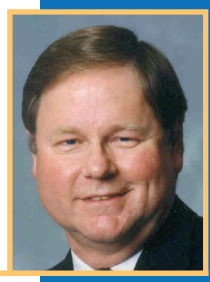
Policy Update

Biofuels (2010) 1(4), 535–537

What drives changes in commodity prices? Is it biofuels?



"There is no doubt that the surge in biofuels production in the USA, EU and Brazil played a role in the commodity price increase. But when we consider the role of biofuels, we must distinguish between biofuels production and biofuels policies."

Wallace E Tyner[†]

There has been substantial controversy over the role of biofuels in commodity price increases. With the commodity price spikes in 2008, many argued that the increases in prices of corn, soybeans, wheat and rice were driven by the increasing use of agricultural commodities for biofuels. In 2008 and 2009, two colleagues and I published two papers on the key drivers of changes in food prices [1,2]. This atricle draws upon those two papers with some recent updates.

We argued that there were three main drivers of the commodity price increases in 2008. The first was global supply and demand conditions. Commodity prices are heavily influenced by what are known as stocks-to-use ratios. The stocks-to-use ratio measures the amount of global stocks of a given commodity compared with global annual use of the commodity. The higher the stocks-to-use ratio, the more margin there is for crop failure anywhere in the world and the lower, in general, are commodity prices. Very low stocks-to-use ratios normally mean higher market prices as the market rations the limited stocks through higher price. Stocks-to-use ratios for global cereals are shown in **Figure 1** for 1960–1961 through 2009–2010. In the 1980s and 1990s, stocks-to-use ratios generally ranged from 23–35%. In 2008 stocks-to-use ratios for cereals were exceptionally low, at approximately 16% and were expected to go even lower. However, this is not a situation that developed overnight. In fact, stocks-to-use ratios have been falling since the turn of the century. In 8 out of the previous 9 years global consumption had exceeded global production, which meant a slow drawdown of stocks.

Why was global consumption exceeding global production? There are several reasons. The biggest was that global demand in aggregate was growing faster than global production. Yields were increasing over this period, but consumption was growing even faster. Many looked at this situation and simply assumed it was India and China. Indeed, consumption was growing rapidly in both countries, but so was production. Both India and China have self-sufficiency policies in basic cereals (e.g., wheat, rice and corn). So it was not particularly India and China; rather, it was growth in demand the world over. As incomes rise, people demand more meat and meat needs much more cereal input than if the cereals are consumed directly by humans alone. In the years just before 2008, there were also some droughts (e.g., Australia) and disease problems in several world regions. These supply problems exacerbated an already declining stocks-to-use ratio. Thus, the stage was set for serious shortages.

The second major factor leading to sharp price rises in 2008 was the plunge in value of the US dollar. The US dollar fell 67% from 2002 through to mid-2008. Agricultural commodities are priced in US dollars, so if the dollar falls in value it takes less foreign currency to buy a metric ton (MT) of grain or oilseeds. Thus, commodity prices did not increase nearly so much in euros or other currency as they did in US dollars. **Figure 2** shows the history of corn prices in US dollars, euros and a USDA market basket of currencies. At the peak corn prices tripled in US dollars, but went up less than 50% in euros. The fall in the US dollar meant that

[†]Purdue University, West Lafayette, IN 47907, USA
E-mail: wtyner@purdue.edu

10.4155/BFS.10.31 ISSN 1759-7269

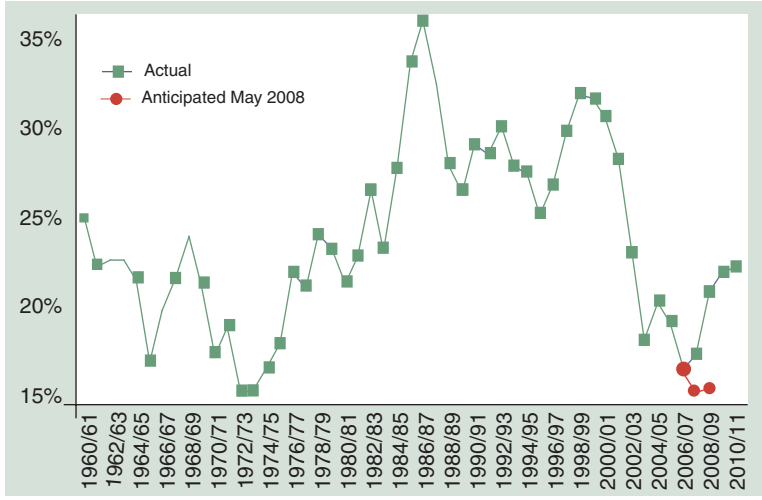


Figure 1. Stocks-to-use ratio for total grains in the world (1960/1961–2009/2010).

global demand could be sustained in the face of sharply higher commodity prices denominated in US dollars. The third major factor in the 2008 price spike was biofuels. There is no doubt that the surge in biofuels production in the USA, EU and Brazil played a role in-the commodity price increase. But when we consider the role of biofuels, we must distinguish between biofuels production and biofuels policies. They are not the same thing. Biofuels production went up in part because of biofuels incentives provided by governments, but also because high oil prices provided a demand for more biofuels. Higher crude oil price means higher gasoline and diesel prices, which in turn, increases demand for corn for ethanol and oilseeds for biodiesel. It was the combination of the high oil prices and government subsidies that led to the biofuels boom from 2006 on. For the USA, the price of corn went from US$79/mt to US$236/mt, at the same time crude oil went from US$40 to US$120/barrel. In other words, both prices tripled. Our analysis concluded that roughly US$40 of that US$157 increase in the price of corn was due to the US government ethanol subsidy, and US$117 was due to the increased profitability due to higher oil prices. So was a lot of the increase related to biofuels? Yes, but most of it was market-driven, not policy-driven. Of course, one could argue that prior to 2006 the US ethanol industry would not have existed without government subsidies, and that is indeed correct. At the time, ethanol needed US$60 crude oil to be viable without government support, and that price arrived only in 2006. However, from that point, much of the increase was driven by high oil prices and the expectation (at the time) that oil prices would stay high.

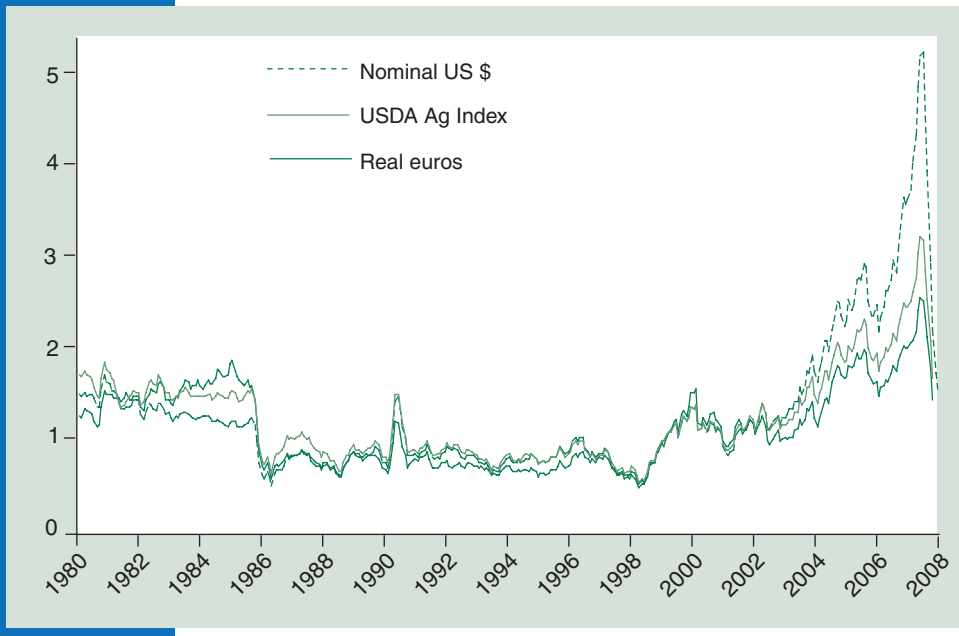


Figure 2. Corn prices in US dollars, euros and a US Department of Agriculture basket of currencies.

So, given this complex maze of factors, can we say how much was due to global supply and demand, how much to the fall in the US dollars and how much to biofuels? The answer is absolutely no. Several of the papers we reviewed attempted to pin the blame mostly on biofuels or mostly on global demand. But the reality is that one cannot, with any precision, partition the effects. For example, earlier I indicated that growing Chinese demand for agricultural crops was not a major driver. However, since 2000, a third of the global increase in oil demand came from China. So China had a big influence on the rising price of

crude oil and, as indicated above, the rising price of crude oil had a big influence on the demand for corn for ethanol. The point is that these drivers are inextricably intertwined, and we cannot reliably partition the drivers of the changes in prices.

Our second paper was completed in March 2009. In that paper, we basically asked the question – were the key drivers of commodity prices spiking in mid-2008 still the drivers behind the plunge in prices in the second half of 2008? Our answer was that, yes, the same three general factors drove the prices down the ladder, but in somewhat different ways. See the 2009 paper for a more complete explanation [2].

Are biofuels a contributor to commodity prices being higher today than historic norms? The clear answer is yes. The USA is the leading producer and exporter of corn in the world. It is beyond the pale to imagine that with ethanol use for corn going from less than 10% of the crop to approximately a third of the crop, there would be no impact. In fact, today the term 'new normal' is often used to describe the new supply and demand situation. Historically, corn price had averaged around US$90/mt and today it is about US$138/mt, about a 50% increase. There is no doubt that part of the shift to this 'new normal' is due to biofuels, and part of that due to government incentives. However, the US dollar is still lower than before, and global demand is holding strong. So all the key drivers are still in place.

Financial & competing interests disclosure

The authors have no relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript. This includes employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties.

No writing assistance was utilized in the production of this manuscript.

Bibliography

1 Abbott P, Hurt C, Tyner WE. *What's Driving Food Prices?* Farm Foundation Issue Report (2008).

2 Abbott P, Hurt C, Tyner WE. *What's Driving Food Prices? March 2009 Update.* Farm Foundation Issue Report (2009).