Dynamics of Renewable Identification Numbers used for Compliance with the Renewable Fuel Standard

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Renewable Identification Numbers (RINs) are used to track the use of biofuels in the US transportation infrastructure and are the primary currency to demonstrate compliance with the mandated biofuel volume requirements under the Renewable Fuel Standard (RFS). The RIN market and its respective players will be modeled using an equilibrium problem, which will be used to quantify the effects of parallel incentives in the form of tax credits and other policy initiatives.

Absent other policy distortions, a simple pricing RIN model might look like an arbitrage condition between the biofuel product price and the equivalent petroleum based product. However, reality must include a number of other policy distortions and effects, such as tax credits and supply/demand effects that stem from the "blend wall". The blend wall stems from the fact that the amount of ethanol used in the transportation infrastructure is limited to 10% of the total market, but to satisfy the volumes mandated in the RFS this limit must bend. This tension directly affects the RIN market, and in particular the price for D6 RINs. In the first quarter of 2013 the D6 RIN price started to spike, up almost 40x. This reflects this tension between the blend wall and the mandated volumes in the RFS; essentially oil companies would rather buy D6 RINs for compliance purposes instead of buying additional ethanol that would be unusable in the fuel market.

The equilibrium model being developed will contain four primary players: ethanol producers, biodiesel producers, importers of ethanol, and oil refiners. The interactions between these four players, under the constraints of the RFS approximate the biofuels market in the United States. In addition to investigating varying tax policies and their effect on RIN markets, EPA has recently signaled that the volume mandate may be revised in 2014 and beyone. A wavier of this type could provide relief from burdensome compliance costs (i.e. high RIN prices) but it is unclear what volumes may be appropriate. This study will also investigate fundamental policy changes within the RFS that EPA already has the authority to modify.