a secured overnight risk-free rate. In contrast, LIBOR is an unsecured rate that includes a credit component and a term element. U.S. regulators and industry trade groups are working to develop a standardized methodology for calculating credit and term spreads to be added to SOFR to adjust for these differences to make SOFR a viable LIBOR alternative.

WHEN WILL LIBOR BE DISCONTINUED?

In July 2017, the regulator of LIBOR, the U.K. Financial Conduct Authority, said that by the end of 2021, banks would no longer have to submit LIBOR. This means the LIBOR submissions will be voluntary after 2021. Regulators believe that, due to litigation risk, many LIBOR-submitting banks would have already stopped submitting LIBOR were it not for the voluntary agreement to submit until the end of 2021.

ARE MARKET PARTICIPANTS PREPARED FOR THE TRANSITION FROM LIBOR?

In July 2018, a variety of industry trade groups led by the International Swaps and Derivatives Association (“ISDA”) released a report on the current state of market readiness for the transition away from LIBOR. The report was based on a survey of over 150 market participants, including Farmer Mac. The report concluded that institutions are preparing for the transition but are holding back on taking many affirmative actions. Respondents identified the following as primary concerns in transitioning away from LIBOR: (1) the need for market acceptance of alternative reference rates; (2) the fear of basis risk between derivatives and cash products they hedge; and (3) the uncertainty of how to amend legacy positions.

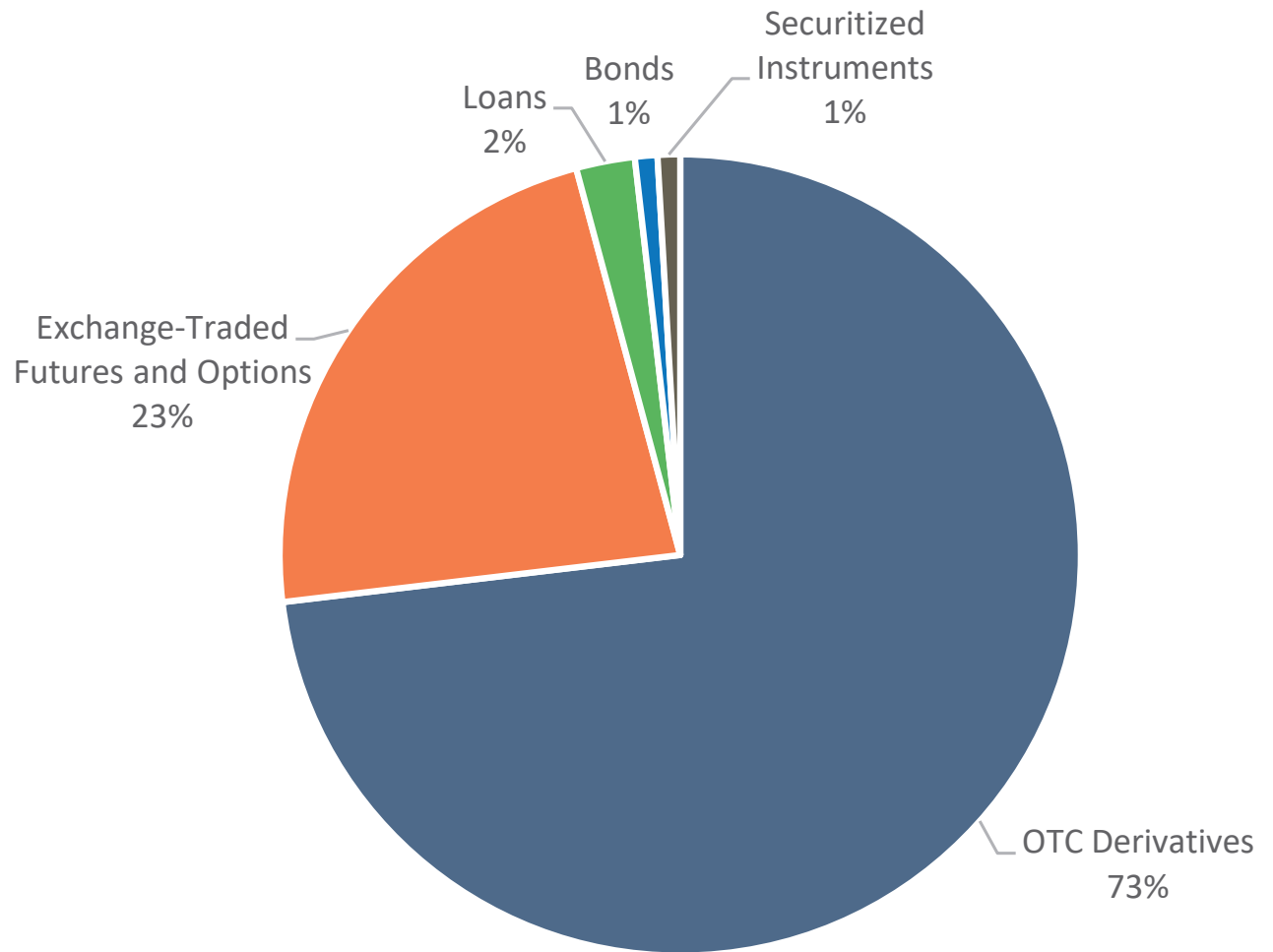
HOW CAN MARKET PARTICIPANTS PREPARE FOR THE TRANSITION?

The ISDA-led report provides a detailed checklist that market participants can use to transition away from LIBOR. Currently, market participants are limited in the actions that they can take to prepare for the transition. However, the law firm Sidley Austin recommends that participants take the following steps:

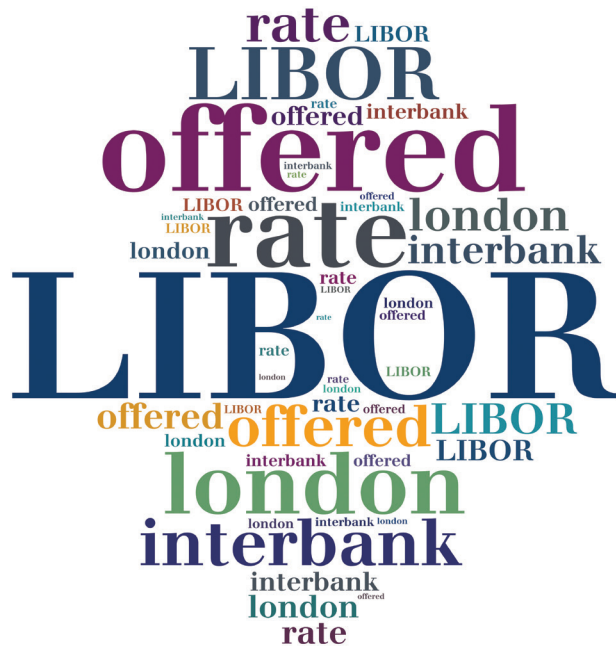
- 1) Continue to monitor the developments related to the LIBOR transition, especially those led by ISDA.

- 2) Take inventory of current LIBOR exposures that reference LIBOR and categorize those that are scheduled to mature, or may otherwise terminate, before and after LIBOR's phase out at the end of 2021. For existing transactions that mature after 2021, consider amending them to address the consequences of a LIBOR phase out.
- 3) When entering into a new transaction that will mature after 2021, if SOFR or an alternative reference rate is not viable, and LIBOR is thus still preferred, consider incorporating terms into the trade confirmation to address actions that the parties will take at the time of the LIBOR phase out. Given the uncertainty at this time, it may make sense to include in the applicable trade confirmation a covenant to negotiate in good faith to designate successor rates for individual transactions if no viable fallback exists.

Figure 6: Breakdown of the \$199 Trillion in USD-Denominated LIBOR Instrument Notional Value



Source: Federal Reserve Bank of New York



Key Highlights

Conditions throughout the Midwest through the fall are likely to be conducive to crop harvest.

Drought conditions will persist in the Southern Plains and Four Corners, though some improvement is likely to develop by late fall.

El Niño conditions are expected to develop over the course of the fall, which will impact weather across the southern tier of states during the winter.

Throughout the central and eastern Corn Belt, except the Missouri Valley, precipitation and soil moisture levels are expected to be reasonably normal heading into autumn, which should result in favorable conditions for crop harvesting. Forecasters anticipate a gradual improvement in drought conditions from Texas through Nebraska through the fall, which should ease stress for crop and livestock producers in this region. Robust summer rains have left much of the East with high soil moisture levels and seasonally-normal amounts of precipitation are expected over the fall.

The relatively dry 2017-2018 Western rainy season helped feed the numerous wildfires that developed during the summer of 2018. By late fall, El Niño conditions are anticipated to develop over the equatorial region of the Pacific Ocean, which is expected to have a significant impact on winter and spring weather from California through the Southeast. If this pattern develops as expected, the Pacific Northwest and the northern Rockies are likely to have a drier than normal winter.

Figure 7: Drought Monitor Map (USDA, NOAA, University of Nebraska-Lincoln)

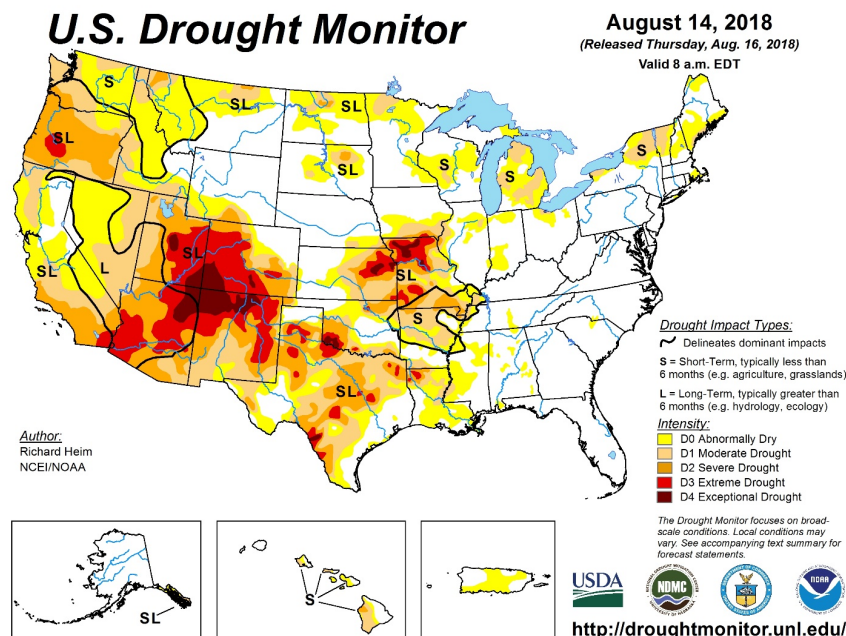
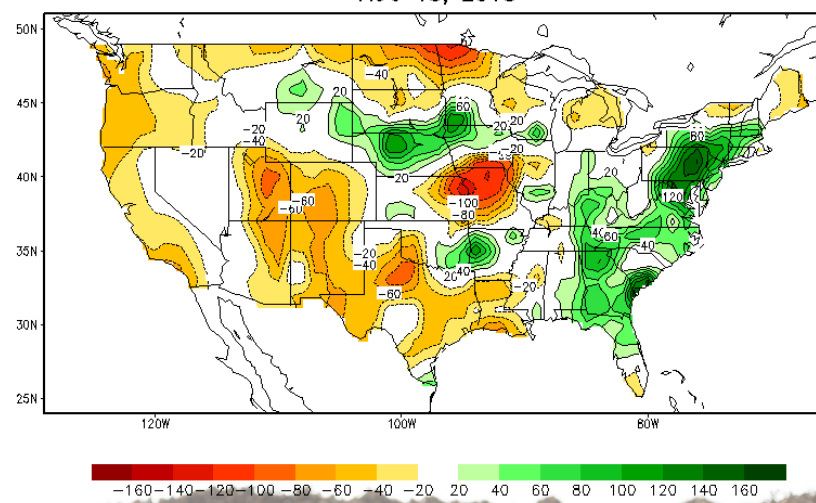


Figure 8: U.S. Soil Moisture Anomaly

Calculated Soil Moisture Anomaly (mm)
AUG 18, 2018



Key Highlights

Average national corn yield may set a new high this year due to excellent growing conditions.

More animals on feed and better ethanol profitability led to strong demand for corn in the first half of 2018.

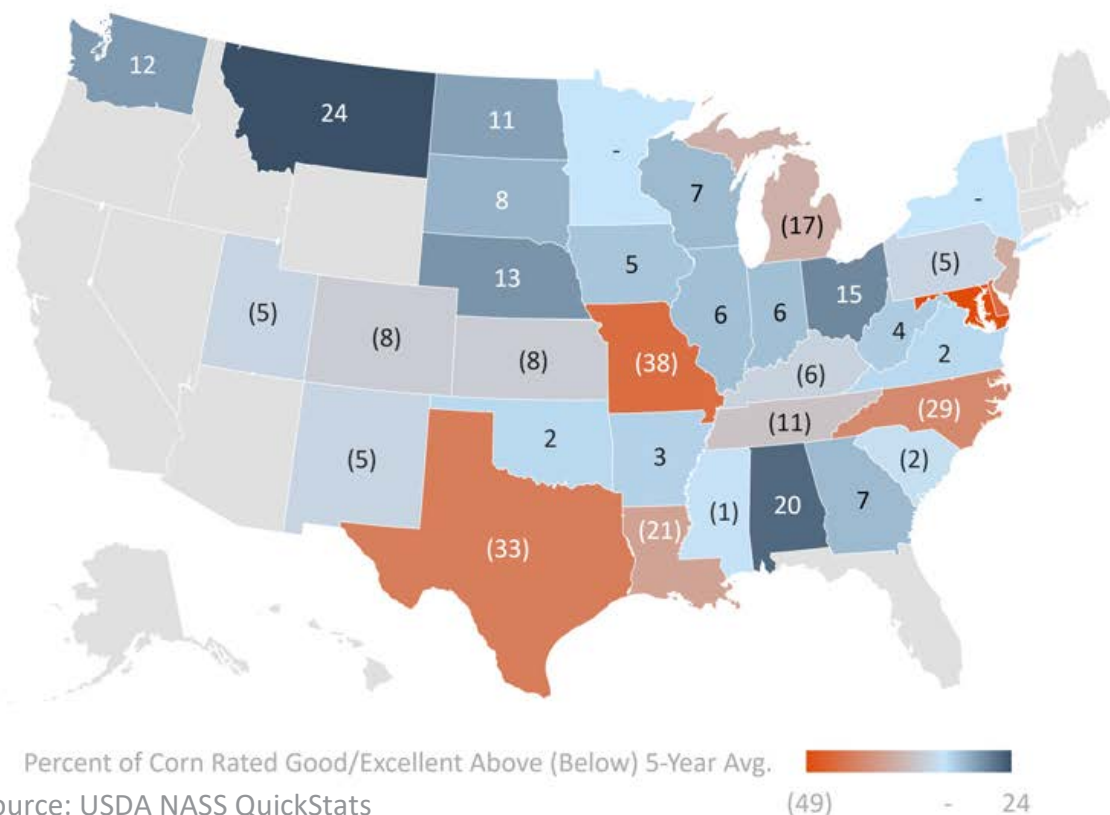
Fundamentals look promising for corn prices to average around \$3.60 per bushel for the upcoming marketing year.

Supply-side conditions for U.S. corn growers appear to have improved in 2018. The USDA is predicting a record national average yield (178.4 bushels per acre, up from 176.6 in 2017). However, because farmers planted fewer corn acres this spring, the USDA projects that total corn production will be slightly lower than last year. Growing conditions have been favorable for U.S. producers across much of the Corn Belt. Southern Plains states and Missouri have grappled with extensive drought conditions, reducing the outlook for corn production from Colorado to Missouri and down to Texas. Missouri growers have reported exceptionally poor crop quality, with only 26 percent of the crop reported as “Good” or “Excellent,” a value 38 percentage points lower than the last five-year average (see Figure 9). Internationally, extensive heat in Germany and France has caused lower corn production expectations for the EU, and Brazil is reporting lower acreage planted to second-crop corn in 2018. In total, the USDA projects a small decline in world corn supplies in 2018. If realized, this would be the second consecutive year of declining world production.



Percent of Corn Rated Good/Excellent Above (Below) 5-Year Avg.
Source: USDA NASS QuickStats

**Figure 9: Corn Crop Rated Good or Excellent on August 13
(Deviation from 5-Year Average)**



Demand for U.S. corn looks to hold up in 2018. There are an estimated 1.5 million more animals on feed this year compared to last, and the increased feed demand is causing a 1.4 percent increase in the usage of corn for feed. Ethanol production is on pace with last year's production through July, keeping fuel-use demand for corn at near record highs. Ethanol exports have been a success story for corn in the last 12 months, but tariffs on U.S. ethanol exports in Brazil and China limit the upside for above-trend growth in export demand. Finally, exports of U.S. corn are holding up in 2018, despite retaliatory tariffs from China and the EU. The two largest markets for corn

(Mexico and Japan) remain unaffected by retaliatory tariffs as of mid-August.

Tighter supplies and consistent demand paint a modestly positive picture for corn producers. The USDA forecasts both domestic and global corn ending stocks to fall to their lowest levels since 2014. Lower ending stocks imply higher support levels for prices, so the USDA also raised its outlook for midpoint average corn price for the upcoming marketing year to \$3.60 per bushel. Prices could see resistance if trade policy and the stronger U.S. dollar put downward pressure on corn and ethanol exports.

Key Highlights

The U.S. crop could set a record this fall, a result of record planted acres and near-record yields.

Demand is holding up because of a larger number of animals on feed and higher export demands due to the lower U.S. average price this summer.

Soybean cash prices are likely to hover between \$8.00 and \$9.00 per bushel until there is greater clarity on trade relations between the U.S. and China.

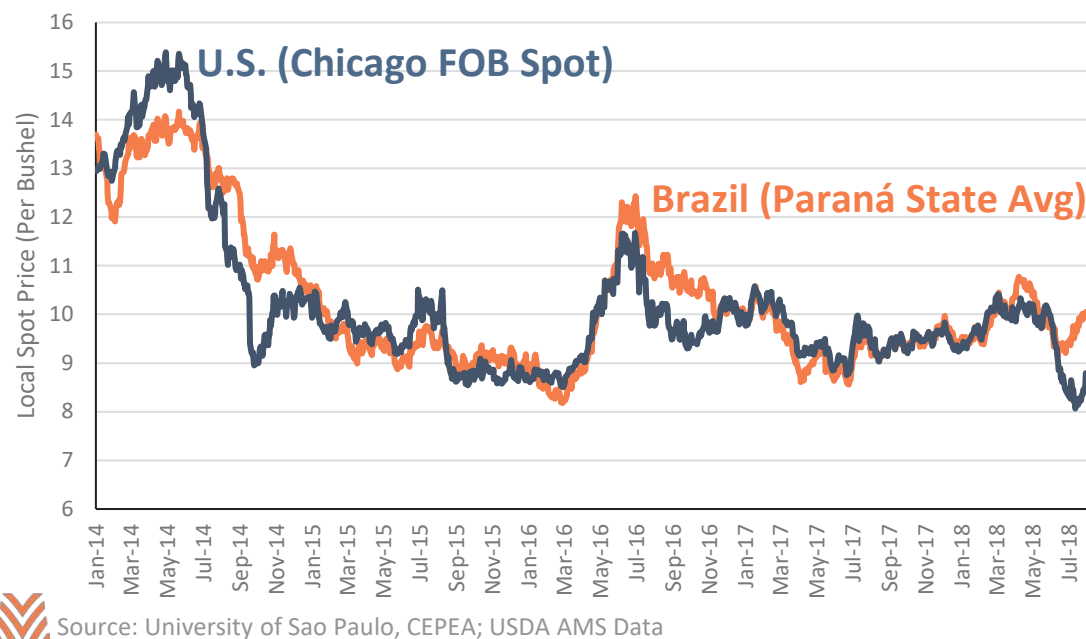
Due to an increase in acres planted and near-record expected yields, U.S. soybeans look to be in ample supply this fall. Earlier in the planting cycle, soybeans appeared to be more profitable than corn and wheat, so many producers expanded soybean acreage in 2018. Growing conditions have been favorable for many, with Corn Belt and Northern Plains growers seeing above-average crop quality, and producers from Nebraska and Missouri and states to the south are reporting lower quality due to heat and dryness. The USDA predicts a record soybean harvest, with average yields at 51.6 bushels per acre. Global supplies look ample into 2019, with Argentina expecting production to bounce back after a disastrous 2018 crop. The USDA forecasts both U.S. and global ending stocks to rise in 2019.

Fortunately, soybean demand is excellent. U.S. soybean crushers have increased output due to demand for domestic feed, biofuel, and meal exports. More grain-consuming animals are driving up demand for feed, and

the production and sale of U.S. biodiesel continue to grow. Exports of soybeans have increased, despite the trade friction between the U.S. and China, the largest soybean market for U.S. exports. Lower average U.S. soybean prices have sparked additional sales: exports during the first half of 2018 are up 6 percent by quantity compared to 2017. The 22 percent decline in sales to China has been more than offset by substantial increases to Egypt, the Netherlands, Pakistan, and Mexico. Egypt has increased soybean imports by more than 36 million bushels in the first half of 2018, almost half of the decrease in Chinese soybean purchases. Increases in aquaculture and poultry production are driving the increased demand for soybeans in Egypt, and that trend is likely to persist beyond 2018.

Soybean prices are down on the perception of a bumper crop and trade disruptions from China. U.S. soy markets dropped nearly 20 percent in June 2018 after China listed soybeans as a targeted commodity for retaliatory tariffs, increasing the duty on American soybeans by 25 percent.

Figure 10: U.S. and Brazil Soybean Spot Price Comparison



Prices in Brazil did not fall by the same amount, implying that the depth of the decline in U.S. soybean markets was a direct result of the tariff. The currency-adjusted price for soybeans in Brazil averaged nearly \$10.00 per bushel in early August, a 15 percent premium over the U.S. price of \$8.50. Prices in the two largest exporting countries tend to converge over time, so there will likely be either downward pressure on the Brazil price or upward pressure on the U.S. price (see Figure 10). The USDA has a wide range on soybean prices for the 2019 marketing year, with a low end of \$7.65 to a high of \$10.15. If the newly-enacted tariffs in China stand, the average fall farmgate cash price will likely stay closer to \$8.00 per bushel. However, soybean growers that apply for the USDA's Market Facilitation Program (MFP) can receive an initial payment of \$1.65 per bushel on half of their production in 2018. This program will put an estimated \$3.6 billion back into soybean producers' hands in early 2019.

Key Highlights

U.S. milk production up 1.1 percent in the first half of 2018.

Demand for dairy products remains strong, but consumption growth slowed in the last six months.

Retaliatory tariffs in Mexico and China and a strong U.S. dollar constrain any milk price upside for the remainder of 2018.

Dairy producers continue to increase production in 2018. U.S. milk production in the first half of 2018 is up 1.1 percent compared to 2017, and production year-to-date is nearly 2.7 percent above the five-year historical average. Western dairies are driving the increase, with more than 80 percent of the rise explained by increases in milk production from Texas, California, Colorado, and Idaho. Supplies of dairy products are also continuing to build and the USDA estimates that U.S. ending stocks of both butter and cheese will close 2018 at 10-year highs. Global production is also rising as dairy producers in the EU increased output by more than 2 percent in the first half of 2018 compared to the first half of 2017. Competition for the global dairy consumer is stiff thus far in 2018.

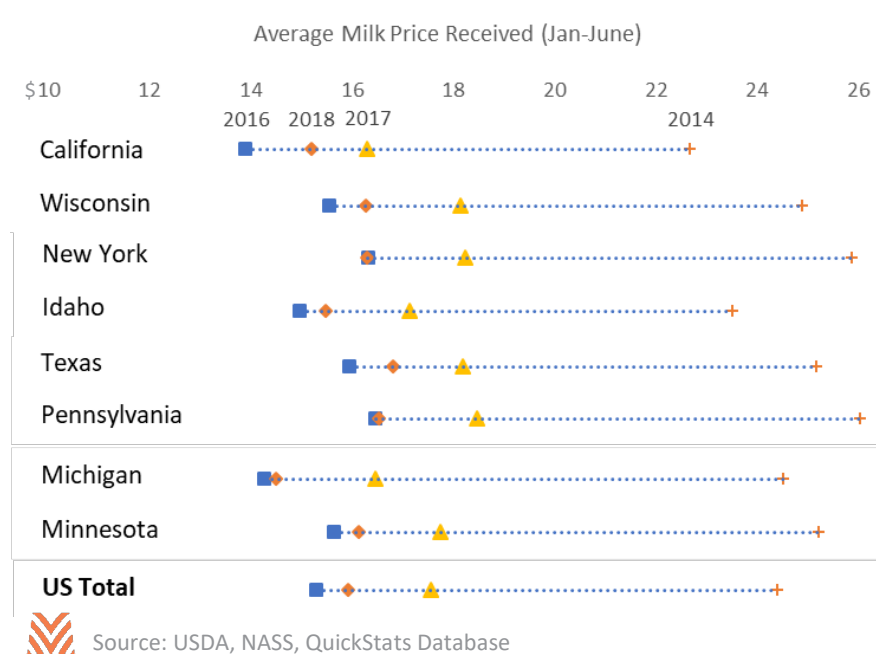
Demand growth for U.S. dairy slowed in the second quarter. U.S. consumers have cut back on butter consumption, and per capita cheese consumption is rising at a slower pace than recent years. These changes are causing rising stocks for both dairy products. However, foreign demand remains strong, and exports are up during the first half of 2018 on both a volume and value basis. Exports of non-fat dry milk products are up 25 percent by volume in 2018 and whey

product export sales are up by 16 percent. Cheese exports have also increased in the first half of 2018, albeit at the more modest pace of 7 percent over the first half of 2017. U.S. prices are generally lower than foreign competitors in the EU, Australia, and New Zealand, making U.S. products more competitive on the world market. However, trade policy remains a headwind to foreign demand. The trade ministers in three of the four largest U.S. dairy trading partners (Mexico, Canada, and China) have imposed retaliatory tariffs on U.S. dairy products. These tariffs effectively raise the U.S. price on the world market and they make our products less competitive for those markets. The three markets in question account for roughly half of the value of U.S. dairy exports, so it will be interesting to see how export levels shift in the second half of the year.

Rising supplies and steady demand have combined for weaker prices in 2018 compared to 2017. As shown in

Figure 11, average all-milk prices in 2018 are near 2016 levels (which was not a terrific year for profitability in the sector). Producers in some states are reporting stronger prices than others; for example, dairy operators in California are reporting prices 9 percent above 2016 levels. However, states like New York, Michigan, and Pennsylvania see dairy prices at or very near 2016 levels. Lower feed costs are a bright spot for Midwestern dairy producers, but drought-stricken areas like New Mexico and Texas are experiencing above-average feed costs compared to national averages. Dairy prices are likely to be heavily impacted by trade policy news, as well as by the strength of the U.S. dollar in the coming months. In the July World Agricultural Supply and Demand Estimates (WASDE), the USDA projected the 2018 milk price to average between \$16.10 and \$16.30 per hundredweight. The August price estimate is slightly better than the USDA July forecast, but certainly a far cry from the 2017 average of \$17.65 per hundredweight.

Figure 11: State Average All-Milk Prices (January to June of Each Year)



CATTLE

(resource 18, 21, 22, 23, 24, 25)

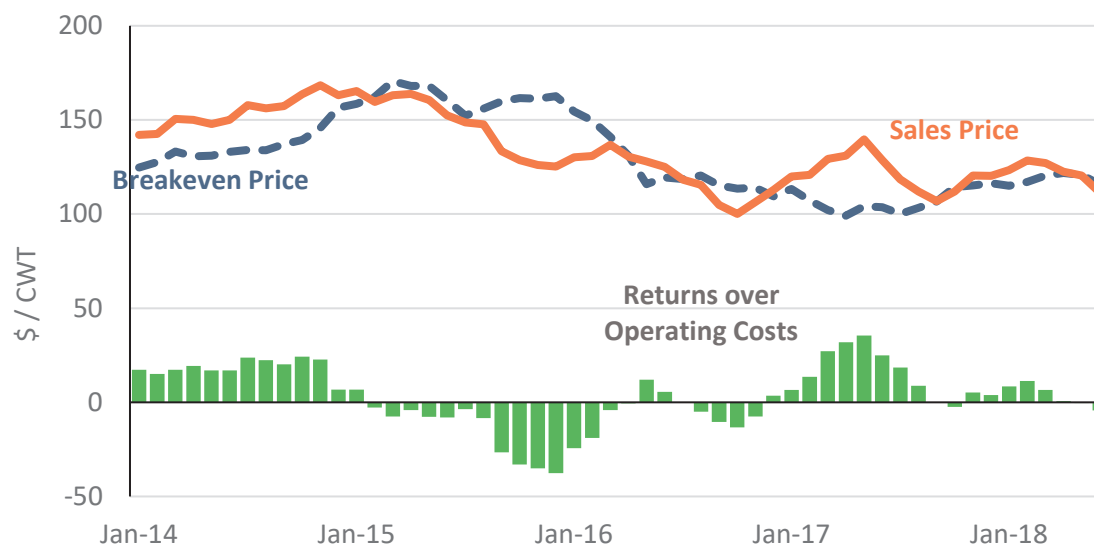
Key Highlights

Although signs point to slowing growth, the U.S. beef industry is projected to produce nearly 4 billion pounds more beef in 2019 compared to 2015.

Strong domestic and foreign demand is expected to continue balancing out higher supplies.

New tariffs only affect a small proportion of beef exports, but concerns about trade remain.

Figure 12: Returns Over Operating Costs for Cattle Feeder Operations



Source: Iowa State University, Estimated Livestock Returns

The U.S. cattle herd and beef supplies continue to expand, but signs point toward slowing growth. The USDA's recent Cattle Inventory report showed a 1 percent increase in the July 1 cattle and calf inventory, which represents a slowdown compared to the last few years. Corresponding to the slowing growth in the U.S. cattle herd, the USDA projects U.S. beef production to continue rising in 2018 and 2019, but at a slower rate compared to the past several years. Despite the slowdown in growth, if the USDA's predictions are realized, the industry will have increased production by 4 billion pounds in 2019 compared to 2015 when beef production bottomed.

Faced with moving an additional 4 billion pounds of beef through the supply chain, finding additional sources of demand has been paramount to supporting beef prices. Fortunately, the beef industry has found ample demand among domestic and international consumers, which has helped keep fed cattle returns largely above operating costs in 2017 and 2018 (Figure 12). U.S. per capita beef consumption rose 2.9 pounds per year between 2015 and

2017, and it is projected to rise another 1.8 pounds per year by 2019. Part of this uptick in consumption likely reflects moderating retail beef prices, which have declined from highs experienced in 2014 and 2015. However, a recent report prepared for the Cattlemen's Beef Board found that beef demand has become less sensitive to retail beef prices and more sensitive to changes in income. Given current economic conditions, consumers should have extra income to spend on food in the coming months, which will help support beef demand.

Growing international demand for beef has also provided a boost to U.S. beef. Year-to-date monthly export data show overall beef exports have increased by 21 percent relative to 2017 through May. Weekly export data also suggest beef exports have continued to substantially outpace last year in June and July. Throughout the year, demand growth from Asian markets, including South Korea, Japan, and Taiwan, has been particularly strong. Exports to South Korea have been particularly robust, with the value of beef shipments up nearly 40 percent annually.

While trade has benefitted the cattle industry this year, new tariffs could impact beef trade with Canada and China. On July 1, 2018, Canada instituted a 10 percent tariff on prepared beef products, and China also increased its tariffs on several beef products, including fresh and frozen beef and offal. Fortunately, prepared beef products represent a small amount of overall U.S. beef exported to Canada. The level of beef trade between the U.S. and China is also relatively small compared to overall U.S. beef exports. However, the U.S. had just regained access to the Chinese market last year, and concerns remain that current trade policies could result in supply chain disruptions that hinder American beef from expanding its footprint within China in the future. Like other agricultural industry segments, the cattle industry will be hoping for a quick resolution to the ongoing trade disputes and greater access to key markets moving forward.

Key Highlights

The hog industry remains in expansion mode despite pricing pressures.

Higher feed costs in the first half of 2018 cut into profit margins for feeder-to-finish operations.

Trade uncertainty could continue to present headwinds to industry profitability.

Following several years of expanding output, U.S. hog farmers continue to increase production. Overall pork production increased 3.5 percent in the first half of 2018, and USDA data indicate a large current pig crop destined for market later this year. At the same time, surveys of producer farrowing intentions in the second half of 2018, continued growth in litter rates, and a 3 percent increase in the breeding stock all suggest that pork production is likely to continue running 3 to 6 percent above year-ago levels over the next 12 months.

The industry has been able to handle the additional hog supplies due to strong global demand and additional processing capacity from new facilities coming online. Combined with low feed prices, this meant farmers throughout the hog supply chain were generally rewarded with positive margins in 2017. However, producers had to contend with higher corn and soybean prices in the first half of 2018, which pushed feed costs higher and cut into margins.

Higher feed costs have been particularly impactful for feeder-to-finish operations, where feed can account for more than a third of costs. The rise in feed costs and

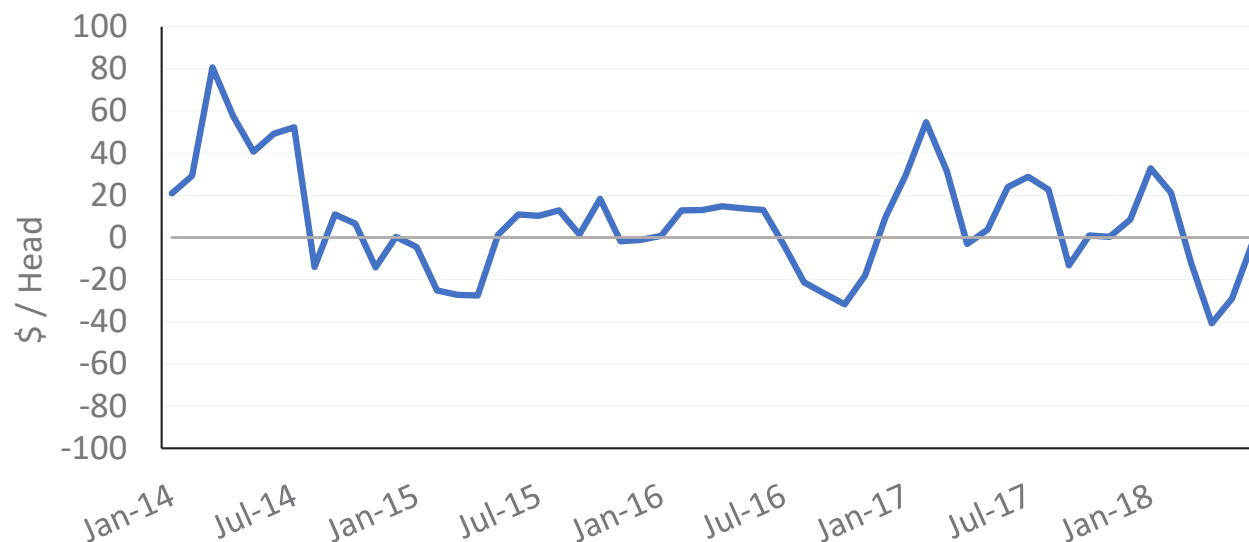
higher feeder pig prices meant many of these operations had experienced negative margins in recent months. With another year of potentially large corn and soybean harvests and continued trade uncertainty, pork producers could feel some relief from lower feed costs in the coming months. However, USDA projections indicate that expected supply increases and trade uncertainty will weigh on prices moving forward. If realized, producers may still find it difficult to cover the cost of production in the coming months.

China and Mexico, two of the largest markets for U.S. pork, have instituted retaliatory tariffs on U.S. pork products. U.S. pork exported to China currently faces a 71 percent cumulative tariff and 10 percent value-added tax, which has led to a sharp slowdown in pork product exports. Monthly data show U.S. pork export volumes to China and Hong Kong were down 45 percent in May, and

weekly data show little pork export activity to mainland China in June or July, a sharp drop relative to past years. Meanwhile, Mexico's increase in the tariff on U.S. pork exports to 20 percent on July 5 could also impact demand. Weekly exports of fresh, chilled, and frozen muscle cuts of pork were down a combined 12.3 percent in the second and third weeks of July compared to last year.

The USDA's recent announcement of \$12 billion in aid to farmers impacted by the recent trade disputes includes pork and could provide some relief to pork producers, but the details are still unknown. Even if the USDA program provides short-term relief, the industry will be monitoring conditions to see how the market will overcome the recent trade disputes. Given the magnitude of world consumers located outside the U.S. and long-term demand prospects for global protein products, expanding access to foreign markets remains key for the industry's long-term health.

Figure 13: Returns Over Operating Costs for Feeder-to-Finish Hog Operations



Source: Iowa State University, Estimated Livestock Returns

Key Highlights

Ad-valorem tariffs raise the foreign market price of affected U.S. exports by the percent of the tariff, but foreign buyers and U.S. sellers are likely to share the cost.

U.S. farm prices are likely to face greater downward pressure when import demand is more sensitive to changes in price than U.S. export supplies.

Depending on how overall world trade responds, the retaliatory tariffs could lead overall exports to fall and hamper export-linked job growth.

Over the last few months, agricultural industry participants have focused a substantial amount of attention on the potential impact of retaliatory tariffs on U.S. agricultural exports. The concern has led to a considerable amount of ink being shed in the popular press and the agricultural media – including here at The Feed – on the importance of trade to U.S. farmers and the scope of U.S. farm products affected. This article takes a deeper dive into how tariffs affect agricultural trade and the nuances that will determine how different commodities are impacted.

As we highlighted earlier in this edition of The Feed (see “Retaliatory Tariffs Against U.S. Agriculture”), six trading partners have instituted retaliatory tariffs on U.S. agricultural products. To date, the retaliatory tariffs on U.S. agricultural products have been ad valorem, which means the tariffs function as a tax on the value of the affected U.S. agricultural products.



Conceptually, this means the cost of an affected U.S. agricultural export in the foreign market has been increased, similar to the way shopping bills are raised for those of us in states with sales tax. When we check out at the store and see the sales tax added to our bill, it sure feels like we consumers are paying the whole tax. But this is not necessarily the case. Sometimes supply and demand conditions allow stores to pass on the entire cost of a tax to consumers, but market conditions could also make it so that sellers cannot pass on any of the tax to buyers. Reality often lies somewhere in between, with buyers paying somewhat more because of the tax and producers absorbing part of the cost.

As is the case with sales tax faced by U.S. shoppers, the cost of the retaliatory tariffs applied to U.S. agricultural products will likely be shared between buyers in foreign markets and U.S. producers looking to sell their products abroad. The question facing U.S. farmers is to what extent the retaliatory tariffs on U.S. agricultural exports will be paid by foreign buyers or will be absorbed by U.S. producers in the form of lower export prices. The exact outcome will depend on the supply and demand conditions for a given commodity and trade partner.

Figures 14 and 15 illustrate a pair of hypothetical markets for U.S. agricultural exports to illustrate how the sensitivity of supply and demand to price changes can impact how the price that U.S. farmers receive for their exports changes in response to a tariff. Since sellers are willing to supply more products at higher prices and buyers demand less as prices rise, both graphs have an upward sloping export supply curve and a downward sloping import demand curve. Each market also faces a hypothetical ad valorem tariff, which raises the cost at every price and is represented by import demand shifting lower.

In Figure 14, the relatively steep import demand curve indicates that the hypothetical foreign buyers are less sensitive to changes in prices and any price change results in small changes in their quantity demanded. The relatively flat export supply curve means that the quantity exported by U.S. producers will have greater changes in response to price movements. Under these conditions, after the tariff is introduced, the foreign market price rises well above the original level and the price received by U.S. exporters falls less substantially. Accordingly, foreign buyers bear most of the tariff's cost.

Of course, the markets for U.S. agricultural exports may face different supply and demand conditions (Figure 15). If U.S. exports have many substitutes or are only a small portion of the foreign country's imports for a product, foreign buyers may be much more price sensitive, leading to a flatter import demand curve. In cases where a significant portion of the product is exported to the foreign country, U.S. suppliers could be less sensitive to price changes yielding a steeper export supply curve. Figure 15 shows that, after the tariff is applied, these conditions result in the foreign market price rising relatively little, and the price received by U.S. exporters falling by nearly the amount of the tariff. Unlike the prior example, this results in U.S. exporters absorbing most of the tariff's cost to remain competitive enough to participate in the market.

Although these examples present hypothetical markets, they provide intuition about how supply and demand fundamentals play an important role in determining how retaliatory tariffs can impact U.S. agriculture. For some products subject to retaliatory tariffs – like almonds exported to China – U.S. production represents the trading partner's primary source of imports, yet the trading partner only accounts for a small proportion of U.S. exports. These cases are more likely to be characterized by the first hypothetical market. On the other hand, goods like soybeans, where China is the world's largest importer and where Chinese buyers can substitute to exports from alternative countries, are more likely to be characterized by the second example. In the second example, U.S. export prices decline to offset most of the cost of the tariff.

Regardless of how export prices for agricultural products are impacted, the retaliatory tariffs can have broader economic consequences. A past analysis by the USDA's Economic Research Service found that a 10 percent increase in the foreign demand for U.S. agricultural products would stimulate additional U.S. jobs; unfortunately, the converse may also be true. Both hypothetical tariff examples presented in this analysis lead to lower quantities of U.S. exports to the country imposing the tariff. If this leads to a reduction in total

U.S. agricultural exports it could slow export-oriented labor markets. However, U.S. agriculture is also likely to continue to see alternative export opportunities emerge that allow trade patterns to shift between countries,

which should help mitigate the impact. Upcoming trade talks with China, as well as our NAFTA trade partners also offer the hope that the current trade uncertainty could clear sooner rather than later.

Figure 14: Effect of a Tariff on Hypothetical Export Market (Price Sensitive Supply and Less Price Sensitive Demand)

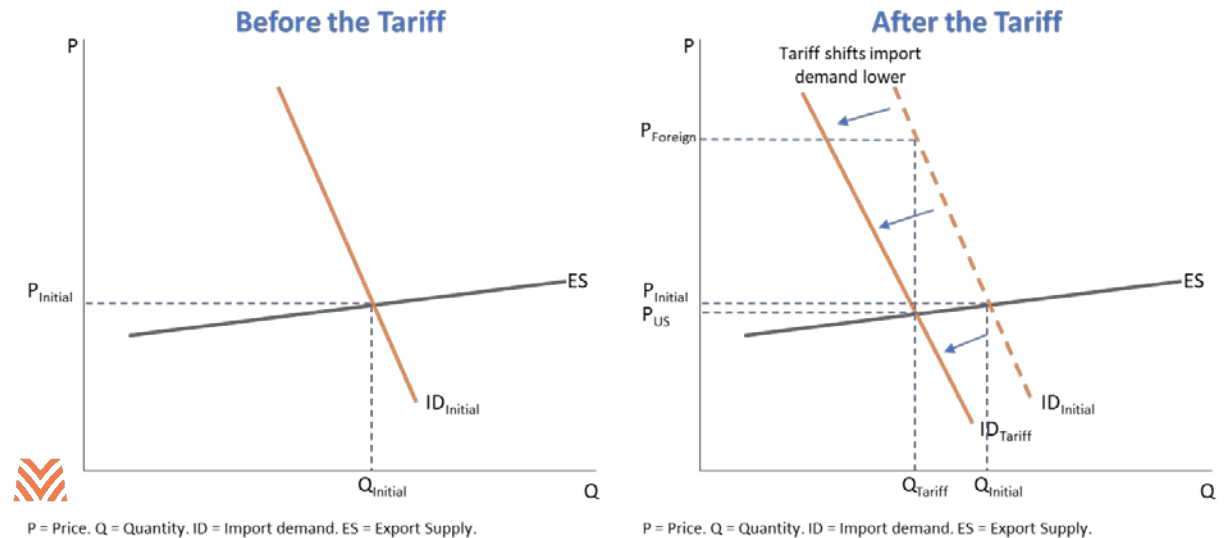
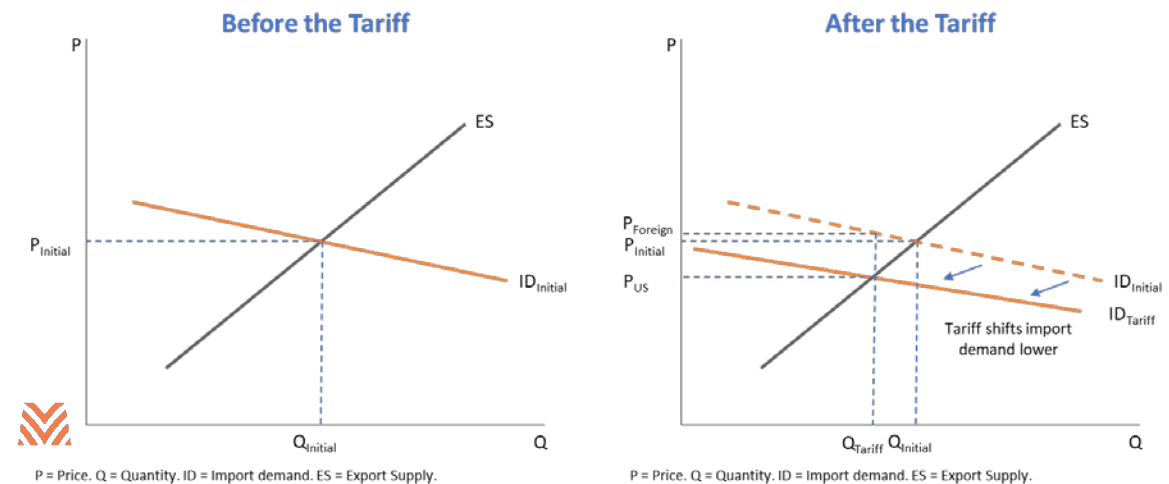


Figure 15: Effect of a Tariff on Hypothetical Export Market (Less Price Sensitive Supply and Price Sensitive Demand)



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