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Agricultural Markets and Food Price Inflation—A conference summary

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On October 2, 2008, the Federal Reserve Bank of Chicago held a conference that focused on the economic impacts of volatile agricultural prices and food policy, especially their intersection with the macroeconomy through food price inflation.

Materials presented at the conference are available at www.chicagofed.org/news_and_conferences/conferences_and_events/2008_agricultural_conference.cfm.

The primary goals of the conference were to examine the roots of increases in agricultural prices, particularly the underlying global factors; to explore the implications of these increases for the food industry; and to discuss the potential implications of persistent changes in food prices on price stability at the macroeconomic level.

David B. Oppedahl, Federal Reserve Bank of Chicago, started the conference by highlighting the intense media attention of the past year on food supplies and price increases. Yet, real crop prices never reached the heights of the 1970s, and they had already started to decline in 2008. Farmland markets responded to higher commodity prices, evidenced by a 16% jump in farmland values for 2007 in the Seventh Federal Reserve District.[1]

Sources of agricultural cost increases

In the opening session, two presentations examined recent increases in agricultural costs and the impacts on farm operations. First, John A. Miranowski, Iowa State University, emphasized the link between energy prices and production costs for agriculture. The "ethanol explosion," created by the rapid expansion and proliferation of processing plants to convert corn into ethanol, has altered corn utilization patterns. Miranowski projected ethanol usage to rise at the expense of livestock feeding and exports in the 2008–09 crop year. Corn prices were pulled higher as ethanol output expanded in response to rising oil and gasoline prices. Also, growing world demand for livestock products added to the competition for scarce farmland, pushing the opportunity costs of land even higher. At the same time, the ascent of energy prices led to large jumps in production costs for farmers, especially for corn production. About 12% of corn farm operating expenses were for direct energy consumption, Miranowski noted, and over 50% were for indirect energy inputs (fertilizers and pesticides). According to Miranowski, livestock producers were hit hard by higher energy costs too, since their largest input shares come from animal feed. The effects of higher energy prices on farms differ in the short run (reduced net returns) and long run (impacts on quantity supplied). Farmers have limited ability to substitute other inputs for energy in the short run, but over time farmers can take advantage of information and technology improvements. Miranowski stated that improved energy efficiency has been a key component of agricultural productivity growth.

Next, Gary Schnitkey, University of Illinois at Urbana–Champaign, focused on farmer responses to higher production costs. Nonland costs have exploded in recent years, with projections of $569 per acre for corn and $324 per acre for soybeans

on high-productivity farmland in 2009. The biggest cost increases would be for fertilizer and seed. Farmers face higher risks, since any cost declines in inputs could be accompanied by greater downward pressure on crop prices. Land costs primarily depend on cash rental rates for farmland, since a large percentage of acres in crop production were rented last year. Bids for farmland cash rents have moved higher, even as 2009 returns to farmers are projected to be lower than in 2007 or 2008. In this riskier environment, rental decisions by farmers may vary more, in part because cost increases of inputs further reduce returns on lower-productivity farmland. Also, shorter leases should be expected. Another decision facing farmers is the planting mix of corn and soybeans. Based on higher relative returns for corn, farmers are likely to favor corn production, though some farmers may plant more soybeans because of lower operating costs. Higher break-even prices for crops are expected to prevent a return to previous low prices. This would create a scenario of higher feed costs for livestock producers in the near term and well into the future. According to Schnitkey, an adjustment process for livestock operations to higher costs will lead to lower livestock numbers, inducing higher prices for livestock.

Food price inflation has risen in recent years because of many factors—on and off farms throughout the world.

Changing world food demand and supply

In the second session, two presenters characterized current and future world food demand and supply. First, Ronald Trostle, U.S. Department of Agriculture (USDA), discussed reasons that food commodity prices have increased 130% since 2002. World food demand has grown for over a decade because of rising populations, rapid economic growth, and increasing per capita meat consumption. Also, the devaluation of the U.S. dollar and large foreign exchange reserves held by importers have lifted food commodity prices. More recently, growth in biofuels production has boosted demand for agricultural commodities, though biofuel feedstocks were still less than 3% of the global area harvested. On the supply side, there has been slowing growth in world agricultural production, as well as rising farm production costs. In recent years, adverse weather cut supplies of agricultural commodities while government policies compounded shortages in some areas. As a result, world usage of grain and oilseeds has exceeded production during most of the past decade. Yet, some of these factors are temporary, and others are likely to have little future impact. Overall, structural changes due to biofuels and increased production costs, combined with the continuation of long-term trends boosting demand in developing countries, will continue to support world food prices, said Trostle. However, several commodities have already fallen from 2008 peaks, leading to considerable uncertainty about future food commodity prices.

Next, Patrick Westhoff, Food and Agricultural Policy Research Institute (FAPRI) and the University of Missouri–Columbia, shared forecasts of food price inflation and agricultural commodity prices. The Consumer Price Index (CPI) for food has risen faster in 2008, pulling up the overall CPI. FAPRI projected food price inflation to continue outpacing overall inflation. In 2009 overall inflation is predicted to decline, while food price inflation is anticipated to increase slightly before falling. These forecasts assumed that crude oil would remain above $100 per barrel. In line with the oil forecast, ethanol and corn prices were projected to remain elevated. Thus, operating costs for ethanol plants would continue at a higher level, and net operating returns would fall. Under this scenario, soybean and wheat prices would remain higher as well. Yet, planted corn acres would increase, while soybean and wheat acres would trend lower. For livestock, higher feed costs would check growth in production. Meat export gains would help livestock prices to rise. Westhoff underscored the existence of many uncertainties, including oil prices, economic growth, exchange rates, and weather, especially since commodity prices had already eased from summer highs.

Mark Cackler, manager, Agriculture and Rural Development Department, The World Bank, presented the keynote luncheon speech, analyzing the global food price crisis. With 75% of the poor in rural areas and most of them dependent on farming, agriculture must be part of world economic growth, poverty reduction, and environmental sustainability. Higher agricultural productivity is vital for economic growth, especially in Africa, because of strong growth linkages and comparative advantages in trade. High-value products have gained share in both consumption and export in developing countries, showing that changing diets can assist development. Agriculture can benefit from technological innovations, improved risk management, and stronger producer organizations. However, global trade distortions suppress development. Land and water constraints also delay development, even as spending on agriculture (particularly research and development) lags spending on other sectors. Weaknesses in governance make the other challenges for development even larger, leading to more rural–urban disparities. Additionally, official development assistance to agriculture has fallen as a percentage of the total. World Bank lending for agriculture has risen recently, but overall donor support for agriculture has not.

Cackler emphasized that rising food prices put at risk recent successes against malnutrition and hunger. With sustained food demand increases from emerging markets, policies to fight food insecurity must avoid generating negative long-term implications (e.g., developing countries' dependence on emergency foreign aid). Promotion of agricultural growth in the long run is key. International food prices have declined, though they remain elevated, but domestic prices have not followed in many countries. With food stocks at record lows and unchanged biofuel policies, said Cackler, volatility in food prices will continue to plague poor countries in both fiscal and human costs.

Impacts of food price changes

In the third session, Leslie McGranahan, Federal Reserve Bank of Chicago, covered the distributional effects of food price inflation in the United States.[2] Household inflation depends on the household's purchasing patterns, which vary by demographic characteristics. The effects of food price inflation differ by the share of a household's budget spent on food and the mix of foods a household consumes. For instance, prices for food consumed *at* home increased more rapidly than for food consumed *away* from home in the past year. In aggregate, households spent 13.5% of total expenditures on food, with over half consumed at home. As household income increased, spending on food decreased as a percentage of total expenditures. This result also held for food consumed at home, but not for food consumed away from home. The elderly spent less on food as a percentage of expenditures than even the top income quartile, yet they also spent less on food away from home than the lowest-income quartile. Food price inflation was highest for the bottom income quartile, the elderly, and food stamp recipients, whereas it was lowest for the top income quartile.

The data suggest that Americans have changed their consumption patterns in response to food price inflation, McGranahan said. More people eat at home more often. Not only have people trimmed how often they eat away from home, but they also have been more frugal when eating out. These trends have left full-service restaurants struggling and promoting value options in the current economic climate. Low-income households spent less on eating out than higher-income households before the rise in food price inflation, so their responses have been more limited. Since households in poorer countries also spend more on food relative to overall spending, food price inflation there has played a bigger role in overall inflation.

Robert L. Thompson, University of Illinois at Urbana–Champaign, looked at the implications of increasing food prices for agricultural and energy policy. Because the share of food prices attributed to farmers averaged 19% in the U.S., the increases in agricultural commodities could only account for a small fraction of the increases in retail food prices. The farm share of the value of retail food ranged widely, from 6% for cereals and bakery products to 47% for beef, according to Thompson. But higher diesel fuel costs for transportation of all foods have added significantly to retail food prices.

Agricultural market trends have been influenced by governmental policies, said Thompson. Indeed, the global development agenda ignored agriculture, illustrated by the drop in the percentage of U.S. foreign aid going to agriculture from 25% in the 1980s to 1% in 2007. Also, large public commodity inventories dwindled, since policies shifted toward payments to farmers rather than commodity purchases, reducing buffers for crop shortfalls. Biofuel policies have created large additional demands for corn and edible oils.

As food prices increased in world markets, Thompson noted, the incidence of hunger grew in many developing countries because of the reduced purchasing power of the poor and fixed budgets for food aid. Policy responses in developing countries often make the problem worse, by reducing incentives for farmers to produce more food. Moreover, panic buying and hoarding were triggered, causing prices to rise by more than necessary to balance supply and demand in world agricultural markets.

In the U.S., the Food, Conservation, and Energy Act of 2008 cut support for ethanol production from corn while boosting other biofuels, Thompson stated. Also, this farm bill maintained most agricultural subsidies and created some new programs to benefit agriculture when commodity prices are high. Support for agriculture in the high-income countries of the Organization for Economic Cooperation and Development had declined to under 25% of gross receipts. The fraction of agricultural production that moves via trade should continue to grow, he said, since more developing countries need agricultural imports, especially of high-value foods. World food demand could double by 2050, putting additional stress on world water supplies and productive agricultural land. The future direction of world food prices will depend on whether research and development increases agricultural productivity faster than the growth in world food demand, Thompson stressed.

The role of food price inflation in the macroeconomy

The final session explored the relationship between food price inflation and the macroeconomy. Daniel G. Sullivan, director of research, Federal Reserve Bank of Chicago, stated that food price increases contributed 0.2% to overall inflation in the past 12 months. In the short run, food prices influence inflation because monetary policy works with a lag and it is not possible to offset all price increases with price declines in other sectors. Yet, in the long run, the Federal Reserve can achieve its goal of price stability regardless of relative food price fluctuations. Relative commodity prices rose in the first half of 2008 as lower real short-term interest rates decreased the costs of holding inventories, allowing greater speculation in the commodity markets. However, inventories have not been particularly high, and prices have increased for commodities without futures markets as well. A one-time increase in the price level may not change inflation

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expectations if the credibility of the Federal Reserve provides public confidence that monetary policy will prevent a persistent increase in average inflation. Core inflation, removing the more volatile food and energy components, provides a decent gauge of overall inflation trends and works better as a forecast of future inflation than recent overall inflation. There is the danger of forecast bias when using core inflation if food price inflation has a higher mean than overall inflation, as seen in the past five years, but not over the past four decades.

Joseph W. Glauber, chief economist, U.S. Department of Agriculture, analyzed food price increases in the past 20 months and USDA forecasts. The forecasts of food price increases ranged from 5% to 6% for 2008 and 4% to 5% for 2009. Glauber reiterated several of the key factors that have contributed to higher food price inflation, especially the role of biofuels. Though impacts on food prices vary, the growth in biofuel production led to about a 10% increase in food price inflation. With expectations for tight and volatile agricultural markets in the near term, food price inflation likely will remain higher than the average of the past decade, he said. This depends greatly on energy prices and the supply of corn and soybeans. In the long run, Glauber argued, yield growth will result in the rebuilding of agricultural stocks, which will tend to moderate prices.

Lastly, Dermot J. Hayes, Iowa State University, examined whether the rise in food prices has been driven by market fundamentals, providing comparisons across futures markets. Speculation due to possible future biofuel plant construction helped push the energy value of agricultural commodities to the fore over their food value. Also, weather disruptions reduced carry-over supplies to very low levels, and commodity prices responded when early summer concerns about crop losses captured attention before fading. Panic reactions in foreign markets contributed to food price increases, as various restrictions on exports were imposed. According to Hayes, an analysis of responses to a dollar per bushel increase in corn prices indicated that soybean prices would increase a bit more than a dollar per bushel, and food price inflation would rise 0.8%, led by meat and dairy price increases. The actual movements in grain prices over the past two years can be explained by energy price movements, coupled with biofuel tax credits, and poor weather. Though the impact on food prices was almost a 3% increase, the implications for policy appear minimal because there does not appear to have been an inflationary or speculative component to these price movements.

Conclusion

In summary, food price inflation has risen in recent years because of many factors—on and off farms throughout the world. The role of energy has been central both as a production cost and as an output from agriculture. With a shifting picture for world food demand and supply, agricultural prices have receded from peaks earlier in 2008. However, conference participants agreed that food price inflation is likely to stay above its long-run average even as agricultural markets keep adjusting.

[1] David B. Oppedahl, 2008, *AgLetter*, Federal Reserve Bank of Chicago, No. 1939, February.

[2] Leslie McGranahan, 2008, "Food inflation and the consumption patterns of U.S. households," *Chicago Fed Letter*, Federal Reserve Bank of Chicago, No. 255, October.