



Biofuels and Grain Prices: Impacts and Policy Responses

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Background

Recent dramatic increases in food prices are having severe consequences for poor countries and poor people. The Food and Agriculture Organization of the United Nations (FAO) reports that food prices rose by nearly 40 percent in 2007 and made further large jumps in early 2008. Nearly all agricultural commodities—including rice, maize, wheat, meat, dairy products, soybeans, palm oil, and cassava—are affected. In response to the price hikes, food riots have occurred in many developing countries, including Burkina Faso, Cameroon, Côte d'Ivoire, Egypt, Haiti, Indonesia, Senegal, and Somalia. According to the FAO, 37 countries are now facing food crises.

Triggers and Underlying Factors

High food-price triggers have included biofuel policies, which have led to large volumes of food crops being shifted into bioethanol and biodiesel production; bad weather in key production areas, such as droughts in wheat-producing Australia and Ukraine; and higher oil prices, which have contributed to increased costs of production inputs and transportation. Prices then spiraled further as a result of poor government policies such as export bans and import subsidies, combined with speculative trading and storage behavior in reaction to these policies.

However, the preconditions for rapidly rising food prices stem from underlying long-term trends in food supply and demand that have contributed to a tightening of global food markets during the past decade. Rapid growth in demand for meat and milk in most of the developing world put strong demand pressure on maize and other coarse grains as feed, and small maize price increases had been projected for some time as a result. Other underlying factors include stronger economic growth in Sub-Saharan Africa since the late 1990s, which has increased the demand for wheat and rice in the region; and rapid income growth and urbanization in developing Asia, which has led to increased demand for wheat, meat, milk, oils, and vegetables. On the supply side, long-term underlying factors include underinvestment in agricultural research and technology and rural infrastructure, especially irrigation, as well as increasing pressure on the natural-resource base (land and water).

The Role of Biofuels in Food Price Increases

The role of biofuel policies in the food-price hikes has become particularly controversial. The rapid increase in demand for and production of biofuels, particularly bioethanol from maize and sugarcane, has had a number of effects on grain supply-and-demand systems. Expanded production of ethanol from maize, in particular, has increased total demand for maize and shifted land area away from production of maize for food and feed, stimulating increased prices for maize. Rising maize prices, in turn, have affected other grains. On the demand side, higher prices

for maize have caused food consumers to shift from maize (which is still a significant staple food crop in much of the developing world) to rice and wheat. On the supply side, higher maize prices made maize more profitable to grow, causing some farmers to shift from rice and wheat (and other crop) cultivation to maize cultivation. These demand- and supply-side effects have tended to increase the price of rice and wheat and other crops.

To examine the impact of alternatives to current biofuel demands, the following analyses were implemented:

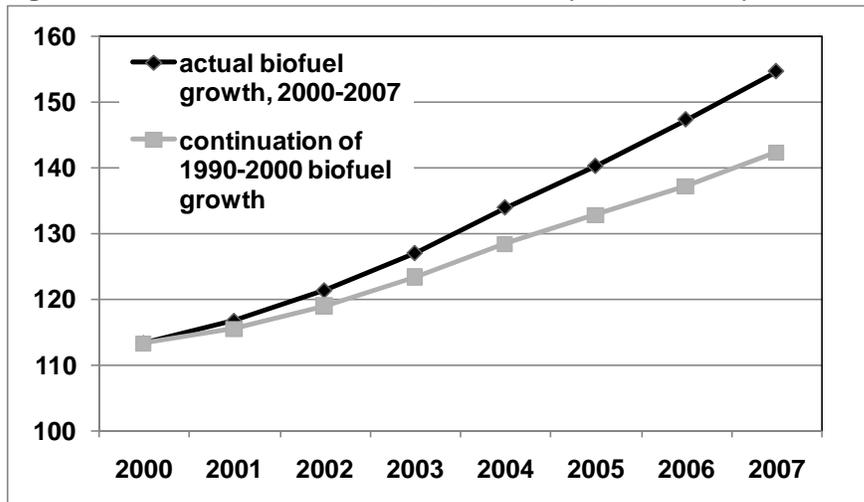
- 1) Recent food price evolution with and without high biofuel demand
- 2) Impact of a freeze on biofuel production from all crops at 2007 levels
- 3) Impact of a moratorium (elimination) on biofuel production after 2007.

These issues are examined using the International Food Policy Research Institute's (IFPRI) IMPACT model (International Model for Policy Analysis of Agricultural Commodities and Trade), a partial-equilibrium modeling framework that captures the interactions among agricultural commodity supply, demand, and trade for 115 countries and the world. IMPACT includes demand for food, feed, biofuel feedstock, and other uses.

1) Recent food price evolution with and without high biofuel demand

A comparison between a simulation of actual demand for food crops as biofuel feedstock through 2007 and a scenario simulating biofuel growth at the rate of 1990-2000 before the rapid takeoff in demand for bioethanol approximates the contribution of biofuel demand to increases in grain prices from 2000 to 2007. The percentage contribution of biofuel demand to price increases during that period is the difference between 2007 prices in the two scenarios, divided by the increase in prices in the baseline from 2000 to 2007. The increased biofuel demand during the period, compared with previous historical rates of growth, is estimated to have accounted for 30 percent of the increase in weighted average grain prices. Unsurprisingly, the biggest impact was on maize prices, for which increased biofuel demand is estimated to account for 39 percent of the increase in real prices. Increased biofuel demand is estimated to account for 21 percent of the increase in rice prices and 22 percent of the rise in wheat prices.

Figure 1: Simulated Real Grain Prices, 2000-2007 (US\$/metric ton)

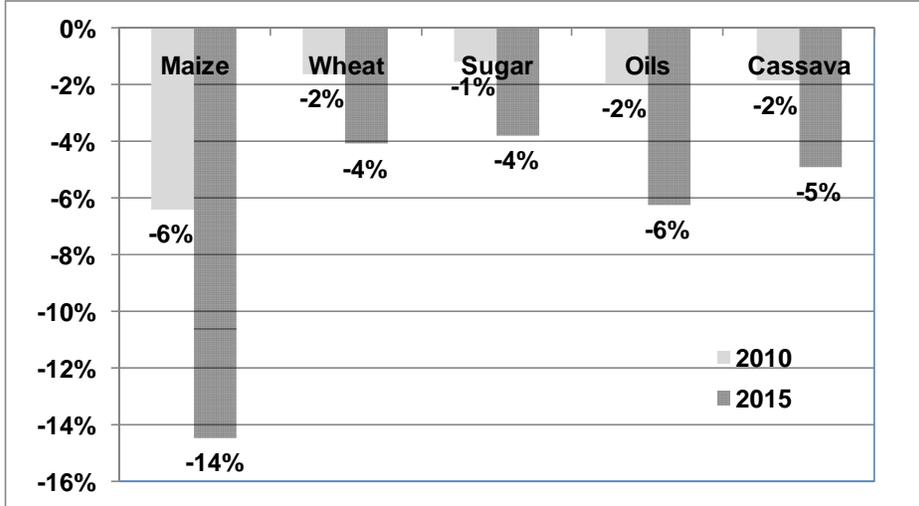


Note: Grain price is the production-weighted average of rice, wheat, maize, and other coarse grains.
Source: IFPRI IMPACT.

2) Impact of a freeze on biofuel production at 2007 levels

If biofuel production was frozen at 2007 levels for all countries and for all crops used as feedstock, maize prices are projected to decline by 6 percent by 2010 and 14 percent by 2015. Smaller price reductions are also expected for oil crops, cassava, wheat, and sugar.

Figure 2: Change in Selected Crop Prices if Biofuel Demand for all Crops was Fixed at 2007 Levels

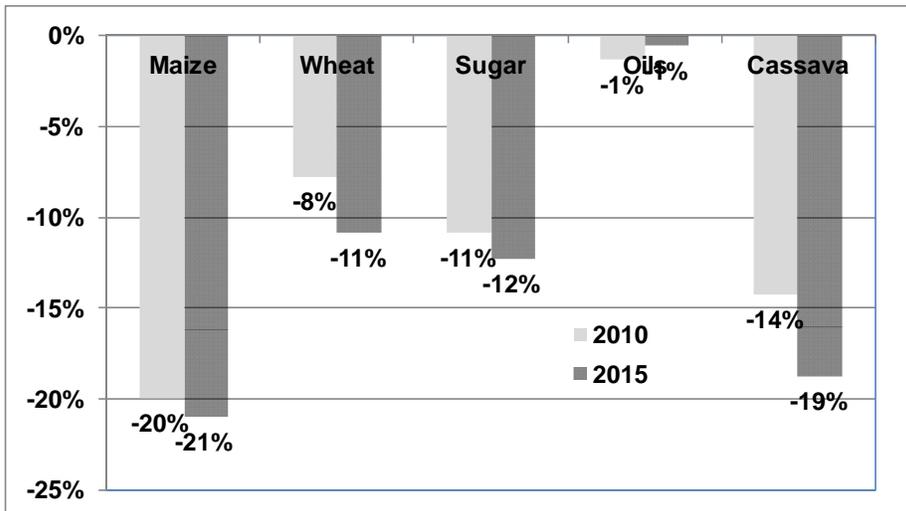


Source: IFPRI IMPACT.

3) Impact of a moratorium (elimination) on biofuel production after 2007

If biofuel demand from food crops were abolished after 2007 (in other words, if a global moratorium on crop-based biofuel production were imposed), prices of key food crops would drop more significantly—by 20 percent for maize, 14 percent for cassava, 11 percent for sugar, and 8 percent for wheat by 2010.

Figure 3: Change in Selected Crop Prices if Biofuel Demand is Eliminated after 2007



Source: IFPRI IMPACT.

Conclusion

Various pressures on international grain markets have contributed to the rapid price increases during the past several years, and biofuels have been just one contributor—albeit a major one. Slowing supply growth and rapidly growing demand for grain for all uses (including food and feed), which have been made worse by policy-induced distortions, are long-term underlying factors that cannot easily be reserved. If the world food economy is to meet the increased demand for food, feed, and fuel that is being driven by rapid socioeconomic growth in the world's biggest and fastest-growing developing countries, and also cope with the future challenges of increasing land-use pressures and climatic change, agricultural productivity will have to grow significantly faster in the future than it has in recent years.

Higher food prices reduce the poor's access to food, which has possible long-term, irreversible consequences for health, productivity, and well-being—particularly if higher prices lead to reduced food consumption by infants and preschool children. If the current biofuel expansion continues, calorie availability in developing countries is expected to grow more slowly; and the number of malnourished children is projected to increase, even though agricultural value added in these regions would also accelerate as a result of higher farm incomes.

It is therefore important to find ways to keep biofuels from worsening the food-price crisis, and a reduction in mandates and elimination of subsidies for biofuel production would contribute to lower food prices. But it is even more critical to focus on increasing agricultural productivity growth and improving developing-country policies and infrastructure related to the storage, distribution, and marketing of food. These factors will continue to drive the future health of the agricultural sector and will play the largest role in determining the food security and human well-being of the world's poorer and more vulnerable populations.

The United States can play an essential role in boosting agricultural growth by increasing investment in agricultural research and supporting reforms targeted at increased crop productivity on a global basis. The 15 international research centers of Consultative Group on International Agricultural Research (CGIAR, www.cgiar.org) have been at the forefront of increasing agricultural productivity in the developing world, with a focus on achieving sustainable food security and reducing poverty in developing countries through scientific research and research-related activities in the fields of agriculture, forestry, fisheries, policy, and the environment. Providing more support to the CGIAR system should be an important part of U.S. efforts to redress the current food crisis.