



# ***Chart of the Week #2022-45***

## **The Renewable Fuel Standard: Do D6 RIN Prices Impact Corn Prices? A Simple Regression Analysis**

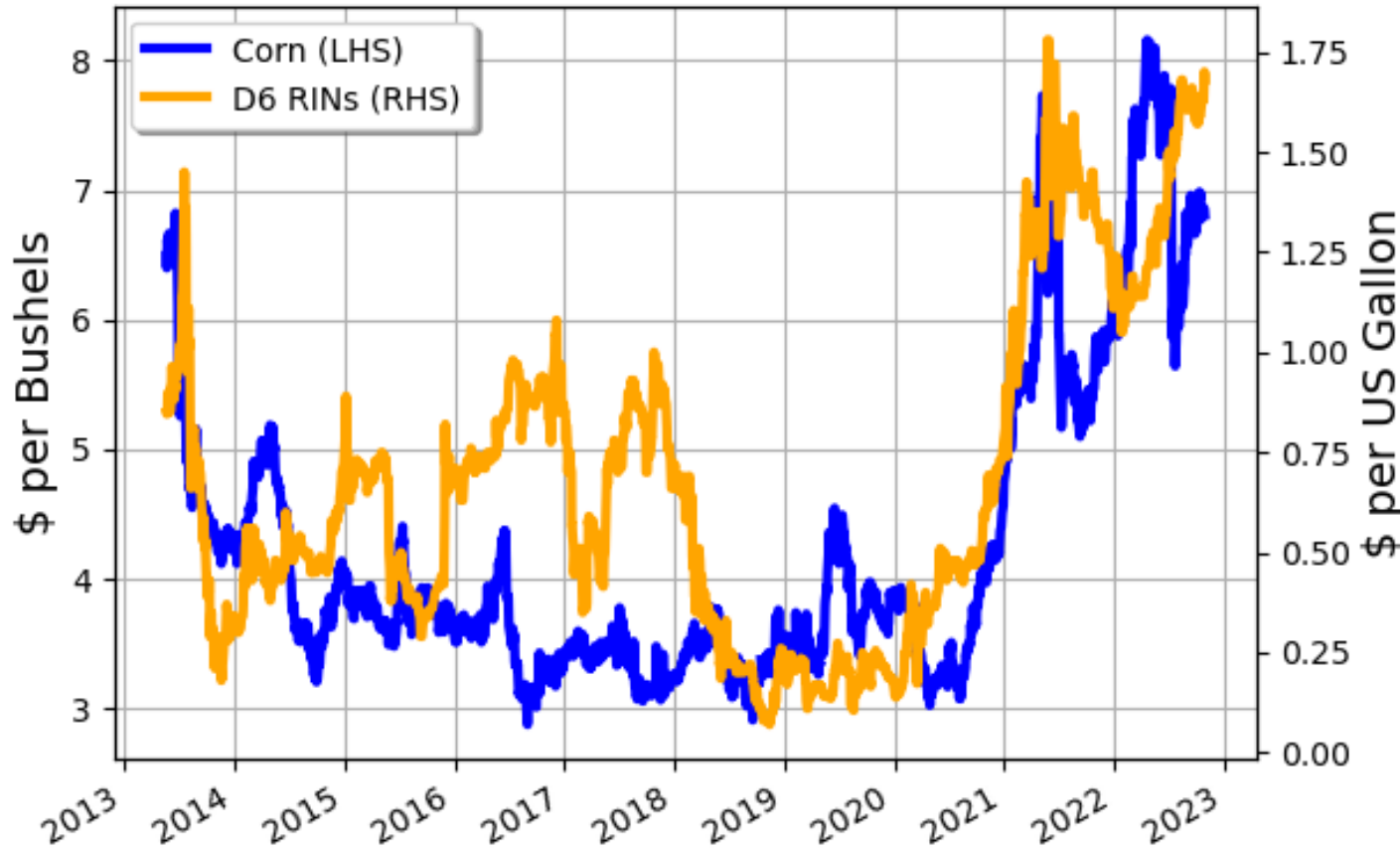


**Max Pyziur**  
**November 30, 2022**  
**Washington, DC**

# The RFS: Do D6 RIN Prices Impact Corn Prices? A Simple Regression Analysis



Corn vs D6 RINs: 05/20/2013 to 10/28/2022



**Since one RFS objective is to support agriculture, a key question is: do high RIN prices, driven by EPA mandates set in excess of the blendwall, have any impact corn prices, causing adjustments to corn production?**

Analysis based on CBOT, CME, EcoEngineers, EPA, PFL, and USDA Data

EPRINC

# The RFS: Do D6 RIN Prices Impact Corn Prices? A Simple Regression Analysis



## Corn Price Change Dependent on D6 RIN Price Change

Dependent variable:

	Corn Price Change All Admins (1)	Corn Price Change Obama Admin (2)	Corn Price Change Trump Admin (3)	Corn Price Change Biden Admin (4)
D6 Price Change	0.017** (0.008)	0.037*** (0.013)	0.019** (0.009)	-0.079** (0.033)
Constant	0.0002 (0.0004)	-0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Observations	2,302	853	1,002	447
<i>R</i> <sup>2</sup>	0.002	0.010	0.004	0.013
Adjusted R <sup>2</sup>	0.002	0.009	0.003	0.011
Residual Std. Error	0.018 (df = 2300)	0.016 (df = 851)	0.017 (df = 1000)	0.022 (df = 445)
F Statistic	5.055** (df = 1; 2300)	8.370*** (df = 1; 851)	4.368** (df = 1; 1000)	5.839** (df = 1; 445)
Note:	*p<0.1; **p<0.05; ***p<0.01			
<b>Correlation:</b>	0.047	0.098	0.066	-0.114

# The RFS: Do D6 RIN Prices Impact Corn Prices?

## A Simple Regression Analysis



- **The Renewable Fuel Standard (RFS) was enacted through the passage of the 2005 and 2007 U.S. Energy Acts. Administered by EPA, the purpose of the RFS is to increase biofuel (ethanol and biodiesel) volumes in the U.S. transportation fuel supply through a set of rising annual mandates through 2022.**
- **The rationales for the RFS are three-fold: to enhance energy security through domestic fuel production; expand the development of new, low greenhouse gas (GHG) transportation fuels; and support U.S. agriculture. With the RFS mandate, between 30% to 40% of the annual U.S. corn harvest is now used to produce fuel ethanol.**
- **RFS mandates are set by statute subject to discretionary parameters contingent on technical feasibility and other factors with final determinations by EPA leadership. Beginning in 2022, subsequent annual biofuel blending mandates are to be made at the full discretion and authority of EPA leadership according to statute.**
- ***Continuing ...***

# The RFS: Do D6 RIN Prices Impact Corn Prices?

## A Simple Regression Analysis



- **Renewable Volume Obligations (RVOs) are required to be made annually by EPA by the end of the November for the subsequent production year. RVOs determine the minimum biofuel blending percentages. EPA has not been timely and has lapsed several times in its RVO announcements. With the success of recent lawsuits by biofuel constituencies, EPA is required to make provisional RVOs by November 30, 2022 for 2023 and 2024 blending years to be finalized in June 2023.**
- **Renewable Identification Numbers (RINs), associating each gallon of transportation biofuel with a unique specifier, are the accounting and enforcement mechanism for biofuel blending. Each RIN is monitored by EPA for compliance purposes. RINs are coded by their respective fuel category: D3 for cellulosic fuel; D4 for biodiesel; D5 for advance biofuel (currently mostly ethanol imports from Brazil derived from sugar cane); D6s, by far, the largest pool of RINs, are associated with fuel ethanol derived from corn.**
- **Blenders and refiners (obligated parties) who hold RINs in surplus of compliance can sell/trade them with those who are in deficit.**
- ***Continuing ...***

# The RFS: Do D6 RIN Prices Impact Corn Prices?

## A Simple Regression Analysis



- A major problem with the RFS is that meeting volumetric targets has become increasingly difficult (and costly) because of consumer resistance and technological constraints in placing ethanol into the gasoline pool at percentages higher than 10%; this phenomenon is known as the "blendwall." These constraints run across the fuel supply chain: from a large number of filling station fuel tanks uncertified for blends above 10%, to design specifications of most gasoline-powered vehicles in the U.S. When RVOs exceed the blendwall, RIN prices, notably D6s, rise considerably.
- Regardless of the RVO, ethanol has been blended into gasoline at an approximate rate of 10% for the last ten years.
- Since one RFS objective is to support agriculture, a key question is: do high RIN prices, driven by EPA mandates set in excess of the blendwall, have any impact on corn prices, causing adjustments to corn production? Running a set of four regression analyses, where the sample periods are varied (three of which coincide with prevailing presidential administrations), shows that the variability of D6 prices has little, if any, impact on/explanation of the variability of corn prices.

# The RFS: Do D6 RIN Prices Impact Corn Prices?

## A Simple Regression Analysis



- This slide deck is available on the [EPRINC Website](#). For more information on this chart, please contact Max Pyziur ([maxp@eprinc.org](mailto:maxp@eprinc.org)).
- *Regressions generated by R, formatted by Marek Hlavac's [stargazer library](#)*