CORN: FOOD and/or FUEL

The 2008 global food crisis that pushed 100 million people into extreme poverty and sparked riots in over 30 countries was followed by another round of rising global food prices in 2010-11. In 2010, an additional 44 million people fell below the extreme poverty line. In 2011 the deadly combination of drought, bad governance, and high food prices gave rise to a famine in the Horn of Africa, and low yields and high food prices have sparked the 2012 food crisis in the Sahel region of West Africa.

There are many causes of increased global food prices and volatility in agricultural commodity markets. In the latest round of food price volatility, climate change, structural changes in commodities markets, food and energy speculation, and longer-term trends on both sides of the food supply/demand equation are driving prices up. On the demand side the causes are population growth, rising incomes and affluence, changing diets, and the increasing use of grain for biofuels to supply motor vehicles. On the supply side: soil erosion (exacerbated by climate change), aquifer depletion, loss of cropland to non-farm uses, plateauing crop yields and the growing impacts of climate change are all squeezing supplies. A weak dollar, ultra-loose monetary policies, and an explosion of speculative activity on food commodity futures markets are also amplifying price movements. Although the interaction of these various factors has compounded the problem, there are three factors that rise to the top of the food-price challenge.

Climate Change

Extreme and unusual weather in key exporting countries and regions have led to crop failures, production shortfalls and downgrades which have restricted supply and driven up global prices. Scientists at Stanford University estimate that global warming is already cutting substantially into crop yields, indicating that global corn and wheat production declined by 3.8% and 5.5%, respectively, between 1980 and 2008. It is estimated that climate change adds approximately 6% to the cost of wheat and corn.

Excessive Commodity Speculation

Excessive speculation on food commodity markets is believed to have played a “significant role” in increasing food prices and price volatility during the 2007/8 food price crisis. A special session of commodities experts at the Food & Agriculture Organization (FAO)
concluded that speculation was one of the "main factors" behind the recent escalation in food prices. The deregulation of commodity markets in the U.S. allowed a rapid influx of large sums of money into these relatively small markets, which "accelerated and amplified price movements in food commodity markets between 2002 and 2008. Holdings in commodity indices jumped from $13 billion in 2003 to $400 billion in 2011.

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Mexico between 2005 and 2011: tortilla prices increased by 69%; and the cost of the basic food basket that a Mexican family consumes increased by 53%.

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Global Demand for Biofuels
The third factor is the stronger global demand for biofuels. The food-versus-fuel debate has gained particular urgency in recent years and the diversion of a large and increasing share of U.S. corn to ethanol production has drawn particular attention. Unlike most other biofuel crops, corn is one of the key staple food crops in the world, the primary source of calories and nutrients for nearly one billion people. Corn is also one of the most widely used feed crops for animals, so its availability and price have direct impacts on the price of dairy products, eggs, and meat.

The U.S. is the world's largest producer and exporter of corn, so what happens to U.S. corn affects prices worldwide. Encouraged by a set of government policies in the last decade to encourage the production of ethanol, the U.S. became the world's largest corn ethanol producer, with ethanol elsewhere produced primarily from sugarcane. More than 40% of U.S. corn is now consumed in the production of ethanol, up from 5% a decade earlier. This represents an estimated 15% of global corn production. This rapid expansion coincided with the global food price crisis, which drove agricultural commodity prices to record highs in 2007-8. The price spikes sparked food riots and political instability in much of the developing world. Prices spiked again in 2010-11. While most agricultural commodity prices have come down from those peaks, corn prices remain stubbornly high. Few dispute the importance of biofuels expansion to rising agricultural commodity prices.

Since 2000, the U.S. has seen rapid growth in the amount of corn used to produce ethanol. At 13.8 billion gallons, corn ethanol use today is nearly nine times what it was in 2000, while the share of U.S. corn going to ethanol has risen from 5% to 40% in the last twelve years. The increases have been particularly sharp since 2004, and they have coincided with recent food price increases.

Ethanol expansion has been encouraged by
several government policies, including a protective tariff, a tax credit, and a consumption mandate. The tariff protected the domestic ethanol industry from foreign competition by imposing a $0.54 tax on imported ethanol from non-NAFTA countries, such as sugarcane ethanol from Brazil. Additionally, ethanol benefited from a sizable tax credit, which existed in some form for more than 30 years, and afforded blenders of ethanol a $0.45 tax credit. In 2011, the value of this credit was estimated at $6 billion. On top of this, the industry is supported with the Renewable Fuel Standard (RFS), which developed originally in 2005 and was expanded six-fold in 2007. The 2007 RFS mandates the consumption of an increasing amount of biofuel each year, culminating in 2022 with a 36 billion gallon mandate, at least 15 billion gallons of which can be produced from cornstarch. The remaining gallons are supposed to be filled with so-called “advanced” biofuels, including 16 billion gallons of cellulosic biofuels, but as that industry continues to be slow to develop, it is unlikely that the U.S. will be able to fill that mandate by 2022.

Another important policy related to ethanol in the U.S. is “the blend wall,” or how much ethanol can legally be blended into a gallon of gasoline. While at present, the limit is 10% (known as E-10), the EPA has approved a petition to increase this limit to 15% (E-15) and has begun to register producers, and making it possible that E-15 could be on the market in some places by the summer of 2012. Because E-15 is not compatible with certain engines, it remains unclear how much this will boost ethanol demand. Other minor forms of support — through loan guarantees, grants and other tax credits — also continue to subsidize the industry. The U.S. Congress declined to extend the tax credit and tariff at the end of 2011, but the RFS and blending mandate remain, keeping a floor beneath ethanol demand. Corn ethanol expansion could slow in coming years. Most agree that while government policies were key to the rapid expansion of corn ethanol in the U.S., high oil prices now make ethanol a competitive substitute for gasoline. But the RFS may well stimulate continued corn ethanol expansion, as would moves toward a 15% blending wall. Many researchers have attempted to estimate the impact of biofuels expansion on recent increases in food prices, and some have looked specifically at U.S. expansion of corn-based ethanol. A recent report published by the National Academy of Sciences synthesizes the conclusions of eleven studies that examined the 2007 food price spikes, finding a range of 20-40% increase in

Corn-based ethanol has not moved the U.S. from using less foreign oil or reduce greenhouse gases.
commodity prices as a result of biofuels expansion internationally.

Researchers at Purdue University in two different studies estimated high price impacts from US ethanol policies and expansion, accounting for as much as one-quarter of the large price increases in 2008 and continuing impact since. In terms of impacts on corn prices, a 2009 study attributed 22 percentage points of the 2006-8 price increases to U.S. ethanol expansion.

Biofuels are projected to continue expanding globally, and so are high food prices. One projection suggests that corn ethanol trends will push corn prices 12% higher in 2017, while another estimates that with continued biofuel expansion the export price of corn will be 18% higher in 2020 than it would have been without added biofuels demand.

The U.S. motivation for expanding corn-based ethanol was the hope that it would lead to energy independence and national security. But in light of ethanol’s contribution to food-price volatility, and to the political and economic issues that accompany it, efforts to replace oil with corn through biofuel policies threaten to replace one national security risk with another.