

Discussion

Comment on “The Price of Biodiesel Rins and Economic Fundamentals”: US Biofuel Policy Failures Reveal Limitations of Market-Based Policy Instruments

Irwin, McCormick, and Stock (2020) AJAE established that fundamental values largely determine the market price of tradable permits used to push biodiesel into the US fuel supply. With many sellers and the arbitrage profit opportunities that open up when prices do not reflect market fundamentals, it would have been surprising had this not been the case. But belief that competitive market forces determine tradable permit prices is no substitute for empirical verification. While the authors do not present findings directly about the far larger D6 (ethanol) RIN (Renewable Identification Numbers) market, there is every reason to suspect that market fundamentals determine D6 RIN prices as well, particularly given that D4 and D6 RINs are often closely linked. Whether their finding will successfully counter claims to the contrary by those opposed to US biofuel policy is doubtful given the success opposition groups have had and continue to have using fallacious economic arguments against biofuels. In 2013, for example, Environmental Protection Agency (EPA) was poised to mandate biofuel volumes under the Renewable Fuel Standard (RFS) that would have pushed ethanol consumption beyond easy-to-achieve E10 (mix of 10% ethanol and 90% gasoline) volumes. But at a critical time, after RIN prices dramatically increased to reflect the expected wide gap between supply and demand prices for biofuels, the Obama EPA paused. One plausible explanation for this pause was that administration economic and political advisors believed oil industry arguments that high RIN prices would put the US refining industry at financial risk and threaten the US fuel supply (Bernstein et al. 2012).

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Biofuel opponents were successful in preventing Obama’s EPA from returning to plans to push ethanol mandates above easy-to-achieve levels. Not surprisingly, opponents have enjoyed continued success at limiting biofuels under Trump’s EPA where fallacious economic arguments used to argue against regulations have a receptive audience (Boyle, Kotchen, and Smith 2017).

It may be sound public policy to limit biofuels given their modest impact on greenhouse gas emissions or because of feasibility considerations. But justification for limiting biofuels should not be based on economic arguments that only seem plausible. One factor that has facilitated acceptance of such arguments is how EPA chose to implement biofuel mandates. By making oil refiners responsible for increased biofuel market penetration and by creating a tradable permit market, EPA created a set of avoidable political hurdles that have hampered expansion of biofuels. This comment reviews RFS implementation with an objective of identifying how US biofuel policy could have been improved.

The RIN Market

The heart of US biofuel policy is a tradable permit system. The four important participants in the market for these permits, called RINs (Renewable Identification Numbers), are biofuel producers, large vertically integrated oil companies (verticals), refiners that have little or no downstream blending capabilities (merchant refiners), and fuel blenders/retailers with no refining capacity (blenders). Biofuel plants generate RINs together with biofuels. Biofuels (in particular ethanol) are usually transported to large fuel blending sites that are located on gasoline pipelines. When biofuel is blended with gasoline or diesel blendstock produced by refiners, the RIN is separated from the

biofuel by the blender, who typically has purchased the attached RINs along with the biofuel.

Producers and importers of gasoline and diesel blendstock have an EPA obligation under the RFS that is met by acquiring and submitting sufficient RINs. Aggregate RIN obligations across all obligated refiners and importers create a floor under which biofuel consumption cannot fall. Thus, US biofuel policy is a floor and trade policy whereby obligated firms can either buy RINs that are attached to biofuels or buy separated RINs in the RIN market. This policy is similar to other market-based instruments used to address pollution such as California's cap and trade CO₂ policy and EPA's cap and trade Acid Rain Program.

Blenders have no use for the RINs they acquire. Verticals can use the RINs they acquire to meet their own obligation and can buy more if they are RIN short or sell if they are RIN long. Merchant refiners have an EPA obligation but do not blend biofuel so they buy RINs in the RIN market. Hence, blenders are RIN sellers; verticals may be net sellers or net buyers depending on whether their blending activities exceed blendstock production or blendstock production exceeds blending; and merchant refiners are RIN buyers. In addition, non-fuel-market participants can buy or sell RINs as speculators.

Motivation for Allowing RIN Trade

Economist generally favor cap and trade policies and emission taxes to meet environmental policy objectives because of the efficiency gains garnered relative to command and control approaches when firms have heterogeneous compliance costs. Newell and Stavins (2003) note that compliance cost heterogeneity typically arises from differences in plant location, size, age, and production technology. The typical pollution-reduction program for which compliance costs are analyzed allows regulated firms to decide whether to reduce pollution or to continue to pollute by buying a permit or paying an emission tax. The relevant compliance cost is the cost of pollution abatement. Each firm decides how to minimize abatement costs and then compares their own abatement cost to the cost of a permit or tax to decide whether to reduce their pollution.

In one sense, compliance cost heterogeneity across all participants in the fuel industry seems quite high. Blenders have zero compliance costs and a lot of RINs. Verticals have compliance costs but can meet at least some portion of their obligation with RINs acquired from their blending activities. Merchant refiners have compliance costs that may be high, depending on EPA mandates, but no RINs. It may seem that efficiency gains are high from allowing RIN trade. However, this apparent variability in compliance costs is an illusion: compliance costs of obligated firms are nearly uniform.

A key difference between cap and trade pollution-reduction policies and the RFS is that under cap and trade, firms choose whether to buy a pollution permit or to invest in abatement. Under the RFS the only way refiners can avoid compliance costs is by reducing blendstock output because RIN compliance is equivalent to an output tax (Pouliot and Babcock 2016). This makes the RFS different from the textbook market-based pollution control policy, which is a tax on emissions not output.

Consider the situation facing merchant refiners under the RFS. Although marginal costs of producing gasoline likely vary across refiners, the marginal cost of complying with the RFS does not because an additional gallon of production carries with it a fixed RIN obligation, and all merchant refiners have no choice but to buy RINs to show compliance.

Now consider verticals. It would seem that because these firms have blending capacity that they could either choose to meet their RFS obligations by blending more biofuels or by buying RINs in the market. But the economic incentive facing verticals is captured best by modeling them as a combination of a merchant refiner producing blendstock and a blender selling finished fuel (Pouliot and Babcock 2016). Being vertically integrated simply means that verticals have the option of selling blendstock internally and of buying finished fuel externally. The marginal gallon of blendstock produced carries with it the same RIN obligation whether a vertical is balanced, RIN long, or RIN short. The marginal cost of this obligation is identical to marginal compliance costs of merchant refiners. The only difference between verticals and merchant refiners is that verticals acquire some or all of their required RINs from purchased biofuels. So long as market fundamentals determine the price of RINs, as supported by Irwin, McCormick, and Stock (2020) AJAE, the

opportunity cost of acquiring attached RINs with biofuels and using them to show compliance is equal to the cost of buying RINs in the RIN market. This implies that marginal compliance costs are nearly the same across all obligated firms, which implies that efficiency gains from RIN trade are quite limited.¹

Unintended Impacts of Allowing RIN Trade

If there are few efficiency gains from RIN trading, why then did EPA adopt a floor and trade policy to implement the RFS? The most obvious answer is that EPA needed some way to facilitate RIN transfers from blenders to refiners after it chose to make refiners obligated parties. Market transfers are a natural way for this to occur. EPA had enjoyed success at creating other cap and trade markets, most notably with SO₂, so perhaps EPA just continued down the market trajectory it was on.

One often overlooked aspect of using a market-based policy is that it facilitated arguments that have been successfully used to undermine Congress' policy objective of increasing US biofuel consumption. As shown in figure 1 of Irwin, McCormack and Stock (2020), D6 RIN prices were low until January 2013 when they began to spike, reaching a peak in June 2013. This spike was the result of an expectation that the Obama administration would push ethanol consumption beyond the so-called E10 blendwall (Lade, Lawell, and Smith 2018). Refiners went from paying almost nothing for RINs to paying more than a dollar. The aggregate value of RINs at a dollar price exceeds \$13 billion annually. Merchant refiners and RIN-short verticals suddenly faced a large RIN tax bill. A connection between a high RIN price and negative financial impacts on obligated parties and consumers was easy to claim and rather difficult to debunk without a good understanding of tax incidence. A casual view of the situation, and a view that continues to be espoused (Blewitt and Mider 2016), was that refiners were paying blenders billions for RINs that blenders acquired at no cost. The evidence for this argument was plain for all to see because, in fact, refiners were paying billions to blenders

for RINs through the RIN market. The reality that was easily lost is that while yes, billions in dollars flowed from refiners to blenders with high RIN prices, billions also flowed back to refiners from blenders from higher blendstock prices. The problem for biofuel supporters is that there is no counterfactual blendstock price to reveal this compensating flow. All that biofuel supporters and White House analysts had to go on were statements by economists who showed why this compensating flow of dollars is a standard tax incidence result.

The sharp drop in RIN prices in June 2013 was a result of the Obama Administration's decision to rethink its commitment to biofuels in response to high RIN prices (Lade, Lawell, and Smith 2018). This reconsideration has continued with the Trump Administration, taking the form of RFS waivers provided to refiners. The idea that the actual economic impact of high RIN prices may not be what it appears at first glance is no news to economists, but tax incidence is a difficult concept to grasp for many people.

Alternative RFS Implementation

With well-functioning markets, it makes little economic difference where along the fuel supply chain EPA puts the RFS obligation. But the decision to make refiners obligated parties has made a political difference to program viability. Refiners have been able to portray themselves as victims of an unfair policy that forces them to subsidize blenders. Their ability to mount an aggressive campaign against biofuels is one reason why congressional intent has not been carried out in terms of biofuels volumes.

An alternative to EPA's floor and trade policy would have been a command and control policy directing blenders to produce motor fuels with specific biofuels content. Irwin (2019) shows that the ethanol content of motor gasoline has been just under 10% since 2012. A policy that simply directed blenders to produce gasoline with 10% ethanol, with some minor exceptions for legacy engines, would have exactly duplicated past ethanol consumption levels, without 8 years of political turmoil. This ability to duplicate policy achievements with command and control also demonstrates that the market-based floor and trade policy has not achieved any efficiency gains with respect to ethanol. Biodiesel consumption

¹ It is not possible to say that marginal compliance costs are identical across all refiners. For example, one source of potential compliance cost variation arises if marginal costs of substituting jet fuel production for gasoline and diesel differ across refiners.

levels could also have been duplicated through the existing tax credit mechanism or by a national mandate directed solely at biodiesel blenders.

US biofuel policy has completely failed to push biofuel content beyond 10% in gasoline or to stimulate production of cellulosic biofuels: two primary goals of the RFS. These policy failures reveal the limitations of primary reliance on market-based policy tools to stimulate technology breakthroughs, commercialization of nascent production processes, or to overcome entrenched business interests. The US oil industry found that it was in their financial interest to use 10% ethanol blends because of the value of octane and the difficulty the industry had with MTBE. So it happened. The oil industry has successfully fought off all attempts by the ethanol lobby and EPA to use ethanol as a substitute for gasoline in higher blends. Better recognition of the need for complementary policies that target specific obstacles to meeting objectives was needed.

Lessons learned from the US biofuel policy experience are plentiful. (a) Recognize that the primary advantage that market-based policy tools have over alternatives are efficiency gains arising from compliance cost heterogeneity. If compliance costs do not vary, there are no efficiency justifications to favor market-based instruments. (b) More attention should be paid to the potential political consequences of large, policy-induced monetary transfers from one impacted party to another. (c) Policies that primarily rely on policy-induced price signals to induce major changes in irreversible infrastructure decisions that negatively affect long-term business profits of entrenched interests may be insufficient unless political commitment to the policy is strong. Price signals alone are not adequate to overcome political resistance of impacted interests.

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