

The Food Price Boom and Bust

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Food commodity prices soared between September 2007 and mid-2008, then fell just as sharply. Macroeconomic factors likely underlie this boom and bust, but biofuel and trade policies continue to hold corn, soybean, and rice prices at approximately double their 2005 levels.

In July 2008, the world found itself in the middle of a food crisis, with sharp food price increases raising concerns about increased hunger and political instability in poor countries and worries over inflation in China and elsewhere. Figure 1 shows that prices of the four major food commodities (corn, rice, soybeans, and wheat) approximately tripled between Fall 2005 and mid-2008. This jump caused food prices paid by consumers to also rise sharply—increasing by 40 percent or more in developing countries. Since July 2008 these prices have dropped just as quickly as they rose, although corn, rice, and soybean prices remain about double their 2005 levels.

What gave rise to the surge in agricultural commodity prices and why did it fizzle out so quickly in

the latter part of 2008? The long list of possible explanations includes:

- Biofuel policies in the United States, Brazil, and the European Union (EU) shifting crop utilization from food to fuel.
- Supply shortfalls due to poor weather in Australia, Europe, and elsewhere.
- A gradual tightening of world food supplies due to rapid demand growth in emerging economies (such as China, India, and Russia) and slowing growth in crop yields.
- Higher energy prices that drive up the cost of food production, transportation, and fertilizer.
- Hoarding and export controls.
- Declining value of the U.S. dollar and relatively low real interest rates.
- Speculation and the increasing involvement of hedge and index funds in commodity futures trading.

The first five of these explanations describe demand growth outpacing supply growth. They were the primary drivers in the first two years of the food

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price boom (Fall 2005–Fall 2007), a period in which corn, soybean, and wheat prices approximately doubled. In the last year, some commodity-specific factors have affected prices, including low Australian wheat production due to drought, rice export

controls by India, and floods in the midwestern United States that were initially thought to have severely affected the corn and soybean crops.

However, two features of the 2008 market situation suggest that commodity-specific supply and demand fundamentals were not the leading cause of the 2007/08 price spike. First, virtually all agricultural commodity prices rose and fell dramatically in 2008, including grains and oilseeds (e.g., corn, rice, soybeans, and wheat) and soft commodities (e.g., cotton, coffee, and cocoa). The only exceptions were some livestock products. Second, the spike in agricultural prices was part of a very broad spike in commodity prices. The prices of energy (e.g., crude oil, natural gas, heating oil) and metals (e.g., copper, gold, and aluminum) also rose and fell sharply in 2008. Could there have been serious supply and demand problems in all of these commodity groups or was there a common factor behind this dramatic across-the-board price move?

High Oil Prices and Biofuel

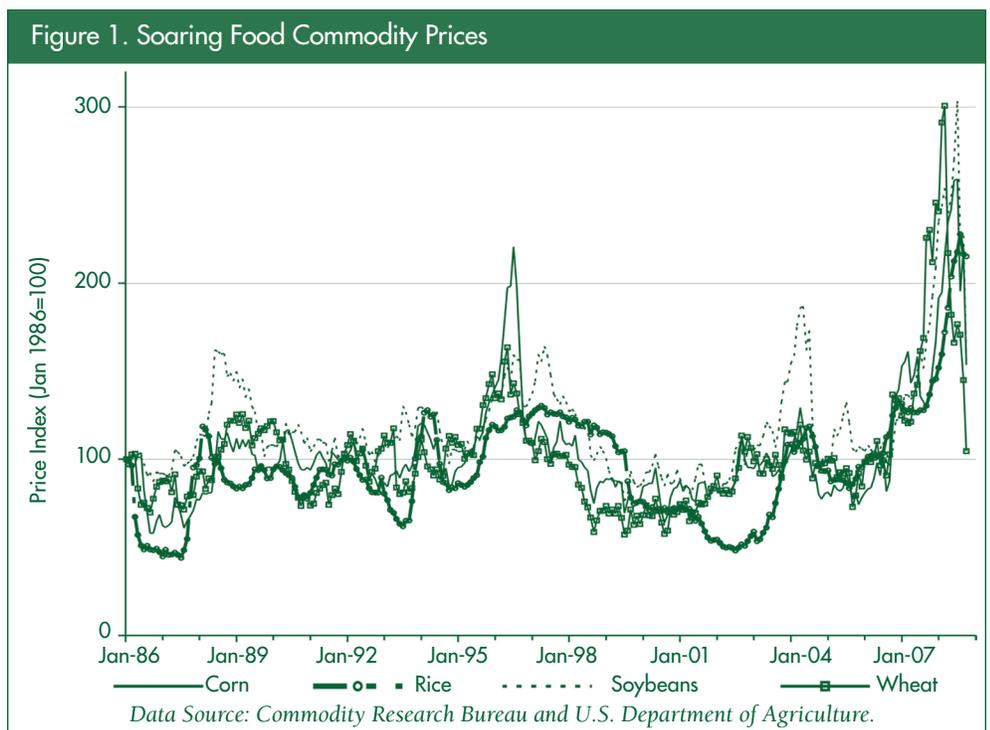
Figure 2 shows that, until recently, grain and oilseed prices were not strongly correlated with petroleum. In 2003, the correlation in daily price changes between corn and crude oil equaled 0.05, which was slightly above the average for the period between 1986 and 2003. By 2007, this correlation had jumped to 0.33. The UN Food and Agriculture Organization (FAO) and others have recognized that commodities are now tied together more closely than ever before—suggesting that agricultural commodity prices now move up and down with prices for fossil-based fuels.

In the past, fossil fuel prices affected agricultural commodities by raising the cost of production, shipping, and fertilizer. The current biofuel era has created a new connection between agricultural and petroleum markets. Increasing fuel prices provide an incentive to move sugar, corn, and oilseed production into fuel channels. Ethanol is produced primarily from sugar in Brazil, whereas the United States produces ethanol largely from corn. In the European Union (EU), bio-diesel is produced from canola. Energy policies in the United States and the EU have been criticized in particular because they promote the inefficient production of biofuels through subsidies and mandated blending requirements.

During the 2008 crop year, more than 30 percent of the U.S. corn supply will be diverted into ethanol production, up from just 14 percent in 2005. This diversion has a significant impact on world corn prices because the United States typically produces about 40 percent of the world's corn and accounts for 60 percent or more of total exports. According to the FAO, the increase in global corn demand in 2007 was about 40 million metric tons, and 75 percent of that growth was attributable to ethanol production.

This dramatic increase in U.S. corn-based ethanol production stemmed from mandates in the Energy Policy Act of 2005. Because of the long lead time in building ethanol plants, the likely quantity of 2007 and 2008 ethanol production was essentially known by late 2006 and therefore would have been incorporated into corn prices by late 2006. Corn prices doubled between November 2005 and November 2006, and we estimate that ethanol production can account for most of that increase. After the 2008 spike, corn prices returned to November 2006 levels.

Cross-commodity linkages are a big part of the biofuel effect. Corn in



the U.S. and canola in the EU compete with other crops for acreage. This competition perhaps was most striking in crop year 2007/08, when U.S. corn acreage jumped 19 percent from the previous year while soybean acreage fell by 16 percent. This crop substitution explains why soybean prices surged in the lead-up to the 2007 harvest, an indirect effect of U.S. ethanol policy on corn acreage.

The Energy Independence and Security Act of 2007 mandates further increases in ethanol production beyond those mandated in 2005. By the time this act was signed into law, ethanol production was already so far above the 2005 mandate that the new mandate will not be binding until at least 2010. Mandated 2008 ethanol production rose from 5.4 to 9 billion gallons under the 2007 Act. However, back in November 2006, the United States Department of Agriculture (USDA) projected that 2008 ethanol production would be 9.4 billion gallons. Similarly, in November 2006 the USDA projected that 2012 corn-ethanol production would equal 11.5 billion gallons. The 2007 Act raised the 2012 ethanol production mandate from 7.5 to 13.2 billion

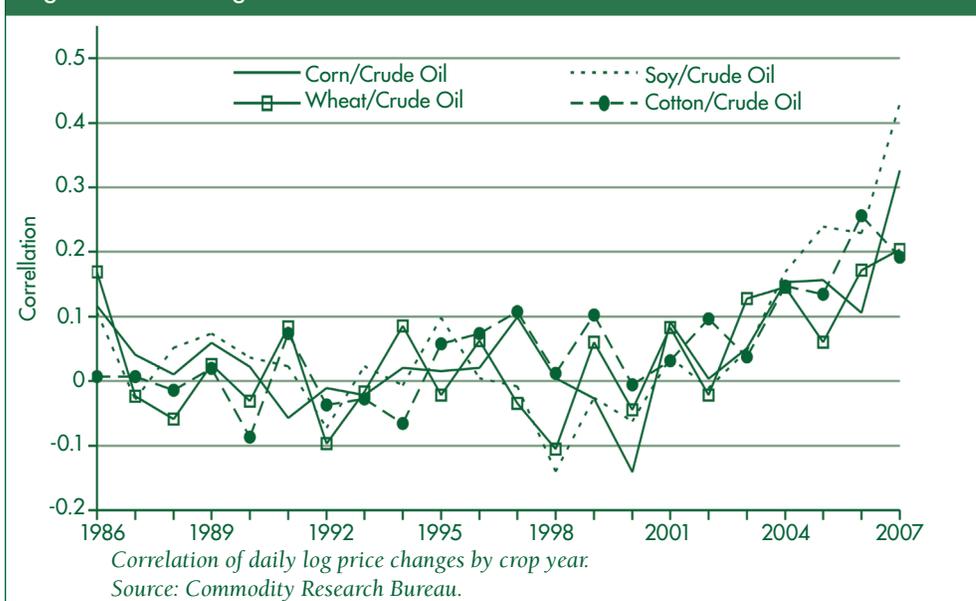
gallons, only slightly above projections made in 2006 by the USDA.

In spite of the passage of the 2007 Act, there seems to have been little change in the ethanol production landscape in 2007/08, so it is difficult to rationalize ethanol production as the cause of the second boom in corn and soybean prices, which began in September 2007. This contention is reinforced by the fact that many other commodity prices also started increasing at that time. Thus, oil, rather than being the cause of the 2007/08 food price spike through the medium of biofuel, appears to be one of many commodities affected by a set of larger forces.

If Not Biofuel, Then What?

In grain and oilseed markets, rising demand in Asia was often mentioned as an important factor behind higher prices. But the trade statistics do not support this contention. China remains a net exporter of corn, rice, and wheat and is a small player in world markets for these commodities. Soybean imports into China have grown rapidly, but that alone cannot explain the recent price increases for all grains and oilseeds. Moreover, the

Figure 2. Increasing Correlation with Crude Oil Prices



growth in Chinese soybean imports displays a smooth pattern over the last decade, suggesting that it was not the catalyst for the price boom.

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The rise in agricultural commodity prices coincides with the view that agricultural commodities have become a new asset class, attracting investment from banks, hedge funds, etc. It was argued that these institutional investors were responsible for a large share of the recent commodity price spike. But research by the U.S. agency that regulates the commodity futures market (the Commodity Futures Trading Commission—CFTC) shows that financial speculation is not an important factor in explaining high commodity prices. The CFTC also pointed out that high prices have been achieved in commodity markets that have no futures trading

(e.g., durum wheat) and in markets with little index trading (e.g., rice).

Commodity prices surged in September 2007, around the same time that the U.S. Federal Reserve began to lower interest rates. Low interest rates raise commodity prices by reducing the cost of storage, thereby creating an incentive to store for future consumption rather than sell today. Low U.S. interest rates also encourage investors to move into currencies with higher interest rates, which causes the U.S. dollar to lose value. A falling dollar increases the dollar value of commodities because the value of dollar-denominated commodities must go up by at least as much as the dollar goes down; otherwise, the value of the commodity falls. These monetary factors likely played a large role in the 2007/08 food price boom, just as they did in the 1970s commodity price boom. The end of the 2007/08 boom coincided with the financial crisis, which generated extreme tightening of credit, financial deleveraging, and predictions of a severe global recession. Recent relatively high correlations among commodity price changes also suggest a strong role for these macroeconomic factors (see Figure 2).

The 2007/08 price spike led to some unfortunate trade policy choices,

especially in the rice market. In March 2008, India banned the export of non-basmati rice and Vietnam also restricted rice exports. India and Vietnam are the second and third largest rice exporters in the world, and their export restrictions reduced global trade by more than 10 percent in 2008. Because of low global stocks and the small share of world rice production that is traded internationally, world prices were extremely sensitive to this reduction. The export restrictions were a significant source of skyrocketing rice prices in 2007/08 and threatened food security in large rice-importing nations such as the Philippines and Nigeria. India's ban remains in effect and rice prices remain double their level of three years ago.

Conclusion

The 2007/08 food price explosion was part of a general commodity price boom and bust, and therefore we must look beyond the agricultural sector for causes and consequences. In all likelihood significant macroeconomic forces, with loosening monetary policy serving as a catalyst, generated the rise and the financial crisis acted as the catalyst for the fall. At the time of writing, many food commodity prices have returned to their Fall 2007 values. However, corn and soybean prices remain about double their 2005 values due to biofuel policies that divert grain from food to fuel. Similarly, rice prices remain twice their 2005 values due to export controls. The food crisis is not over.

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