Evidence of E85 Price Gouging?

A Case Study of the St. Louis E85 Market

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RENEWABLE FUELS ASSOCIATION

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Executive Summary

A case study of the St. Louis fuel market was conducted to examine E85 pricing trends and to determine whether anti-competitive pricing practices are being used to discourage E85 sales. The St. Louis E85 market is unique in that the only stations offering the fuel are affiliated with "Big Five" oil company brands. All nine E85 stations in the study area carried the brand of Mobil, Conoco or Phillips 66, or BP.

E85 is economically competitive when it is discounted approximately 20 percent relative to E10 gasoline. **During the study period, E85 in St. Louis was discounted by an average of 12 percent relative to E10 at the *wholesale level*. However, at the *retail level,* E85 was priced 1 percent above E10 on average.** With the exception of one station, E85 was never offered for less than 97 percent of the price of E10, and more typically was offered at 100 percent the price of E10 or more. The wholesale-to-retail price "markup" for E85 was nearly twice the amount of the markup for E10.

Based on prices for locally available ethanol, hydrocarbon blendstock, and RFS "RIN" credits, E85 could have conservatively been priced 26-29 percent below E10 at retail stations during the study period. This would have roughly equated to a $1 per gallon discount to E10.

There are several possible explanations for the unattractive E85 pricing strategies employed by most St. Louis-area E85 retailers during the study period.

- Some oil company franchise agreements may preclude the branded retailer from selling fuels that are not manufactured or offered by the affiliated oil company at the local terminal rack. Thus, branded retailers wishing to sell E85 may need to seek special exemptions, comply with additional burdensome requirements, or source E85 from less convenient terminals.
- Branded fuel supply contracts often require marketers to sell specific quotas of branded fuels like diesel and premium gasoline. Thus, if a retail station sells large volumes of unbranded E85 in lieu of a branded fuel, it may put the franchisee in jeopardy of failing to meet contractual fuel quotas.
- Because of the fuel's environmental and macro-economic benefits, some FFV drivers will buy E85 regardless of its pump price relative to E10. Thus, retailers who overprice E85 may be purposely price gouging FFV drivers who choose E85 over E10 for reasons other than price.
- Due to the relative proximity of the stations offering E85 in the St. Louis market, there is very little price competition to attract FFV drivers to one station over another.
- Branded retail stations—and their oil company franchisors—may wish to perpetuate negative consumer perceptions toward E85. Selling E85 at, or above, price parity with E10 will discourage FFV drivers from purchasing the fuel, thus reducing competition for gasoline and making it the more attractive option. This method of pricing, in which a business sets the price for one product artificially high to boost sales of a lower-priced product, is referred to as "decoy pricing."

The study's results provide clear support for the notion that some gasoline producers/suppliers and their franchised retailers purposely employ E85 pricing strategies meant to discourage E85 consumption and negatively influence consumer perceptions about the fuel. In turn, this allows affiliated refiners to claim they cannot meet increased blending requirements under the Renewable Fuel Standard (RFS).

Introduction

Most gasoline consumed in the United States today contains 10 percent ethanol (E10). However, "flex-fuels" (often referred to as "E85") containing 51-83 percent ethanol are also available at more than 3,400 U.S. refueling stations for use in approximately 17.4 million Flex-Fuel Vehicles (FFVs).[1]

Because E85 contains less energy per volume than E10, its price per gallon is often discounted relative to E10 to compensate for reduced fuel economy. Pouliot (2013) and Anderson (2012) have shown that the FFV driver's willingness to purchase E85 generally increases as its price relative to E10 decreases.[2] Energy parity between E10 and E85 (i.e., the same cost per mile) is reached when the retail price for E85 is approximately 80 percent the retail price of E10.[3] In retail locations where E85 is regularly priced at or below energy parity to E10, consumer demand has been strong.[4]

The Renewable Fuel Standard (RFS) compels U.S. gasoline refiners ("obligated parties") to increase the volumes of renewable fuels blended with gasoline on an annual basis. Until recently, obligated parties could entirely satisfy their RFS obligations simply by blending E10. However, the U.S. E10 market is now saturated, and future RFS requirements are scheduled to exceed 10 percent of projected gasoline consumption. Thus, if obligated parties opt to use ethanol (as opposed to other renewable fuels) to meet future RFS blending requirements above the E10 saturation point, they will need to distribute higher ethanol blends like E85.

However, oil refiners and gasoline marketers have claimed that future RFS requirements are unattainable and E85 is not a viable compliance option because "…motorists have largely rejected the fuel."[5] The Petroleum Marketers Association of America has claimed that its member companies are hesitant to distribute E85 "due to weak consumer demand."[6] It is not surprising that oil refiners and gasoline marketers are resistant to increasing E85 sales; after all, E85 is comprised mostly of a product (i.e., ethanol) that they do not manufacture. Gasoline suppliers will naturally resist offering fuels that compete with the gasoline they produce and market.

Further, gasoline refiners, marketers and retailers know that FFV drivers will generally choose E10 over E85 if E85 is not discounted appropriately to offset fuel economy loss. Recent ethanol prices and RFS "RIN" credit values have provided marketers and retailers with the opportunity to price E85 at, or below, energy parity with E10 at the retail level, which would strongly encourage FFV drivers to choose E85. In Minnesota and Iowa, prices for E85 have frequently been at, near, or below energy parity since early 2013. In response, FFV drivers have markedly increased their consumption of E85.[7] The experience of these two states shows that the RFS program can work as intended to drive expansion of ethanol blends above E10.

However, other E85 markets appear to remain dysfunctional. Instead of discounting E85, retailers in some markets have recently priced E85 the same as, *or even above*, E10 prices. This raises the distinct possibility that some marketers and retailers are using unattractive E85 pricing strategies to negatively influence consumer attitudes toward the fuel and discourage FFV drivers from buying E85.

Such practices establish a vicious cycle in which: 1) some retailers purposely set E85 prices at levels that do not sufficiently compensate fuel economy loss, 2) FFV drivers choose E10 over E85 due to insufficient discounting, 3) the gasoline retailers and their suppliers claim FFV drivers have "rejected" E85, and 4) obligated parties (refiners) thus claim they cannot comply with future RFS requirements.

A case study of the St. Louis market was conducted to examine E85 pricing trends and to determine whether anti-competitive pricing practices are being used to discourage E85 sales. The study examined wholesale and retail prices for E85 and E10 in the St. Louis market during the 2014 summer driving season. Local ethanol and hydrocarbon blendstock prices were also examined to determine *potential* E85 retail prices.

We find that the St. Louis E85 market is highly dysfunctional in comparison to other well-functioning E85 markets. On average, E85 in the St. Louis market was discounted by 12 percent relative to E10 at the wholesale level, *but was priced 1 percent above E10 at the retail level*. The wholesale-to-retail price "markup" for E85 was nearly twice the amount of the markup for E10. Further, based on prices for locally available ethanol, hydrocarbon blendstock, and RFS "RIN" credits, E85 could have conservatively been priced 26-29 percent below E10 at retail stations during the study period. The study's results provide clear support for the notion that some gasoline producers/suppliers and their franchised retailers purposely employ E85 pricing strategies meant to discourage E85 consumption and negatively influence consumer perceptions about the fuel.

Data and Methodology

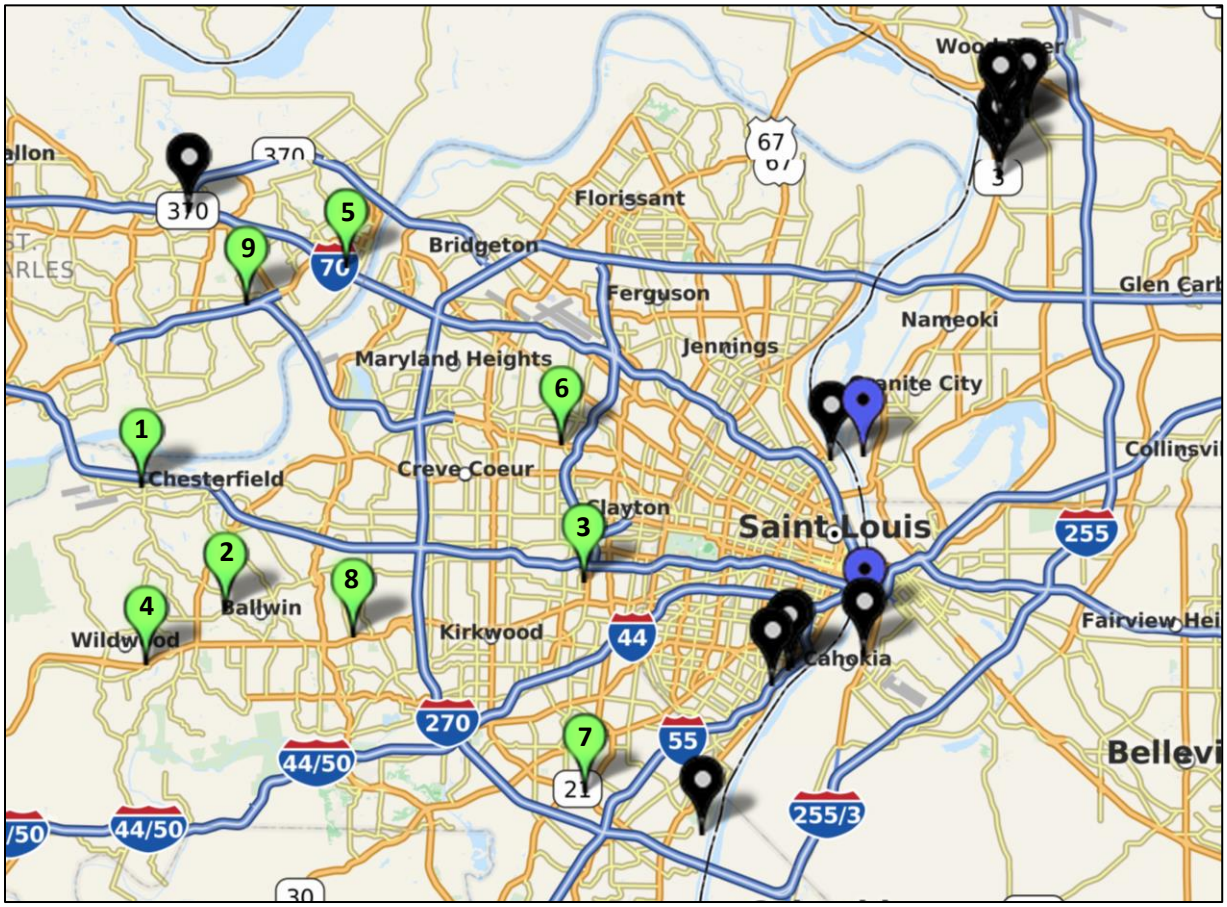
Study Area

E85 is available at nine Missouri retail gasoline stations (see Figure 1, green markers) within a 25-mile radius of downtown St. Louis (note: marker numbers coincide with stations shown in Table 1).[8] This area, which includes the city of St. Louis and large parts of St. Charles and St. Louis Counties, has a population of approximately 1.7 million people. Vehicle registration data show a relatively high concentration of FFVs in the St. Louis area.[9]

All nine of the stations in the study area offering E85 are franchisees of one of the "Big Five" major integrated oil companies. This is uncommon, as RFA (2014) and AJW, Inc. (2014) have demonstrated that retail stations affiliated with a "Big Five" oil company brand are four to six times less likely to offer E85 than independent or unbranded stations.[10] Of the nine St. Louis area E85 stations, five carry the Mobil brand name, three are affiliated with the Phillips 66 or Conoco brands, and one is a BP-branded station.

Both E10 and E85 are available as finished fuels at St. Louis area wholesale fuel terminals (Figure 1, black markers). The St. Louis area is also home to two fuel ethanol plants (Figure 1, blue markers), both of which are located on the Illinois side of the Mississippi River within four miles of downtown St. Louis.

Figure 1.
St. Louis Area E85 Stations (green), Wholesale Fuel Terminals (black), and Fuel Ethanol Plants (blue)



Data

Posted E10 and E85 retail prices at the nine retail stations were observed during the 2014 "summer driving season."[11] A total of 251 observations were made during the study period, for an average of 3.3 observations per day. One observation provided two data points: the posted E85 price and the corresponding E10 price. Figure A-10 in Appendix A shows observations per day. Retail prices were observed during morning and evening drive time on weekdays only. Daily wholesale "rack" prices for E10 and E85 in the St. Louis market were obtained from the Oil Price Information Service (OPIS).[12]

Weekly Illinois ethanol plant prices from the U.S. Department of Agriculture, hydrocarbon blendstock prices from OPIS, and RIN credit prices from OPIS were used to construct a notional E85 "potential price."[13] The potential E85 price assumes ethanol is purchased directly from one of the two St. Louis-area ethanol plants and blended onsite with 25 percent hydrocarbon to make a 75 percent ethanol "flex-fuel." The potential price further assumes that RIN credits associated with the blended ethanol were sold by the blender at the posted OPIS price and 50-80 percent of the revenue from the RIN sale is passed on to the consumer through a lower E85 price. Finally, we assume the potential price includes a retail markup that is equal to the average wholesale-to-retail markup observed for E10 during the study period.

Results

Across all observations, the average retail price for E85 was $3.476 per gallon and the average E10 price was $3.452 per gallon. Thus, retail E85 prices were $0.024 per gallon more expensive than E10 prices on average, and the average E85 retail price was 101 percent of average retail E10 prices during the study period. Table 1 shows high, low, and average E10 and E85 retail prices by station, along with the average E85-E10 spread per station.

Table 1. E10 and E85 Retail Prices by Station

	Station	Brand	E10 Retail ($/gal.)			E85 Retail ($/gal.)			E85-E10 Spread
			High	Low	Avg.	High	Low	Avg.	Avg. ($/gal.)
1	BP	BP	3.679	3.299	**3.511**	3.599	3.399	**3.494**	(0.016)
2	Claymont Auto Repair	Phillips 66	3.699	3.299	**3.485**	3.699	2.999	**3.440**	(0.044)
3	On the Run	Mobil	3.679	3.329	**3.486**	3.679	3.329	**3.480**	(0.005)
4	On the Run	Mobil	3.699	3.279	**3.460**	3.599	3.339	**3.485**	0.025
5	On the Run	Mobil	3.599	3.229	**3.409**	3.599	3.399	**3.442**	0.033
6	On the Run	Mobil	3.599	3.159	**3.422**	3.599	3.359	**3.490**	0.068
7	Mobil	Mobil	3.599	3.229	**3.431**	3.659	3.399	**3.509**	0.078
8	Energy Express	Conoco	3.619	3.169	**3.430**	3.849	3.149	**3.486**	0.056
9	Fastlane	Phillips 66	3.599	3.229	**3.433**	3.699	3.259	**3.459**	0.026
	All Stations		**3.699**	**3.159**	**3.452**	**3.849**	**2.999**	**3.476**	**0.024**

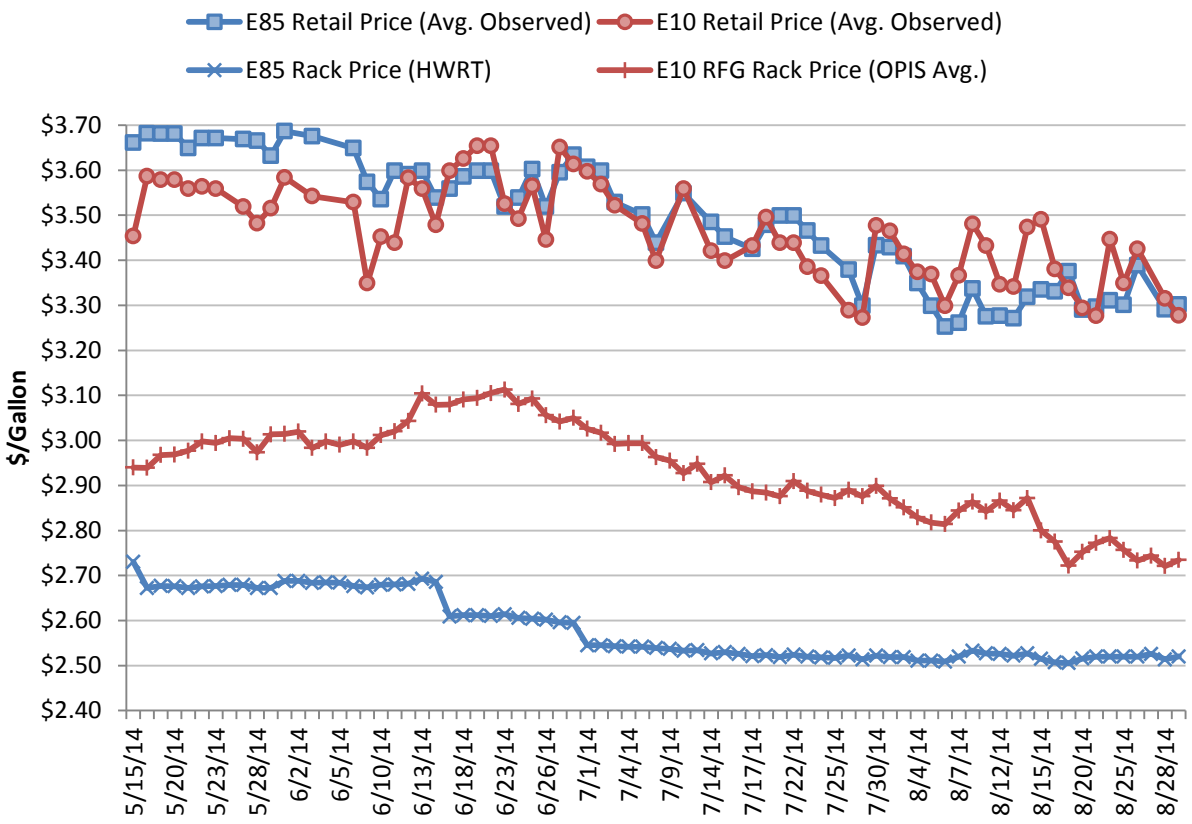
However, at the wholesale rack level, E85 was available for an average price of $2.582 per gallon, compared to $2.933 per gallon for E10. This means E85 was $0.351 per gallon *less expensive* than E10 at the wholesale level, and that wholesale E85 prices were 88 percent of wholesale E10 prices on average. The wholesale-to-retail spread ("markup" for taxes, transportation, profit, etc.) for E10 averaged $0.519 per gallon, while the average markup for E85 was $0.895 per gallon. Therefore, the average markup on E85 was $0.376 per gallon (72 percent) greater than the average markup on E10. Table 2 shows the average wholesale rack prices for E10 and E85 over the entire study period. Figure 2 shows retail E10 (RFG) and E85 prices compared to average wholesale rack prices for the two fuels.

Table 2. St. Louis Wholesale Rack Prices for E10 and E85

	High	Low	Avg.
	$/gal.		
E85	2.730	2.507	2.582
E10 Reformulated Gasoline (RFG)	3.113	2.721	2.933
E85-E10 Spread	(0.499)	(0.207)	(0.351)

Source: OPIS

Figure 2. St. Louis E85 and E10 Prices (Wholesale Rack vs. Retail)

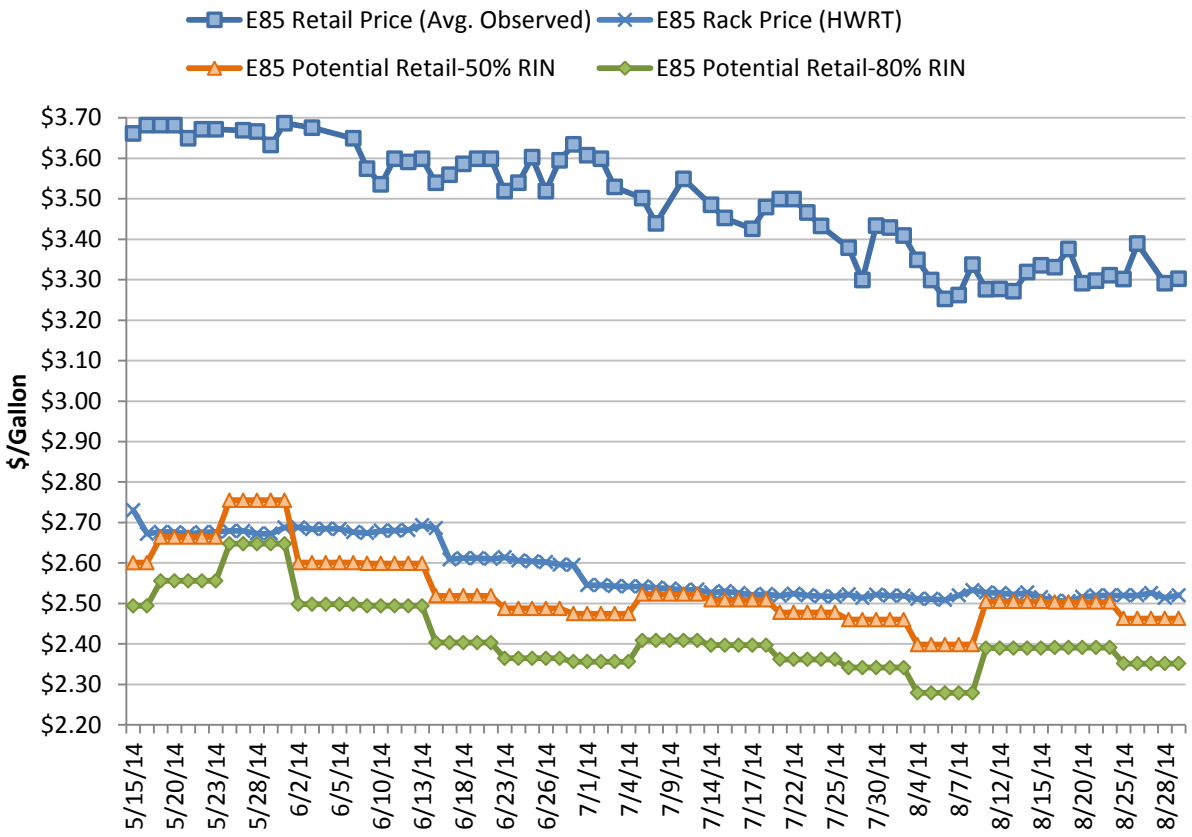


Source: OPIS (rack prices); study observations (retail prices)

E85 retail stations in the study area consistently sold E85 at, or near, *price parity* with E10. With the exception of one station (Station #2), E85 was never offered for less than 97 percent of the price of E10 during the study period. Only Station #2 came close to temporarily matching the wholesale E85/E10 spread at the retail level, offering E85 at 86-88 percent the price of E10 for several weeks toward the end of the summer. E10 and E85 price observations for each station are shown in Figured A-1 through A-9 in Appendix A.

Retail stations in the area could have potentially offered E85 for $2.44-$2.55 per gallon during the study period, even when including the same $0.52 per gallon average markup that was applied to E10. Potential E85 retail prices were equivalent to 71-74 percent the retail price of E10, well below the 80 percent energy parity level. Pricing E85 at these levels would have created an incentive for FFV drivers to choose E85 over E10, while still ensuring profit margins for the retailer are equal to or better than margins on E10. Thus, E85 was sold in the St. Louis market during the study period for roughly $1 per gallon more than was justified by wholesale prices for E85 blend components and a typical markup. Even wholesale E85 prices were slightly higher than potential retail prices during the summer. Figure 3 shows actual E85 retail and wholesale rack prices compared to potential E85 prices. A full description of the method used to determine potential E85 prices is available in Appendix B.

Figure 3. St. Louis E85 Prices (Retail, Potential Retail, and Rack)



Source: OPIS (rack price); study observations (retail price); author's calculations based on OPIS and USDA (potential retail price)

Pricing strategies designed to emphasize E85 sales were in use in other markets during the study period. For example, several Iowa ethanol plants blended E85 onsite and typically sold the product for $1.70-$2.00 per gallon to marketers or directly to retail locations.[14] Even with a $0.52 per gallon retail markup, this enabled E85 to be sold to the consumer for $2.22-$2.52 per gallon, compared to E10 prices in the $3.40-$3.60 per gallon range. Similarly, E85 retail prices in Minnesota averaged $2.86 per gallon in May and June, compared to average E10 prices of $3.52 per gallon.[15] Thus, Minnesota E85 prices were 81 percent of E10 prices on average. Notably, Minnesota E85 sales volumes increased nearly 20 percent from April to May, as the average discount to E10 increased from 16.8 percent to 18.9 percent.

Discussion

The data collected for this study clearly demonstrate that St. Louis-area E85 stations generally failed to price the fuel competitively with E10 gasoline. With the exception of one station, E85 was never offered for less than 97 percent of the price of E10, and more typically was offered at 100 percent the price of E10 or more. Prices for locally available ethanol and hydrocarbon blendstock indicate that E85 could have been sold for 71-74 percent the price of E10. There are several possible explanations for the

unattractive E85 pricing strategies employed by most St. Louis-area E85 retailers during the study period.

First, all nine St. Louis area E85 stations are franchisees of "Big Five" oil company brands, which means they must comply with the strict conditions of franchise and branding agreements. RFA (2014) showed that some oil company franchise agreements may preclude the branded retailer from selling fuels that are not manufactured or offered by the affiliated oil company at the local terminal rack.[16] Thus, if a "Big Five" oil company does not offer branded E85 at the local fuel terminal, area franchisees who wish to sell E85 may be required to obtain the fuel from less convenient terminals where it may be offered by the franchisor, obtain special exemptions allowing the sale of unbranded E85, or secure an exemption allowing "splash blending" of E85 by the station's supplier. These options may add unnecessary transportation and handling costs. Because we were unable to obtain fuel supply contracts, franchise agreements, or branding requirements for the nine E85 stations in the study area, we do not know with certainty whether they were prevented from purchasing unbranded E85 at the terminal. In the St. Louis market, E85 is not offered at the terminal by any of the "Big Five" oil company brands, according to OPIS. Only one wholesale fuel terminal, operated by HWRT Oil Company, offers unbranded E85 at the rack in the St. Louis area. The HWRT terminal is roughly 16 miles from downtown St. Louis.

Second, branded fuel supply contracts often require marketers and retailers to sell specific quotas of branded fuels like regular, mid-grade, and premium gasoline (RFA, 2014).[17] If a retail station sells large volumes of unbranded E85 in lieu of E10 or other branded fuels, it may put the retailer and/or its supplier in jeopardy of meeting the branded fuel quotas specified in the fuel supply contract. This could result in termination of the contract and/or loss of the franchise. Thus, retailers who must meet such quotas are motivated to maximize sales of branded fuels over sales of unbranded fuel options like E85. One obvious method of maximizing branded fuel sales at the expense of unbranded fuel sales is to price unbranded fuel unattractively relative to branded fuel. Indeed, AJW, Inc. (2014) showed that the E85 price discount to E10 at independent or unbranded stations was typically two to three times larger than the discount at major oil company-branded stations.[18] The report concluded that, "[a]s long as there is limited availability and unattractive pricing at *major-branded stations*, low E85 demand likely will persist among consumers using those stations."

Third, Pouliot (2013), Anderson (2012), and others have shown that E85 demand is inelastic for a small fraction of FFV drivers. That is, some FFV drivers will buy E85 regardless of its price relative to E10. These drivers may value the ability of E85 to reduce greenhouse gas emissions compared to gasoline, or they may purchase E85 to support U.S. agricultural producers. Thus, retailers who overprice E85 may be purposely "gouging" FFV drivers who choose E85 over E10 for reasons other than price.

Fourth, due to the relative proximity of the stations offering E85, there is very little price competition to attract FFV drivers to one station over another. Not a single E85 station had a competing E85 station in close proximity. In fact, no two E85 stations in the study area were closer than 4.2 road miles apart. Thus, there is little or no incentive for one E85 station to undercut the price of another E85 station, since the stations are far enough apart that they generally are not competing for the same FFV drivers. In

contrast, E85 markets like Minneapolis and Chicago often feature multiple E85 stations within 1-2 miles of each other. The effect of E85 station concentration on E85 retail prices is an area for further study.

A final potential explanation of the unattractive pricing strategies used in the St. Louis market is that the branded retail stations—and their oil company franchisors—may wish to perpetuate negative consumer perceptions toward E85 and other alternatives to gasoline. Selling E85 at, or above, price parity with E10 will discourage most FFV drivers from purchasing the fuel, thus reducing competition for gasoline and making it the more attractive option. This method of pricing, in which a business sets the price for one product artificially high to boost sales of a lower-priced product, is sometimes referred to as "premium decoy pricing." Companies like Apple have regularly employed this pricing strategy to drive consumer purchasing behavior. In marketing, decoys are "…products, services, or price points that a business *doesn't really want you to take*, but rather use as a reference to make another product look better."[19] Further, pricing E85 at levels intended to deter consumption allows refiners to claim they can't meet the increasing blending requirements of the RFS because, as the American Petroleum Institute claims, "…consumers don't want E85."[20] This is precisely why policy mechanisms like the RFS are needed to oblige the gasoline supply chain to offer increasing volumes of domestically-produced renewable fuels in lieu of fuels derived from imported petroleum.

Conclusion

This study examined E85 and E10 wholesale and retail prices in the St. Louis market during the summer of 2014. We found that E85 was priced 12 percent below E10 at the wholesale level, but 1 percent above E10 at the retail level. Further, it was determined that E85 prices could have been 26-29 percent below E10 prices at retail, given prices for locally available blending components and RFS RIN credits. Thus, actual E85 prices were roughly $1 per gallon higher than potential E85 prices. While the exact reasons for unattractive E85 pricing in the St. Louis market are not known, we offer several potential explanations. First, the conditions of franchise agreements and fuel supply contracts may essentially force retailers to overprice the fuel to cover the costs of burdensome contractual requirements. Second, retailers in the area may be purposely price gouging the share of FFV drivers who buy E85 for reasons other than price. Third, the low concentration of E85 stations in the area results in weak competition. Finally, unattractive pricing strategies may be employed to discourage FFV drivers from purchasing E85, thus reducing competition for gasoline and influencing public perceptions about flex fuels. In the end, unattractive E85 prices lead to weak demand for the fuel, which in turn provides oil refiners with an argument for opposing increased blending requirements under the RFS.

End Notes and References

[1] According to ASTM D5798-14, flex-fuels for use in FFVs may contain 51-83% denatured fuel ethanol by volume. E85prices.com reports 3,418 retail stations selling E85 (Sep. 19, 2014). The Department of Energy reports 17.4 million FFVs are on U.S. roads today. (citing IHS Polk) http://www.afdc.energy.gov/vehicles/flexible_fuel.html.

[2] Pouliot, Sébastien (2013). *Arbitrage between ethanol and gasoline: evidence from motor fuel consumption in Brazil*. Agricultural and Applied Economics Association, 2013 Annual Meeting, August 4-6, 2013, Washington, D.C.; also, Anderson, Soren T. (2012). *The demand for ethanol as a gasoline substitute.* Journal of Environmental Economics and Management 63: 151–168.

[3] Denatured fuel ethanol contains 76,700 BTU per gallon. RBOB gasoline contains 115,000 BTU per gallon. Thus, E10 contains 111,525 BTU per gallon. Throughout this paper we assume that the average denatured ethanol content of "E85" (or "flex-fuel) is 75%. Thus, "E85" contains 86,350 BTU per gallon, or 78% of the BTU in E10.

[4] Data from the Minnesota Department of Commerce show E85 sales increase as the percent discount to gasoline (E10) decreases. http://mn.gov/commerce/energy/topics/clean-energy/Vehicles-Fuels/Ethanol.jsp

[5] American Petroleum Institute (2014). *Bob Greco's remarks at press conference call on RFS letter.* http://www.api.org/news-and-media/testimony-speeches/2014/bob-greco-press-conference-call-on-rfs-letter

[6] Petroleum Marketers Association of America (2014). *Letter to John Podesta, counselor to the President, from PMAA President Dan Gilligan*. http://www.pmaa.org/weeklyreview/attachments/Ltr_Podesta_RFS_Concerns_PMAA.pdf

[7] Data from the Minnesota Department of Commerce show E85 sales hit a 5-year high in Aug. 2013 when the average E85 price was 74% the price of E10. http://mn.gov/commerce/energy/topics/clean-energy/Vehicles-Fuels/Ethanol.jsp; Iowa E85 sales established a new first quarter record in 2014, as "... [wholesale] E85 is being sold for nearly half the price of regular gasoline." http://www.iowarfa.org/Record20141stQ.E85Sales.php

[8] E85 is offered at three retail stations on the Illinois side of the Mississippi River. Those stations were excluded from this study due to different state motor fuel tax treatment, which makes comparison of Illinois and Missouri retail fuel prices difficult.

[9] FFV concentration estimates by county are available from the National Renewable Energy Laboratory. http://maps.nrel.gov/transatlas

[10] Renewable Fuels Association (2014). *Protecting the Monopoly: How Big Oil Covertly Blocks the Sale of Renewable Fuels*. http://www.ethanolrfa.org/page/-/Protecting%20the%20Monopoly.pdf?nocdn=1; and, AJW, Inc. (2014). *E85: A Tale of Two Markets*. http://www.ascension-publishing.com/BIZ/E85-A-Tale-of-Two-Markets.pdf

[11] The study period was May 15-August 29, 2014. The study period encompassed 77 weekdays, including holidays.

[12] Oil Price Information Service (subscription). *OPIS Wholesale Racks with OPIS Spot Mean: St. Louis, MO.* E10 price is "rack average" for RFG with 10% ethanol. E85 price is "rack average," which includes only one terminal (HWRT Oil Company) in Hartford, IL.

[13] U.S. Department of Agriculture, Agricultural Marketing Service. *Illinois Ethanol Corn & Co-products Processing Values Report*. Price is for "Ethanol tank cars & trucks, Illinois plants." http://www.ams.usda.gov/AMSv1.0/ams.fetchTemplateData.do?template=TemplateN&leftNav=MarketNewsAndTransportationData&page=Bioenergy; Daily D6 RIN prices and hydrocarbon blendstock (natural gasoline, Conway terminal) from Oil Price Information Service (subscription).

[14] Iowa RFA. *Wholesale E85 Price Listing.* http://iowarfa.org/E85PastPriceProgram.php

[15] Minnesota Department of Commerce. *2014 Minnesota E85 + Mid-Blends Station Report*. http://mn.gov/commerce/energy/images/E85-FuelReport.pdf

[16] Renewable Fuels Association (2014). *Protecting the Monopoly: How Big Oil Covertly Blocks the Sale of Renewable Fuels*. http://www.ethanolrfa.org/page/-/Protecting%20the%20Monopoly.pdf?nocdn=1

[17] *Ibid*.

[18] AJW, Inc. (2014). *E85: A Tale of Two Markets*. http://www.ascension-publishing.com/BIZ/E85-A-Tale-of-Two-Markets.pdf. The report found that the average E85 discount to E10 at independent stations was 14% or greater in all but one month between March 2013 and March 2014. In contrast, the average discount at major-branded stations exceeded 14% in only one month and was more typically in the 2-8% range.

[19] Kunz, Ben (2010). Bloomberg Businessweek. *Apple's Pricing Decoys*. http://www.businessweek.com/technology/content/sep2010/tc2010091_060916.htm

[20] American Petroleum Institute (2014). *Bob Greco's remarks at press conference call on RFS letter.* http://www.api.org/news-and-media/testimony-speeches/2014/bob-greco-press-conference-call-on-rfs-letter

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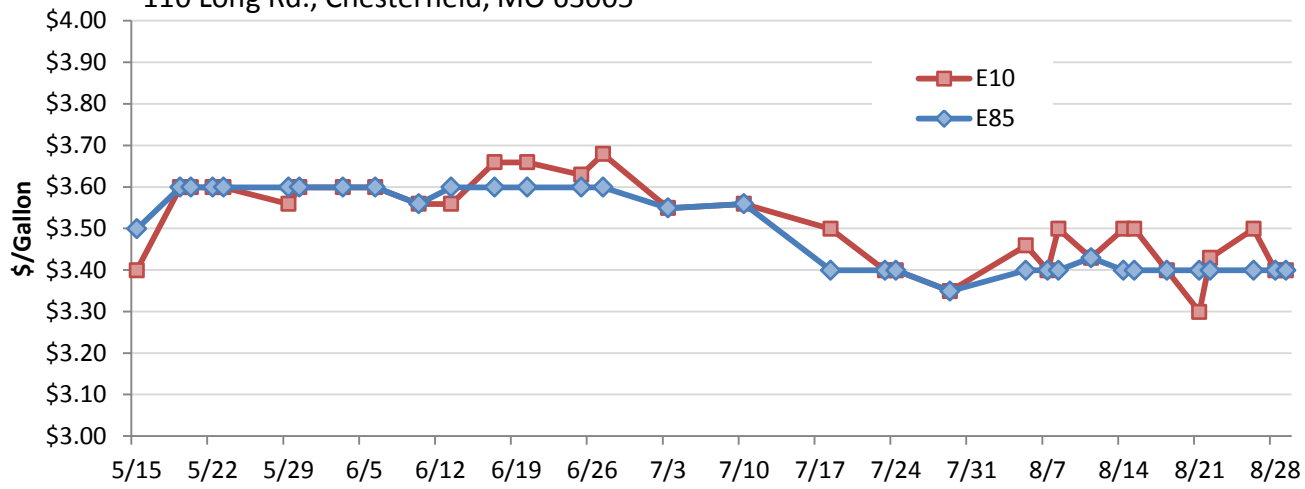
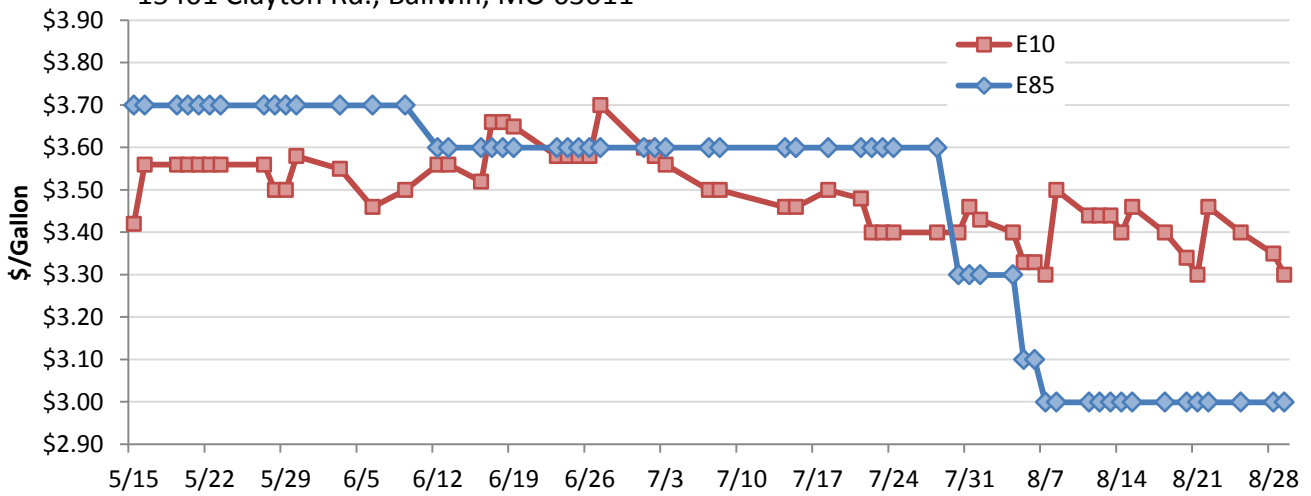
APPENDIX A

Figures A-1 through A-9: Observed retail E10 and E85 prices by station

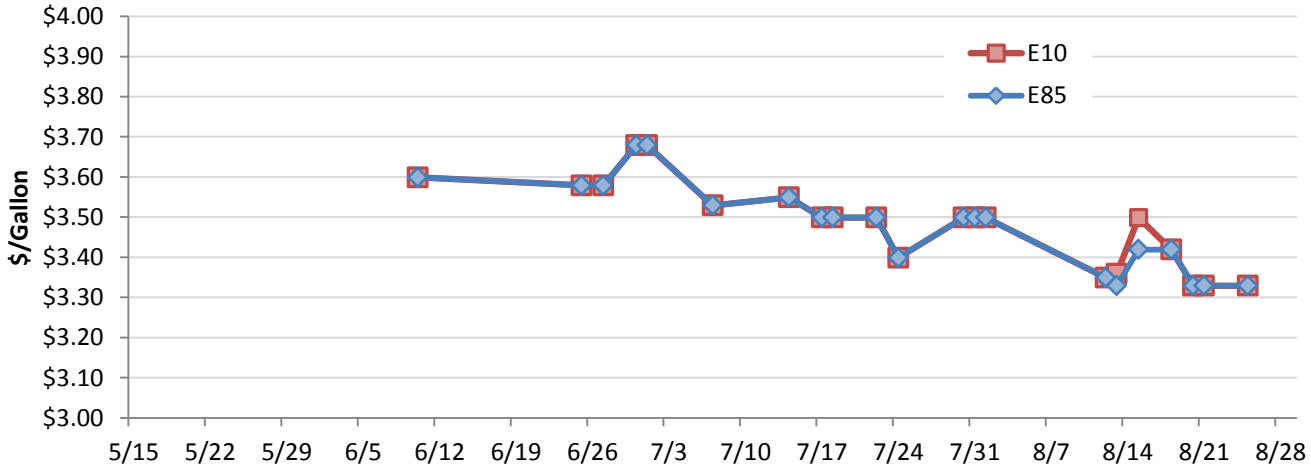
A-1. Station 1: BP
110 Long Rd., Chesterfield, MO 63005



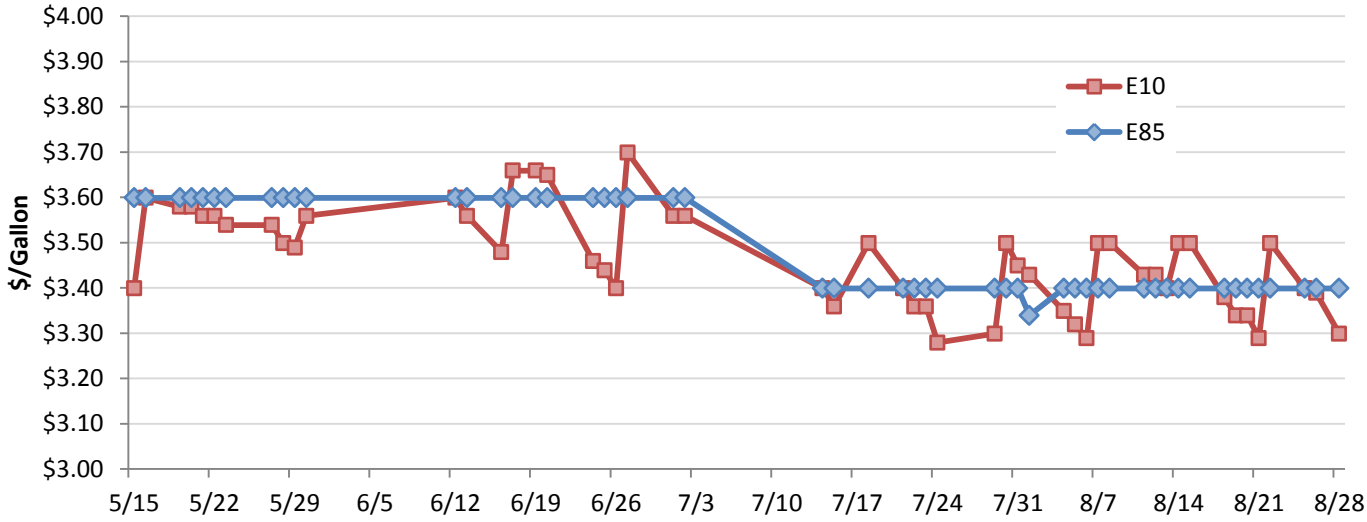
A-2. Station 2: Claymont Auto Repair (Phillips 66)
15401 Clayton Rd., Ballwin, MO 63011



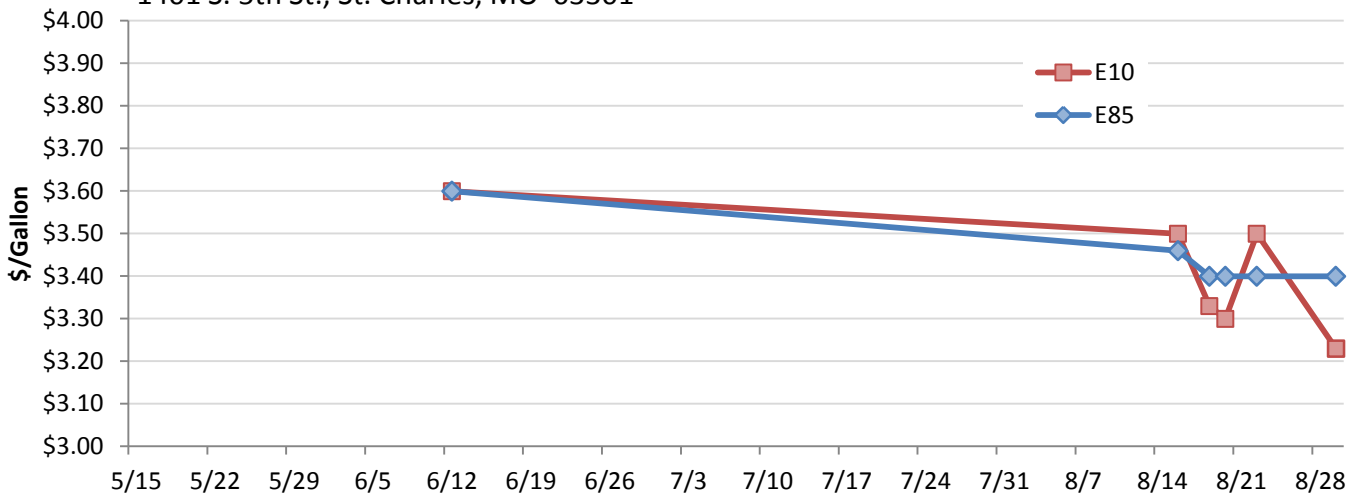
A-3. Station 3: Mobil On the Run
2120 S. Brentwood Blvd., Brentwood, MO 63144



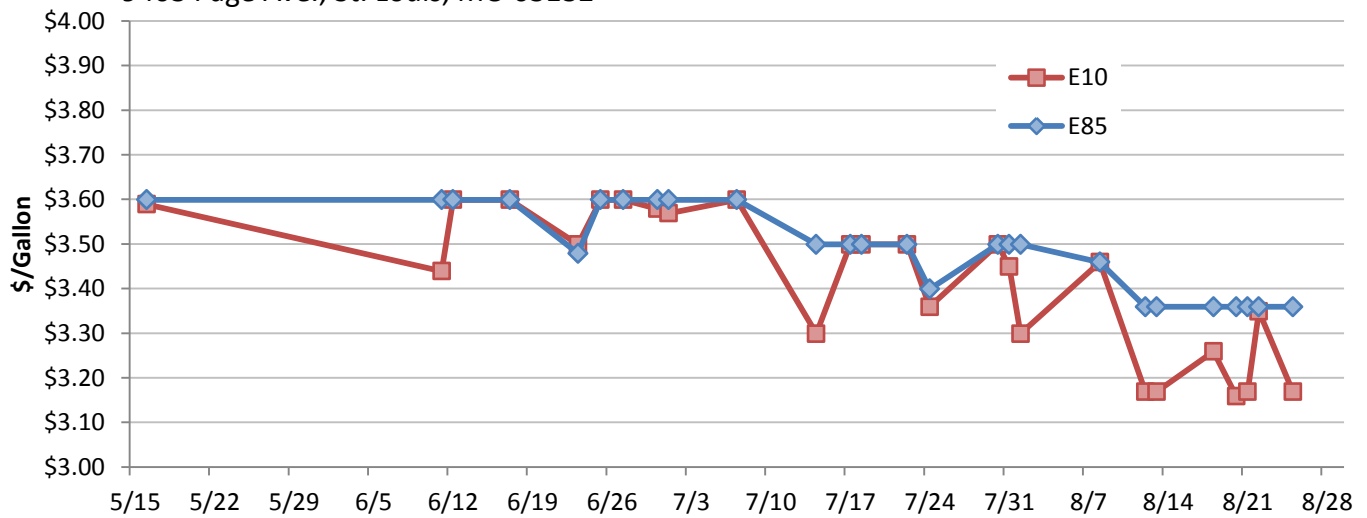
A-4. Station 4: Mobil on the Run
16509 Manchester Rd., Wildwood, MO 63040



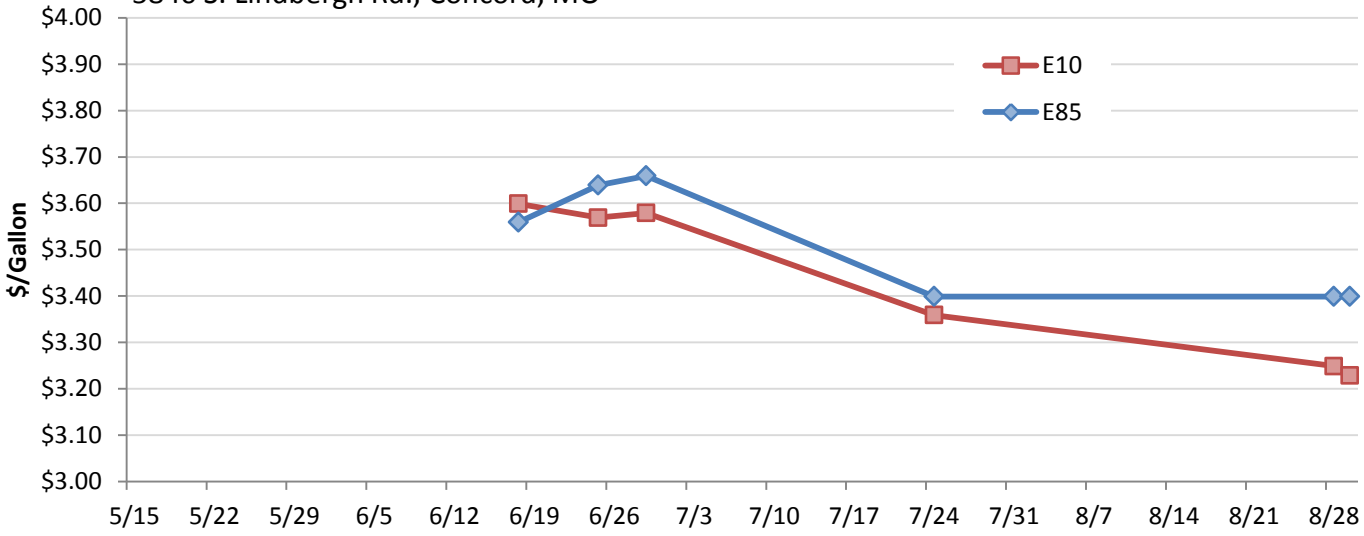
A-5. Station 5: Mobil on the Run
1401 S. 5th St., St. Charles, MO 63301



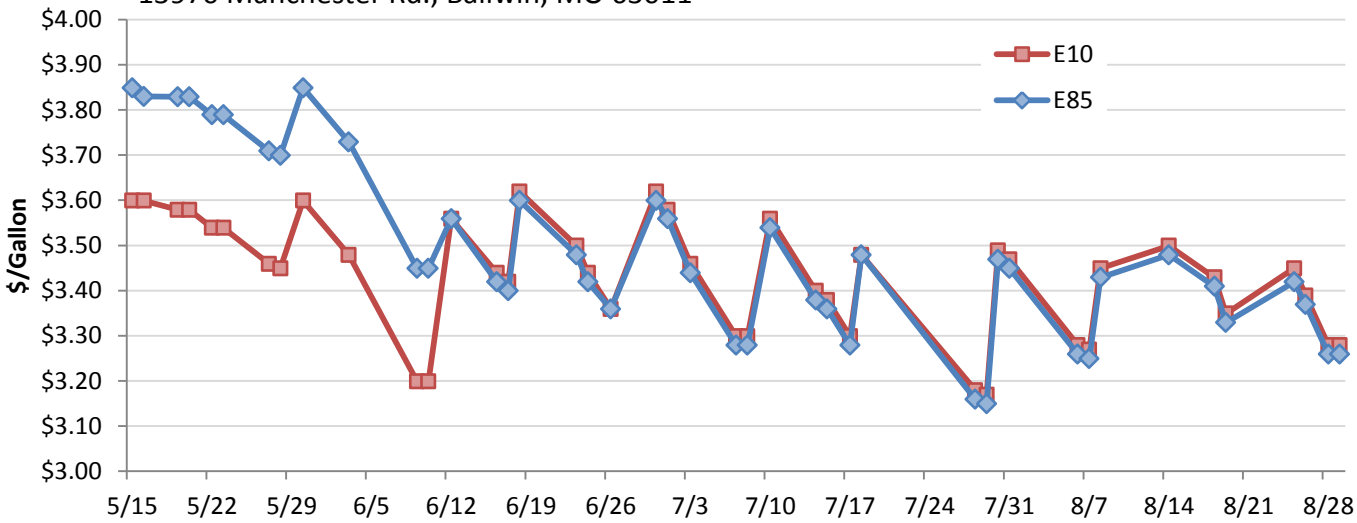
A-6. Station 6: Mobil on the Run
9403 Page Ave., St. Louis, MO 63132



A-7. Station 7: Mobil
5840 S. Lindbergh Rd., Concord, MO



A-8. Station 8: Energy Express (Conoco)
13970 Manchester Rd., Ballwin, MO 63011



A-9. Station 9: Fastlane (Phillips 66)
2301 Old Highway 94 S., St. Charles, MO 63301

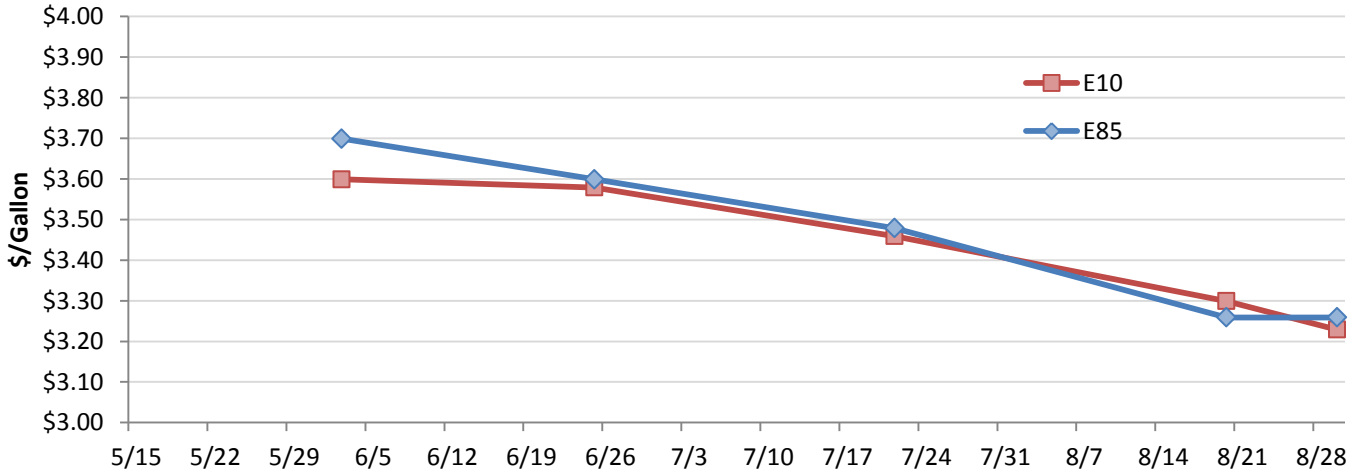
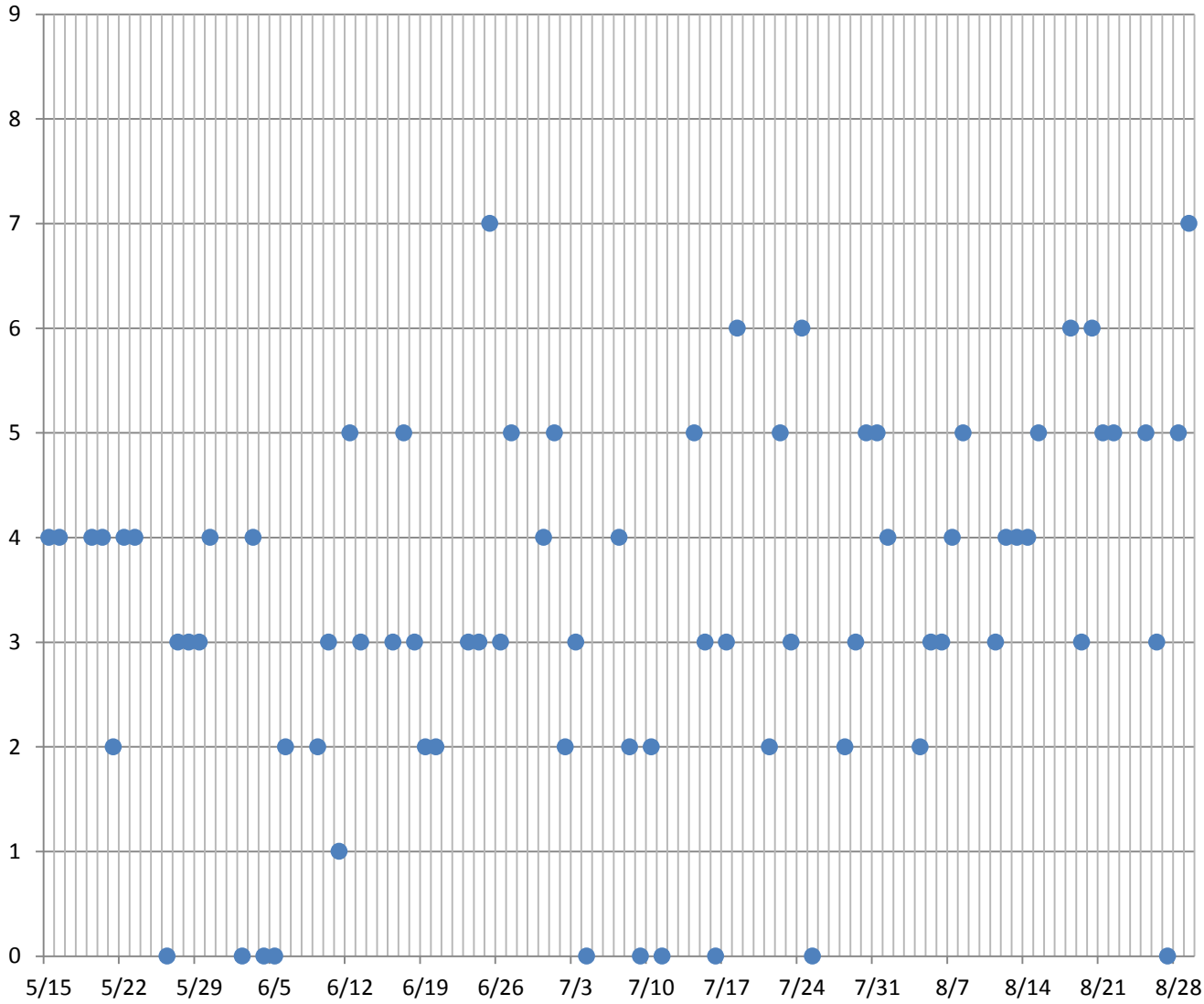


Figure A-10: Observations per Day



APPENDIX B

Derivation of E85 "Potential Price"

A "potential price" for E85 in the St. Louis market was derived as follows:

1. Illinois FOB plant ethanol prices were taken from weekly *Illinois Ethanol Corn & Co-products Processing Values Report.* U.S. Department of Agriculture, Agricultural Marketing Service. Price is for "Ethanol tank cars & trucks, Illinois plants."
2. Hydrocarbon blendstock (natural gasoline) prices were taken daily from OPIS and averaged by week. OPIS reports natural gasoline prices FOB the Conway (KS) terminal. We add transportation costs to derive a delivered price for natural gasoline to the St. Louis market. Transportation costs are based on standard rail and truck rates.
3. RIN credit prices were taken daily from OPIS and averaged by week.
4. The potential E85 price assumes ethanol is purchased directly from one of the two St. Louis-area ethanol plants at the FOB price. The ethanol is blended onsite with 25 percent natural gasoline to make a 75 percent ethanol "flex-fuel." Onsite E85 blending is occurring at a number of ethanol plants today.
5. The potential price further assumes that RIN credits associated with the blended ethanol were sold by the blender at the weekly average OPIS price.
6. Then, it is assumed the E85 price is marked down by 50-80 percent of the RIN value, as the blender passes some of the RIN value on to the consumer through a lower E85 price. Again, there is evidence that pass-through of at least 50 percent of the RIN value is occurring in other E85 markets today.
7. Finally, we assume the potential price includes a retail markup that is equal to the average wholesale-to-retail markup observed for E10 ($0.52) during the study period. This would cover taxes, transportation to retail, profit, etc.

Weekly calculations of the St. Louis E85 potential price are shown on the following page.

Week Ended	A	B	C	D	E	F	G	H	I	J	K	L	M
	Ethanol Price	**Natural Gasoline Price**			**E85 Potential Price**								
	FOB Illinois Plant	FOB Conway Terminal	Transp. to St. Louis	Natural Gasoline Delivered Price	E85 Wholesale (ex-RIN)	RIN Value	50% RIN Passthru	E85 Wholesale w/50% RIN Pass	80% RIN Passthru	E85 Wholesale w/80% RIN Pass	Wholesale -to-Retail Markup	E85 Potential Retail Price w/50% RIN Pass	E85 Potential Retail Price w/80% RIN Pass
	USDA-AMS	*OPIS*	*Author's est.*	*B+C*	*A x .75 + B x .25*	*OPIS*	*F x .75 x .5*	*E + G*	*F x .75 x .8*	*E + I*	*This study*	*H + K*	*J + K*
5/16	2.30	2.16	0.06	2.22	2.28	0.48	-0.18	2.10	-0.29	1.99	0.52	2.62	2.51
5/23	2.38	2.18	0.06	2.24	2.35	0.48	-0.18	2.16	-0.29	2.06	0.52	2.68	2.58
5/30	2.50	2.17	0.06	2.23	2.43	0.48	-0.18	2.25	-0.29	2.15	0.52	2.77	2.67
6/6	2.30	2.13	0.06	2.19	2.27	0.46	-0.17	2.10	-0.27	2.00	0.52	2.62	2.52
6/13	2.28	2.19	0.06	2.25	2.27	0.47	-0.17	2.10	-0.28	1.99	0.52	2.62	2.51
6/20	2.18	2.25	0.06	2.31	2.21	0.52	-0.19	2.02	-0.31	1.90	0.52	2.54	2.42
6/27	2.16	2.24	0.06	2.30	2.19	0.55	-0.21	1.99	-0.33	1.86	0.52	2.51	2.38
7/3	2.14	2.21	0.06	2.27	2.17	0.53	-0.20	1.97	-0.32	1.86	0.52	2.49	2.38
7/11	2.20	2.19	0.06	2.25	2.21	0.51	-0.19	2.02	-0.30	1.91	0.52	2.54	2.43
7/18	2.18	2.18	0.06	2.24	2.20	0.50	-0.19	2.01	-0.30	1.90	0.52	2.53	2.42
7/25	2.14	2.21	0.06	2.27	2.17	0.52	-0.19	1.98	-0.31	1.86	0.52	2.50	2.38
8/1	2.14	2.15	0.06	2.21	2.16	0.53	-0.20	1.96	-0.32	1.84	0.52	2.48	2.36
8/8	2.09	2.06	0.06	2.12	2.10	0.53	-0.20	1.90	-0.32	1.78	0.52	2.42	2.30
8/15	2.23	2.04	0.06	2.10	2.20	0.51	-0.19	2.00	-0.31	1.89	0.52	2.52	2.41
8/22	2.23	2.01	0.06	2.07	2.19	0.50	-0.19	2.00	-0.30	1.89	0.52	2.52	2.41
8/29	2.16	2.06	0.06	2.12	2.15	0.50	-0.19	1.96	-0.30	1.85	0.52	2.48	2.37
AVG	**2.23**	**2.15**	**0.06**	**2.21**	**2.22**	**0.50**	**-0.19**	**2.03**	**-0.30**	**1.92**	**0.52**	**2.55**	**2.44**