The Russia/Ukraine War and Evolving Commodity Market and Supply Chain Issues

OSU Rural Economic Outlook Conference

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The views expressed here are those of the speaker and do not necessarily reflect the opinions of the Federal Reserve Bank of Kansas City or the Federal Reserve System.

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Summary

- The agricultural economy in the United States remains strong, supported by high prices and robust demand for U.S. farm products.

- However, concerns about supply chains have intensified following the pandemic, the war in Ukraine, and other supply chain disruptions.

- One primary result of these disruptions has been higher prices (and costs) for producers and consumers.
The “Fed” consists of three main entities:

- Board of Governors: 7 members appointed by U.S. President
- Federal Reserve Banks: 12 total; semi-independent by design
- Federal Open Market Committee: 19 members; 12 voting

Primary responsibility areas:

- Monetary policy
- Bank regulation
- Financial services
Oklahoma City Branch of the
Federal Reserve Bank of Kansas City

Functions and purposes ~ 50 staff
• Research on U.S. and Oklahoma economies; energy sector and business survey focus
• Examinations of Oklahoma financial institutions (~45 banks, ~175 holding cos.) Risk analysis and IT development for bank exams; exam assistance for other Fed offices
• Community development programming for low/moderate income groups, workforce focus
• Economic education and public outreach programming

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The Kansas City Fed has a high concentration in agriculture and monitors conditions closely.

Farm Income as a Share of Total Personal Income
Average Across Counties by Fed District, 2010-2020

Proportion of “Farm Dependent” Counties and Agricultural Banks

Source: BEA and staff.

*Agricultural banks are defined as banks with farm production and farm real estate loans equaling approximately 18 percent or more of total loans.
At the end of 2019, the ag economy appeared to be entering another year of decline in 2020.

*Q1 2020.
**As of February 5, 2020
Sources: USDA and Haver Analytics.
And then the pandemic disrupted nearly all segments of the food and ag sector in 2020.

Sources: USDA, EIA and staff calculations.
But especially the beef supply chain, which then was impacted by additional disruptions in 2021.

Sources: USDA and author’s calculations.
Dramatic changes in consumer food purchases also disrupted food and commodity markets.

Source: USDA
A more efficient supply chain may have made both producers and consumers more vulnerable to shocks.

Transitioning to a More Efficient Supply Chain

Million head


Cattle slaughtered annually
Steer and non-replacement heifer inventories, January

Trend, 1970-2020

Million head

Note: Cattle slaughter for 2021 projected based on number of animals slaughtered year-to-date in September 2021.
Sources: U.S. Department of Agriculture (USDA) and Iowa State University.
Also, cattle inventories may have declined by less than expected in 2021.

U.S. Cattle Inventories and Price-to-Cost Ratios

Percent change from previous year

-3 -2 -1 0 1 2 3 4

Inventory change (left)

Sale-price-to-feed-cost ratio (right)

Average, 1996–2021 = 2.6

Sources: USDA and author’s calculations.
Unlike in the past, household income rose during the pandemic-induced recession, supporting demand.

Sources: USDA and BEA.
Following the global pandemic, prices of farm commodities rebounded strongly and have supported farm income.

* Weighted based on share of total 2020 agricultural cash receipts attributed to each individual commodity. Individual commodities allocated account for 86% of total 2020 cash receipts.
Sources: USDA and staff calculations
Cattle markets have struggled to recover, and despite a recent pullback in other commodities, prices remain above previous levels.

Agricultural Commodity Prices

Percent change from Jan-2019

Source: The Wall Street Journal (Haver)
Farm prices continue to be supported by strong demand, both in the U.S. and internationally.

Sources: U.S. Energy Information Administration Short-Term Energy Outlook as of February 8, 2022 and USDA.
However, Russia’s invasion of Ukraine caused broad disruptions in global commodity markets.

2022 Production Forecasts

Source: USDA

Grain Prices

Source: USDA
Price movements for oil and wheat following the Ukraine conflict were historical in nature.

* The change in oil prices from February 2022 to March 2022 was the 16th largest on record, and the change in wheat prices in March 2022 was the seventh largest on record, after the Russian Grain Deal and Dust Bowl/WWII period (three months in 1933 were in the top six, and two of those months are excluded for brevity).

Note: Historical crude oil prices are available back to 1946 via the Federal Reserve Bank of St. Louis, and the U.S. Department of Agriculture provides data on wheat prices back to 1908.

Sources: The Federal Reserve Bank of St. Louis and U.S. Department of Agriculture.
Russia and Ukraine account for a large share of global production and exports of several major commodities.

Sources: U.S. Departments of Energy and Agriculture.
Price increases were exacerbated by low and declining inventories.

Sources: U.S. Departments of Energy and Agriculture.
As an exporter, the U.S. has been somewhat insulated from concerns about shortages and food security.

U.S. Net Exports

Exports as a share of production (%)

- Oil
- Natural Gas
- Wheat
- Corn

Source: U.S. Departments of Energy and Agriculture.
But the potential for food shortages is a growing concern in several key regions.

Note: 71% of wheat exports from Russia were destined for the Middle East and Africa in 2021, while 77% of wheat exports from Ukraine went to partner countries in Africa and Asia.

Source: USDA
Particularly those regions reliant on agricultural exports from Russia and Ukraine.

Share of Corn Exports to Partner Regions

Share of Wheat Exports to Partner Regions

Source: USDA
Another disruption: severe drought has had a notable impact on crop conditions and expected production.

Sources: USDA and University of Nebraska – Lincoln.
Drought and higher feed costs have prompted some herd liquidation in cattle-producing states.

Sources: USDA and University of Nebraska-Lincoln Drought Monitor.
Drought has also disrupted barge traffic on the Mississippi River.

US farmers face another headache as a drought in the Midwest forces restrictions on Mississippi River barge traffic. Falling river levels have come at a time of year when crop harvests require increases in river shipping capacity. “The U.S. Department of Agriculture’s Grain Transportation Report released Thursday said that 1,890 grain barges have unloaded in New Orleans since Sept. 1, about 39% fewer than the five-year average.” (Baton Rouge Business Report)

No sign of near-term relief -- “Some Mississippi River communities between St. Louis and New Orleans may see record low water levels in the coming days, including Caruthersville, Missouri, and Osceola, Arkansas. The National Weather Service predicts the reading at Memphis, Tennessee, will reach its second-lowest level ever by Oct. 13.” (Baton Rouge Business Report)
We are starting to see some divergence between the Iowa and Gulf prices for corn, though it seems a gap is normal. 

Source: USDA
Total tonnage of grain shipments is down, but similar to levels from a year ago.

Source: USDA
However, although barge rates typically increase in September, they have increased more rapidly this year.

Note: The Twin Cities is the northern-most city, and Cairo-Memphis is the southern-most city for which the USDA reports barge rates.
Source: USDA
We will also monitor the movement of fertilizer in the other direction, from south to north.

Source: Bloomberg
Drought has likely weighed on expectations for farm income, especially in Oklahoma.

** Mountain States include Colorado, northern New Mexico and Wyoming, which are grouped because of limited survey responses from each state.

Source: Federal Reserve Bank of Kansas City.
Another notable disruption has been Avian Flu, which spread rapidly and had a notable impact on egg and poultry prices.

Avian Flu Deaths, Year-to-Date through May 2022

Food Inflation

Percent change since Aug, 2022, annualized

Source: USDA (Gro Intelligence)
Expectations of long-term interest rates declined in the aftermath of the pandemic but have risen more recently.

Median Federal Funds Rate, June

Source: Federal Open Market Committee Summary of Economic Projections (Board of Governors).
Concluding Thoughts

• The outlook for 2022 is generally more optimistic than previous years but the outlook for 2023 will depend strongly on whether costs abate.

• Inflation has affected everyone along the food value chain, from producers to consumer, and key risks moving forward include
  • Ongoing supply chain disruptions and shortages
  • Tight labor markets
  • Drought

• The pandemic, weather shocks, and Russia’s invasion of Ukraine have all had swift and substantial effects on commodity markets, and imbalances continue to persist in supply chains for most food and ag products.
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