Government Policy and Ethanol: What Does the Future Hold?

Daniel Staley and Sayed Saghaian

The worlds of government and agribusiness have become intertwined with the increase in ethanol production that has occurred over the last decade. With tariffs and subsidies, the question regarding ethanol becomes whether these initiatives are needed. This paper investigates whether the government policies of the $0.54 per gallon tax on imported ethanol and the $0.45 ethanol blender tax credit are still needed.

Government policy concerning ethanol has a long history in the United States. It dates back to 1978, when subsidies were offered under the Energy Policy Act of 1978. In the beginning, subsidies were offered to boost farm income and to stabilize energy security (Taheripour and Tyner 2008b). The Clean Air Act required vendors of gasoline to "oxygenate" their product. Adding oxygen to gasoline enables fuel to burn cleaner, creating a cleaner environment as a result. Also at this time, ethanol and subsidies began to be offered to create a cleaner environment.

In 2004, when the price of crude oil began to rise at a very high rate, ethanol profitability began to rise at a very high rate. Adding to this profitability was the ban on MTBE in 2006 and lower corn prices. Once MTBEs were banned, leaving ethanol as the only additive, prices peaked at $3.58/gal. Since this peak, the price of ethanol has been steadily falling; it is priced now based on its energy content, which is about 70 percent that of gasoline (Taheripour and Tyner 2008a).

Background

The Energy Policy Act of 2005 enacted the Renewable Fuel Standard, which mandated 7.5 billion gallons of renewable fuel consumption by 2012. In regard to ethanol policy, the government provides policies with blenders' tax credits beginning at $0.54/gal and an ad valorem tariff of 2.5 percent for a $2.00/gal import price, a total of $0.59/gal. Since this policy came into effect in 2005, the fixed subsidy was changed with the 2008 Farm Bill to $0.45/gal of corn ethanol. In addition to these incentives and barriers, there is a cellulosic production tax credit of $0.46 and a small producer credit of $0.10. When combined with the general blenders' credit, cellulosic fuels receive a total subsidy of $1.01 (Taheripour and Tyner 2008b).

The United States Environmental Protection Agency met again on March 26, 2010 and published the Renewable Fuel Standard Program (RFS2) Final Rule, which made changes to the original Renewable Fuel Standard to guarantee that transportation fuel sold in the US contains a minimum volume of renewable fuel. The result of this was an increase in total volume of renewable fuel to be blended into transportation fuel, to 36 billion gallons by 2022 (US EPA 2010).

Impact on Commodity Markets

It has been believed that as production of ethanol increases, so does the price of corn and other input commodities. As shown by Saghaian (2010), however, there may not be a full causal relationship. Although ethanol production has increased over the years, it has not accounted for the entire rise in food prices across the world. Some things that have contributed to the higher food prices include bio-fuel policies, bad weather in production areas, higher oil prices, poor government policies (export bans and import subsidies), and storage behavior in reaction to these policies (Rosegrant 2008).

Land and water are two constraints that affect production of corn and other crops used in ethanol production. Due to these constraints on production, a higher yield per acre is needed. This has shown to be occurring as corn yields per acre continue to increase. This could affect the domestic food supply with an increase in ethanol production. According to the Renewable Fuels Association, 10.75 billion gallons of ethanol were produced in 2009, leaving

Staley is a graduate student and Saghaian is Associate Professor, Department of Agricultural Economics, University of Kentucky.

This research was supported by the University of Kentucky Agricultural Experiment Station and is published by permission of the Director as station number 10-04-128.

much room for growth to the 36 billion gallons in 2022 as mandated by the RFS2. It has been found also that when the U.S. ethanol industry reaches 22 billion gallons, the U.S. will no longer have an excess amount of corn to export (Elobeid et al. 2007). According to the USDA Economic Research Service (USDA-ERS 2010), there was an increase in yield per harvested acre of corn from 2005 to 2009 (147.9 bu/acre to 165.2 bu/acre), so the 22 billion gallon limit found by Elobeid et al. may have increased slightly.

Biofuel demand has been shown to increase weighted grain prices up to 30 percent, since land must be taken to produce more corn. This demand also has affected an increase in the prices of maize (39 percent), rice (21 percent), and wheat (22 percent) (Rosegrant 2008). Farmers in the U.S. would begin to switch crop production from a corn-soybean rotation to corn-corn-soybean production to meet the new demand for corn. This change was found by Rosegrant to reduce soybean production nine million acres to meet corn demand.

Ethanol may not be the only contributing factor in the corn price increase, but it is definitely one factor that has increased price. This also puts a constraint on other industries such as the meat/livestock industry. According to Elobeid et al. (2007), with the increase in corn prices consumers would pay a higher cost for livestock products. The higher corn prices will have the largest effect on the pork and poultry industries, since these are the least able to switch to Dried Distillers Grains with Solubles (DDGS) based diets (Elobeid et al. 2007). The increase in total production costs in the pork industry will necessitate a 10–15 percent decline within the industry.

Cellulosic Fuels

Since one of the constraints on the production of ethanol and corn used for ethanol is land, it is important to look for other materials to use in ethanol production. One option that is yet to become commercially produced is cellulosic fuels, or energy crops. The energy crops used are those of perennial grasses miscanthus and switchgrass. Along with these "energy crops" are crop residues such as corn stover and wood chips.

There are many positives to cellulosic fuels but one potential difficulty to their production is the very high start-up costs involved—an initial investment of at least $400 million (at 2008 prices) would be required for a 100 million gallon cellulosic plant (Taheripour and Tyner 2008b). The Advanced Biofuel Investment Act of 2010 will increase the tax credit given to advanced biofuels upon investment into biorefineries. It is believed that this tax credit will show investors that investing in advanced biofuels is a safe and smart decision. This investment could prove to be the impetus that enables the U.S. advanced biofuel industry to reach the 2022 mandate.

Tyner (2010) found it unlikely that corn ethanol production will exceed the 15 billion gallon with the blending wall issues present, and the cellulosic fuels industry is a very expensive method even with the top technologies available. Many cellulosic fuel producers have put a halt to cellulosic fuel production facilities. It is not unreasonable to believe, however, that if oil prices were to return to previous high levels, more investment could be attracted to the cellulosic industry. With new investment as well as an increase in oil prices, cellulosic fuels could be a productive industry in regards to meeting the RFS2 level mandated.

Renewable Identification Numbers (RINs)

The discussion of mandates to reach the desired level of biofuels has shown that there must be ways to monitor and ensure that those in the industry are reaching the mandate. The EPA achieved this by creating a market for Renewable Identification Numbers (RINs). Each gallon of gasoline produced possesses a RIN number. Gasoline producers and importers are assigned a number of RINs that they must give to the EPA each year (Babcock 2010). The only way for producers and importers of ethanol to receive RINs is through the purchasing of biofuels. There is the possibility that RINs can be purchased through other sources that may have more RINs than required by the EPA.

This market achieves this goal because the demand for RINs increases when the quantity of biofuels purchased is insufficient to meet the mandate (Babcock 2010). If the relative price of the RIN is high due to a demand increase, producers and importers will choose to buy biofuels for their price benefits. When the RIN is factored into the wholesale price of ethanol, ethanol will become the more appealing option if the total price is below or close to the wholesale value of gasoline.

Import Tariff

Brazilian ethanol, prior to the RFS2, competed directly with U.S. corn-based ethanol. Since the release of the new mandates ruling Brazilian sugarcane ethanol to be an advanced biofuel, the two no longer are competing directly. Advanced biofuels are predicted by Babcock (2010) to be higher in price than corn-based ethanol since they are scarcer relative to their mandate. To be a competitor of U.S. corn-based ethanol, Brazilian sugarcane ethanol will have to meet Brazil's internal demand along with the demand for U.S. advanced biofuel.

There is no fundamental benefit to keeping the import tariff. Since it is very specific in keeping Brazilian ethanol from being imported, all it accomplishes is to cause U.S. gasoline producers to pay enough to encourage Brazil to export enough to meet the U.S. mandated amount. This import tariff is increasing the price for Brazilian ethanol. Babcock (2010) states that if there is no alternative supply of domestically produced noncellulose advanced biofuels, there will be no benefit to the U.S. biofuel industry in maintaining the import tariff.

With the current import tariff it is difficult for ethanol produced outside of the United States to be imported. With recent prices it has become more difficult, since ethanol with an import value of $2.00 incurs a total import tariff of 59 cents per gallon, compared to a 45 cent per gallon subsidy for U.S. ethanol. The imported ethanol also receives the 45 cent per gallon subsidy, but that still leaves a net 14 cent per gallon penalty for imported ethanol (Tyner 2010). With this large difference between imported and domestic ethanol, the import tariff should be lowered. The reason for the import tariff was to help protect the U.S. ethanol industry and balance the levels of imported and domestic ethanol. With a net loss on imported ethanol, relatively more U.S. ethanol will be on the market. If the import tariff were to be lowered to the level of the subsidy, this would help balance the amount of imported and domestic ethanol in the U.S.. It is important to note that the price of sugar has increased, so production in Brazil has shifted slightly from sugarcane ethanol, which may make it more difficult for Brazilian ethanol to enter the U.S. market.

Conclusions

The new mandates have increased the ethanol production that will be seen over the next 12 years. With the subsidies and import restrictions in place, although mandates may be reached, it is questionable whether or not this will be done efficiently. The industry will find that there will be a market for ethanol products even if crude oil falls below $40 per barrel.

Tax credits will have no impact on industry profits unless oil prices rise high enough that the combination of market demand and tax credits push ethanol production higher than mandated levels. If oil prices were to rise to a certain level, the only impact a tax credit would have would be to push the price higher, while returning more to the ethanol producer. This could lead to a large impact on commodity prices that may be unnecessary and unwanted.

The Renewable Identification Numbers (RINs) are a useful and efficient way to reach the mandated levels at the lowest cost possible. By allowing the market to find the lowest possible cost on its own through RINs, mandated levels will be reached more efficiently. If motor fuel producers find it too difficult, or for some reason do not have the means to produce biofuels themselves, RINs give them access to reach the level set by the EPA at the lowest possible cost.

While it is important to note that the government and U.S. ethanol producers have made large strides in reaching the mandates set forth in the RFS2, it will be extremely difficult to meet the mandated levels in a realistic and efficient method. With the possibility of meeting the mandate, is important to note that there are staggering costs associated with the incentives put in place. U.S. ethanol will also need to find a way to become priced at its energy value compared to gasoline (70 percent), as this is the point where consumers will be indifferent between gasoline and biofuels.

References

Babcock, B. 2010. "Mandates, Tax Credits, and Tariffs: Does the U.S. Biofuels Industry Need Them All?" *CARD* Policy Briefs. http://www.card.iastate.edu/publications/DBS/PDFFiles/10pb1.pdf.

Elobeid, A., S. Tokgoz, D. Hayes, B. Babcock, and C. Hart. 2007. "The Long-Run Impact of Corn Based Ethanol on the Grain, Oilseed, and Livestock Sectors with Implications for Biotech Crops." *AgBioForum* 10(1):11–18.

Rosegrant, W. 2008. *Biofuels and Grain Prices: Impacts and Policy Responses*. International Food Policy Research Institute.

Saghaian, S. 2010. "The Impact of the Oil Sector on Commodity Prices: Correlation or Causation?" *Journal of Agricultural and Applied Economics* 42(3):477–485.

Taheripour, F. and W. Tyner. 2008a. "Biofuels, Policy Options, and Their Implications: Analyses Using Partial and General Equilibrium Approaches." *Journal of Agricultural and Food Industrial Organization* 6(9).

Taheripour, F. and W. Tyner. 2008b. "Ethanol Policy Analysis—What Have We Learned So Far? *Choices* 23(3):6–11.

Tyner, W. 2010. "The Integration of Energy and Agricultural Markets." *Agricultural Economics* 41(November):193–201.

USDA, Economic Research Service. 2010. "Feed Grains: Custom Queries."

U.S Environmental Protection Agency (US EPA). 2010. "Renewable Fuel Standard (RFS)." http://www.epa.gov/otaq/fuels/renewablefuels/.

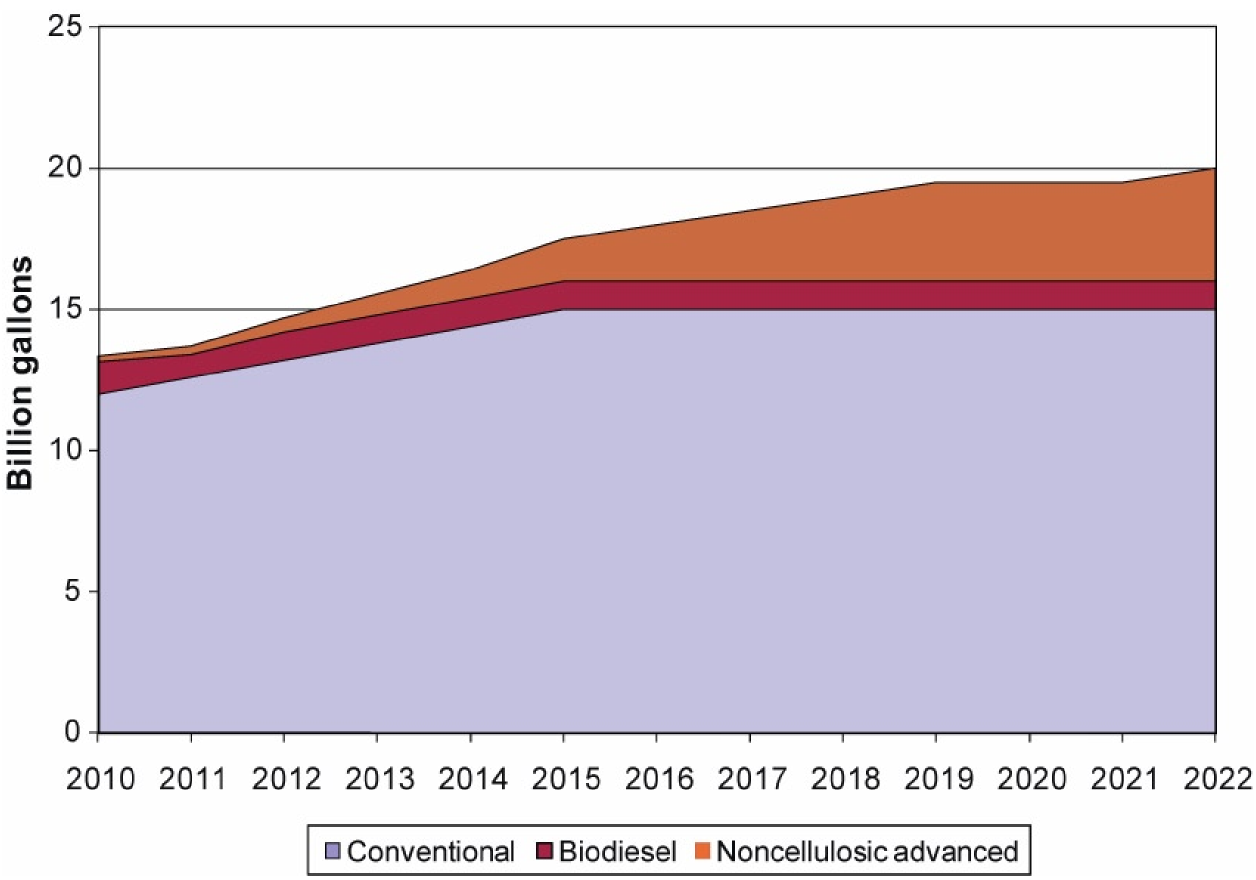

Figure 1. Biofuel as a Result of Government Mandates.

Source: Babcock (2010).

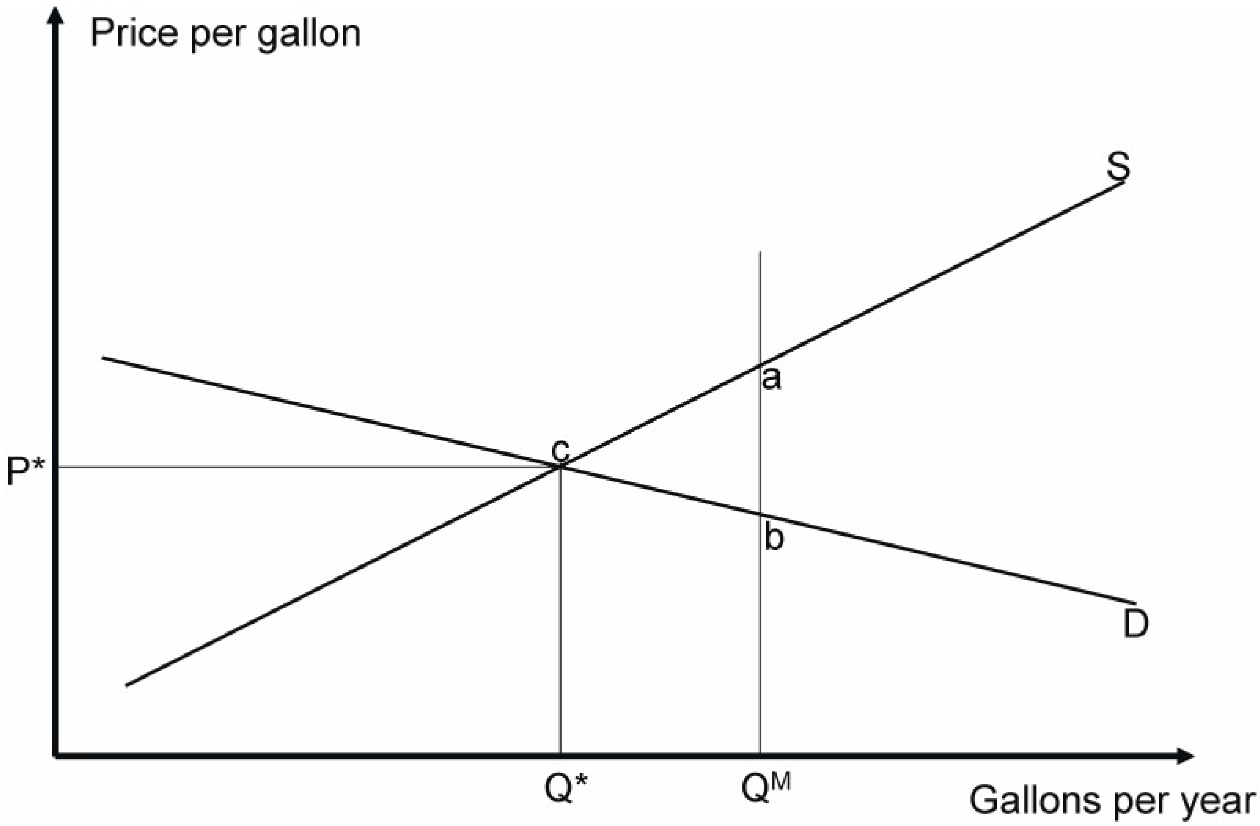

Figure 2. Ethanol Supply and Demand.

Source: Babcock (2010).