2023

THE YEAR AHEAD:

Forces That Will Shape the U.S. Rural Economy

COBANK
KNOWLEDGE EXCHANGE

DECEMBER 2022

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To Our Customers and Business Partners

By Tom Halverson

IF WE HAVE LEARNED ANYTHING over the past couple of years, it is that trying to predict the future is an extremely difficult business. Consider the major events that have defined the operating environment for U.S. companies since the start of 2020: the COVID-19 pandemic, the Russia-Ukraine war, surging inflation. All occurred suddenly and with little warning, catching the world off-guard.

Nonetheless, at this time each year, we at CoBank make a significant effort to anticipate and describe the future trends that will matter to us and to our customers. We fully recognize that circumstances will prove us wrong in many cases. Despite that risk, we believe that the exercise of forecasting – making a concerted, thoughtful attempt to look forward – is a worthy and valuable one. Boards and executive teams that employ such discipline in their businesses will be better informed about themselves and the operating environment – and better able to adapt to disruption when it comes.

In that spirit, it is our privilege to provide our customers and business partners with CoBank's year-ahead report for 2023. Our Knowledge Exchange team of economists and industry analysts has once again assembled a collection of essays about key trends in the rural industries we finance. We hope that our customers and other partners find the report useful as they devise strategies and business plans for the year ahead and position their businesses for future growth and success.

In addition to the insights on the pages that follow, I would ask readers to consider a handful of additional key themes that I personally am thinking about as I reflect on the coming year. They are as follows:

The question of "deglobalization."
From the standpoint of the global economy, the last three decades have proven to be an era of remarkable liberalization and economic integration.

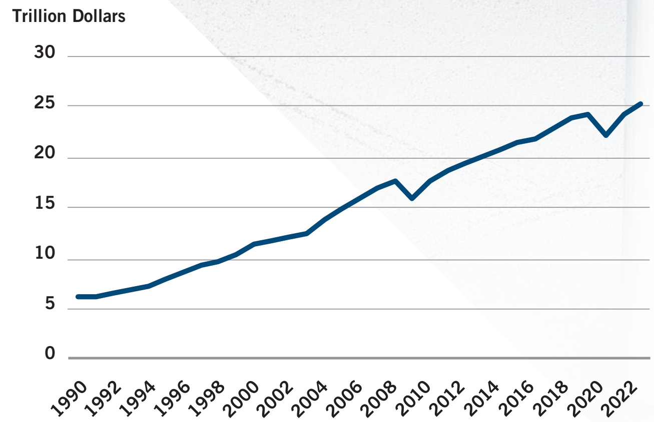
In the United States, we experienced both positive impacts and negative impacts as a result of globalization. On balance, however, I am absolutely convinced that our country was a net beneficiary of this trend.

The end of the Soviet empire in Europe in 1989 and China's decision to open its economy to Western investment in the 1990s helped pave the way for this era of globalization, which drove huge increases in the volume of global trade and much higher overall levels of prosperity. Here in the United States, we experienced both positive impacts (e.g. low inflation) and negative impacts (e.g. the loss of manufacturing jobs) as a result of globalization. On balance, however, I am absolutely convinced that our country was a net beneficiary of this trend. Certainly American agriculture experienced substantial growth in foreign demand for a wide variety of agricultural and food products generated by U.S. farmers, ranchers and farmer-owned cooperatives.

Today, many are wondering if globalization is set to go into reverse. The global economy has suffered multiple systemic shocks, including the pandemic, the war in Ukraine and increased tensions between the U.S. and China. The fallout from these events has cast doubt on the security of international supply chains and the reliability and wisdom of trade dependency, especially of critical goods, on hostile foreign powers.

From today's standpoint, it is not clear what direction the world will take — what new construct will replace the integrated, liberalized global economic system that developed over the past 30 years. This is one of the great questions before us, and its answer has

EXHIBIT 1: World Trade Volume, 1990-2021



Source: World Bank

huge import for industries like agriculture that are deeply intertwined with global markets.

Money is no longer free.

Following the Great Recession of 2008-2009, major central banks around the world adopted a new, highly interventionist posture that radically changed the marketplace for capital. Thanks to near-zero interest rates and quantitative easing programs, debt became almost free for all types of borrowers, including governments, consumers and businesses alike. That environment persisted, more or less unchanged, for the ensuing 14 years.

However, the era of easy money has come to a close. The onset of high levels of inflation in early 2022 forced the U.S. Federal Reserve onto an aggressive tightening path, as evidenced by six rate

Going forward, it will cost money to borrow money, and companies will think and act much differently than they have in recent years.

hikes totaling 375 basis points in the span of just nine months. It has been the steepest series of rate increases since the early 1980s, and it signals a paradigm shift for the world's central banks and for borrowers as well.

Going forward, it will cost money to borrow money, and companies will think and act much differently than they have in recent years. They will need to borrow more prudently, be more selective about investments they finance with debt. This is healthy and not unwelcome, but it will produce changes that will impact decision-making and economic behavior going forward.

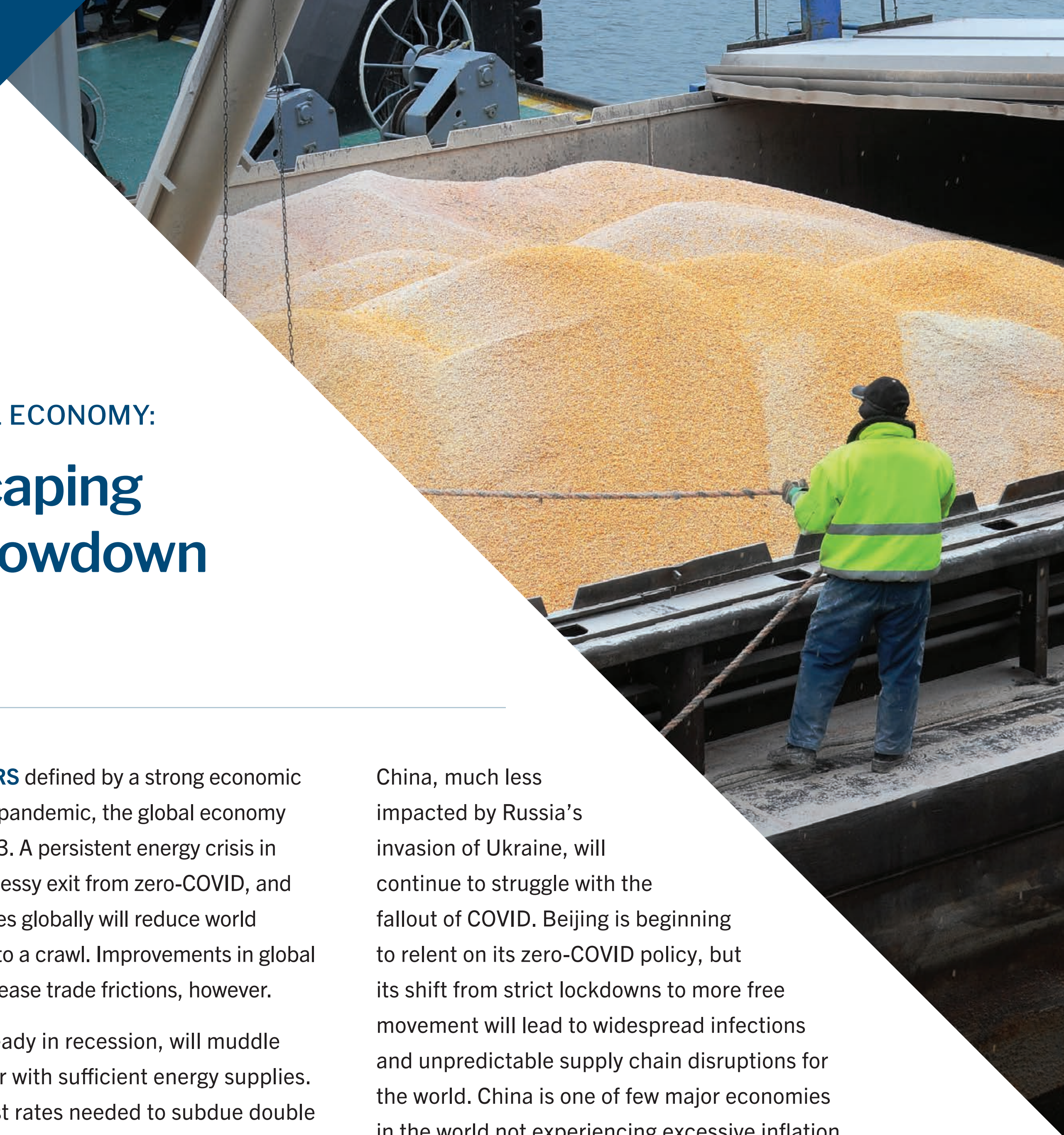
Divided government reflects a divided country. As a result of the recent mid-term elections, the United States will return to divided government in January 2023. We can expect political gridlock to be a dominant feature of federal policymaking as a result. Many will welcome that fact; many others will worry that it will hinder the government from addressing important problems for at least the next two years (including the passage of the new Farm Bill). No matter what one's political leanings are, it is clear that the nation is more divided along political fault lines than at any time in recent memory.

I'll close this introduction by reiterating once again how grateful and honored we at CoBank are for the relationship we have with our customers. Collectively, our customers form the backbone of the U.S. rural economy, delivering food, fiber, energy and other vital services to people throughout the country and around the world. It is a privilege for all of us at CoBank to serve you and stand by you as your financial partner.

With best wishes for the year ahead,

Tom Halverson

Tom Halverson
President and Chief Executive Officer



THE GLOBAL ECONOMY:

No Escaping This Slowdown

By Dan Kowalski

AFTER TWO YEARS defined by a strong economic rebound from the pandemic, the global economy will sputter in 2023. A persistent energy crisis in Europe, China's messy exit from zero-COVID, and higher interest rates globally will reduce world economic growth to a crawl. Improvements in global supply chains will ease trade frictions, however.

Europe, likely already in recession, will muddle through the winter with sufficient energy supplies. But higher interest rates needed to subdue double digit inflation – along with weak industrial activity and sluggish consumer spending – will lead to flat or slightly negative GDP growth in 2023. Energy prices are off their peak, but still 35% higher than Q4 2021, and will remain elevated through 2023. That increases the risk that high inflation and high interest rates will persist, creating a drag on businesses and consumers. The risk of cold winter temperatures and the need to replenish gas supplies again later in 2023 will keep energy prices volatile and their effect on Europe's economy high.

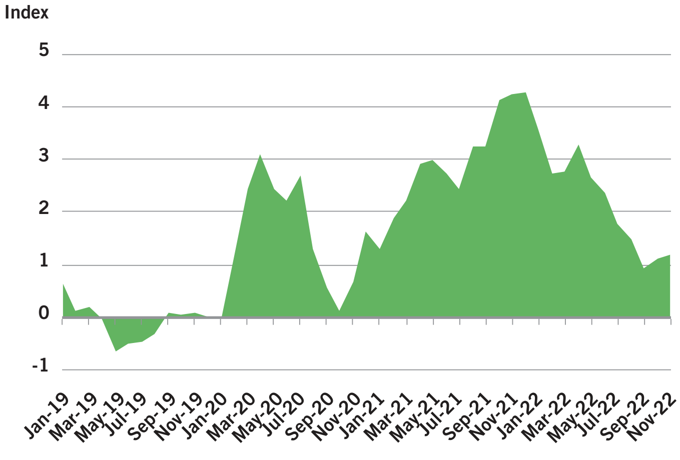
China, much less impacted by Russia's invasion of Ukraine, will continue to struggle with the fallout of COVID. Beijing is beginning to relent on its zero-COVID policy, but its shift from strict lockdowns to more free movement will lead to widespread infections and unpredictable supply chain disruptions for the world. China is one of few major economies in the world not experiencing excessive inflation, but that is largely because of domestic economic weakness. China's GDP growth could reach 4% in 2023, but unpredictable COVID policy and potential waves of infection point to a very uneven year ahead.

China's young workers are reeling from the slowdown, with 20% of them unemployed. And the drag of China's demographics will continue to intensify. As China's population begins to shrink in 2023, it will be surpassed by that of India. Xi's consolidation of power and increasingly concerning rhetoric about Taiwan does raise the prospect of conflict in the region. Though we believe a Taiwan invasion is relatively unlikely in 2023, the global economic impacts would be devastating.

Greater Asia will be negatively impacted by sliding global demand for goods. Fewer semiconductor sales will hurt suppliers in Taiwan even as auto sales rebound and benefit Japan. Beneficiaries of the pandemic-induced binge on goods purchasing – Vietnam, Indonesia, and others – will experience a hangover in 2023. India, though, appears poised to rise in economic prominence. As it benefits from investments in offshoring and manufacturing, India will likely overtake Japan and Germany as the world's third-largest economy later this decade.

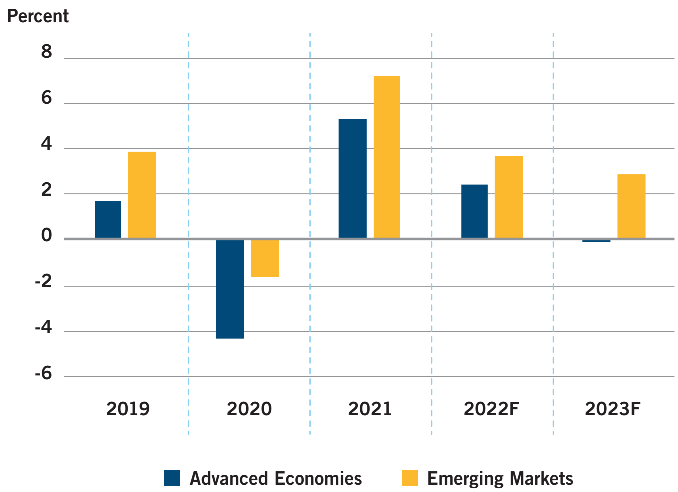
Heading into this slowdown, emerging market economies broadly are much better positioned compared with past cycles. Disciplined fiscal policies, proactive monetary tightening, and less severe inflation problems than in the advanced economies should enable most emerging markets to grow moderately next year, despite a strong dollar that makes borrowing more expensive. Emerging markets will keep the global economy growing in 2023 as advanced economies collectively stagnate, and possibly even shrink. ■

EXHIBIT 2: Global Supply Chain Pressure Index



Source: Federal Reserve Bank of New York

EXHIBIT 3: Real GDP Growth, YoY



Source: Oxford Economics

THE U.S. ECONOMY:

Some Pain is Necessary

By Dan Kowalski

ECONOMISTS HAVE NEVER BEEN this pessimistic about the U.S. economy — at least not since the Federal Reserve started tracking economists' expectations in 1969. Nearly half of surveyed economists expect a U.S. recession in 2023, far exceeding the second-largest figure of 34%, which preceded the recession of 1979-80. The extremeness of this data point can only be fully appreciated in the context of the current unemployment rate, which is near a 50-year low. The best of times and worst of times are forecast to be separated by only a few months.

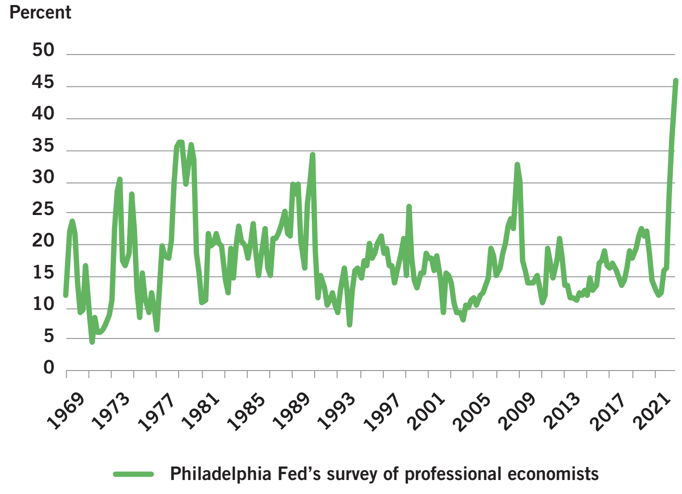
Of course the pessimism stems from the Fed's record-setting pace of interest rate hikes, and the damage that could result. There are real reasons for concern, including the current slump in manufacturing and housing, a deeply inverted yield curve, and the fact that over the past half century inflation over 5% has never been tamed without incurring a recession.

But the U.S. economy still has considerable momentum and is not currently on the verge of recession. The labor market remains very tight, consumers are still spending aggressively, and corporate profit margins have hit record levels despite high inflation. If a recession is coming, it will take several months for these factors to reverse course, delaying any potential recession until at least Q2 2023. Even then, it is unclear how readily businesses would lay off workers after experiencing such extreme staffing challenges over the past two years. Millions of workers in two categories — women and people over age 55 — abruptly left the labor force in 2020, and many of them have not returned. This structural loss of more than 2 million workers is contributing to higher inflation for both goods and services. However, the void that their exit has left could also cushion the economy from the worst of a downturn in 2023.

As financial conditions continue to tighten, we expect the U.S. economy to steadily soften through the first half of 2023, ushering in a brief, modest recession. The number of jobs available and jobs filled will decline, adding slack to the labor market, and easing the upward pressure of wages. The unemployment rate could rise as high as 5%, indirectly leading to a decline in consumer spending. Without this softening in the labor market, and associated slowing of wage gains (supply-side inflation pressure) and spending (demand-side inflation pressure), it will be difficult to stabilize prices. Improving supply chain conditions and moderating commodity prices will generate additional downward pressure on supply-side inflation.

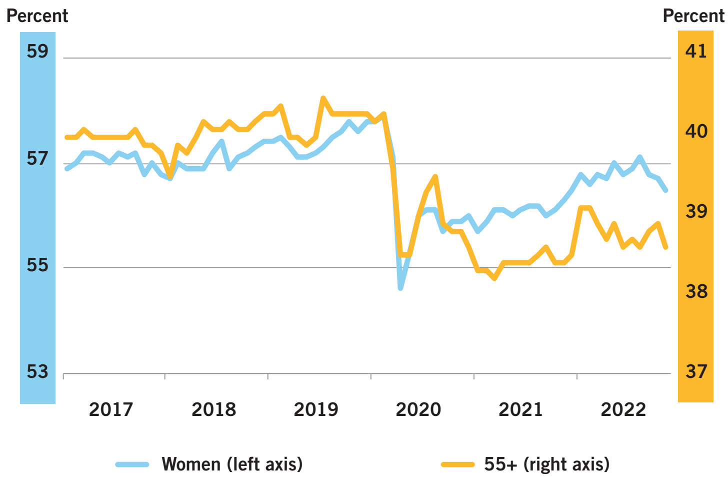
We estimate that this painful yet necessary chain of events will reduce headline inflation to a range of 3.5% - 4.5% by late 2023, and lead to flat GDP growth for the year. ■

EXHIBIT 4: Probability of Recession Over Next 12 Months



Source: Federal Reserve Bank of Philadelphia

EXHIBIT 5: U.S. Labor Force Participation Rate



Source: U.S. Bureau of Labor Statisics

MONETARY POLICY:

Gut Decisions Ahead

By Dan Kowalski

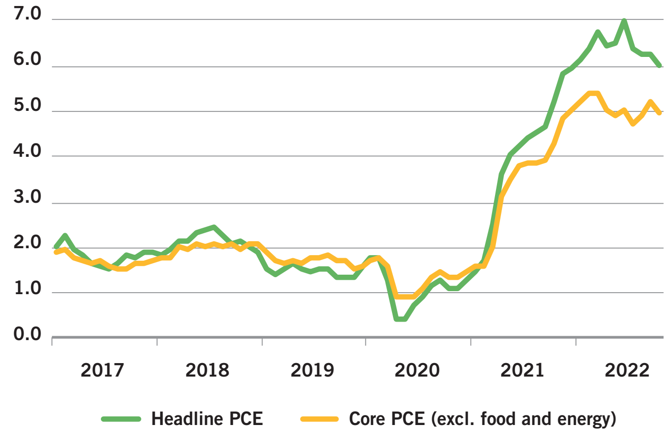
THE FEDERAL RESERVE'S JOB will not get any easier in 2023. In nine months, the Fed has raised its federal funds rate from zero to over 4%. Now, as some economists argue that inflation is falling and the Fed has done enough, Chair Powell and the Federal Open Market Committee will make even tougher decisions about when to halt rate increases. The Fed's preferred inflation measure, the personal consumption expenditures index (PCE), has eased from its peak of 7% to 6%. Still much too high for the Fed's comfort, Chair Powell has vowed to continue with rate increases.

The trickiest aspect of the Fed's inflation fight is that there is no playbook or rule of thumb to tell the Fed when to pause rate hikes. Many lessons were learned in the 1970s-1980s when interest rates reached nearly 20% to tame rampant inflation. But much about the U.S. economy has changed over the last 40 years, and we still lack key knowledge about how inflation responds to interest rate changes. Economists like to call rate hikes a blunt tool when used to lower inflation, meaning that it's not very precise and it causes significant collateral damage. So the Fed does not want to move rates any higher than necessary. But economists also understand that changes in monetary policy do not have an immediate impact. The Fed makes decisions knowing that monetary policy works with "long and variable lags." This means that the timing and severity of impacts from rate changes are very hard to predict.

So the Fed, even equipped with great data and analytical tools, will not know with any certainty when it should pause its rate hikes. Chair Powell has stated that there is greater risk in stopping too early than in raising rates for too long. This is an acknowledgement that inflation was terribly hard to tame in the Paul Volcker era of the 1980s because expectations of high inflation had become embedded in society. So rate hikes are intended to slow corporate investments and borrowing, but also to prevent workers from demanding much higher wages. There is a window of time in which the Fed can act before workers en masse demand cost of living adjustments. The Fed seems to still be within that window, but time is running out. If inflation expectations rise, the Fed may have to do even more to stamp out inflation.

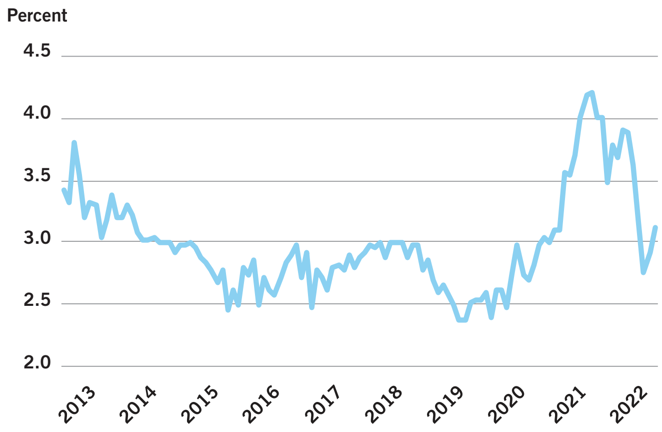
There is great irony in monetary policy making. The science behind it is based in advanced mathematics and quantitative analysis. And yet when it comes to taming inflation, our understanding is so limited that informed gut decisions must be made. Our best gut prediction is that the Fed will pause rate hikes at 5.5% in Q2, a bit higher than consensus. But all of us are hoping the Fed's gut is more accurate than our own. ■

EXHIBIT 6: Personal Consumption Expenditures Price Index



Source: : Bureau of Economic Analysis

EXHIBIT 7: Median Three-Year Ahead Expected Inflation Rate



Source: Federal Reserve Bank of New York

U.S. GOVERNMENT:

Unique Midterm Results Muddy Farm Bill's Path

By Brian Cavey

THE OPENING OF THE 118TH CONGRESS on Jan. 3, 2023, marks the official beginning of the farm bill reauthorization effort. The current Farm Bill sunsets on Sept. 30, 2023, leaving Congress just nine months to complete its herculean task of passing the next bill. The process will commence with some questions remaining unanswered.

The 2022 midterm elections defied conventional wisdom as the party in control of the White House usually loses seats in both the House of Representatives and Senate. While the Republican Party did take control of the House, its majority in numbers are far smaller than most expected. The GOP's control is by the slimmest of margins with a final margin of no more than 222-213. That close margin, in reality, puts actual control of the House in the hands of the most conservative GOP members – that is, unless the Speaker reverts to an "old school" strategy of bi-partisan governing from the middle.

That bi-partisan model could work effectively since the White House and Senate will be controlled by the Democrats with a 51-49 majority. The remaining question is who will be leading each party and how they will leave their mark on the 2023 Farm Bill.

Leadership will be crucial to understanding how the next Congress will function. The composition of the House leadership remains uncertain. Rep. Kevin McCarthy (R-CA) is the GOP nominee for Speaker, and he will need 218 of his colleagues' votes to be elected to that position on Jan. 3. As of today, he has not locked down enough votes but he will be cutting deals for the next month to secure votes knowing he can lose just four and still be elected. If he fails to reach that threshold – which happened in 2015 when former Speaker John Boehner (R-OH) stepped down – an alternate GOP nominee would be advanced, likely disrupting the election process and current expectations for the remaining House GOP leadership positions. This uncertainty will slow the organization of the House Ag Committee and the naming of the Republican subcommittee leaders.

On the Democratic side of the House, longtime leaders Speaker Nancy Pelosi (D-CA), Majority Leader Steny Hoyer (D-MD), and Majority Whip James Clyburn (D-SC) are all stepping down, creating the first new generation of House Democrats' leadership in two decades. Rep. Hakeem Jeffries (D-NY) will be the new face of House Democrats by serving as the minority leader. Nationally, he has presented a much lower profile than Speaker Pelosi, so his style, priorities, and impact remain to be seen.

Both new leaders will have a significant say in who will be named to the House Agriculture Committee. There will be at least 80 new members of Congress and only two in this class, Senators-elect Peter Welch (D-VT) and Markwayne Mullin (R-OK), have voted on a farm bill (as U.S. representatives). House Republicans will add a number of seats while Democrats will likely lose a few with the change in control. As a result, while we know that GT Thompson (R-PA) will chair the committee and David Scott (D-GA) will serve as ranking member, yet to be determined are the subcommittee chairs, ranking members, and the rank and file members. Those new members and any departures will determine the direction of the final bill.

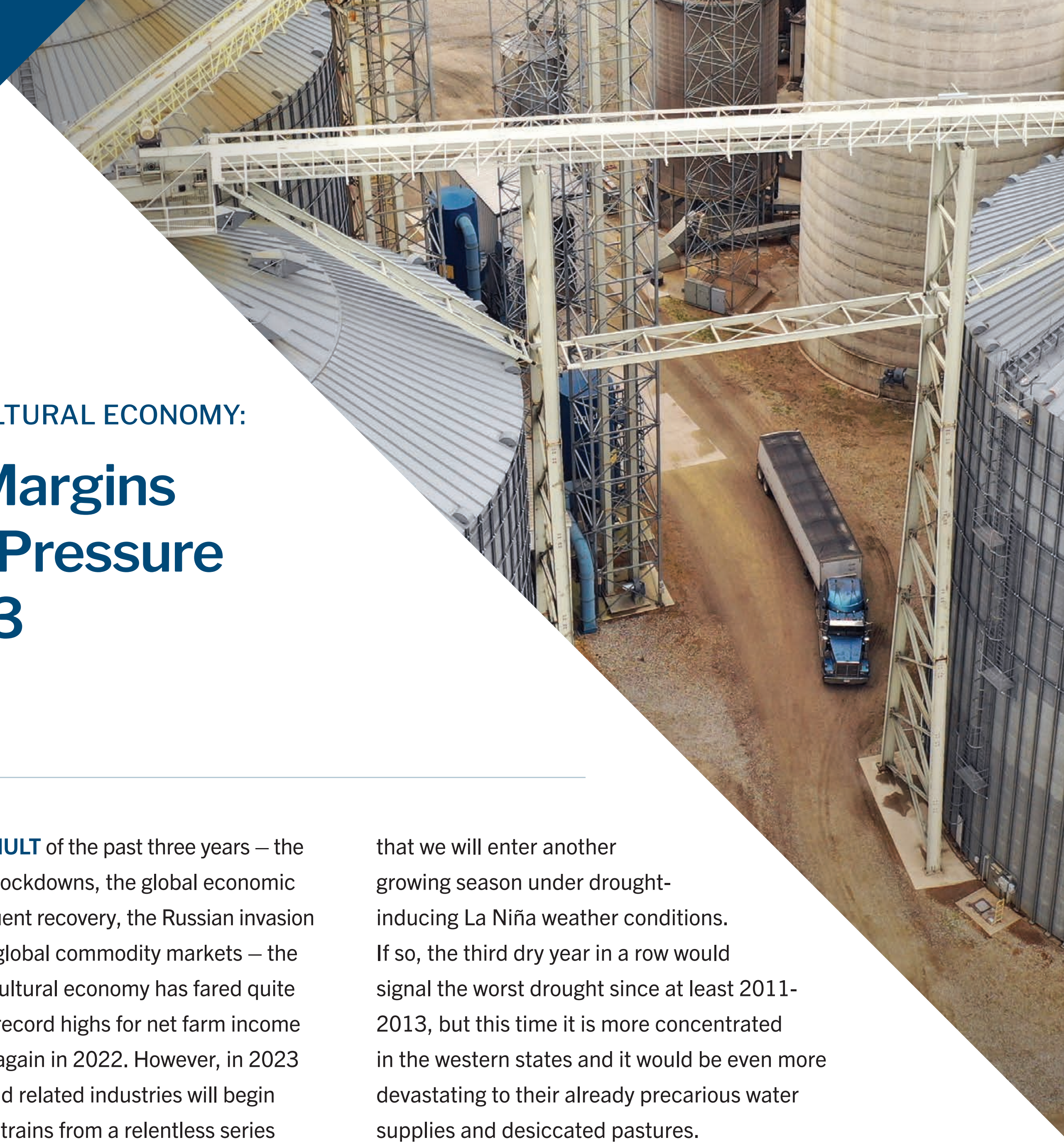
In the Senate, Debbie Stabenow (D-MI) and John Boozman (R-AR) keep their spots at the top of the Agriculture Committee as chair and ranking member. The retirement of Vermont's long-serving Patrick Leahy left just one opening on the committee, and there is no indication of who will pursue the open seat.

As the reauthorization gets underway, each party's area of focus will differ significantly. House Republicans can be expected to focus on input costs, inflation, work requirements for nutrition assistance programs, controlling immigration, and limiting the cost of the bill. Senate Democrats can be expected to focus on protecting conservation and climate spending, urban agriculture, equitable program delivery, maintaining or growing nutrition programs, domestic and global food security, and ag labor provisions. Both parties will be focused on inflation, protecting against supply chain challenges, limiting foreign ownership of land and ag resources, expanding broadband access and hopefully, promoting trade and maintaining or improving crop insurance. The White House can be expected to focus on broadband delivery, climate program delivery, and social justice in program delivery.

Some interest groups are lined up to address consolidation in farming and agribusiness. Large-scale farming may well capture the spotlight in the Senate Agriculture Committee. Additionally, some groups will push policies to direct more resources, public and private, to small and beginning producers and to operations these groups describe as sustainable.

A political pundit described the 2022 midterms as the strangest election of his career. As such, the results can be expected to have a unique impact on major legislation, including the final farm bill.

At the end of the day, the Senate will have the upper hand in this debate. And the policies that arise in the bill — be it in September or December of 2023 or November of 2024 — will impact agriculture for the next decade to come. ■



U.S. AGRICULTURAL ECONOMY:

Farm Margins Under Pressure in 2023

By Rob Fox

AMIDST THE TUMULT of the past three years — the COVID pandemic lockdowns, the global economic crash and subsequent recovery, the Russian invasion of Ukraine roiling global commodity markets — the broader U.S. agricultural economy has fared quite well, posting new record highs for net farm income in 2021 and then again in 2022. However, in 2023 farm producers and related industries will begin to show financial strains from a relentless series of adversities: skyrocketing production costs, steeply higher interest rates, an elevated dollar, and weakening domestic and export demand caused by declining real incomes amidst spiraling inflation. And, in our view, none of the above headwinds are likely to reverse in the near term.

But other potential, less quantifiable, downside risks loom. The most notable are the ongoing U.S. drought and increasing political tensions with our largest agricultural export market, China. The National Weather Service's Climate Prediction Center is currently posting better than 50/50 odds that we will enter another growing season under drought-inducing La Niña weather conditions. If so, the third dry year in a row would signal the worst drought since at least 2011-2013, but this time it is more concentrated in the western states and it would be even more devastating to their already precarious water supplies and desiccated pastures.

Finally, we must consider our deteriorating political relationship with China, spurred first by the 2018 trade war and then by increasingly intense saber-rattling between both parties regarding Taiwan's status as an independent state. The likelihood of an all-out Chinese invasion of Taiwan seems extremely low, but China has made it clear that it would like to minimize its dependence on imports of U.S. farm products. We see that signal clearly in China's recent political decision to allow for the first time several major international traders to ship corn from Brazil, our largest competitor for grain and oilseed exports. We anticipate a similar "buy only if we have to" attitude from China not only with U.S. soybeans, but also with U.S. meat, poultry, and dairy products.

The good news for U.S. farmers is that global grain and oilseed supplies are exceedingly tight: The combined global ending stocks of corn, wheat, and soybeans are forecast to decline for the fifth straight year in 2022/2023. For the 2023 harvest, the futures market is currently offering what would historically be considered very strong prices. But when accounting for all the line item production cost increases, profitability pencils out near breakeven, at best. Considering all of the above, it is no wonder that recent producer sentiment surveys show that despite record high net incomes in 2022, farmers' expectations for future conditions are at their lowest since 2015. ■

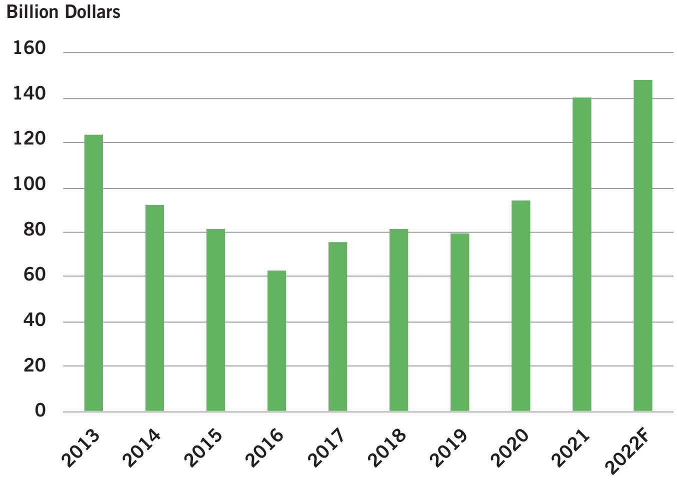
Sources

"Ag Economy Barometer Declines Again, Producers Express Concern About Interest Rate Policy," James Mintert and Michael Langemeier, Purdue University-CME Group Ag Economy Barometer, Nov. 1, 2022. https://ag.purdue.edu/commercialag/ageconomybarometer/ag-economy-barometer-declines-again-producers-express-concern-about-interest-rate-policy/

Historical Data and Conditions, November 2022, Drought.gov National Integrated Drought Information System. https://www.drought.gov/historical-information?dataset=0&selectedDateUSDM=20110607

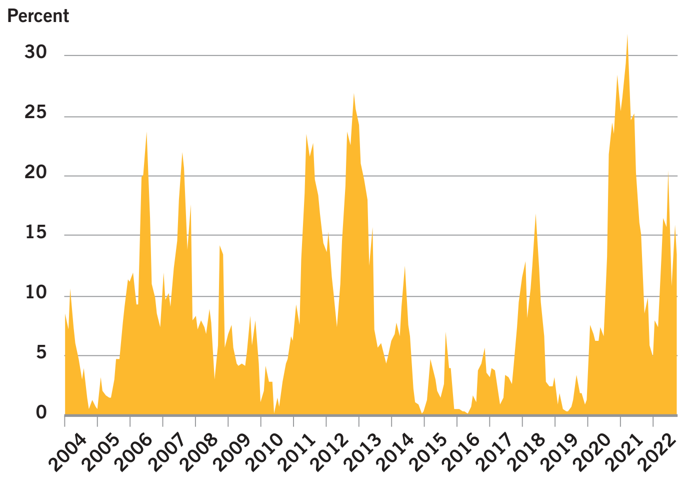
Farm Income and Wealth Statistics, USDA-ERS, September 2022. https://www.ers.usda.gov/data-products/farm-income-and-wealth-statistics/

EXHIBIT 8: U.S. Net Farm Income



Source: USDA ERS - Data Files: U.S. and State-Level Farm Income and Wealth Statistics

EXHIBIT 9: Percent of the U.S. in Severe Drought



Source: Drought.gov, National Integrated Drought Information System

GRAIN, FARM SUPPLY, BIOFUELS:

Outlook for Biofuels is Solid, Less So for Grain and Farm Supply

By Kenneth Scott Zuckerberg

A YEAR AGO WE SIGNALED that the grain, farm supply, and biofuel sectors would face a mixed outlook from a combination of escalating costs, supply chain bottlenecks, and high energy prices. But 2022 proved even more tumultuous than expected given Russia's invasion into Ukraine, multi-decade high inflation in the United States and Europe, and the steep economic slowdown in China. Interestingly, U.S. diversified ag cooperatives generally delivered above-average results driven by agronomy related sales and services, even in the wake of fertilizer and chemical supply chain disruptions. In the meantime, ethanol producers defended margins (even with slowing gasoline demand) through prudent commodity risk management and operational efficiencies.

Looking forward to 2023, we see an environment of margin pressure amidst a slowing economy, rising interest rates, high labor and energy costs (namely diesel fuel), and trade uncertainty with China and Mexico. Ongoing drought and volatile weather remain additional risk factors for crop production. Animal feed demand is softening, reflecting flat overall growth in the domestic livestock sector.

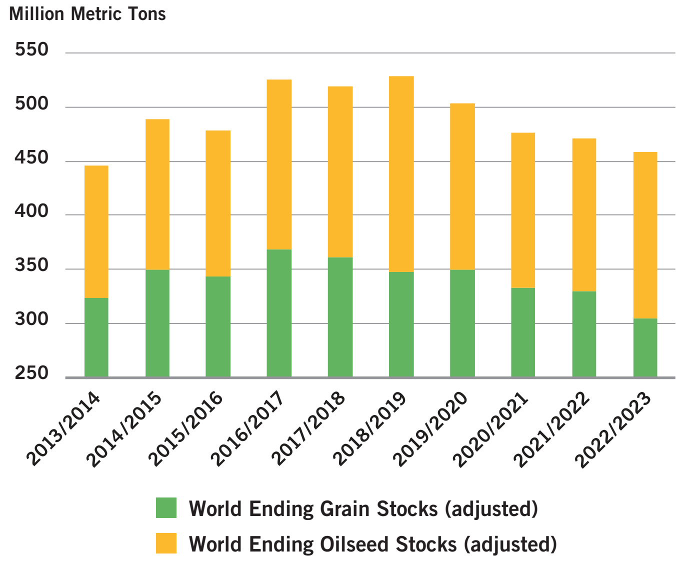
Grain elevators and merchandisers face a mixed picture for the year ahead. On the negative side, grain exports were stunted in Q4 2022 by transportation bottlenecks on the Mississippi River and reduced purchases of soybeans and corn by China, both of which could result in missed opportunities for the current marketing year. And then there is the Mexico situation: The country's president decreed that Mexico would ban the importation of genetically modified corn in 2024, which would have jeopardized roughly one quarter of all U.S. corn exports. The Mexican Secretary of Economy recently suggested the ban will be pushed back to 2025 and it now appears that U.S. corn exports to Mexico will continue unabated for the next two calendar years. We continue to believe that the GMO corn debate is a bargaining tactic in Mexico's quest to improve Mexico/U.S. energy trade policies.

On the positive side for U.S. producers, Ukrainian grain and oilseed production and exports are likely to remain constrained for the next few years due to the Russia conflict. This will provide underlying support for grain prices, and aid U.S. corn exports. Finally, combined global ending stocks for grain and oilseeds are still very tight after falling for four straight years to their lowest level since 2013/2014. It will take at least a couple of years to build stocks to a more comfortable level.

Ag retailers begin 2023 on strong financial footing but face several challenges. Labor shortages and rising wages will negatively impact margins. In addition, wholesale fertilizer acquisition costs will remain high during the first half of 2023 as cooperatives not only absorb high barge and rail costs but also compete with export markets for limited supply. Some 70% of European fertilizer production was offline during Q3 2022 as the region dealt with record-high natural gas (feedstock) prices. Fertilizer prices will likely begin and end 2023 at elevated levels, minimizing the opportunity for retailers to capture the same level of carry margin that was available during 2021/22.

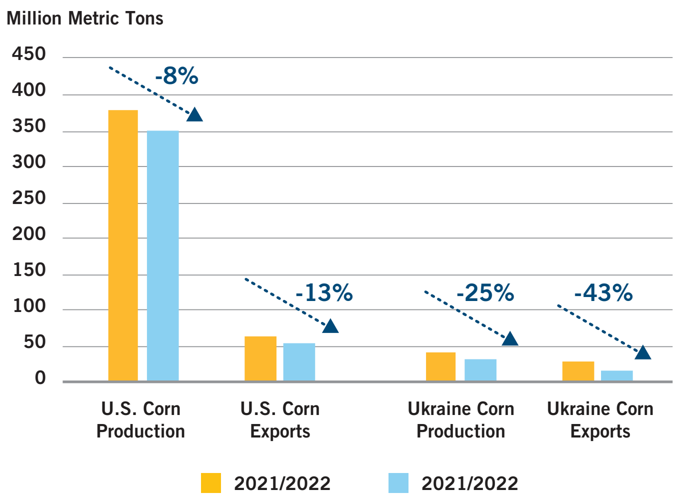
The outlook for biofuels is very strong, supported by federal policy and demand tailwinds from 2022. Ethanol will benefit from greater usage of E15, growing demand for corn oil, and strong pricing of carbon dioxide. Carbon dioxide, a co-product from fuel ethanol production, is experiencing a demand surge from both industrial users (food and beverage companies) and carbon sequestration projects. The momentum behind renewable diesel will continue to grow as new soy crush processing and oil refinement facilities come on line, supported by the Inflation Reduction Act of 2022. ■

EXHIBIT 10: World Grain and Oilseed Ending Stocks (Excluding China)



Source: USDA WASDE Report

EXHIBIT 11: Falling Corn Production and Exports



Source: USDA WASDE Report

ANIMAL PROTEIN:

Meat and Poultry Production to Slow Despite 2022's Robust Profits

By Brian Earnest

DESPITE TECTONIC SHIFTS IN CONSUMER EATING HABITS, record high feed costs, labor shortages, and supply chain logjams, most U.S. animal protein industry segments have posted phenomenal financial performance over the past three years. However, this broad-based era of profitability will likely come to an end in 2023.

On the supply side, the high costs of feed, labor, and construction support the prevailing cautionary mood toward expanding production. On the demand side, consumers are reeling from rapidly declining real wages – a trend likely to continue well into 2023. Add in climate uncertainties, ESG pressures, and increasing labor and energy costs and it's likely that 2023 will be a year when major market participants pause, reflect, and guard balance sheets.

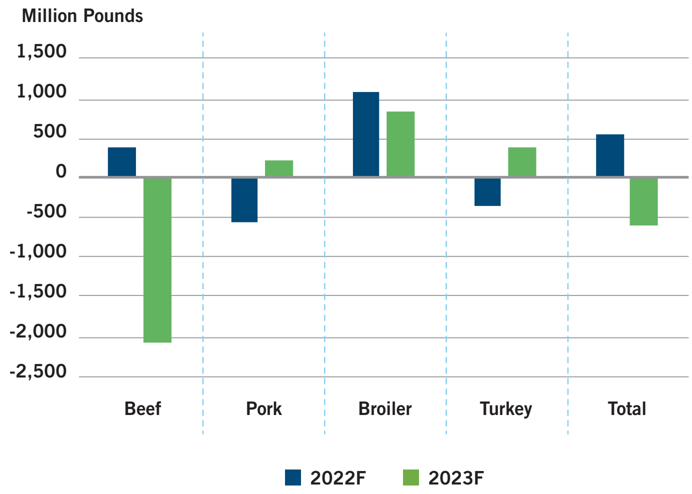
Consumer red meat and poultry demand has remained steadfast over the past two years despite the highest inflation in over four decades. Aggregate food service sales have gained back most of the COVID era losses, but that came with outsized gains in the quick serve and fast casual segments while higher-cost sit down options are still well below 2019 levels. Retail grocery sales continue to rise, but not as fast as inflation – meaning unit volume sales have been declining in recent months, finally giving way to the realities of declining real incomes and savings accounts. This trend is expected to accelerate into the first half of 2023 as the Fed's escalating interest rates take their intended toll on the U.S. economy. After reaching an all-time high of more than 226 pounds per capita (projected) in 2022, we expect U.S. meat and poultry consumption to be flat at best in 2023, with marginal gains in chicken and pork offsetting a decline in beef.

Following eight years of growth, red meat production – and specifically beef production – is set for a rather substantial contraction during 2023, down 2 billion pounds annually YoY, as a result of shrinking cattle supplies. The decline reflects an estimated 5% annual reduction in total beef cow inventory and comes at a time when beef still has a tailwind of support from consumers. As a result, prices will remain historically strong, in both live cattle and beef markets.

While pork production is set for a moderate rebound in 2023, the hog breeding herd is at a five-year low, down 6.5% from the peak in 2020 suggesting minimal potential for supply growth. In order to partially offset the gap in red meat production, the U.S. may rely more on imports in the upcoming year. The domestic pork supply has benefitted from a 13% reduction in exports and a 32% rise in imports for the 12 months ended in September; global economic headwinds and an elevated dollar suggest this trend will continue.

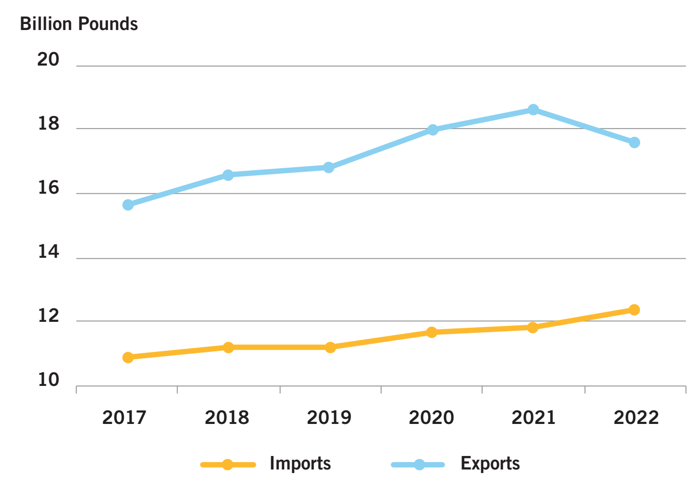
Chicken consumption seems well suited for growth, but it will require the major integrators to actively boost chick placements and bird weights. We saw an incremental rise in production late in 2022 which hints at the direction to start 2023. Most chicken items were trading at historically high levels to start 2022, but saw significant declines as surplus surfaced amid weaker domestic and export offtake. While we do not expect broiler prices to revert to pre-pandemic low levels, the record highs of 2022 will not return either. ■

EXHIBIT 12: Animal Protein Production



Source: USDA-ERS World Agricultural Supply and Demand Estimates at a Glance

EXHIBIT 13: U.S. Meat and Poultry Trade Volume



Note: Years are for 12 months October-September

Source: USDA-ERS Livestock and Meat International Trade Data

DAIRY:

Milk Supplies to Gradually Grow as Demand Base Shifts

By Tanner Ehmke

DESPITE RECORD-HIGH MILK PRICES earlier in 2022, major exporting countries have expanded their herds only minimally, and we expect this trend to continue well into 2023. Europe and Oceania (New Zealand and Australia) continue to struggle with sustainability policies, higher feed costs, inclement weather, and an energy crisis in Europe. Likewise, U.S. dairy herd growth has been impaired as farmers continue to battle a number of factors: high costs for feed, construction, replacement heifers, and borrowing, as well as tight labor availability, and the ongoing drought in the West.

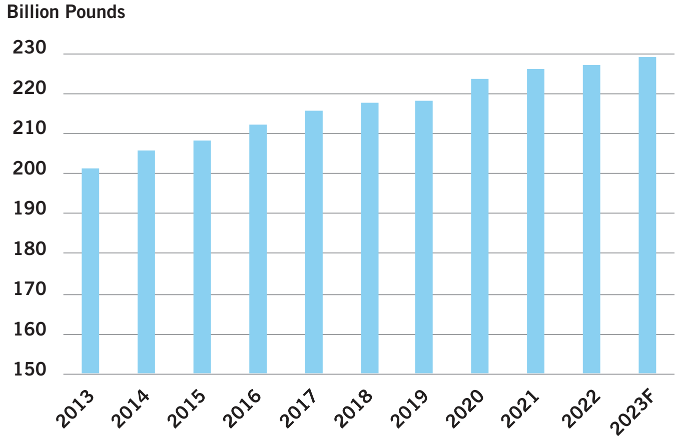
Total milk collections will continue to inch higher, though, as milk production per cow improves. However, Oceania's milk production growth is stalling during its peak production months and the U.S. stands to potentially gain new export market share in Asia.

Dairy product prices will moderate in response to a slow but steady growth in global milk supplies in the face of a sharply slowing global economy. China, the top dairy-importing country, is heading into its worst COVID outbreak to date and U.S. exports of skim milk powder and whey products may be disproportionately affected. And the high value of the dollar will continue to act as a headwind to U.S. dairy exports. After a year of stronger profits that allowed producers to pay down debt, dairy farm margins will come under more pressure in 2023.

Domestic demand for U.S. dairy products, particularly higher-priced brands, will face headwinds as consumers trade down to trim grocery costs. Processing margins for most dairy categories, though, should remain stable. Milk prices will be lower, but wholesale and retail dairy product prices have remained mostly resilient. Manufacturers of lower-priced products that appeal to cost-sensitive consumers should be well positioned. However, food service demand for cheese may weaken as more consumers dine at home, at the same time that restaurant chains look to trim ingredient costs to appeal to cost-conscious consumers.

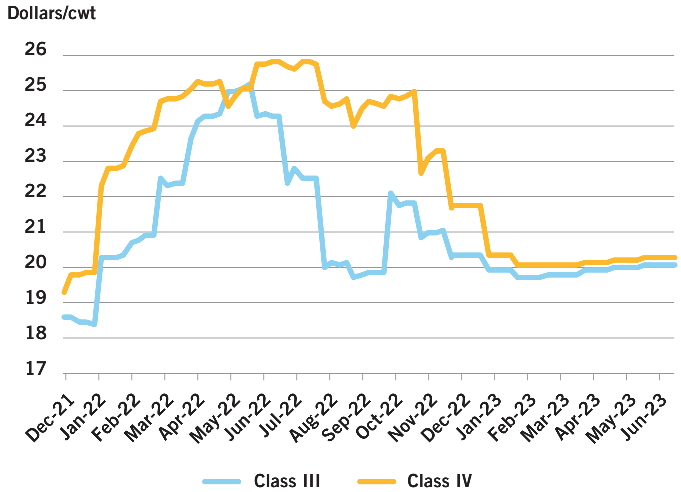
Long-term structural changes to the economy and the dairy sector will persist in 2023. Manufacturers will continue struggling with labor shortages and higher energy costs. And, the continual expansion of cheese processing capacity will siphon milk away from butter churns, guaranteeing ample cheese supplies while keeping butter inventories tight. That scenario suggests that Class IV milk prices will likely maintain a premium to Class III milk in 2023. ■

EXHIBIT 14: U.S. Milk Production



Source: USDA-ERS

EXHIBIT 15: Class III and IV Milk Futures



Source: CME Group

SPECIALTY CROPS:

Drought, Labor Shortages, and Strong U.S. Dollar to Keep Squeezing Specialty Crops

By Tanner Ehmke

SPECIALTY CROP GROWERS and processors face a multitude of headwinds in 2023: Costs of water, labor, fertilizer and other inputs are rising while a stronger U.S. dollar and weakening global economy drag on the U.S.'s ability to sell products abroad.

California in particular faces worsening conditions with the trifecta of the highest diesel prices and farm wages in the U.S. amidst a worsening drought. The drought has lifted the price of water to record highs as La Niña conditions persist into a third straight year in 2023.

With the Colorado River system and reservoirs at record lows, specialty crop growers across the West are bracing for reduced water allocations and more fallowed acres. In Arizona, no surface water deliveries will be allocated from Lake Mead to growers in 2023. Lake Powell and Lake Mead, the nation's two largest reservoirs, both contain about 25% of their designed capacity. The Bureau of Reclamation warns that if water levels continue falling in 2023 and hit critical thresholds, a first-ever cut in allocations to California could follow. California is likely to experience reduced allocations from other reservoirs that are also at historically low levels.

Tight labor availability will require growers to lean harder on H-2A workers or adopt more automation in the field. Processors likewise will be investing in more automation for tasks that used to be done by hand, such as sorting, packaging, and palletizing. A recession in the U.S., though, may relieve some of the stress in farm worker availability if competing industries like construction and oil and gas extraction reduce hiring.

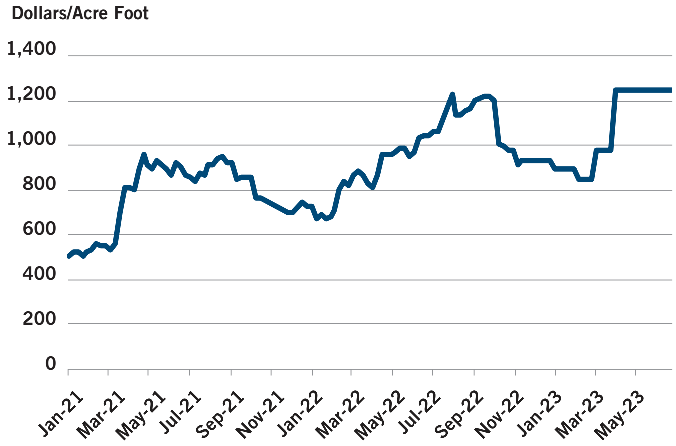
Financially exhausted U.S. consumers will try to cut grocery bills, and the relatively pricey fresh fruit and vegetable aisle is a likely place to start. While the U.S. dollar has eased its rally in the past few weeks, it is still 15% higher than in mid 2021. We expect the strong dollar will continue to be a headwind to U.S. farm exports and will continue to incentivize fruit and vegetable imports. The combination of the strong dollar, the ongoing pandemic in China, and the economic slowdown in Europe all portend weakness in tree nut exports.

In Florida, citrus growers will continue to struggle with citrus greening disease. Growers hope for a rebound in production in 2023 after hurricanes and freezing temperatures devastated the historically small 2022 citrus harvest. The strong U.S. dollar, though, will make orange juice concentrate imports cheaper for processors, helping them to replace domestic orange crops lost in 2022.

Cotton prices will continue to edge higher as the worst of the global economic outlook has already been priced into the market. Although we expect cotton prices to recover near the $1.00/lb mark by early spring, U.S. planted acreage will decline, but with any decent rainfall in West Texas, U.S. cotton production should actually increase.

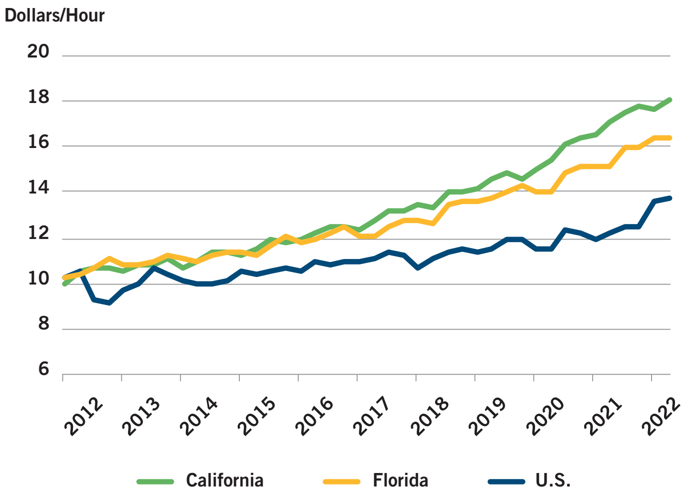
Despite the numerous headwinds, specialty crops growers and processors will benefit from falling costs of transportation and shipping containers and fewer delays at ocean ports. ■

EXHIBIT 16: Nasdaq Veles California Water Index Futures



Source: NASDAQ

EXHIBIT 17: Hourly Wage Rate for Crop Workers



Source: USDA-NASS

RURAL ELECTRICITY:

Time to Look Beyond Yesterday's Energy Crisis Playbook

By Teri Viswanath

THE GLOBAL OIL SHOCKS OF THE 1970S had a profound and wide-range impact on energy use, and today's energy crisis foreshadows a similar response. The collective response to the 1970s crisis led to innovative policy measures, paving the way for greater energy security. These measures largely included dramatic conservation and fuel diversity but also funded moonshot projects for renewable energy development. Surging energy prices caused in large part by the Russian invasion of Ukraine are yielding similar levels of policy intervention today. The initial seed investments made a half-century earlier are opening doors to greater opportunities for market substitution.

Daniel Yergin, a leading historian on energy and geopolitical risk, suggests that the crisis unfolding this year might be even worse than what the world experienced in the 1970s. He notes that today's energy supply shock extends well beyond oil — encompassing natural gas, coal, and even the nuclear-fuel cycle. What's more, the timing couldn't be worse, with the European conflict occurring when global energy balances had already tightened from the post-pandemic demand surge. Yergin explains that the current crisis "is transforming a previously global market into one that is fragmented and more vulnerable to disruption, crimping economic growth." Yet, as we look beyond this year's fallout, we see new paths toward energy security that could accelerate fossil fuel transition while enabling economic growth.

The current energy crisis is surfacing age-old fault-lines, with upstream fuel dependencies looking unsettlingly similar to those of the last crisis. During the early 1970s, Americans relied on oil for almost half of all their energy needs, with Middle-East imports needed to satisfy 30% of these domestic requirements as domestic production failed to keep pace with demand. By comparison, today two-thirds of Europe's energy needs are met with fossil fuels – gas (34%), oil (31%) and coal (11%) – and Russia meets 20%-40% of these requirements. But the real problem boils down to Europe's dependence on Russian natural gas.

While the continent's demand for natural gas peaked about a decade earlier, consumption remains elevated because of its use as a strategic "bridge fuel" for phasing out higher-emitting fossil fuels. And because Europe's domestic production has been declining at a faster pace than this transition, Russian imports have been used to fill the gap. Now with much of these Russian imports restricted, European countries have been scrambling to line up new supplies as well as fuel-switching or conserving to ration what limited supplies are available on the continent.

This response is very similar to the steps taken by the U.S. in response to the twin oil shocks of the 1970s. The upshot of the U.S. effort was to restrict domestic petroleum demand for two decades through electric generation fuel-switching and major conservation efforts for other hard-to-switch consuming sectors. While Europe's short-term response appears to mirror these steps, there are firm plans in place to depart from this well-worn playbook. Contrary to the energy crisis of the 1970s, mature, cheaper and better alternatives to fossil fuels are now available to reduce European vulnerability. What's more, economic growth is no longer inextricably linked to carbon emissions. At the COP27 summit in Egypt, EU policymakers vowed that the use of more fossil fuel to respond to the current crisis will be temporary, citing plans to expand renewable energy through new proposals that will help countries quit Russian gas faster.

The International Energy Agency acknowledges these policy changes, seeing Russia's invasion of Ukraine as a tipping point for the global energy market transition to renewables. They believe that as governments seek a more sustainable response to today's energy crisis, they will naturally limit reliance on imported fuels, and instead opt for more secure, cleaner energy resources. All told, according to IEA, Russia's war in Europe could translate to a peak for fossil fuels within the decade. ■

RURAL COMMUNICATIONS:

Multiple Crosscurrents Set the Stage for the Rural Communications Market

By Jeff Johnston

THE RURAL COMMUNICATIONS MARKET is heading into 2023 with numerous crosscurrents. On one hand, the increasing importance of broadband helps insulate the industry against economic weakness. However, new headwinds are emerging from a softening economy, tightening capital markets, and aggressive network build activity across a wide range of market actors.

The COVID-19 pandemic exposed the vulnerability of the underserved in rural America and the critical importance of broadband access. Couple this with a massive digital transformation sweeping across businesses and consumers, and it's easy to see how broadband is akin to having electricity. This should help shield broadband operators from bad debt exposure resulting from a weakening economy in 2023. As well, broadband pricing isn't exposed to the inflationary pressures seen in other parts of the economy, making it easier for users to pay their bills.

But with many commercial banks becoming more conservative in how they use their balance sheets, operators might find it more challenging in 2023 to meet their network build requirements. A lot of capital within infrastructure funds is still looking for a home, but these investors too might become a little more conservative with deal terms they are willing to accept. And higher interest rates increase the cost to deploy networks, which increases the risk to network plans. However, as we exit 2022 it's important to note that we have yet to see any of this play out, but must consider a wide range of outcomes for 2023 in these unprecedented economic times.

We think the bigger risk to network builds in 2023 is the much discussed tight labor market and supply chain issues. This is of particular concern for smaller broadband operators who are competing against the larger national ones for resources. Despite some of these potential headwinds, another factor to consider is excess overbuilding. A number of telcos are aggressively building fiber to replace old copper networks or to enter a new market in what is still a land grab in many instances. For example, AT&T is rumored to be exploring a multi-billion dollar fiber joint venture to add to its already ambitious plans to cover 30 million locations with fiber by the end of 2025. And T-Mobile is reportedly looking for partners to invest $4 billion for new fiber build outs.

Overbuilding happens when unexpected competition enters a market before it's served with fiber from the first operator who entered the market. This has the potential to negatively change the dynamics of the business case, especially if the new competition is coming from AT&T or another large telco. With access to greater resources and suppliers, large telcos' network build efforts could leapfrog smaller operators. And with the first mover advantage in the market being incredibly important, it's something to be aware of.

On the merger and acquisition front, we could see a slowdown in the number of deals closing with lower multiples — largely a function of tighter capital conditions and investors taking a more risk-off approach. But just like the current network build activity, we have not seen these factors impacting the current M&A landscape. ■

Contributors

KNOWLEDGE EXCHANGE is an innovative knowledge-sharing initiative that is designed to provide strategic insights about trends, structural change, and policy directives within the key rural industries served by CoBank. It draws upon the expertise within CoBank and the rest of the Farm Credit System, the broad perspective of outside consultants and academics, and the first-hand knowledge and experience of our customers to enhance our collective understanding of emerging business opportunities and risks.

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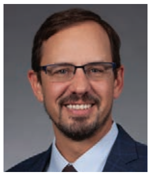

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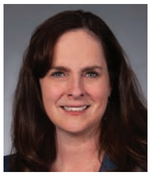

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About CoBank

COBANK IS a cooperative bank serving vital industries across rural America. The bank provides loans, leases, export financing and other financial services to agribusinesses and rural power, water and communications providers in all 50 states. The bank also provides wholesale loans and other financial services to affiliated Farm Credit associations serving more than 76,000 farmers, ranchers and other rural borrowers in 23 states around the country.

CoBank is a member of the Farm Credit System, a nationwide network of banks and retail lending associations chartered to support the borrowing needs of U.S. agriculture, rural infrastructure and rural communities. Headquartered outside Denver, Colorado, CoBank serves customers from regional banking centers across the U.S. and also maintains an international representative office in Singapore.

CoBank's Knowledge Exchange Division welcomes readers' comments and suggestions. Please send them to KEDRESEARCH@cobank.com.

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