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Renewable Identification Numbers and the Renewable Fuels Standard: How They Support Corn and Soybean Prices

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The Renewable Fuels Standard (RFS) mandates that the nation’s fuel supply contain at least 11.1 billion gallons of biofuels in 2009 and 12.9 billion gallons in 2010. Of these volumes, biodiesel must make up at least 500 million gallons in 2009 and 650 million gallons in 2010. Other “advanced” biofuels must make up 100 million gallons in 2009 and 200 million gallons in 2010. If the volumes of biodiesel and other advanced biofuels are exactly met, then the RFS mandates consumption of 10.5 and 12.0 billion gallons of conventional biofuels, the most important of which is domestic corn ethanol and Brazilian ethanol that is not used to meet the other advanced biofuels mandate. The corn and soybean lobbies, together with the biofuels industry, worked hard to get these mandates passed. The biofuels industry wanted guarantees that they would have a market for their product. Corn and soybean farmers wanted to lock in increased demand for their crops. An examination of the linkages between the RFS, energy prices, and crop prices shows how the RFS works in the interest of corn and soybean farmers by creating a floor under their commodity prices.

**Impact of the RFS on Biofuels and Crop Prices**

Market forces could be used to determine ethanol and biodiesel prices. Fuel blenders use biofuels in their blends if the price is low enough to make it worth their while, and biofuels producers produce biofuels if the price is high enough to cover their costs. The market-clearing price equals blenders’ willingness to pay for another million gallons of biofuels to the cost of producing the additional million gallons. Existing tax credits and ethanol import tariffs serve to boost the demand for U.S. biofuels so the market-clearing price and quantity of biofuels is greater than if they did not exist. If the market-clearing production of biofuels is greater than the RFS, then the RFS has no impact on production or price. However, market forces along with tax credits and tariffs may not stimulate enough biofuels production to meet the RFS. This situation will occur if blenders’ willingness to pay for more biofuels is less than the cost of producing them. The gap between willingness to pay and production costs must be closed somehow if the RFS is to be met.

The gap can be closed by reducing production costs or by increasing blenders’ willingness to pay. Production costs could be decreased through outright subsidies. For example, the cost of corn to ethanol producers could be lowered through price subsidies. This would entail losses to taxpayers and gains to corn farmers. Or blenders’ purchases of biofuels could be directly subsidized by increasing the blenders’ tax credit sufficiently to increase their willingness to pay for biofuels. This alternative would also involve losses to taxpayers to the benefit of blenders and corn farmers. The alternative that was chosen by Congress was to specify how much biofuels must be used by each fuel refiner, importer, and blender. If these entities choose to use less than their required amount, then they are free to buy credits from others who choose to use more than their required amount. Because each batch of biofuels has a unique Renewable Identification Number (RIN) attached to it, it is easy to keep track of how much biofuels each entity is using. RINs are bought by those who find it more profitable to buy credits rather than biofuels.

RINs are bought by those who find it more profitable to buy credits rather than biofuels. RINs are sold by those who generate excess RINs by using more biofuels than required. The price of RINs will keep rising until the demand for biofuels grows enough to bridge the gap between
the willingness to pay for ethanol and the cost of producing ethanol. The RFS will be met when this gap is bridged. The market for RINs combined with the authority of the Environmental Protection Agency will ensure that the price of biofuels increases enough to cover the costs of producing enough biofuels to meet the RFS.

The power of the market for RINs ensures that ethanol demand will generate high enough biofuel prices to allow biofuel plants to cover their production costs up to the RFS. Increased demand for biofuels translates directly into increased demand and higher prices for feedstocks. For example, Figure 1 shows that daily movements in nearby corn and ethanol prices on the Chicago Board of Trade are highly correlated, with a correlation coefficient of 0.97. This high correlation suggests that the ability of ethanol plants to pay for corn has largely determined the price of corn in the last year. If this relationship continues to hold, then any RFS-induced increase in the price of ethanol will result in higher corn prices. The market for RINs is the mechanism by which corn prices are supported by the RFS.

**Outlook for Corn and Soybean Prices**

The amount of corn acreage that will be needed in 2009 can be estimated using the latest USDA data, released on January 12. If food, feed, and exports remain at projected levels for the current marketing year, 11 billion gallons of corn ethanol are needed to meet the RFS, and 2009/10 carryout stocks are set at 1.5 billion bushels, then 12.1 billion bushels of corn will be needed from the 2009 crop. This will require approximately 86 million acres to be planted at an average yield per planted acre of 140 bushels. To get 86 million acres of corn will require that a significant number of corn acres be planted on acres that were planted to corn in 2008. Because yields typically drop when corn is planted after corn, and because it takes more nitrogen fertilizer and higher-priced seed to plant corn after corn, this level of acreage will not be planted unless market prices make it worthwhile for enough farmers to plant corn after corn.

Figure 2 shows the daily changes in the expected returns from planting an acre of corn this spring on ground that was planted to corn instead of planting an acre of soybeans. (See the accompanying article on page 10 for an explanation of this difference in returns.) As shown, there currently is no incentive for any farmer to plant corn after corn. If market prices stay where they are, then this lack of incentive to plant corn will mean that corn acreage will drop to perhaps 81 million acres. At 140 bushels per acre, this would result in production of 11.3 billion bushels, which would mean a drawdown in stocks combined with a rationing of feed and export demand with higher corn prices in the 2009 marketing year. If the foregoing
arithmetic is correct, and if market prices really do reflect all available information, then prices will not stay where they are because current prices do not reflect the potential for higher prices in 2009. Either the price of corn will need to be bid up or the price of soybeans will need to drop. Because of worries about the size of the South American soybean crop, future export demand for U.S. soybeans has also helped push soybean prices higher. If South American yields turn out to be low, then it is unlikely that soybean prices would drop by much, which would push the price of corn higher. If South American yields turn out to be good and the world recession continues, the incentive to plant corn on corn could be increased if soybean prices drop more than corn prices.

RINs and Tax Credits
Because tax credits increase the demand for biofuels, they shrink or eliminate the gap between the willingness to pay for biofuels and production costs. If the gap is completely eliminated, then tax credits drive the price of RINs down to zero. If the gap is only partially eliminated, then the price of RINs is decreased by the amount of the tax credit. The current price of 2009 ethanol RINs is about 7¢ per gallon. The tax credit is 45¢ per gallon. Thus, if the tax credit were eliminated, then the price of RINs would rise to approximately 52¢ per gallon.

This direct substitution between the price of RINs and the tax credit calls into question why both are needed. If the RFS is binding, then eliminating the tax credit would not change the demand for biofuels or the demand for corn and soybeans. Thus, the prices of biofuels, corn, and soybeans would all be unchanged. If the mandate is not binding then the tax credit provides support to biofuels and crops beyond that needed to meet the RFS, with resulting increases in feed and food costs.

A straightforward alternative would be to eliminate the tax credit. Taxpayers would benefit. Blenders and fuel users, on the other hand, would likely object to this change because rather than receiving a taxpayer subsidy they would be taxed through higher RIN prices. However, one benefit of this change would be that the cost of meeting the RFS would be fully and transparently reflected in the value of RINs, thus leading to a more informed public debate about the costs and benefits of biofuels.

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