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Biofuels and food prices: Separating wheat from chaff

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ABSTRACT

Biofuels are produced from agricultural commodities, so they represent a competing demand for those commodities. Therefore, it is clear that biofuels have some impact on agricultural commodity prices, so the food–fuel debate surrounds the relative contribution of biofuels to agricultural commodity price increases compared with other drivers. In this paper we have argued that there are many causes for the increase in food commodity prices—not biofuels alone. These include global supply and demand trends, regional or commodity specific supply disruptions, changes in the value of the US$, macroeconomic issues such as recession or financial crisis, trade policy changes, and biofuels. As for biofuels, we have argued that one must distinguish between biofuels driven by market forces and biofuels driven by government policy. Clearly the biofuel industries in the US, Brazil, and Europe were created with government support. However, at least in the US, the market is the major driver today for corn based ethanol.

We have also argued that higher commodity prices adversely affect the poor, particularly the urban poor. However, there is another side to this picture, which is the supply increases that can be induced all over the world via the higher commodity prices. If governments establish policies that are conducive to supply growth, the higher commodity prices offer an opportunity to at least partially close the yield gap between developing and developed countries, thereby helping poor farmers in developing countries. Developing country farmers have already shown that markets work with the huge expansion in cropped area in many regions due to higher commodity prices.

1. Introduction

Biofuels are produced from agricultural commodities, so they represent a competing demand for those commodities. Therefore, it is clear that biofuels have some impact on agricultural commodity prices, so the food–fuel debate surrounds the relative contribution of biofuels to agricultural commodity price increases compared with other drivers. There are some who focus on biofuels as virtually the sole cause of food commodity price increases. In this paper, we examine what has been happening in food commodity markets since the first recent price surge in 2008, with particular emphasis on the links between biofuels growth and food commodity prices.

Agricultural commodity prices are driven by forces related to supply of and demand for the commodities. In some cases, most of the agricultural commodity prices move together, especially when responding to some generalized shift in supply (large scale drought) or demand (rising food demands in developing countries). In some cases, agricultural commodities move together with other commodity prices (oil, copper, etc.) as happened in 2008, and in other cases, agricultural commodities respond to different factors. Often, when important macroeconomic factors are involved (rapid change in the value of the US$), or rapid economic growth or decline (2009), many commodity prices do move together. Then there are cases when one or two agricultural commodities move apart from the general set of agricultural commodities (corn and soybeans in 2011). In those cases, commodity stocks-to-use ratios (current stocks divided by annual consumption) almost always play a large role in determining prices. In what follows, we will attempt to explain how these different drivers function in affecting food commodity prices.

2. 2008 Commodity price increases

In our analysis of the 2008 commodity price surge, we identified three major drivers of the price increases (Abbott et al., 2008)

- For the decade prior to 2008, consumption of agricultural food commodities globally had been increasing faster than production. Thus it was a somewhat slow change due to dietary transition and rising incomes in developing countries and

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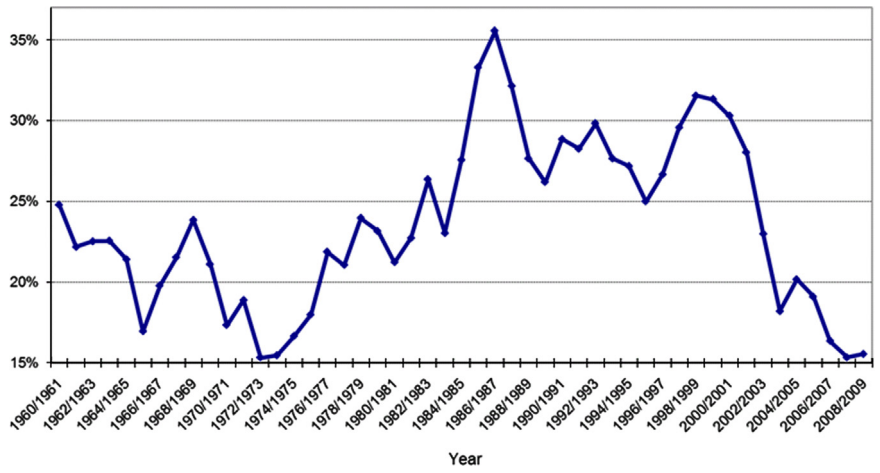

Fig. 1. Global grains stocks-to-use ratio, 1960–2009.
Source: Abbott et al. (2008).

many other factors that culminated in a low stocks-to-use ratio entering the 2008 crop year.

- Commodity prices are expressed in US dollars. Between 2002 and 2008, the US dollar depreciated about 64% vs. the Euro. Thus commodity prices increased much more in US$ than in other currencies such as the Euro.
- The third major driver for the upswing in 2008 was the growth in production of biofuels, particularly corn ethanol in the US.

Now we will describe each of these important drivers in a bit more detail. Fig. 1 shows the stocks-to-use ratio for global world grains from 1960 to 2008. From 1982 through 1998, we went through a period with "normal" stocks-to-use ratios between 25 and 35%. Then after 1998 the ratio started falling because global consumption in most years surpassed global production with the ratio reaching 15% in 2008. In other words, we went from an era of surplus agricultural production to the beginning of a period of shortage.

At the time, there were many authors who attributed a significant part of the commodity price increase due to large demands from India and China. However, the reality is that India and China were not significant traders in many agricultural commodities. Both countries applied policies aimed at achieving self-sufficiency in key agricultural commodities. Even though consumption in some commodities had been growing rapidly (corn in China and wheat in India), imports had been insignificant. Countries that do not trade any given commodity do not have a significant impact on its world price even if their consumption is high and growing. Even though, except for a few commodities (e.g., oilseeds and vegetable oils in China) China and India were not to blame for the price increases, the fact remains that globally consumption had grown faster than production in the decade prior to 2008. Starting from very low stocks, there were some regional production problems in 2007/08 that led to reduced output making conditions worse.

Fig. 2 displays the indexed prices of crude oil and several agricultural commodities. Crude oil led other commodity prices up, but all the major commodities moved up except cotton, as shown in Fig. 3. In 2008, rice had the sharpest price climb due to supply and demand conditions in that market and also to trade restrictions imposed by several countries. The trade restrictions made an already thinly traded market even thinner and led to panic buying in a tight market. While cotton was not affected in 2008, it had the largest price climb in 2011. This change was due in part to declining production in other parts of the world but also due to considerable cotton acreage drops in the US to accommodate the increased demand for land for soybeans and

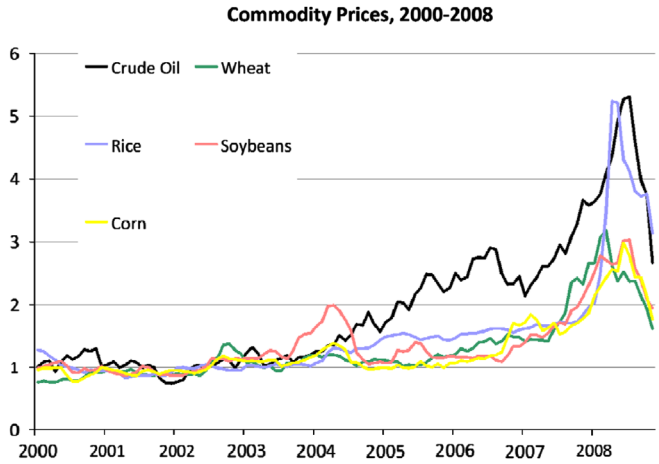

Fig. 2. Indexed commodity prices 2000–2008 (2002=1).
Source: Abbott et al.(2008).

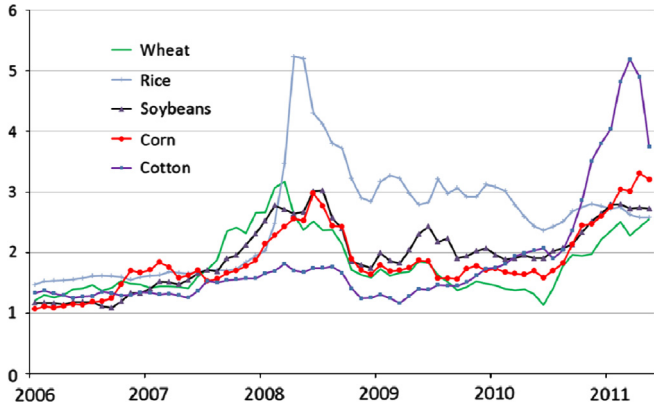

Fig. 3. Agricultural commodity price indices 2006–2011 (2002=1).
Source: Abbott et al. (2011).

corn. Note also that rice was not affected by the 2011 price surge, as market conditions remained stable for this commodity. Clearly, global supply and demand conditions impacted the prices of all agricultural commodities but to different degrees in different periods.

Fig. 4 shows the corn price from 1980 to 2008 expressed in US$, Euros and the USDA Ag Index of currencies, with 2002 pegged to 1. Clearly, the corn price went up much more in US$ (250% of the 2002 level) than it did in the other currencies (150% of the 2002 level).