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PURDUE

AGRICULTURAL ECONOMICS REPORT

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FROM THE EDITOR:

Roman Keeney Associate Professor of Agricultural Economics, PAER Editor

Welcome to the Purdue Agricultural Economics Report (PAER) Annual Outlook issue. As usual, the editors have solicited contributions from around the Purdue Ag Econ department on a number of topics. These can be roughly split into “general economy and policy” and “agricultural economy”. In many cases these authors contribute on an annual basis so we’d invite you to look at the PAER archive to find their past writings to get some perspective on how these experts use data trends, recent events, and core economic and financial principles to try and highlight the items they will be keen to watch the coming year. Of course, the annual outlook is really a one-shot digest of the year-round process of our Ag Econ faculty making regular contributions to

economic phenomena. One such monthly output we’d like to highlight in this introduction is the Ag Economy Barometer from the Center for Commercial Agriculture. I’d encourage you to visit the web homes of all the department’s centers as a means of getting more regular writing on topics of interest.

In this issue:

- Larry DeBoer explains the complicating role of the ongoing COVID pandemic in determining economic growth. He highlights the role of inflationary expectations – many sprung from responses to COVID – as key to the economy matching recovery growth and labor force participation targets.

- Maria Marshall digs deeper into the COVID economy – looking to how households have responded to COVID economy issues such as shutdowns, lost services, unemployment etc. Marshall identifies a number of issues that might cause rural economy recovery to lag that of the general economy.
- Russell Hillberry shifts the focus to economic policy, examining the role of transition from Trump to Biden presidencies and the opportunity to pursue some more cooperative and multilateral aims through international agreements. Hillberry cites resolving previous trade conflicts – particularly those with China – as important for agriculture’s export fortunes as well as fostering a trading system that is more resilient to supply chain shocks.
- Roman Keeney turns the policy focus to agriculture, examining the role that government support has played in farm earnings since 2012 when farm bill reforms away from direct payments began. The past four years have seen large transfers to farmers due to trade and pandemic shocks. Keeney considers whether there is a role in the Farm Bill to provide farmers with clear expectations about forthcoming support from general economic shocks.
- In a return to the inflation topic highlighted by DeBoer, Jayson Lusk examines offers a primer on food price inflation and examines recent experience in context of purchasing power. Lusk suggests that the slow-down in federal spending and remedying the labor shortage are key to curtailing the inflationary pressures that drove prices of many goods higher in 2021.
- Nicole Widmar’s Dairy Outlook sees pressures on food inflation continuing due to reduced cow numbers and production and slowly recovering exports. Widmar highlights that as the near-term economic focus – but identifies a number of other issues for Dairy watchers related to health and policy effects of changing consumer habits and preferences for milk and milk fats.
- The role of prices continues to be an important discussion point as Michael Langemeier writes about the Center for Commercial Agriculture’s Crop Costs and Returns Guide. Langemeier details the rising costs of fertilizer and other inputs relative to expectations for commodity prices and sees tight margins for 2022.
- Todd Kuethe takes on the outlook for land values and cash rents, identifying that prices in land markets may still have some catching up to the agricultural receipts of the past two years. Kuethe looks to the expected contribution margins estimated in the Crop Costs and Returns Guide and sees strong likelihood of continued increase in the coming year.
- Finally, we close the issue with Brady Brewer and Todd Kuethe examining agricultural credit trends. The combination of low interest rates and supplies of funds from lenders should lead to a strong credit market for farmers in 2022. They indicate that Ag Credit may have largely stabilized in response to persistent COVID fears and that a key issue to better understand is the uptick in non-payments and whether a liquidity issue may have arisen.

I’d like to close this editorial introduction with my gratitude to all the contributors. I’d encourage PAER readers that want to know more or follow along throughout the year to follow Purdue Ag Econ’s social media as it will feature timely outputs of these and many of our other excellent faculty as they continue their various efforts in research and extension on topics of interest to Purdue’s stakeholder community.



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AGRICULTURAL ECONOMICS REPORT

Title: General Economic Outlook – COVID calls the shots again

Author: Larry DeBoer

Article ID: PAER_2022-1

Tags: Covid, Economy, GDP, Economic Growth

Summary: Uncertainty over the course of the pandemic and the response by workers and businesses to inflationary pressures are expected to be the determining factors in what is likely to be slower GDP growth in 2022.

General Economic Outlook: COVID calls the shots, again.

Larry DeBoer
December 2021

The outlook for the general economy depends on the course of the COVID pandemic. Perhaps COVID will fade by this summer—but that’s what we predicted last year. Perhaps the worst of COVID is still ahead of us, with the spread of the highly-contagious Omicron variant. Perhaps we’ll see another lockdown and a second short, sharp recession. Perhaps we’ll simply ignore COVID, go about economic business as usual, and accept the elevated case rates.

Needless to say, the pandemic creates more than usual uncertainty about the general economic forecast. Let’s suppose, as a baseline, that COVID cases peak again this winter and fall during the summer. Many consumers and employees will be fearful of COVID during the first half of the year, but fear will subside in the fall. Schools and businesses will close and reopen sporadically for the first half of the year. And let’s assume that the government will encourage social distancing, mask wearing and vaccinations, but will not lockdown the economy again.

The economy recovered rapidly in 2021. Real GDP grew 4.9% in the past year, the fastest growth in at least 20 years. The unemployment rate fell from 6.7% in November 2020 to 4.2% this November. Still, the economy is not back to where we want it to be. Unemployment was 3.5% in January 2020. The Congressional Budget Office estimates that output is still 1.6% below potential, which is what output would be if all resources were fully employed.

High inflation was a surprise. The consumer price index increased 6.9% in the year through November, which was the highest 12-month rate in almost 40 years. Energy prices contributed, rising 33%, and food prices rose 6.1%. But the “core” rate, not counting food and energy, still was the highest in 30 years at 5.0%.

Consumers have shifted purchases from services to goods during the pandemic. In October 2021 goods accounted for 35% of spending, up from 31% in January 2020. This shift is reflected in the inflation rates. Prices of goods excluding food and energy increased 9.4% in the year up to November. Prices of services rose 3.4%. Manufacturing and transportation of goods has been stressed by the spending shift. Goods inflation may remain high as long as the pandemic lasts, because many people fear the face-to-face transactions of service purchases.

The shortage of labor is also a source of inflationary pressure. The Bureau of Labor Statistics measured 11 million job openings but only 7.4 million people seeking work in October. That’s a shortage of employees of 3.6 million. A reason for this shortfall is the extraordinary decline in labor force participation. The percentage of the population that is employed or seeking work was 61.8% in November 2021, down from 63.4% in January 2020. There are almost 3.5 million fewer people working or looking for work—not coincidentally, about the same number as the employee shortage.

The breakdown by age is revealing. More than half of the missing workers are over age 54. These are the people most vulnerable to COVID, and also the people most likely to retire. Early retirements may be a large part of the participation decline. Retired people sometimes return to work, but many are likely out of the labor force for good.

Federal spending was a source of demand for both goods and services in 2021. Spending in 2021 was 54% higher than it was in 2019, mostly due to COVID relief programs. This represents an extra \$2.4 trillion. The federal budget deficit was 13.4% of GDP.

With no added COVID aid, and the apparent failure of the administration’s Build Back Better bill, the federal deficit will fall substantially in 2022. In July the Congressional Budget Office projected a drop in the deficit to 4.7% of GDP. That’s a subtraction of almost \$2 trillion in fiscal stimulus.

The passage of the infrastructure bill in November will modify this estimate slightly. The bill envisions \$1.7 trillion in added spending over ten years, but the impact in 2022 is expected to be only \$155 billion. New infrastructure should eventually improve productivity, raise output growth and even reduce inflation—but not in 2022. Next year the overall fall in federal spending will be a drag on the demand for goods and services.

Interest rates remained near record lows, with the ten-year Treasury yield at 1.6% and the 3-month yield near zero. The Federal Reserve cut the federal funds rate to near-zero in March 2020 and has held it there since then. Policymakers recognized that they raised rates too much during the second half of the 20-teens expansion, and pledged to keep rates low in order to achieve inflation rates averaging 2% to 3% over several years.

Then the inflation rate increased. The Fed held to the view that the inflation would be transitory through most of 2021, but in November decided it wasn't transitory enough. As a result, the Fed will lessen monetary stimulus during 2022, and expects to raise the federal funds rate three times to near 1%.

Is inflation transitory or will it be sustained for years? That depends on inflationary expectations. If employees expect inflation, they'll require wage hikes to cover it. If businesses expect wage increases, they'll pass them along in higher prices. Business and employee expectations would be confirmed, and the spiral would continue.

Inflationary expectations can be measured by the difference between the nominal and inflation-adjusted Treasury bond yields. The nominal yield shows the return lenders need to compensate for inflation; the adjusted rate shows only the return after inflation. Ten-year Inflation expectations were 2.5% in November, up slightly from the 1.5% to 2% range during the second half of the 20-teens. Inflationary expectations are not high yet, so inflation still has a chance to be transitory.

Where do these trends leave us? Suppose consumption growth slows with the drop in federal COVID aid. The shift from goods to services consumption doesn't get started until the second half of the year. Investment continues to grow despite the Fed's interest rate increases. Rising home prices should encourage home building. The labor shortage should encourage investment in business equipment. Imports should grow more slowly as goods demand slows in the second half of the year. Exports should grow more rapidly as COVID fades. Federal spending will fall, but state and local government spending should rise. Many states are flush with revenue, and much of the federal COVID aid to local governments remains to be spent.

Output growth will be constrained by low labor force participation and supply disruptions. Participation should begin to rise in the second half of the year, and supply problems should lessen with the shift to service consumption and new investment in manufacturing and transportation.

Expect real GDP to grow more slowly next year than this, at 3.5% to 4%. Call it 3.8%.

That's faster than usual, but slower than we'd like.

With so many more job openings than job searchers, the unemployment rate should continue to fall. **Expect an unemployment rate around 3.7% by this time next year.** Twelve-month inflation rates will register above 7% early in 2022, but lower federal fiscal stimulus, monetary tightening, lower oil prices and improving supply conditions should reduce **inflation to 4.5% by December 2022.** Federal Reserve tightening should add three-quarters of a point to the long-

and short-term Treasury bond yields. That would make the **10-year Treasury yield about 2.3% and the 3-month yield 0.8% by the end of 2022.**

What could go wrong? COVID calls the shots for this economy. Suppose the pandemic gets worse and stays bad. Consumers pull back and labor force participation doesn't improve. Supply disruptions continue. Inflation is sustained, and the Fed must raise interest rates higher. Fiscal stimulus grinds to a halt. Output growth could be as low as 2% with inflation above 6%.

But have a good thought. What could go right? Suppose the omicron variant burns itself out by Spring, and we're finally done with COVID. Labor force participation rises, consumers shift spending to services, and pressure on supply abates. Inflation proves more transitory than not. Further tightening of monetary policy is not needed. Parts of the administration's Build Back Better bill pass, so fiscal policy is not such a drag on spending. Real GDP growth could be 5%, with inflation under 4%.

Uncertainty is the order of the day. But remember, though pessimism is often mistaken for realism, optimism is right about half the time.



PURDUE

AGRICULTURAL ECONOMICS REPORT

Title: The Impact of COVID-19 on Households: Lessons for 2022?

Author: Maria I. Marshall, Jim and Lois Ackerman Endowed Chair in Agricultural Economics

Article ID: PAER_2022-2

Tags: COVID-19; Household Impacts; Employment; Childcare

Summary: COVID-19 exposed how lack of childcare impacts households and employment.

Disasters, both natural and economic, tend to unearth cracks in our foundation. Weak links and inequities are not only revealed, but in many cases worsened. The COVID-19 pandemic has exposed the fissures in the labor market and the realities of employment with low pay, few benefits, and lack of childcare. Small businesses also bore the brunt of continued health risks and changes in consumer behavior.

The unprecedented amount of funds provided to both households and small businesses temporarily softened the economic shock caused by the pandemic. The CARES act in 2020 provided funds for households and forgivable loans for small businesses. The Coronavirus Response and Relief Supplemental Appropriations Act 2021 (signed in December 2020) provided additional stimulus payments from December 2020 through January 2021. The American Rescue Plan signed in March 2021 provided among other benefits expansion of the child tax credit for households and continued worker retention credits for small businesses.

The availability of COVID-19 vaccines in the spring led to an increase in the number of workers returning to work and the start of schools returning to in-person instruction. However, the damage of business and childcare closures (daycares and schools) to low-wage and low-skilled workers and to women will continue to be felt into 2022.

Employment

Federal unemployment benefits ended on September 6, 2021; although 25 states ended unemployment benefits as early as June 2021 citing lack of available workers and blaming the extended benefits. Figure 1 demonstrate that the unemployed had a variety of reasons for not being employed. In February 2021, layoffs and closures due to COVID-19 along with caring for children were among the highest-ranking reasons for not working. This changed substantially by

October when layoffs and closes decreased. However, caring for children remained one of the most significant reasons for not working.

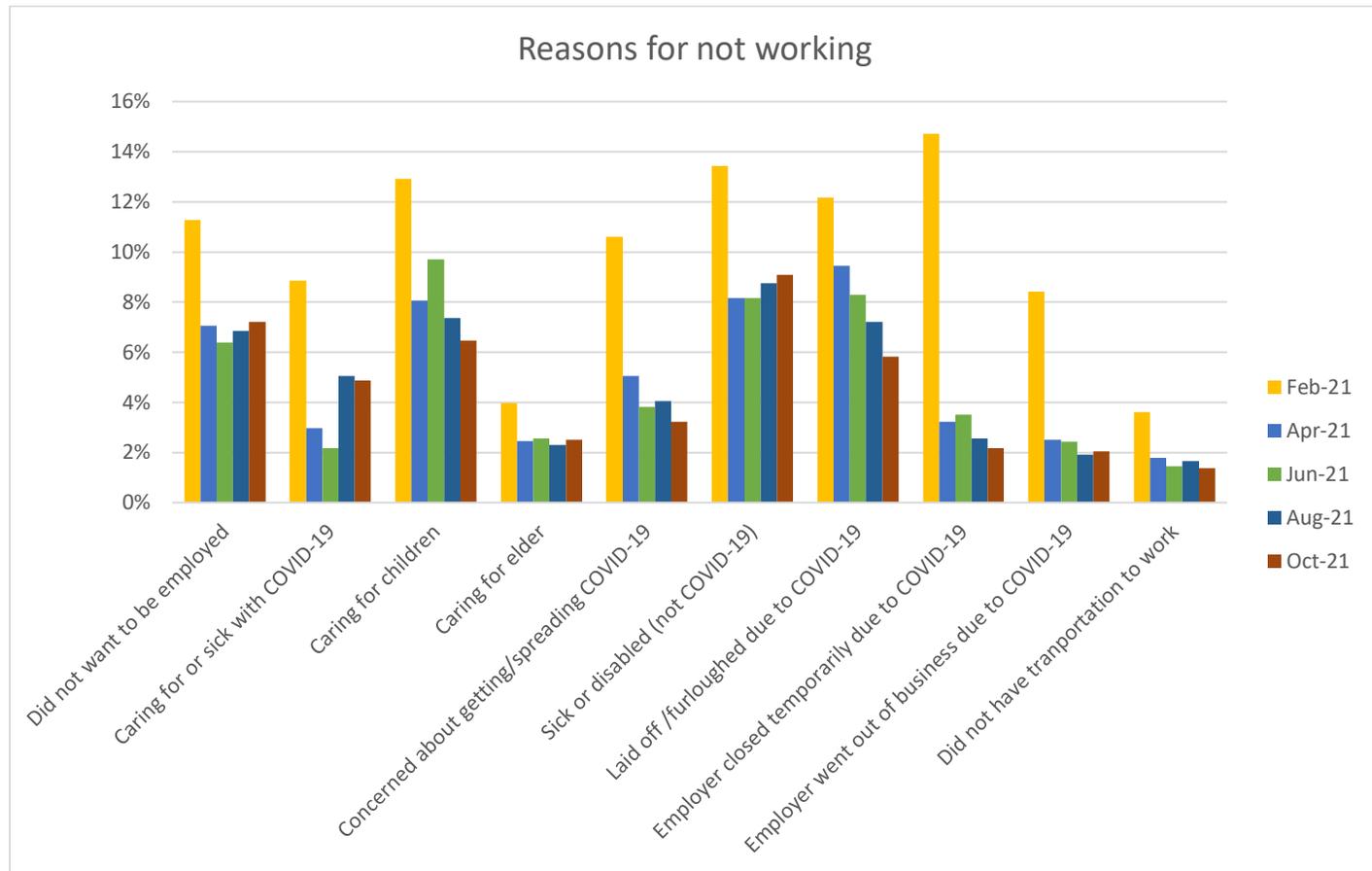


Figure 1. Stated reasons for not working from February 2021-October 2021. Data: U.S. Census Bureau, Household Pulse Survey (author calculations)

Not included in the figure below is the number of individuals who were retired which increased by 11 percentage points from the beginning of the pandemic to the last Household Pulse Survey in October 2021. According to Pew Research Center (Fry, 2021), the number of retirees increased by 29% since the pandemic. This increase in retirement not only affects the number of individuals available for wage employment, but the number of small businesses that have closed as Baby Boomers that own small businesses retire in record numbers.

Childcare

The last two years have demonstrated the uneven impact of COVID-19 on households with children and particularly women in the workforce. School and daycare closures exacerbated a problem already felt by many parents and especially those in rural communities (USDA, 2021). Figure 2 shows the disproportionate impact of these closures on women. In October, the majority of those that did not look for a job, lost a job, and left a job due to lack of childcare were women. For example, 69% of the adults that did not look for a job because of lack of childcare were women, compared to 41% that were men. Of the total adults that lost their job because of time away to take care of children, 66% were women and 44% were men. These are issues still pervasive well into the second year of the pandemic that will linger well into 2022.

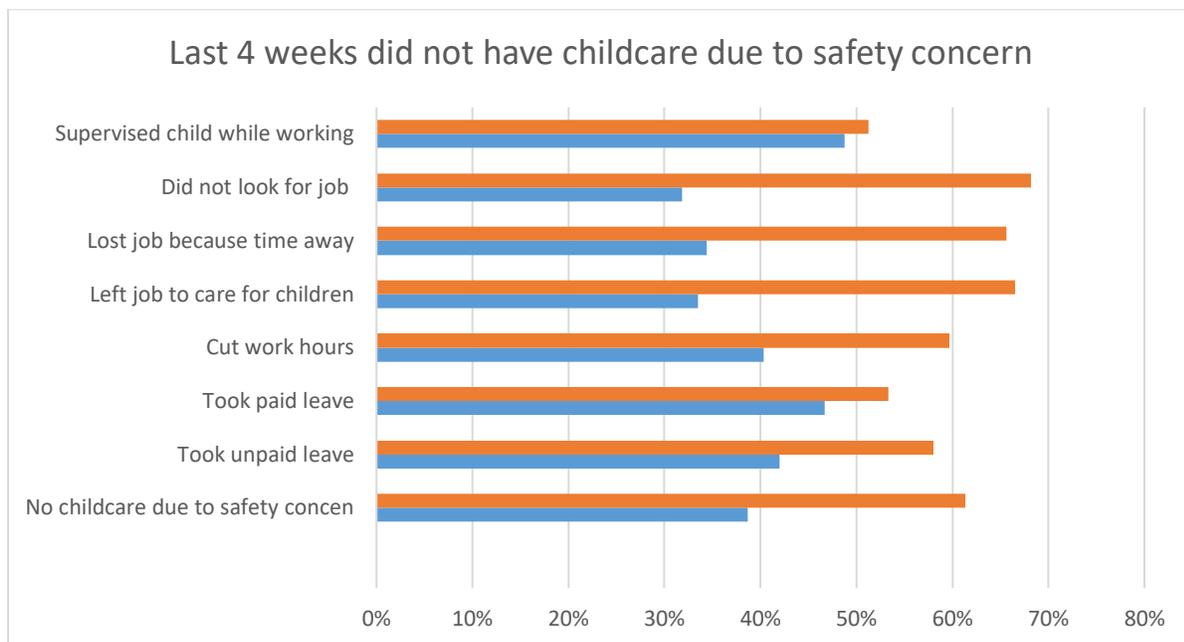


Figure 2. Impact of COVID-19 on Childcare, October 2021. Data: U.S. Census Bureau, Household Pulse Survey (author calculations)

Lessons for 2022?

Rural communities which lagged urban communities in recovering from the Great Recession may continue to fall behind not only in employment but also job growth. According to McKinsey and Company, post-pandemic job growth is set to occur in high-wage jobs and most low-wage workers that lost their jobs during the pandemic may have to retool and shift occupations. We may continue to see an increase in the number of workers that shift to not only higher paying job, but also to jobs with guaranteed benefits. So, we may not have seen the end of the Great Resignation and we may continue to see a *great retirement* as well. If we see the end to the pandemic in 2022 (or at least manage it enough to decrease health-based closures to schools and daycares) we may see the increased return of women with children to the workforce. Looking ahead, access to workforce development and quality childcare may be the most important policy issues to ensure the equitable recovery of low and medium-income households in both urban and rural communities to the pandemic.

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PURDUE

AGRICULTURAL ECONOMICS REPORT

Title: Trade and trade policy outlook, 2022

Author: Russell Hillberry, Professor of Agricultural Economics

Article ID: **PAER_2022-3**

Tags: Supply chain, trade policy, China, tariffs, Biden

Summary: While trade policy does not appear to be a major priority of the Biden Administration, it does affect many key objectives. One example is the supply chain problem, which may not be fully resolved in 2022.

Last year's trade policy outlook offered informed speculation about the trade policy that might be expected from President-elect Biden (Hillberry 2020). At that time, the incoming administration seemed to be attempting to maintain ambiguity on many trade issues, so there was considerable uncertainty about how a Biden administration might handle trade policy. One year later, the administration's approach is becoming clearer. US trade policy will not be as outwardly combative as it was under the Trump Administration, but neither should we expect a return to the pre-2016 situation. This has implications for the supply chain crisis, and for the broader international trade system, which is important for export-oriented agriculture.

The Supply Chain

One of the economic concepts with which many people have recently become familiar is the "supply chain" - the sequence of production and transportation activities required to make and deliver goods to our doorstep or to our stores. The arrival of the COVID-19 pandemic generated a large volume of supply chain issues, many of which abated as pandemic-related restrictions eased. During the last year, however, problems in the supply chain have become widespread once again, delaying the delivery of some kinds of goods. Supply chain problems go well beyond agriculture, but they have also beset agricultural producers (Gayman 2021).

The primary reason for the supply chain issues we see is that demand in the United States is growing faster than the ability of the supply chain to deliver the goods that consumers and other

buyers desire. A set of interlocking problems - Covid-related shutdowns in upstream countries, labor shortages (in the US and elsewhere), high costs of freight, and the unavailability of necessary inputs at various points in the supply chain - have hamstrung the ability of suppliers to meet surging demand.

While surging demand is the primary reason for supply chain difficulties, trade policy has contributed to the problem. The tariffs imposed by President Trump make imports more expensive, and limit the availability of some goods altogether. While President Biden has taken some administrative actions to relieve supply chain difficulties, an important step that he has not taken is broad-based removal of these tariffs. Lower tariffs would reduce the price of imported goods, both final goods and inputs into US production. Lower tariffs might also generate new supply routes for imports, routes that would avoid the congested Southern California ports.

Since the problems in the supply chain are multi-faceted and interlocking, it is difficult to grasp the scale of the problem, or how long it might last. One aspect of the supply chain problem that affects export-oriented agriculture has been the run-up in freight costs, especially the costs of international shipping. A look at these costs is perhaps informative about the broader situation.

Figure 1 shows the “Baltic Dry Goods Index,” the best summary measure of the costs of moving bulk freight. Figure 1 shows the index from 1985 to the present. Looking narrowly at recent events, one can see a rapid run-up in freight prices since the end of 2020 (when the index was at approximately 1000 on the scale). Bulk freight rates peaked in October 2021 at levels that were nearly six times higher than they had been 10 months earlier. More recently, freight rates have fallen back; they are now only three times last December’s rates. It is hazardous to guess how quickly freight rates might normalize, but the history of the index offers some hope. During the Financial Crisis of 2007-8, the index was much higher than today – more than three times its current level. During that time, shipping rates came quickly off their highs, but remained volatile for a period of another two to three years. Current fluctuations are not so extreme, but we should probably take the lesson that full normalization of freight rates is unlikely to occur in 2022. It also seems likely that many of the other problems in the supply chain will ease throughout 2022, but not be completely resolved during the next year.

Figure 1. Baltic Dry Goods Index, 1985-Present



Source: <https://www.marinevesseltraffic.com/1998/01/baltic-dry-index-bdi.html>

China

The most difficult trade policy problem facing any U.S. President is dealing with China. Several of the international challenges that President Biden is pursuing require China's cooperation (notably the supply chain problem, the Covid-19 pandemic, and the mitigation of climate change). But at the same time China's is widely seen – in the US and elsewhere – as having flouted World Trade Organization rules. Since the multilateral system relies, to a large degree, on countries voluntarily adhering to commitments they have made, China's intransigence is seen as an important challenge/threat to that system.

To date, President Biden has taken relatively few trade policy actions that relate to China directly. President Trump's tariffs have been kept in place, but there has not been an escalation of the trade war. But there is potential friction coming. Stung by criticism of its mismanagement of the trade war, the Trump administration negotiated what they called a "phase one" agreement with China during its final year in office. This was an unusual trade agreement in that the focus was not on specific trade policy commitments from China (such as permanent reductions in tariffs on certain goods). The Trump administration instead wanted - and received - a commitment from China to purchase an additional \$200 billion of US products (compared to 2017 purchases) during the years 2020 and 2021. \$80 billion of the \$200 billion were to be purchases of agricultural products. Bown (2021a) shows that those commitments have not been met. One question the Biden Administration will face is, what to do about this shortfall? An effort to punish China might risk a reignition of the trade war, exacerbating the supply chain

problems. Nonetheless, it appears that the administration plans to attempt to enforce the deal (Bown 2021b).

US policy and the international trading system

One of the key ways that we should expect the Biden Administration to differ from its predecessor is its approach to managing trade relations with traditional US allies in Europe and elsewhere. President Trump's combative approach saw US relations with these allies deteriorate. Most notably, President Trump imposed iron and steel tariffs on "national security" grounds, but nonetheless included traditional US allies in the list of exporters to be taxed. Those countries responded in kind, imposing tariffs on many US exports, including agricultural goods and food items. More importantly, the tariffs alienated countries who would have been receptive to a collective effort to respond to China's violation of WTO rules (a collective effort would be more likely to produce results). As expected, President Biden has sought to ease tensions with traditional US allies. An October agreement with the European Union removed tariffs on imported steel from the European Union (Amaro 2021).

While the President's handshake diplomacy with the Europeans is an important step in rebuilding the international trading system (a system that is critically important for export-oriented agriculture), the President has also pushed policies that pose risks to that system.

First, the agreement with Europe included an agreement to impose tariffs on steel and aluminum from countries that do not impose a price on carbon. While this approach makes sense as climate policy, carbon tariffs have not yet been reconciled with longstanding rules about how countries should structure their trade policies (Hayashi and Schlesinger, 2021).

Second, President Biden (along with Congress) has imposed more stringent "Buy America" provisions as part of the major infrastructure package that the President signed in November. These provisions will make the construction of new infrastructure more costly than it needs to be; they will also likely conflict with past US commitments on open trade. The legislation itself says that the new rules are not to contradict past trade agreements, but it seems unlikely that this will be true, in practice. US trading partners - especially Canada - are concerned that the new rules run counter to past agreements, and have threatened to respond in kind (Ljunggren 2021).

Summary

The international trading system is critically important for producers of export-oriented agricultural products. President Trump's trade policy actions gravely undermined this system. One key question that was unresolved last year is what actions President Biden would take take

in the wake of the chaos President Trump left him. By now, it seems clear that trade policy is not a key priority of the Biden administration, but that several other Biden Administration priorities affect, and are affected by, international trade. Some progress has been made with respect to restoring normal trade relations with Europe. But President Biden, like President Trump, appears ready to use unilateral trade policy, albeit with different goals. Unilateral trade policy has domestic political appeal, but it risks undermining the international system that rewards US agriculture so handsomely. Unilateral policies pursued over the last five years have also contributed to the current difficulties with the supply chain.

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PURDUE

AGRICULTURAL ECONOMICS REPORT

Title: How might the past four years of economic shocks inform the next Farm Bill agenda?

Author: Roman Keeney

Article ID: PAER_2022-4

Tags: Farm Bill; Emergency Payments; COVID; Trade War

Summary: Payments to farmers have spiked the past four years from trade war and COVID assistance. Should the next Farm Bill expand its criteria for emergency assistance to wider economy shocks?

Each year I begin my Agricultural Policy course for undergraduates with a discussion about “What is Agricultural Policy?” Readers of the PAER probably already understand that the punchline to that talk is “everything!” In fact, a significant learning objective of that course is to develop an understanding of how policies that are not specifically aimed at agriculture might end up causing adjustments in the food and farm economy of the US.

The global trading system and pandemic shocks that have dominated economic fortunes of the past four-plus years have made the “everything is agricultural policy” clear in the data – as agricultural support payments have spiked to a level that averages to nearly 30% of net farm income over the 2018-2021¹ period. This is nearly three times the rate of support (12%) observed in the previous six years (2012-2017).

As we consider where we are in the “Agricultural Policy Legislative Clock” created by the expiration of the 2018 Farm Bill (at the end of the government’s fiscal year 2023), the political

¹ All data used in this brief are from USDA reporting (see references). All data and calculations that incorporate a 2021 value should be taken as “Forecast” since those data will not be completed and finalized in government reports until later in 2022. The forecast values used are those supplied by USDA reporting.

calendar (2022 is a federal midterm election year) and federal pandemic response (economic support payments appear to be winding down) it is instructive to look at the past ten years in agricultural income and policy support payments to give some guidance on the outlook for food and farm policy.

Farm Support – Ten Year Review

In Figure 1, we see the ten-year history of farm payments as a percentage of national net farm income – including the 2012-17 and 2018-21 breakouts that were cited in the previous section. The graphic indicates a dramatic rise in the relative role farm support plays in net farm income starting in 2019 when the largest tranches of trade adjustment payments under the auspices of USDA’s market facilitation program (MFP) were delivered. These payments began in 2018 and many of the payments received in 2019 were based on previous year’s estimated losses from retaliations against US trade measures aimed at NAFTA partners and China.

A renegotiated NAFTA (set to begin in July 2020) and a phase 1 agreement with China (reached in January 2020) promised a settling of some of the biggest shocks facing agriculture with hopes that the 2020 crop year would transition the sector back to a “more normal” equilibrium with resumed market access to larger importers of US agricultural products. The news of a phase 1 deal with China was coupled with uncertainty about actual enactment as that was the same time that international reports indicated the possibility of a global pandemic which would surely play havoc with the global economy.

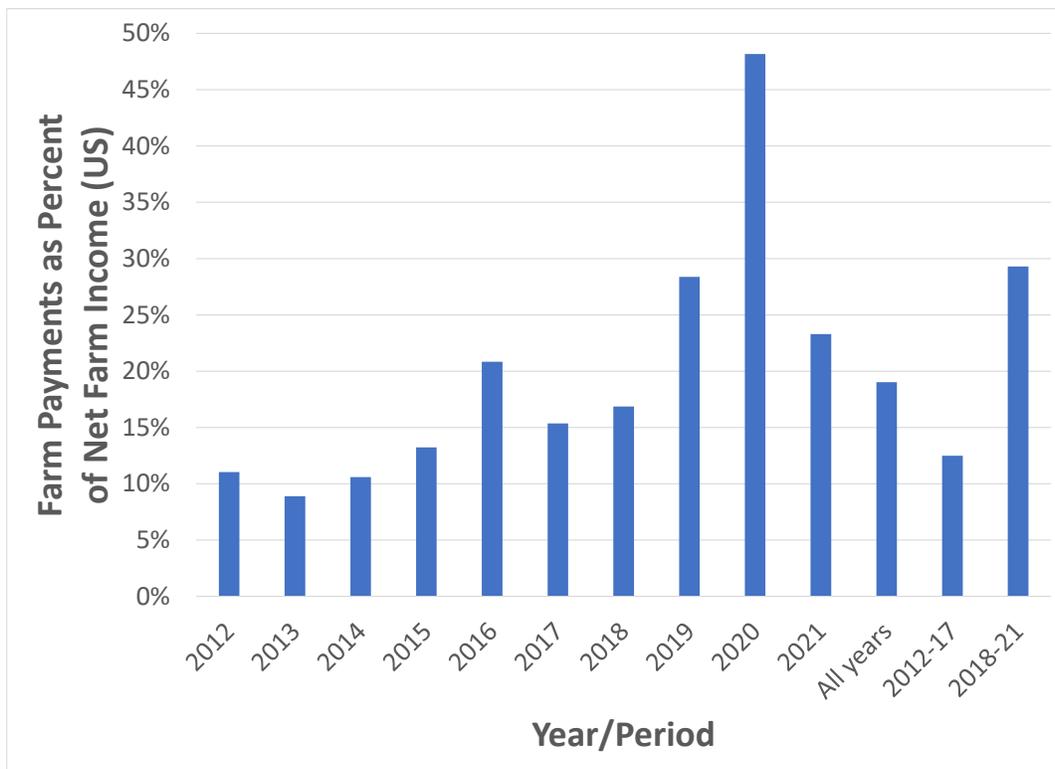


Figure 1. Government payments as a percentage of national net farm income.
Source. Author’s calculations using USDA reports (see references).

This of course came to fruition and nearly all economic activity since early 2020 has to be viewed through the lens of pandemic response. For agriculture this appears as a large government transfer in 2020 (\$24 billion in USDA administered pandemic assistance plus \$6 billion directed to agriculture from outside USDA) that accounted for more than half of government spending in agriculture that year. Subsequent to the 2020 USDA allotment for the pandemic was an additional \$16 billion in 2021 (from USDA and other administered funds).



Figure 2. Role of trade and pandemic payments in agricultural support, 2012-21
 Source. Author’s calculations using USDA reports (see references).

Figure 2 gives some perspective on both the baseline agricultural support programs as enacted in traditional farm bill programs and the role of government response to economic shocks that affect agricultural incomes. The solid bars in the graph representing “traditional payments”² produce the pattern one might expect observing the farm economy in the US over that time period. The past ten years has seen an increasing role for federal crop insurance as a protection against income losses which has relegated direct outlays to producers as those with a programmatic focus that is not farm incomes (e.g., conservation) or the so-called “shallow loss” programs that seek to stabilize farm incomes against sustained small reductions in farm earnings. It is not surprising that 2020 and 2021 saw these shallow loss claims increase given the economic shock of the pandemic permeating into farm prices and incomes.

² Here, traditional payments refers to direct transfers received by farms. This includes the various income and price support programs (e.g., ARC, PLC) as well as conservation program payments. It does not include crop insurance premium subsidies (the farmer sees those only as a reduced cost for crop insurance) nor indemnities. We focus on payments made to producers only here to key in on the role of traditional and emergency support to agriculture that show up as direct transfers.

While the pandemic response funds have been duly legislated, the 2018-19 emergency response to losses incurred through the trade war were provided at USDA’s discretion using the market facilitation program. These payments were made based on formulae developed by the department to determine the losses associated with trade retaliations aimed at agriculture. Even though these payments were made under pre-existing legislation, they can be viewed as similarly *ad hoc* because the trade loss assistance formulae are not permanent features of the legislation.

Taken as a whole, the data in figure 2 demonstrate a functional farm policy design that is geared to deliver between ten and fifteen billion dollars per year to agriculture through the various programs income support programs as well as programs that benefit agriculture while pursuing other objectives in areas of rural development or conservation.

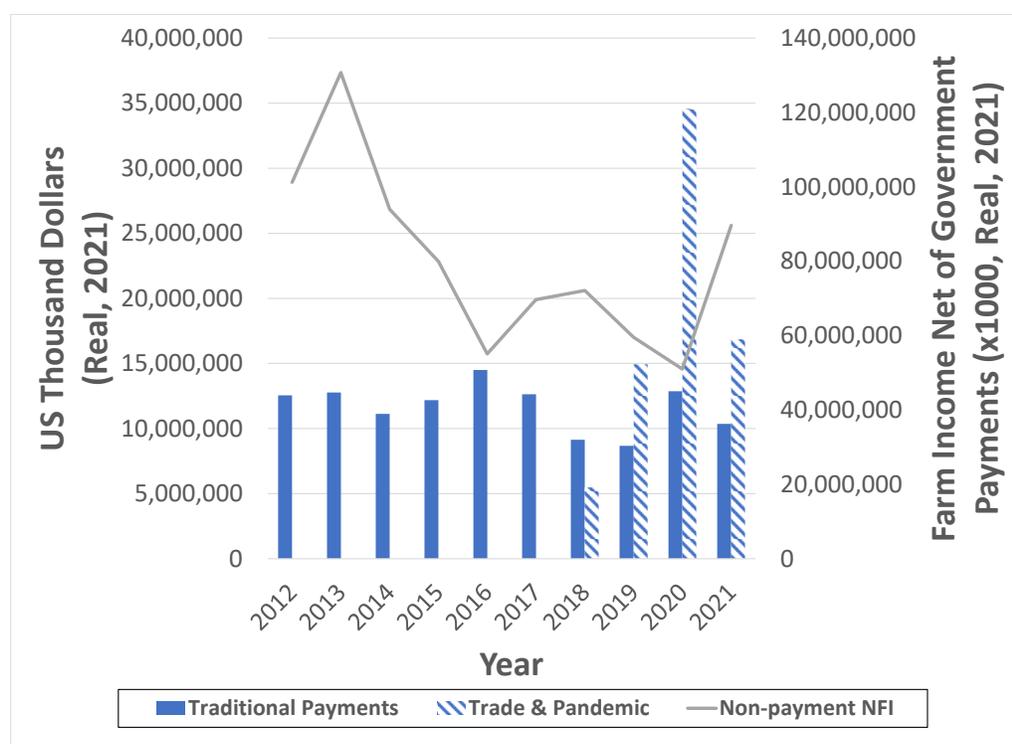


Figure 3. Farm earnings vs. support payments, 2012-21
 Source. Author’s calculations using USDA reports (see references).

In Figure 3, we add the role of farm earnings (measured as national net farm income less receipts from government) to the traditional and emergency support measures we saw in figure 2. In this graphic, the farm earnings measure is read from the right-hand axis while government support levels are read from the left. The data make clear the more limited role for direct government support in traditional programs. The declining net farm incomes in the period 2012-2017 were met with small changes in direct support – by design. The transition of the farm safety net to crop insurance and shallow loss coverage means that we would not expect volatility in farm incomes year-over-year to show up similarly in direct government outlays.

The last four years of the data show total government disbursements to agriculture to be large and quite responsive to the levels of income decline in agriculture with trade adjustment and pandemic relief payments being triggered by the declines seen in the aggregate income measure displayed. Note that approximately the same level of agricultural earnings (net of all government transfers) is seen in 2016 and 2020. Only in 2020, when there was a large economy-wide shock did income support arrive in the form of pandemic relief and stimulus. Agricultural incomes in 2016 were dependent on a small increase in the programmatic funds seen in the graph plus indemnities in insurance contracts to stabilize income levels at a national level.

Closing Thoughts

This brief examination has clarified a pair of summary thoughts as we consider the evolving role of government in the agricultural economy. First, the farm support structure, first begun with reforms to direct payments envisioned in the 2008 and 2014 Farm Bills, appears to be working as planned. Programmatic payments are relatively constant, leaving the income stabilization role to an expanded crop insurance program. Second, when there is a broad economy-wide shock, government response (executive and legislative) in the form of *ad hoc* actions that include agriculture have been key in supplementing the farm bill's limited payment options.

Taken together, these would seem to signal that the reforms of farm spending embodied in the last two Farm Bills are working as intended – if the thinking is that major economy-wide shocks will see agriculture as a full and proportional beneficiary of any *ad hoc* efforts at stabilization. If Congress wants to take a more direct role in defining when *ad hoc* assistance is considered and activated for agriculture, expanding the directions to the executive branch and USDA in the various existing programs like MFP or disaster relief would be an important step. It's clear that a more limited role for program payments in the farm safety net has taken effect, an important consideration for participants in the next debate over farm bill legislation look to the specifics of how the agricultural economy responds to large economic disruptions in trade, supply chain, health etc. and make clear in the legislation whether and when emergency provisions within the farm bill should be triggered by these broader economy shocks rather than just the traditional weather and drought related programmatic efforts. As the agricultural economy's fortunes continue to be influenced by policies and shocks that originate outside of agriculture, the farm bill's safety net design needs to make explicit consideration of this.

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PURDUE

AGRICULTURAL ECONOMICS REPORT

Title: The Year of Food Price Inflation

Author: Jayson L. Lusk

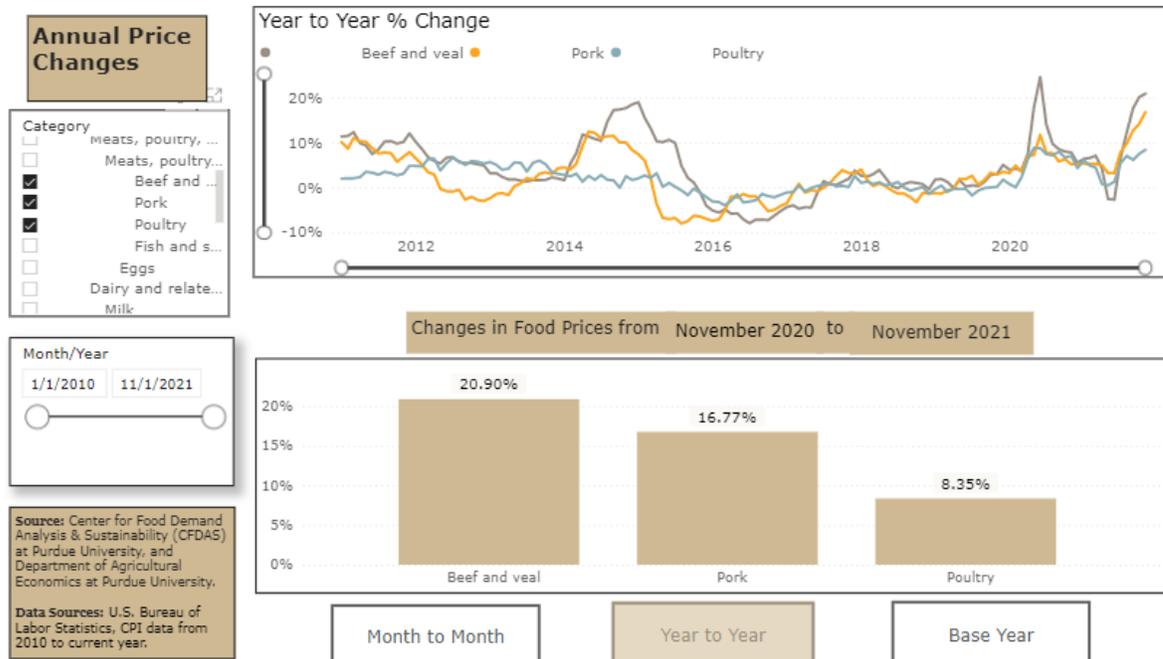
Article ID: PAER_2022-5

Tags: Food prices, inflation, consumers

Summary: Almost two years into the pandemic, concerns about empty grocery shelves have been replaced by concerns about higher food prices. Increases in wages in the food sector, rising agricultural commodity prices, transportation bottlenecks, and strong consumer demand have led to the highest annual grocery price increases in a decade and the highest annual restaurant price increases since the early 1980s.

2021 will likely be a year remembered, among other reasons, for the rising prices that hit U.S. consumers. In November 2021, [prices of food](#) bought through grocery were 6.4% higher than the year prior in November 2020. The last time grocery prices increased at this annual pace was in late 2008. Likewise, prices of food away from home through restaurants rose 5.8% from November 2020 to November 2021, the sharpest annual increase since 1982. The biggest contributors to the food price increases have been meat products. Beef, pork, and poultry prices increased 20.9%, 16.8%, and 8.4%, respectively over the course of the past year. To visualize these and other price changes, see the interactive [dashboard](#) created by the Department's new Center for Food Demand Analysis and Sustainability (CFDAS).

CHANGES IN U.S. FOOD PRICES



There are three broad reasons for the run-up in food prices. The first is overall inflationary pressures caused by macroeconomic phenomena. There was a [dramatic increase in money supply](#) brought about by expansion of unemployment benefits and stimulus-type spending in response to the pandemic. As result, [personal savings rates](#) have been at unprecedentedly high levels through much of the pandemic. More dollars chasing fewer goods has led to an across-the-board rise in price levels. The overall consumer price index less food was up 7% in November 2021 relative to the same month the year prior. This is the highest rate of annual inflation since 1982.

Extra money in consumers' pockets points to a second driving factor behind food price inflation: increased demand. Total inflation-adjusted [consumer spending](#) on both food at home and food away from home in October 2021 were both 14% higher than before the start of the pandemic in January 2020. There has also been strong demand for U.S. agricultural products abroad. The value of [U.S. agricultural exports](#) through the first 10 months of 2021 was 20.7% higher than the same time period in 2020, and 22.6% higher than the same time period in 2019. Foreign customers buying U.S. agricultural products has helped pull up prices at home.

Finally, there are supply-side factors contributing to the increase in retail food prices. Grain and oilseed prices have been higher in 2021, and this has pushed up the cost of feed for livestock and poultry. Challenges finding sufficient labor in the food and agricultural sector have led to rising wage rates. For examples, since before the start of the pandemic in January 2020, [average weekly earnings](#) of all employees is up 16.3% in food service (i.e., restaurants), 8.9% in food manufacturing, and 14.9% in food and beverage (i.e., grocery) stores. Higher retail food prices are reflecting these higher wage rates. Additional challenges associated with transportation and supply chain logistics have added further costs to the system.

Attempting to forecast future food prices is fraught with peril, but it may be more instructive to ask what will have to change for the inflationary pressures to dissipate? The “great resignation” and tight labor market has pushed up wages and presented challenges in getting food from farm to fork. Until the labor market disruptions subside, the challenges in the food supply chain are here to stay. In addition, COVID-19 continues to shift consumer buying patterns, close schools and daycares, disrupt operation of food processing facilities, and affect some people’s willingness to work in “front line” jobs. In this sense, curing COVID-19 will also help cure food price inflation. Reigning in federal spending will also help halt the rise in prices. The USDA Economic Research Service [is projecting](#) a slow-down in food price inflation, forecasting a 2 to 3% annual price food increase in 2022. It should be noted that, at the same time last year, this is the same range they projected for 2021. Only time will tell as to whether food price increases are, again, dramatically under-estimated.

Finally, it is important to put food price rises in context. Focus should not be on prices per se, but on consumers’ buying power. As noted, wages in the food industry have risen alongside rising food prices. At least in the food sector, the increase in wages has been sufficient to enable consumers to buy more food despite the higher prices. The same is not true for all workers. After adjusting for inflation, [average weekly earnings](#) of all private employees in the U.S. economy was down by 1.9% in November 2021 relative to November 2020. At this broad level, consumers’ buying power has fallen over the course of the past year, emphasizing the need to seek remedies for the current inflationary pressures.



PURDUE

AGRICULTURAL ECONOMICS REPORT

Title: Dairy and Milk Markets in 2021-2022

Author: Nicole Olynk Widmar

Article ID: **PAER_2022-6**

Tags: Dairy; Milk

Summary: Total US cow numbers and milk production have declined in the second half of 2021 placing upward pressure on prices heading into 2022. Changes in consumption have been highly product specific and the discussions surrounding fluid milk consumption, especially among children, continue. Potential changes in preferences surrounding milk fat content in products are worthy of watching in the coming years.

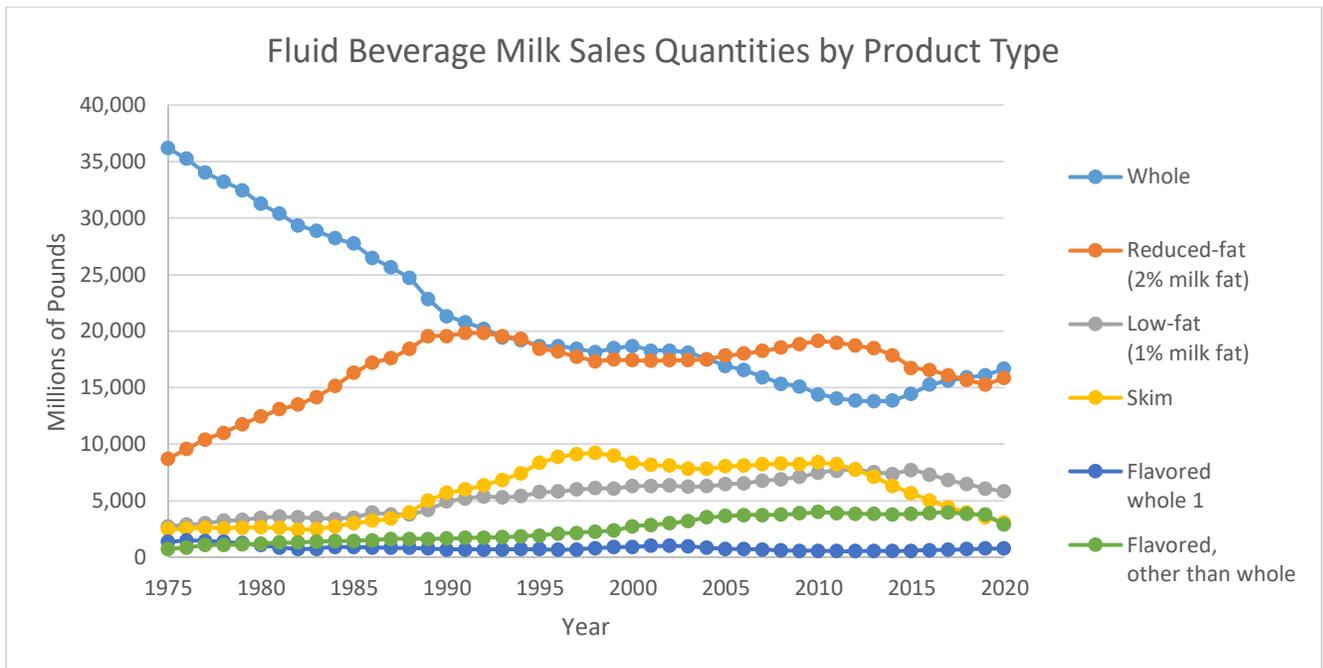
The end of 2021 marks a 6 month run of declining U.S. milk cow numbers; U.S. milk cow numbers have declined each month since June 2021. From mid-June to early June 2021 the federally inspected dairy cow slaughter activity was up over corresponding weeks in 2020, but recently is below corresponding weeks in 2019. As of October 2021 the year-over-year growth in milk supply fell below October 2020 after sluggish growth numbers foreshadowed in August and September. For 2021 Q4 dairy cow numbers are projected to average 9.395 million head. Average milk per cow in Q4 is projected down 10 pounds per head from November's forecast. Taken all together the all U.S. milk production forecast has been lowered for 2021 and 2022, while prices are forecasted higher, according to the latest [USDA Economic Research Service Situation and Outlook report](#) (Dec 2021).

Last year's concerns in dairy markets were heavily fueled by [COVID-19 associated closures, short-lived but highly publicized milk dumping, and food away from home versus at home consumption](#). In 2021 the domestic use varied significantly across types of dairy products, with significant decreases reported for dry skim products and the largest increase in domestic use for Q3 being reported in November for butter, up 10.1% year-over-year.

Fat Content and Fluid Milk

While perhaps not headline leading specifically in 2021, fluid milk consumption trends remain a heavily debated aspect of milk demand and markets. A recent report, [Examining the Decline in U.S. Per Capital Consumption of Fluid Cow's Milk, 2003-2018](#) was released by USDA, ERS researchers delving into milk uses and consumption by children, teenagers, and adults. U.S. per capital consumption of fluid cow's milk has been in decline for over 70 years, falling at an

average rate of 1% per year during the 2000s and 2.6% per year in the 2010s. Investigating fluid beverage milk data available from [Dairy Data files from USDA ERS](#), it is suggesting that the overall sales quantities by fat content may be worthy of investigation.



While the decrease in whole milk is evident over the time period shown, the more recent upward turn in total whole milk sales may be of interest, especially in light of [recommendations for milk fat consumption by children by the American Academy of Pediatrics](#).

Fluid milk and dairy products are often associated with children's diets, [spurring our recent investigation into consumer purchases in households with and without children present](#). We have found that households with children indeed bought dairy differently, buying not only higher total quantities of milk but also milk with higher fat content. Nonetheless, debates continue surrounding milk fat consumption, and given the ongoing economic and political concerns surrounding school meals and milk provision, especially considering school closures (or the threats of school closures) due to the ongoing pandemic.

Dairy Markets

Overall 2021 export projections are higher, by approximately 2.5 billion pounds (on a milk-fat basis); exports of cheese, butter, dry skim products, whey, and lactose are expected to remain strong. Imports are raised slightly on a milk-fat-basis, largely due to imports of cheese and butterfat. ERS is forecasting lower ending stocks on a milk-fat basis and domestic use up 0.3 billion pounds on a milk-fat basis. Taken all together we can summarize as higher use, lower ending stock projects, lower cow numbers and production ... all factors expected to exert upward pressures on prices. All-milk for 2021 Q4 was projected in the ERS Dec 2021 report at \$20.45 per cwt, which is an increase of \$0.45 over the November forecast. All 2021 all-milk is forecasted at \$18.60 per cwt, which is an increase of \$0.10 over November's forecast. Currently the 2022 all-milk forecast is \$20.75 per cwt, which is up \$0.50 from November's forecasted price and is bolstered by expected higher Class III and Class IV price projections.



PURDUE

AGRICULTURAL ECONOMICS REPORT

Title: 2022 Purdue Crop Cost and Return Guide

Author: Michael Langemeier, Professor, Department of Agricultural Economics

Article ID: PAER_2022-7

Tags: Contribution Margin, Crop Costs

Summary: Despite substantially higher production costs, it is not out of the realm of possibility to see positive margins in 2022, particularly for rotation corn and soybeans on high productivity ground.

**Figure 1. Fertilizer, Seed, Pesticide, and Cash Rent Cost per Acre
Rotation Corn in Indiana.**

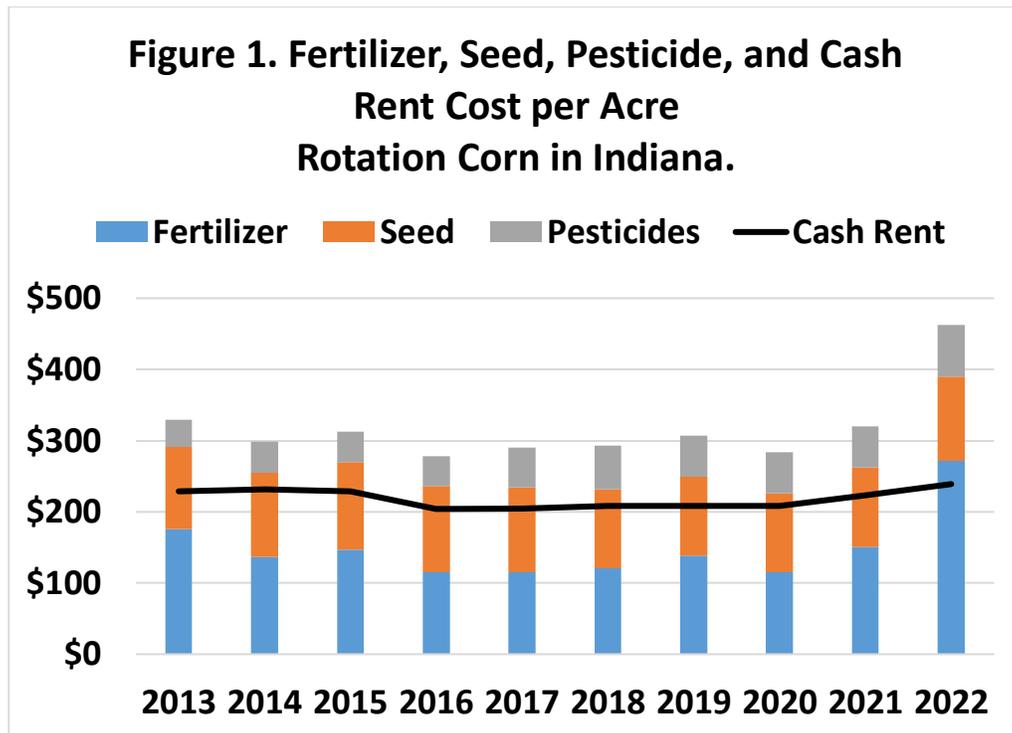


Figure 2. Variable Cost, Overhead Cost, and Gross Revenue per Acre Rotation Corn in Indiana.

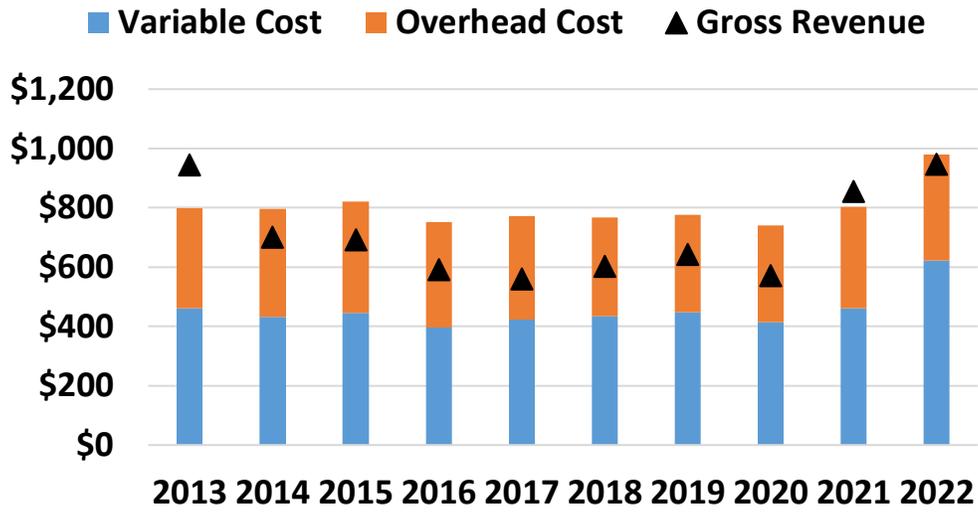


Figure 3. Fertilizer, Seed, Pesticide, and Cash Rent Cost per Acre Rotation Soybeans in Indiana.

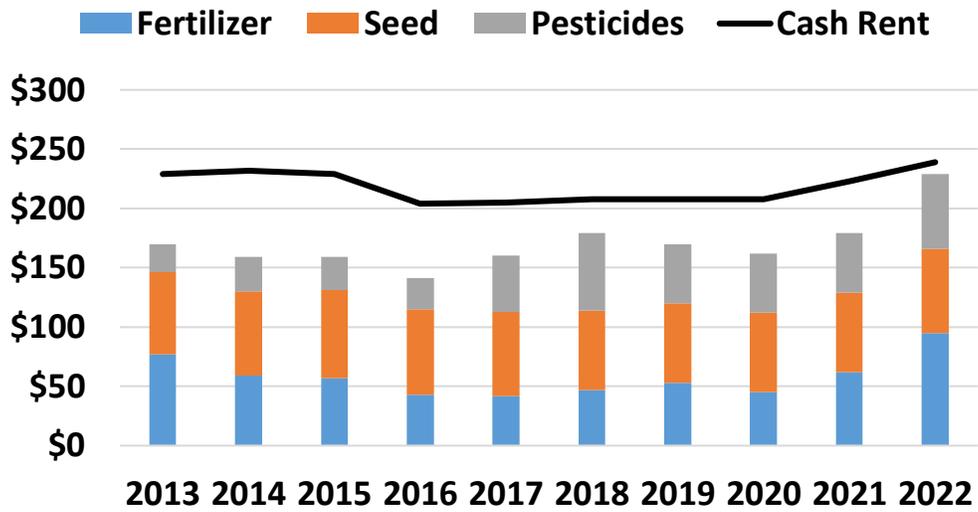


Figure 4. Variable Cost, Overhead Cost, and Gross Revenue per Acre Rotation Soybeans in Indiana.

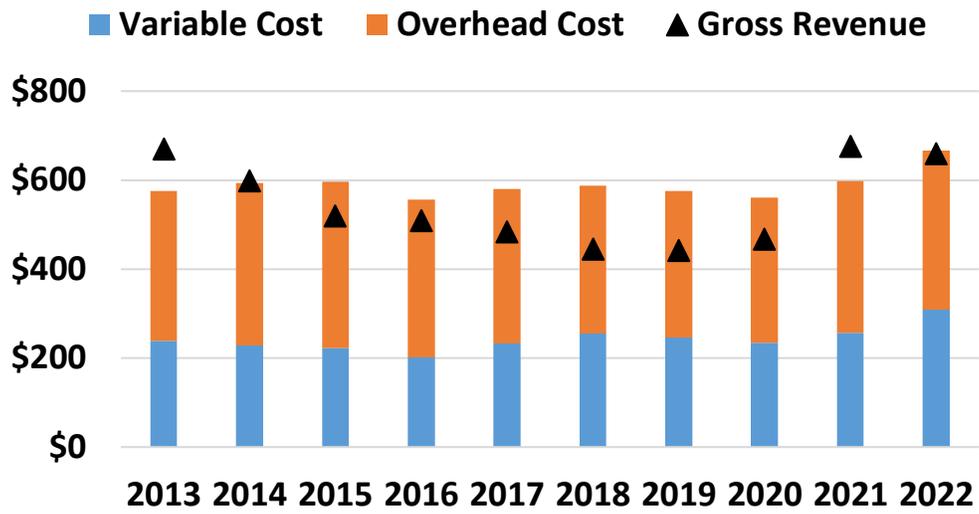


Table 1. 2022 Purdue Crop Budget for Average Productivity Soil.

	Continuous Corn	Rotation Corn	Rotation Soybeans	Wheat	Double-Crop Soybeans
Expected Yield per Acre	171	182	55	78	39
Harvest Price	5.20	5.20	12.00	7.50	12.00
Market Revenue	\$889	\$946	\$660	\$585	\$468
Less Variable Costs					
Fertilizer	303	272	95	158	71
Seed	118	118	71	44	82
Pesticides	73	73	63	38	56
Dryer Fuel	52	42	0	0	5
Machinery Fuel	21	21	13	13	9
Machinery Repairs	22	22	18	18	15
Hauling	17	18	6	8	4
Interest	20	18	9	10	8
Insurance and Miscellaneous	38	38	34	9	9
Total Variable Costs	\$664	\$622	\$309	\$298	\$259
Contribution Margin	\$225	\$324	\$351	\$287	\$209

See [ID-166-W](#) for more detail, December 2021 Estimates.



PURDUE

AGRICULTURAL ECONOMICS REPORT

Title: Farmland Values and Cash Rent

Author: Todd H. Kuethe

Article ID: PAER_2022-8

Tags: Farmland, cash rent

Summary: Both land values and cash rents are likely to increase in 2022.

Farmland Values

Indiana farmland prices set a new record high in 2021. The 2021 [Purdue Farmland Values and Cash Rent Survey](#) indicated that top quality farmland prices increased by 14.1% to \$9,785 per acre. Average quality land values increased by 12.5% to \$8,144, and poor quality land values increased by 12.1% to \$6,441. Farmland prices are determined by a complex set of economic forces, such as commodity prices, net incomes, interest rates, and agricultural policy. In 2021, the Purdue Farmland Values and Cash Rent Survey respondents suggest that all of these forces put upward pressure on farmland prices. Farm incomes and commodity prices were higher than recent years, as was agricultural policy support. Conversely, low interest rates lowered the cost of borrowing. The survey respondents were optimistic about continued growth for the remainder of 2021. In addition, recent results from the [Purdue University-CME Group Ag Economy Barometer](#) suggest farmers remain optimistic about long-term farmland value expectations.

While the prospects for continued farmland price growth seem likely, rising input costs and continued supply chain disruptions may dampen positive price appreciation. As the economy adjusts to changes originating with the COVID-19 pandemic, a large amount of economic uncertainty remains.

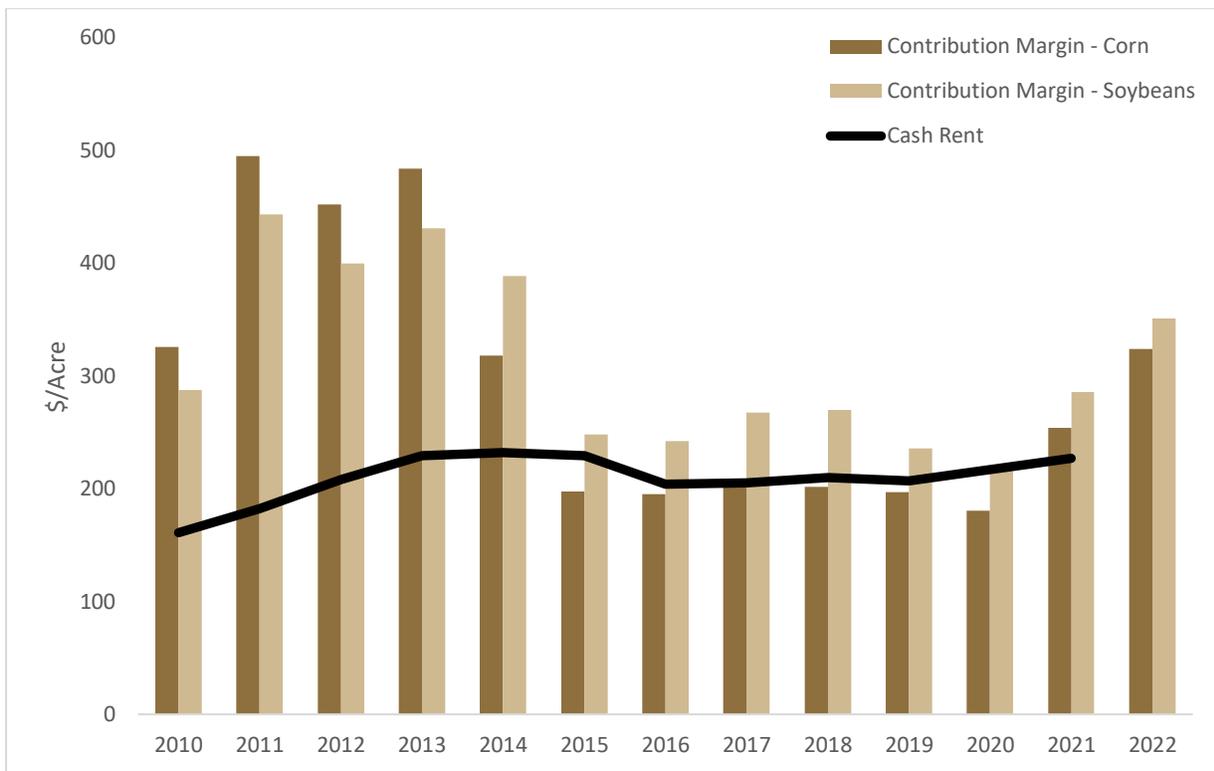
Cash Rental Rates

Cash rental rates also increased across Indiana in 2021. The 2021 [Purdue Farmland Values and Cash Rent Survey](#) indicated that cash rent on top quality farmland increased by 3.9% to \$269 per acre. Average quality land rents increased by 4.6% to \$227, and poor quality rents increased by 4.6% to \$183. Unlike land values, the cash rental rates do not exceed the previous highs set 2013 or 2014. Cash rental rates are typically negotiated well in advance of the growing season, and as a result, rental rates reflect the *expected* costs and returns to production. While commodity prices remained above recent lulls, the expected costs of production may limit farmers' willingness to

pay higher cash rental rates in 2022. At the same time, landowners may expect farm incomes to remain elevated and try to negotiate rate increases.

The recent [2022 Purdue Crop Cost & Return Guide](#) suggests that the contribution margin, the difference between market returns and variable costs, is expected to rise in 2022 for both rotation corn and rotation soybeans. Increasing margins generally sign upward pressure on cash rental rates, as farm operators will have additional revenues to allocate to labor, investment, and land. As shown below, the contribution margin for average quality farmland in 2021 exceed the average cash rental rate, which also places additional upward pressure on cash rental rates.

Figure 1: Cash rental rate and contribution margin for rotation corn and soybeans for average quality land, 2010-2022.





PURDUE

AGRICULTURAL ECONOMICS REPORT

Title: 2022 Agricultural Credit Outlook
Authors: Brady Brewer and Todd Kuethe
Issue: PAER_2022-9
Tags: Agricultural lending, interest rates, market outlook
Summary: Low interest rates, low demand for loans, high repayment rates, and fund availability suggest agricultural credit markets well positioned for 2022

2021 saw low interest rates and increasing land values. Overall, it was a good year for farmers balance sheets for both short-term and long-term assets. Liquidity and solvency were direct beneficiaries of the 2021 environment. This article examines the trends in three key parts of the agricultural credit markets: interest rates, the demand for loans, and non-performing loans. We examine data obtained from the two Federal Reserve banks that serve Indiana. As shown in Figure 1, 68 counties in northern and central Indiana are part of the Federal Reserve Bank of Chicago region, and the remaining 24 counties in southern Indiana are part of the Federal Reserve Bank of St. Louis.



Figure 1: Chicago and St. Louis Federal Reserve Districts

Both Federal Reserve banks conduct quarterly surveys of agricultural bankers in their region. The surveys address important issues in farmland and agricultural credit markets. It is important to note that both Federal Reserve regions cover a large area with diverse agricultural sectors.

Thus, local conditions may deviate from broad, regional trends. At the time of writing, data for the St. Louis Federal Reserve district were available through the third quarter of 2021 through the Federal Reserve Bank of Kansas City's [Agricultural Finance Updates](#), and data for the Chicago Federal Reserve district were available through the third quarter of 2021 through the bank's [AgLetter](#) publication.

Interest Rates

In 2021, interest rates continued the downward trend that started in 2019. Figure 2 plots the average interest rate on farm operating loans since the first quarter of 2015 for both Chicago and St. Louis Fed districts. Farm operating loans are defined as those used primarily to finance current crop production expenses and the care and feeding of livestock (including poultry). The most recent survey results suggest an average interest rate of 4.76% for the St. Louis region and 4.34% for the Chicago region. The rates are the lowest recorded in more than 50 years. It should be noted, that this outlook noted the same thing last year at this time. Interest rates have remained at historically low levels.

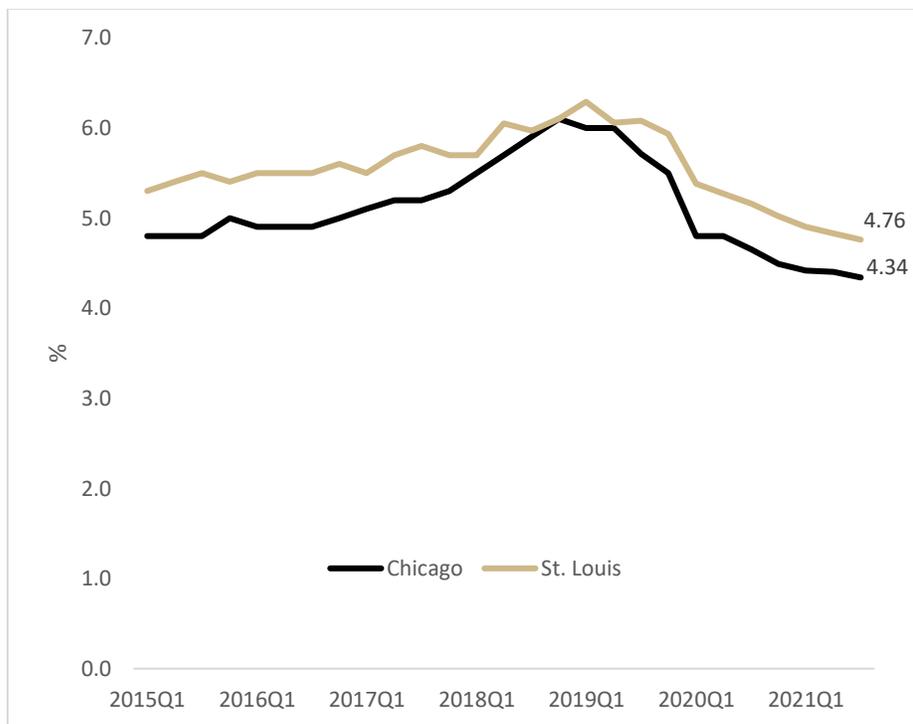


Figure 2 Average Fixed Interest Rate on Operating Loans, 2015Q1 - 2021Q3

Figure 3 similarly plots the average fixed interest rates on long-term farm real estate loans. The most recent survey results suggest an average farm mortgage rate of 4.34% in the St. Louis Fed district and 4.01% in the Chicago Fed district. Again, the rates are at the lowest recorded in more than 50 years.

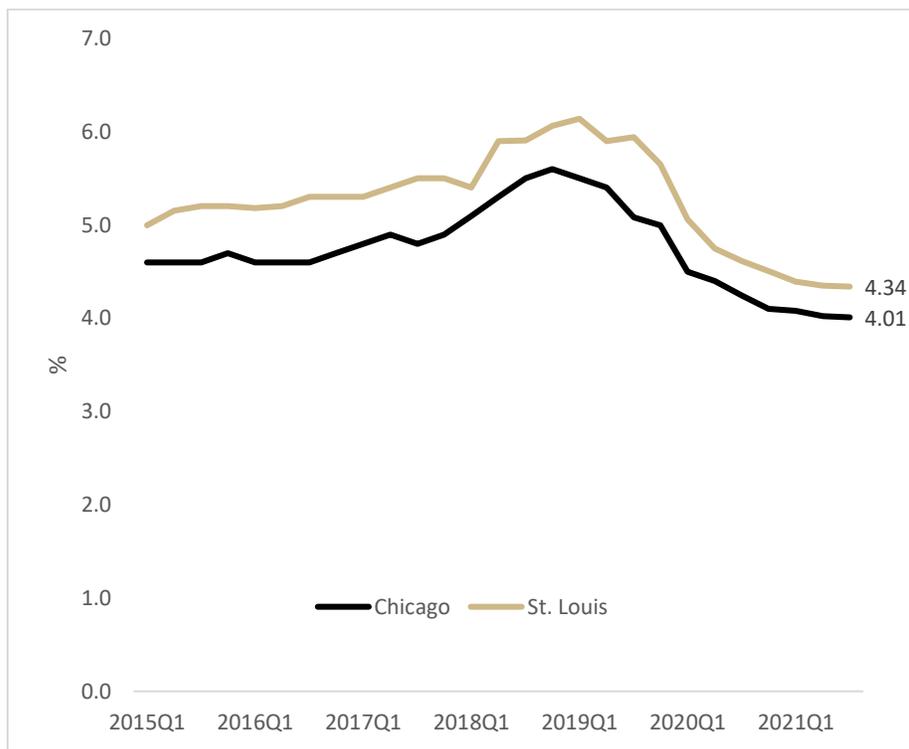


Figure 3 Average Fixed Interest Rate on Long Term Farm Real Estate Loans, 2015Q1 - 2021Q3

The decline in interest rates through 2021 has been a result of the lingering impacts that the COVID-19 pandemic has had on the economy. The Federal Open Market Committee (FOMC) lowered the federal funds rate in early 2020 in response to the onset of the pandemic. The federal funds rate has not been increased since. The FOMC sets the federal funds rate, the rate at which commercial banks borrow and lend their excess reserves to each other overnight, in an effort to control unemployment and inflation. Given the increase in inflation, it is speculated that the FOMC will once again increase the federal funds rate. However, the expectation is for a moderated approach to the increase. While this may cause some concerned for more leveraged borrowers, in the short-term, interest rates appear to be well positioned to stay at the historical lows we currently see. However, in the long-term, the FOMC may take actions that increase interest rates in the foreseeable future.

Demand for Loans

The Federal Reserve Bank surveys ask agricultural bankers to rate the demand for loans at their institution relative to a year earlier. Respondents report whether the demand for loans is “higher,” “lower,” or the “same.” These responses are summarized by a loan demand index, calculated as the share of lenders reporting “higher” minus those reporting “lower” plus 100. Thus, when the loan demand index is less than 100, the demand for agricultural loans is decreasing. Figure 4 shows that the demand for agricultural loans decreased in 2021 relative to 2020, however, the St. Louis Fed reported a diffusion index of 105 for the third quarter of 2021 which indicates a weak sentiment for stronger demand for agricultural loans. The Chicago Fed reported a diffusion index of 78 which indicates a lower demand for farm loans.

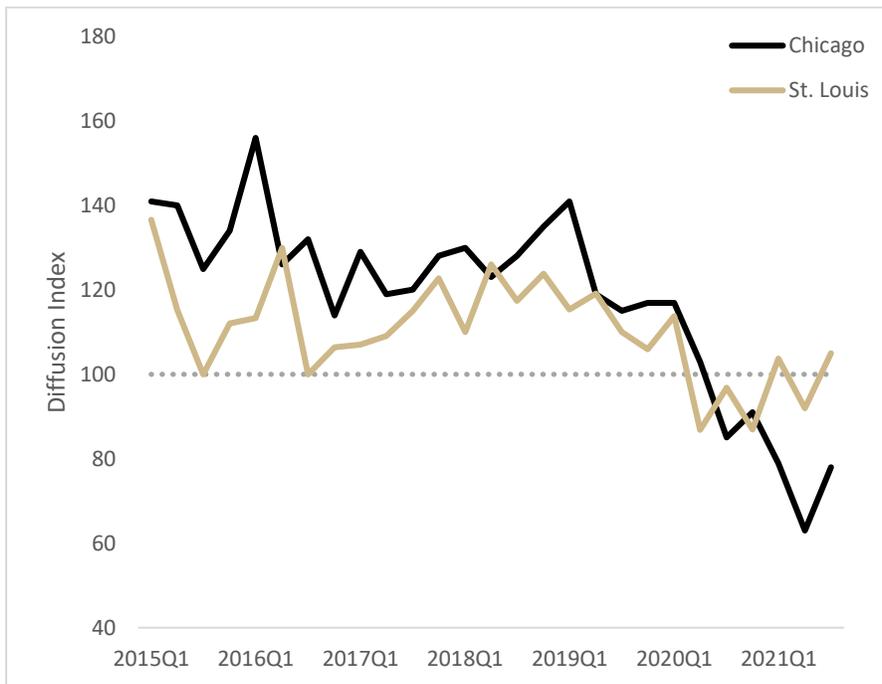
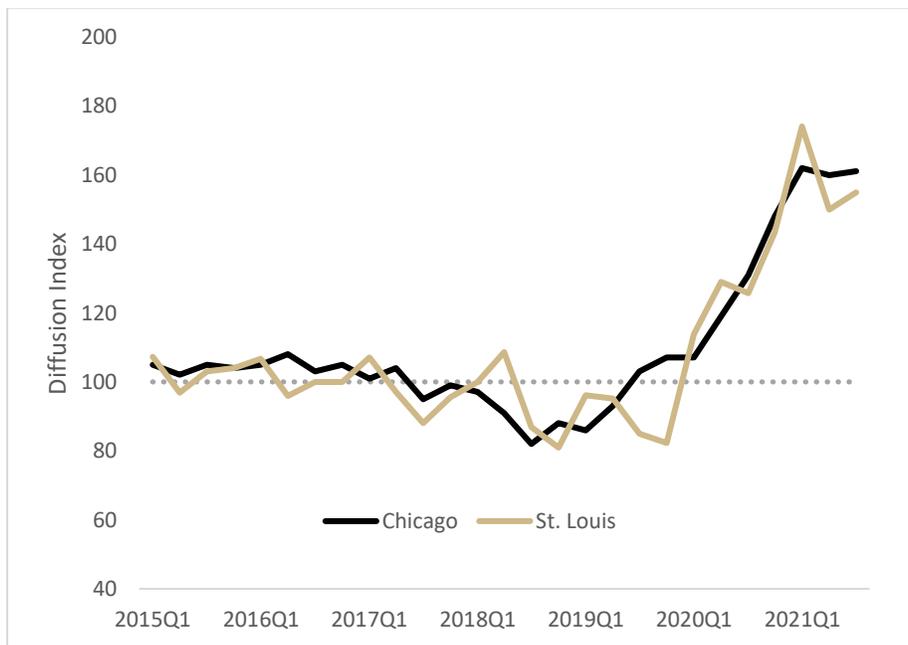


Figure 4 Demand for Agricultural Loans, 2015Q1-2021Q3

It should be noted that agricultural banks are well positioned for an increase in loan demand as agricultural lenders are reporting a higher amount of available funds to loan than in previous years. The similarly constructed funds availability index for both Federal Reserve Banks is plotted in Figure 5.



and St. Louis Fed surveys is above 100, the indexes suggest that farmers were able to pay off a smaller portion of their debt. Loan repayment rates are the worse they have been over the past seven years. This suggests that repayment rates may be slowing across the region and should provide some caution for the agricultural finance sector.

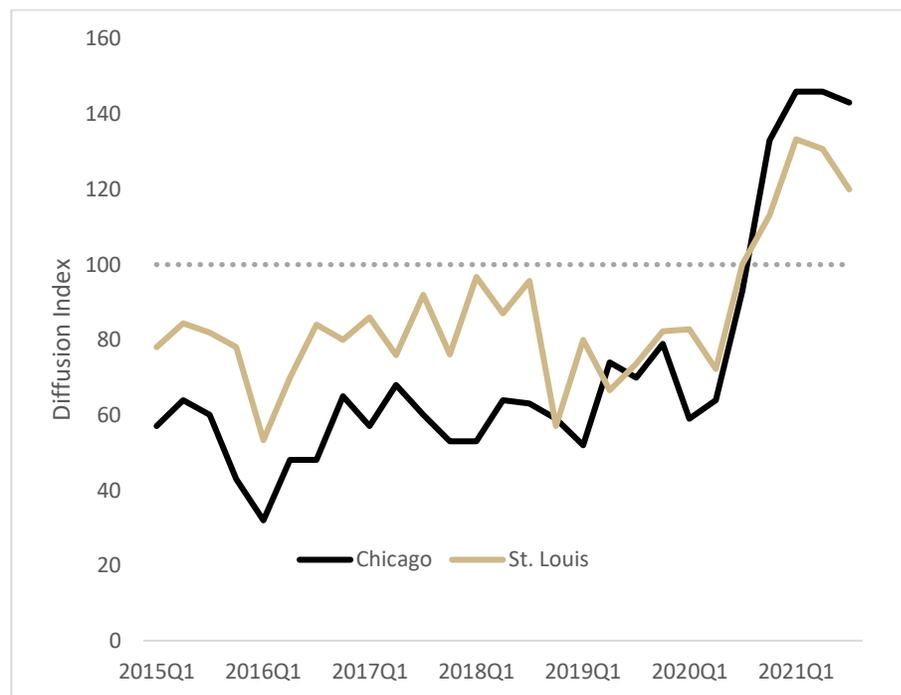


Figure 6 Loan Repayment Index, 2105Q1 - 2021Q3

Overall, the agricultural credit market is riding several positive trends into 2022. Farmers are likely optimistic that interest rates will remain at or near all-time lows, which supports the acquisition of new capital assets. If farm loan demand increases, banks appear to have a sufficient stockpile of funds available to loan. However, there are some negatives at the moment as bankers are reporting higher rates of non-payment from farmers. This would indicate that the liquidity positions of farmers may be deteriorating as they have less cash on hand to pay off current debts. Over the past several years, there have been high levels of uncertainty in the agricultural commodity markets due to the COVID-19 pandemic, political disputes, and supply chain issues. While these are expected to continue at least in the near future, the agricultural credit sector does not have as many concerns. Deteriorating liquidity among farmers and uncertain Fed policy are key drivers to how 2022 will shape the farmers and banks balance sheet alike.

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