

## RIN Prices: Still (Mis)Behaving?

Last year, FAPRI-MU explored an anomaly in the prices of Renewable Identification Numbers, or RINs, that are used for compliance with the biofuel mandates set out in the Renewable Fuel Standard (FAPRI-MU Bulletin #04-15). In particular, we explored RIN price inversions: why are prices of new, 2016 RINs lower than the prices of old, 2015 RINs that will expire sooner? Such inversions run counter to expected price behavior based on the rules outlined in the Energy Independence and Security Act of 2007. In this bulletin, we see what has changed and what has not and whether we are closer to finding an explanation. These differences amount to pennies or nickels per gallon of biofuel, but add up to tens or hundreds of millions of dollars if applied to all the billions of gallons of biofuel used to meet the RFS each year.

### The setup

The RFS requires obligated parties to submit RINs to prove that they comply with the mandate. The RINs are defined by biofuel type and also by year. The year, or vintage, is when the RIN is generated. The RIN can be used for compliance in the same year that it was generated and up to 20% of the obligation in the next year. For example, 2015 RINs can be used for 2015 compliance and up to 20% of 2016 compliance; and 2016 RINs can be used for 2016 compliance and up to 20% of 2017 compliance.

The two-year life of a RIN makes them a perishable product. A 2015 RIN can be used in for 2015 or 2016 compliance, but has no value after that, whereas a 2016 RIN can be used through 2017 compliance. If someone has a choice of buying a 2015 or 2016 RIN at the same price, they would presumably prefer the 2016 RIN that will last longer, rather than spend just as much for a 2015 RIN that will have a shorter shelf life.

### The problem

We have already discussed conventional ethanol (D6) RIN price inversions, but now even larger inversions are occurring for biodiesel and advanced (D4 and D5) RINs, as well (Figure 1). D4 inversions did not become prevalent until about mid-March. Since then, however, inverted prices have become the norm. D6 differences are quite small and are difficult to see visually. That said, the vintage inversions began occurring around the same time as the D4 category and have been nearly as persistent. Although not shown here, D5 RINs follow a similar pattern.

Both the monthly average difference between vintages when the inversion occurs and the frequency with which those inversions occur also suggest persistent and important differences (Figure 2). The inversions have become more frequent, and the size of the inversion – the price gap between 2015 and 2016 vintages – has been growing as well.

### Summary:

*In the time since our bulletin on this topic was published last year, RIN price inversions by vintage have become prevalent across RIN types. We continue our exploration of these inversions, why they might be occurring, and what their impacts might be.*

### For more on this topic, see these FAPRI-MU publications:

Bulletin #04-15  
RIN Price (Mis)Behavior?

Bulletin #09-15  
How Hard Will EPA Push the Accelerator on Biofuel Expansion? What Could it Mean for RIN Prices and Compliance Costs?

Bulletin #03-16  
Potential Impacts of EPA's Proposed RFS Requirements for 2017

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## What has changed?

In the time since the earlier bulletin was published there have been many developments in the relevant markets. Possibly the most notable has been the dramatic decline in crude oil prices and the resulting adjustments in motor fuel demand. Another important development has been the finalization of the 2014-16 RFS requirements and the proposed requirements for 2017.

## RFS requirements and RIN stocks

Last year, we listed uncertainty by obligated parties regarding the RFS requirements as a potential explanation for the RIN price inversions. That uncertainty still persists, albeit for a slightly different reason. Although the requirements have been finalized for 2014-16, there is still uncertainty regarding the estimates of motor fuel used to set those requirements. An underestimate of total fuel use could tighten RIN markets across vintages and drive up their respective prices.

These concerns might lead to vintage price inversions –2015 RIN prices greater than 2016 RIN prices – under two conditions. First, there would have to be few or no extra RINs to carry over from 2015. If all the RINs generated in 2015 were necessary for compliance, without any extra to use in 2016, there would be no opportunity for traders to buy and use a 2015 RIN instead of a 2016 RIN to use for 2016 compliance. There would be no arbitrage. However, evidence suggests that there are fairly sizeable RIN stocks relative to the maximum that could be used for 2016. The second condition is that a deficit is not seen as a viable alternative in most cases, which would also limit arbitrage. If obligated parties can declare a deficit fairly easily, then they could handle RIN price inversion by buying 2016 RINs necessary for complying in both years, 2015 and 2016, rather than buying any higher priced 2015 RINs.

## Reasons for the price inversion

We identify these possible explanations for 2015 RIN prices higher than 2016 RIN prices:

1. Uncertainty about overall fuel use puts pressure on RIN stocks, but that means higher prices overall, not higher prices for older RINs if left-over 2015 RINs for use in 2016 are plentiful;
2. Obligated parties do not or cannot exploit the deficit provision, so they do not to meet all of 2015 and 2016 requirements with 2016 RINs;
3. People are holding extra 2015 RINs, even though they could make money and gain flexibility by trading them for 2016 RINs, perhaps because of they have not calculated 2015 compliance requirements or because they see little profit from arbitrage; or
4. Something else

RIN markets are still relatively new and relevant data are difficult to obtain. We do not know trade volumes associated with the different prices, for example. In the absence of additional price and RIN carryover stock data, we cannot state with certainty the reason for the inverted prices.<sup>1</sup>

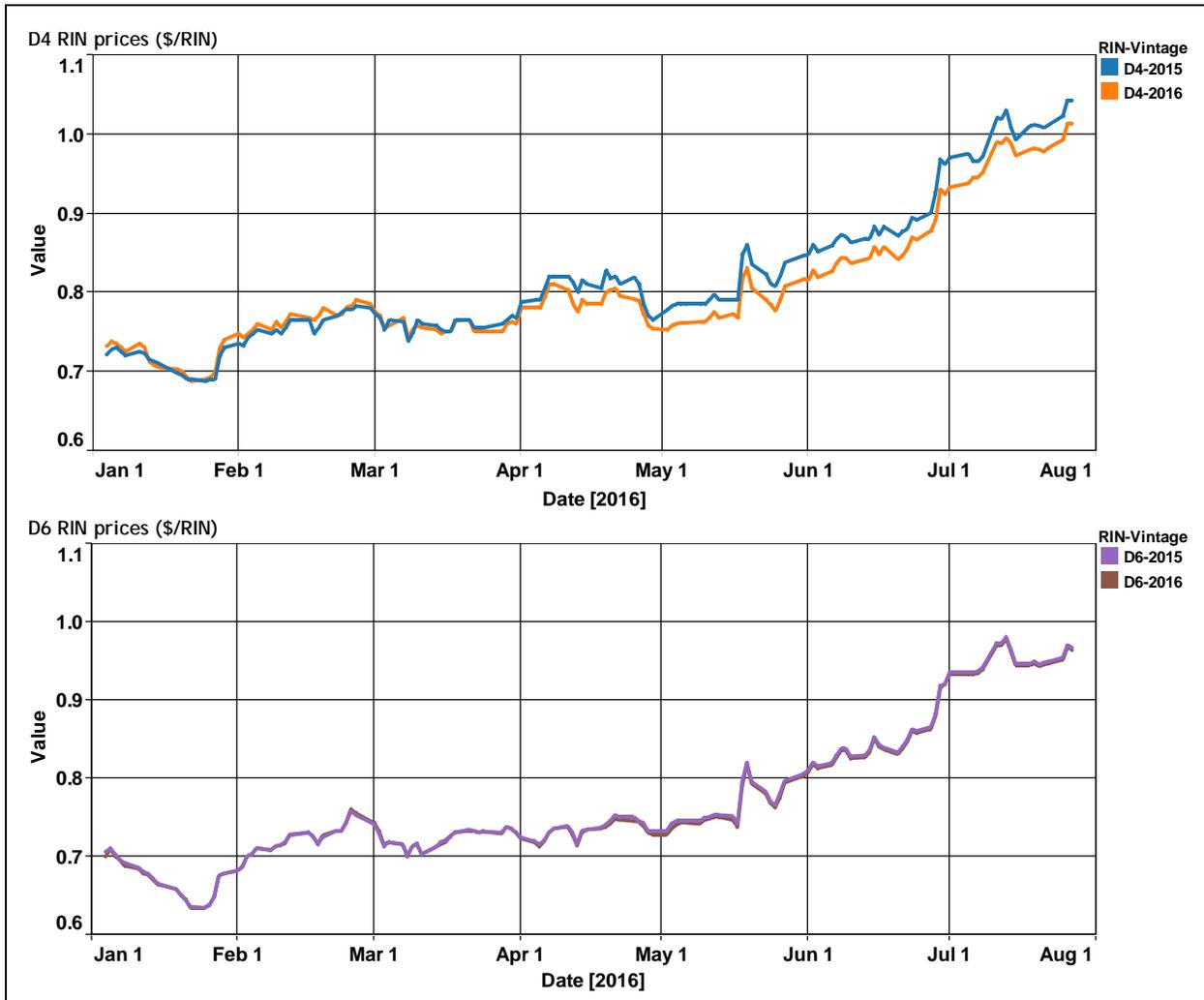
## Relevance – About \$125 million

RIN price inversion might not add up to billions of dollars, but the recent \$0.03 inversion on D4 RINs times the biomass-based diesel requirement for 2015 equals about \$80 million. The smaller price inversion for D6 RINs is applied to a much larger volume, implying another \$25 million value. D5 RIN price inversion adds almost \$9 million more. If, in addition, we expect that 2015 RINs should sell at a discount to 2016 RINs because of their greater perishability relative to 2016 RINs, then the implied value of price inversion might be greater. Alternatively, if 2016 RIN prices rose to erase inversion, then the compliance costs for that year would rise, potentially by even more. However, given estimates of significant 2015 RIN stocks and the theoretical possibility of declaring deficit, we are left no closer to understanding why this inversion persists.

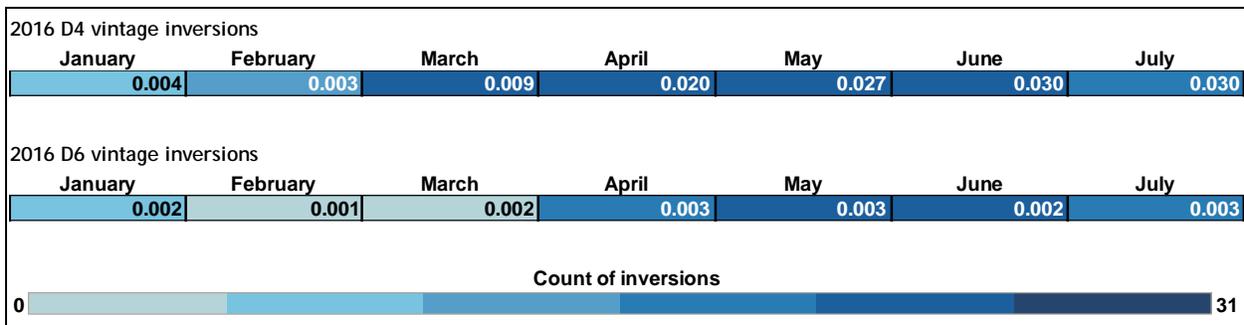
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1. We do not know at this time if newly released EPA summary data on RINs volumes (<https://www.epa.gov/fuels-registration-reporting-and-compliance-help/annual-compliance-data-obligated-parties-and#deficits>) will help to reduce this uncertainty.

**Figure 1. RIN price inversion in daily data. Older RIN prices exceed newer RIN prices.** Source: Oil Price Information Service



**Figure 2. RIN price inversions: average difference and frequency.** Source: authors' calculations based on data from Oil Price Information Service. Note: darker shades represent more frequent inversions.



Published by the Food and Agricultural Policy Research Institute (FAPRI) at the University of Missouri (MU), 101 Park De Ville Dr., Suite E; Columbia, MO 65203. This material is based upon work supported by the U.S. Department of Agriculture under Agreement No. 58-0111-15-008 and the USDA National Institute of Food and Agriculture, Hatch project No. MO-HASS0024. Any opinion, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the view of the USDA nor MU. Permission is granted to reproduce this information with appropriate attribution to the author and FAPRI-MU.