Energy Markets: The Impact on Trade in Biofuels and Farm Goods

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Introduction

Since late 2006, biofuel policies have caused high grain/oilseed prices by creating a link between crop and biofuel policies. The value of agricultural trade has increased sharply, mostly because of high prices, not increased trade volume. Biofuel policies have little to do with the agenda of the Doha trade negotiations but have had indirect effects in that production subsidies and import barriers are lower due to higher prices, which thereby changes the politics of farm policy and trade negotiations in general.

1. Biofuel policies and farm prices: an overview

Over five months, beginning in October 2006, the US farm price of yellow corn rose by 88 per cent (107 per cent for white corn) as the market reacted to the doubling of the corn ethanol production capacity (Rausser and de Gorter 2013). Crude oil and ethanol prices had more than doubled in the previous 33 months when corn prices remained flat. However, two key events activated by high crude oil prices created the corn-ethanol price link: the blender’s tax credit and the ban on methyl tertiary butyl ether, a lower cost fuel additive that competes with ethanol. This caused tortilla prices to double, thereby precipitating the Mexican Tortilla Crisis in January 2007. The ensuing political anxiety led to the February 2007 ban on wheat exports by India, the beginning of many developing countries’ policy responses to come. Finally, in December 2007, the United States doubled its ethanol mandate, and so the high grain/oilseed price boom was in full swing (the EU consolidated its 2003 mandate in 2009). Meanwhile, soybean and rapeseed oil prices were tightly linked to biodiesel prices in the United States and the European Union, respectively. US exports of ethanol in 2010 linked world ethanol prices to such an extent that shocks in world sugar markets impacted corn prices.1

Biofuel policies are a subset of energy, environmental and agricultural legislation designed to achieve the multiple goals of energy security, an improved environment, enhanced agricultural incomes, technological change, the overall economic benefits of ‘green’ jobs, and foreign exchange savings. Although biofuel production and consumption are mostly concentrated in the United States, Europe and Brazil, more than 60 countries have implemented biofuel policies. The most important policies are formal blending mandates, de facto mandates induced by various environmental regulations, subsidies aimed at supporting biofuel consumption and production, biofuel import barriers and export enhancements, subsidies on feedstock production, and binary sustainability standards where biofuels from different feed stocks have different greenhouse gas emission reductions relative to the fossil fuel they are expected to replace. It is important to recognize that the first two categories of biofuel policies (i.e. tax credits/exemptions and mandates) do not, by themselves, discriminate against international trade. However, the other policies listed above do.

1 See de Gorter et al. (2013a, b, c).
Following three decades of a decline in real prices of cereal and oilseeds, Figure 1 shows how nominal prices have spiked three times in eight years. Figure 1 also illustrates the importance of the crop-biofuel price links and how the quantity of crops going into biofuels may not be the principal driving force in explaining food commodity price levels.

Biofuel energy prices are locked onto each other when the tax credit is binding; if there are ‘mandate’ premiums, then biofuel prices float up and away from energy prices. There are therefore two states of nature: corn and ethanol prices – now locked onto each other for the first time ever – are lowest when ethanol prices are locked onto gasoline prices, which are locked onto crude oil prices. Otherwise, ethanol – and hence corn prices – float up and away from energy prices, and so are even higher than otherwise.

These two states of nature are important because, if corn prices are locked onto crude oil prices through the tax credit (if any), then supply/demand shocks in corn markets or traditional farm subsidies have no impact on corn prices (except for the effect of the change in ethanol production on world crude oil prices, which will be modest at best). Only when biofuel prices float up and away from energy prices can crop supply/demand shocks affect corn prices (but only by the amount of the mandate premium). This has implications for future WTO trade disputes as the effect of farm policy depends on the biofuel policy regime that determines the grain/oilseed price.

The production of biofuels accelerated in the mid-2000s and has now levelled off. Many commentators use this, along with the fact that only 1.5 per cent of total cropland is allocated to biofuels, as proof that biofuels are not the leading cause of high, volatile foodgrain and oilseed prices. However, ironically, in the time periods when grain prices decline in Figure 1, the relative impact of biofuel policies is even higher because ethanol price premiums rise above the tax credit so mandate price premiums arise. Therefore, much of the impact of biofuel policies is summarized in price links.

There are now two counterfactuals: how much did biofuel policies increase food commodity prices compared to no biofuels (like the good old days) or compared to the lowest crop prices can go, given the crop-biofuel price link (the new reality)? For the former, Drabik (2011) estimates a 40 per cent increase due to biofuels;2 for the latter, de Gorter et al. (2014a) and de Gorter and Drabik (2014) estimate that 80 per cent of the foodgrain/oilseed prices increase would have occurred regardless (because prices can never go lower than when locked onto crude oil prices).3 De Gorter et al. (2014a) show that the price increasing effects of biofuels policies for the 2007–08 to 2011–12 time period resulted in an average USD1 billion per day transfer from crop consumers to crop producers (to complement the USD1 billion per day farm subsidy as calculated by the OECD “Producer Subsidy Equivalent” measure).

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2 This estimate is a lower bound because it does not take into account stockholding behavior where the impact of supply/demand shocks are highly non-linear as the price change is higher when stocks have been depleted, perhaps even because of biofuel policies – see Wright (2014).

3 This assumes that all food grain and oilseed prices move together because of substitution in demand and competition for land. De Gorter et al. (2013a) show that relative prices have not changed since October 2006, while Wright (2014) and Roberts and Schlenker (2009) show that the price of calories is highly correlated among the grain and oilseeds.
2. The value and quantity of agricultural trade in this new biofuels era

The value of agricultural trade has skyrocketed since 2006 (see Figure 2). The cereal and oilseed value of trade has followed it quite closely, so the price increase has been for all crops; however, higher crop prices mean higher input costs for value-added agriculture and so the value of meat, poultry and dairy trade has also increased. However, one can notice that the quantity of cereal and oilseed trade has continued on trend but that the value of trade is far above trend as of 2006. This means there has been a price-induced increase in the value of trade for agriculture.

Figure 3 provides a summary of the main events since October 2006. The first thing to note is that crude oil prices led cereal prices early on (a hint that things were different this time in that the crude oil price affected crop prices on the demand side, not just through higher input costs). Second, the corn wakeup call on ethanol production capacity growth beginning in October 2006 is reflected not only though a higher grain price index but also through the fact that cereal prices go in the opposite direction to crude oil prices. However, after that, oil prices continued their steep rise, while cereal prices were fairly flat until August 2007. Third, corn and soybeans were locked onto crude oil prices all the way up and all the way down the 2008 price spike (with wheat and later rice prices overreacting – de Gorter et al. 2014a). Finally, the 2008 US financial crisis induced the biggest economic recession since the Great Depression (where the Illinois farm price of corn plummeted to a low of USD3.30 per bushel, nowhere near the USD1.62 per bushel low in 2005–06 when the world was enjoying its biggest economic boom in history).

By the last quarter of 2007, cereal and oil prices were rising in lockstep all the way to the peak of July 2008 and the bottom of December 2008, but crude oil prices plunged much more because of ethanol mandate price premiums, keeping food commodity prices higher and not following crude oil prices to their bottom. Crude oil prices went up from USD41 per barrel to USD75 per barrel from December 2008 to June 2010 (basically straight up). However, cereal prices held steady from December 2008 to June 2009 and then slowly fell, even though crude oil prices were rising the entire time period from December 2008 to June 2010. Why was there a negative relationship between crude oil and cereal prices? The answer is that mandate premiums over the tax credit were being built.

Nevertheless, after June 2010, cereal prices reversed their decline and marched straight up with no hesitation. This climb came alongside crude oil price increases, peaking at UAD123 per barrel. This time, however, cereal and crude oil prices were strongly positively related. The mandate premium was at a record high in 2012–13 because of the expired US blender’s tax credit and drought, thereby generating a large gap between the cereals price index and the oil price.

3. The new economics of impacts of subsidies and international trade distortions

If a biofuel consumption subsidy (the blender’s tax credit in the United States or excise tax exemption in the rest of the world) is binding, corn production subsidies have minimal (but negative) impacts on corn market prices as any impact has to go through crude oil prices; however, under a mandate, corn prices fall by 25 per cent more compared to a corn production subsidy in a situation with no biofuel
production (Drabik 2011). Therefore, the traditional effects of farm subsidies are now quite different and have implications for WTO trade disputes.

An ethanol production subsidy, on the other hand, reduces the ethanol market price and lowers the marginal cost to fuel blenders, while expanding ethanol production, because the producers receive the ethanol market price plus the subsidy. The corn price increases because it is linked to the price received by ethanol producers. However, a corn production subsidy reduces all market prices analyzed. This is because it lowers the marginal cost of corn production, thereby expanding ethanol production as the former becomes less costly. Therefore, the market distortions of biofuel policies increase the market prices of grains/oilseeds (something the WTO does not concern itself with) while traditional farm and trade policy impacts on world prices are now different (compared to the previous era of no biofuels) with world price distortions dependent on the biofuel policy regime (world prices distorted more/less with a mandate (tax exemption) determining the biofuel price compared to the era of no biofuels).

4. The new politics of the US farm bill

Biofuel policies and the resulting high, volatile grain and oilseed prices have created a new politics of the US Farm Bill. Moreover, the central role energy and environmental policy play in determining grain prices has also changed the political-economic landscape that directly affects grain prices, so that the US farm legislation now wields less impact than it did previously. The major stakeholder groups who have been engaged in the political process and the specialized interest-group landscape have changed since 2006. There is no longer an “iron triangle” that influences commodity prices; instead, we now have the “iron maze” of environmental, energy and agricultural legislation, interest groups and public agencies (Rausser and de Gorter 2013).

Because ethanol policies support feed-grain markets through higher prices, livestock, dairy and poultry producers are beginning to form organized opposition interest groups, as do those food processors that no longer enjoy the low market prices that traditional agricultural policies ensured. New interest groups include coalitions of livestock organizations such as various meat, livestock, poultry and dairy producer associations.

The higher commodity prices due to biofuel policies have resulted in a new politics of the Farm Bill where direct payments were considered embarrassing and thereby eliminated, along with the countercyclical programme. Most of the so-called reforms are largely cynical because, in this new era of high prices and record farm incomes, direct payments (where most of the “cuts” fall) were politically unviable and likely to end anyway, and countercyclical and loan deficiency payments (which are paid out when prices are low) were unlikely to be triggered. The new Farm Bill therefore introduced the “price loss coverage” (PLC) programme with a system of much higher target prices, generating production distortions with implications for crop production, commodity prices, federal outlays, the environment and US international trade commitments.

Meanwhile, in an era of high prices, subsidies associated with the crop insurance programmes have become very high, especially if one includes underwriting and administration costs. The new Farm Bill introduced “revenue insurance” programmes that cover “shallow losses” for crop insurance designed to complement crop insurance. The most important of these is the Supplemental Coverage Option
(SCO) shallow loss programme. Evidently, Farm Bill advocates believe it is more advantageous to their interests to redesign such policies as “revenue insurance” programmes that will kick in whenever prices vary (the loan rate serves as a minimum price guarantee).

**Conclusion**

Biofuels have linked energy prices and food prices directly, changing the dynamics of food production and trade. The value of all agricultural trade has increased sharply as a result, mostly because of higher prices, not from increased trade volumes. Biofuels directly increased the price of crops, while the latter increased the costs of production for value-added agriculture. These developments have few direct implications for the multilateral trade talks. It is true that many OECD country production subsidies are price contingent and therefore expected to be lower and less trade distorting (e.g. in the United States) with high prices (likewise, the distorting effects of tariff rate quotas are now lower too). Meanwhile, import barriers in developing countries have fallen with policy changes induced by the international food price spike in 2007–08. Therefore, a decline in both subsidies and import barriers may reduce the urgency of a Doha negotiation outcome; however, at the same time, the political costs of such a deal are lower. It is therefore not clear how biofuels have changed the negotiating position of different countries and the dynamic of trade negotiations. However, the US Farm Bill politics towards revenue insurance programmes have changed, and the subsidy costs are very high, especially in an environment where prices begin to fall, as is now the case.
Figure 1: Grain prices vs. biofuel production

Figure 2: Value of agricultural trade vs. cereal + oilseeds
Figure 3: Cereal and crude oil price movements

- **Cereals Price Index**
- **Crude Oil Price**

- Corn/soybeans locked onto crude oil (but at a discount)
- Corn/wakeup call on biofuels
- Crude oil lead cereals
- Corn/oilseeds lead with premiums
- Biofuel mandate
- premiums kick in
- Dec-08 - May-10
- June-1 - April-11
- 2008 US financial crisis including biggest economic recession since the Great Depression
- Excess profits and high ethanol prices
- US tax credit expired and US drought
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Source: World Bank Pink Sheets databank
References


