

*Economic Effects of the Marathon-
Ashland Joint Venture: The
Importance of Industry Supply Shocks
and Vertical Market Structure*

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Views and opinions expressed in this presentation are solely those of the presenter.

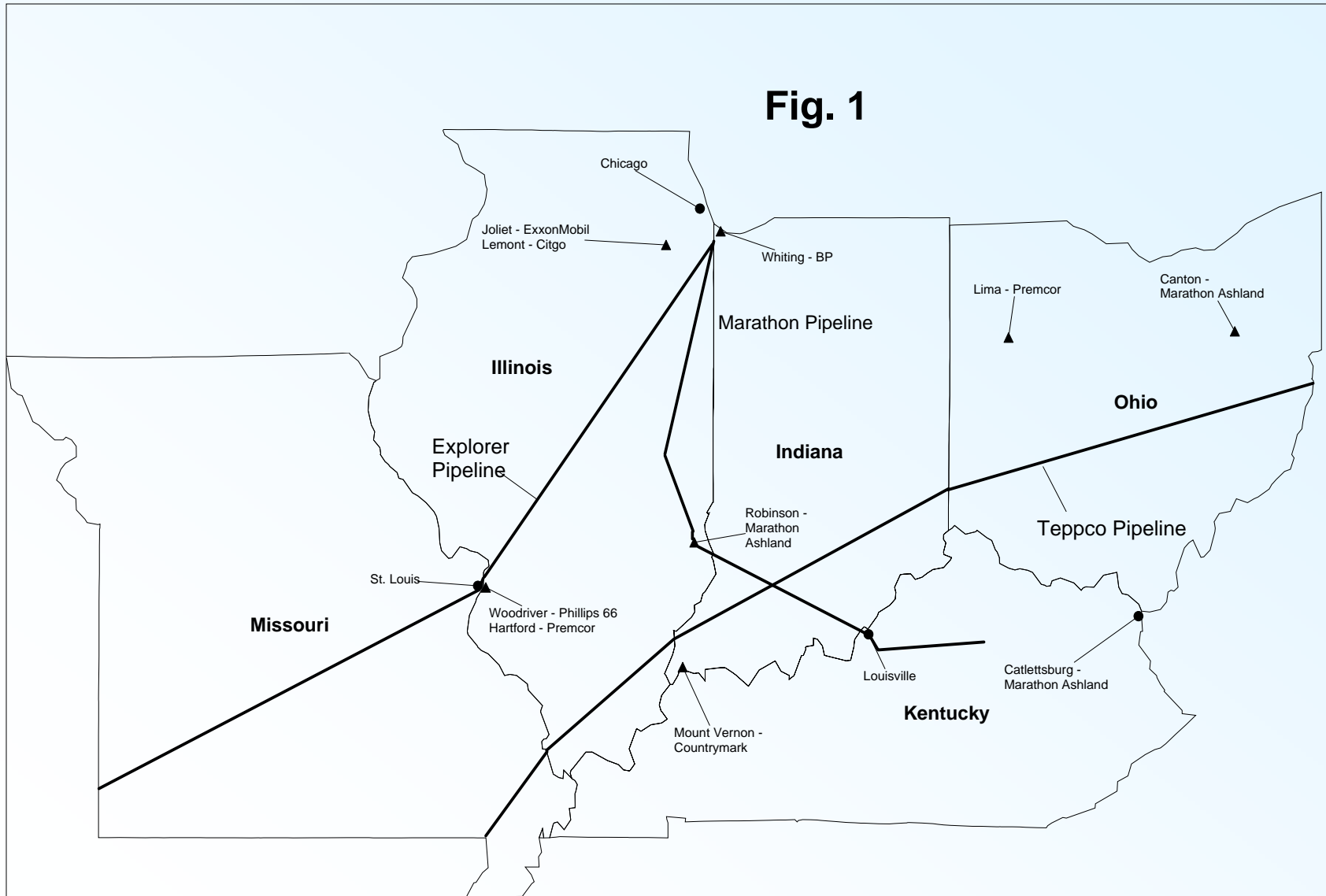
Introduction

- Why do case study merger retrospectives in the petroleum industry ?
- U.S. petroleum industry has undergone restructuring since the mid 1990's. (BP-Amoco, Exxon-Mobil, Chevron-Texaco etc.)
- Concerns of government officials, consumer advocates and others.
- Research papers examining petroleum mergers tend to:
 - either examine a larger number of mergers on a broad cross section of regions (markets).
 - examine wholesale (rack) or retail prices but not both at the same time.
- We want to focus on one merger, one region where the market structure and change in structure would make an anticompetitive effect possible and examine both rack and retail prices.

Introduction

- Why examine the Marathon-Ashland (MAP) transaction?
- MAP was a major transaction with a large change in market structure.
 - Change in state level wholesale HHI of about 800 to 2260 in Kentucky.
- The MAP joint venture included:
- Seven Refineries
 - Marathon - Louisiana, Texas, Illinois, Michigan
 - Ashland – Kentucky, Minnesota, Ohio
- 84 terminals, 5,400 gasoline stations, 5,000 miles of pipelines
- Parties acknowledge FTC investigation – no divestitures or other enforcement action.

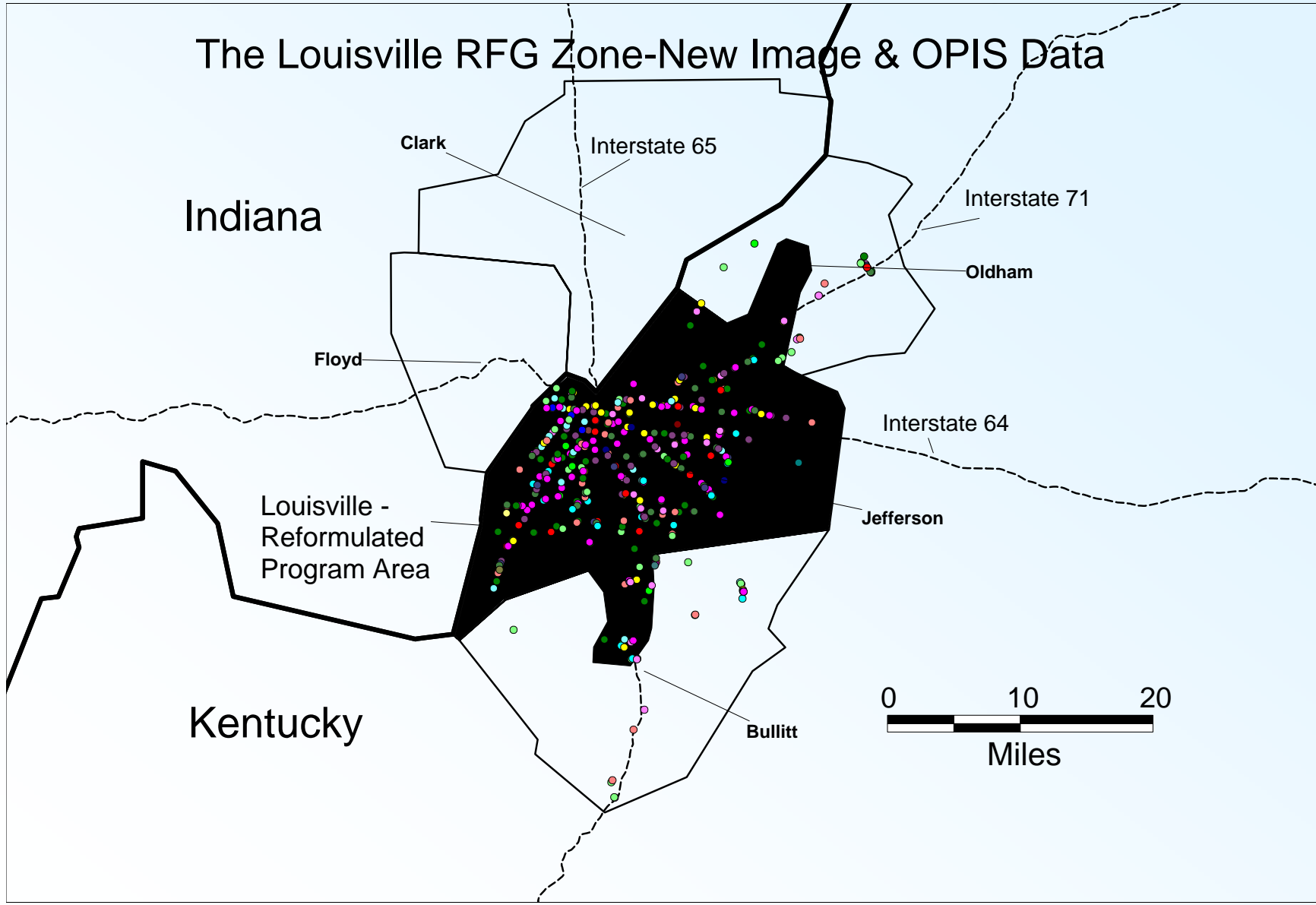
Midwest Refining and Marathon-Ashland



Introduction

- Why Louisville?
 - Uses reformulated gasoline (RFG) (ethanol or MTBE).
 - Arbitrage may be difficult from nearby regions making an anticompetitive price effect possible.
- Kentucky is the only state where both Marathon and Ashland were in the top 4 wholesale suppliers
- Combined retail sales share in Kentucky - 32%
- Possible anticompetitive effects at bulk supply (refining), terminal/wholesaling, and retail levels.

The Louisville RFG Zone-New Image & OPIS Data



Empirical Method

- We observe a large change in market structure in a relatively isolated area.
 - Louisville
- Region uses a somewhat unique formulation of gasoline.
 - RFG both with MTBE and ethanol in Louisville
 - Conventional in Indiana and surrounding Louisville.
- Our goal is to determine if this change in market structure led to a change in gasoline prices.
 - Nearby terminals do not sell RFG gasoline.

Empirical Method

- Need to control for “but-for” world.
- Compare Louisville price to other similar cities’ prices-cities that arguably are subject to the same or similar demand and supply shocks.
- Cities need to use RFG, similar source of supply, not affected by merger.
 - Chicago: most similar, Ashland not present; receives marginal supply from Gulf.
 - Houston: net exporter of RFG.
 - Northern Virginia: supplied from Gulf. (Marathon and Ashland sold unbranded gasoline in Northern Virginia – along with 9 other firms)
 - All of the racks in these cities also have conventional gasoline for use in the larger surrounding areas.

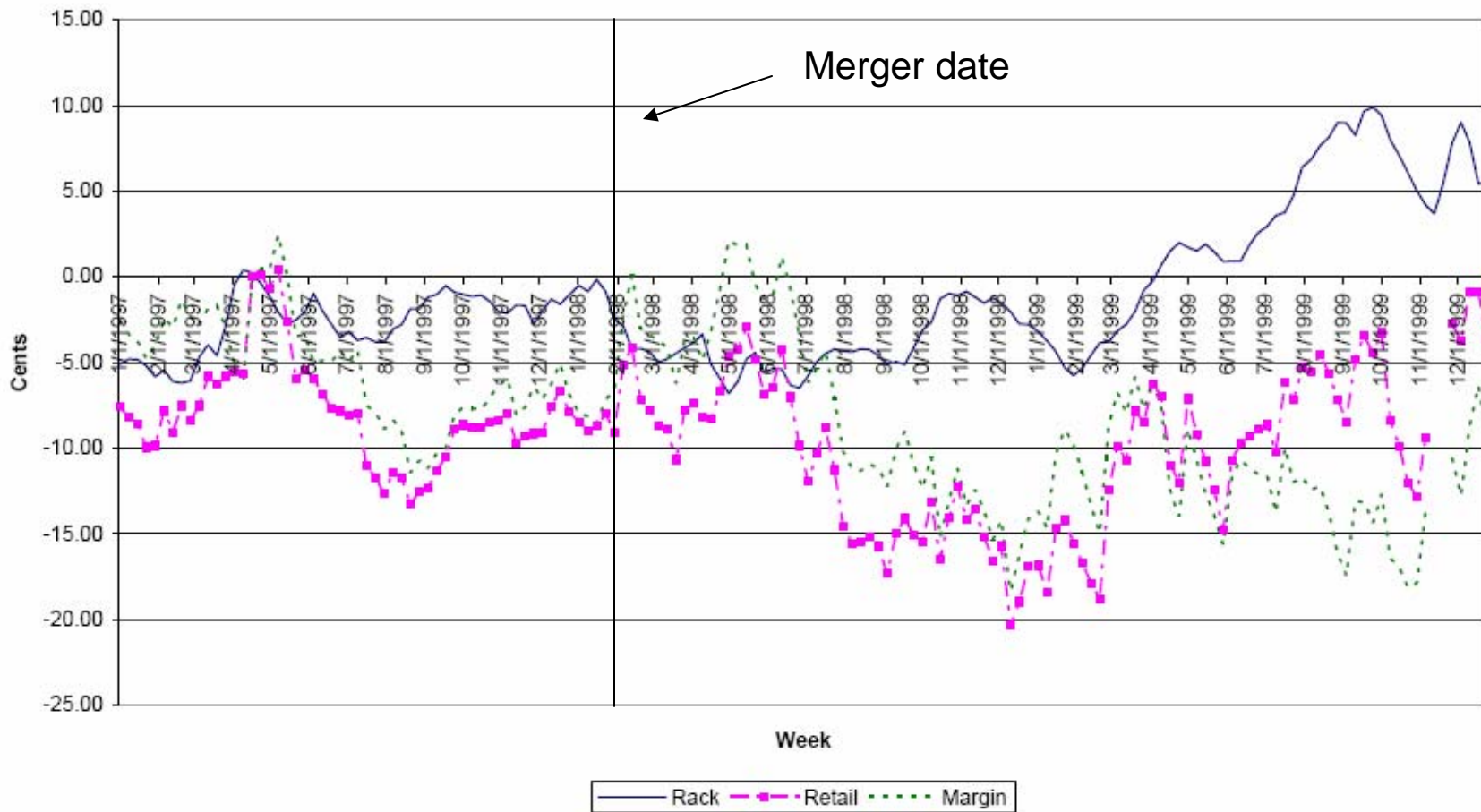
Data

- Gasoline price data comes from Oil Price Information Service (OPIS)
- Wholesale Prices
 - Purchased daily branded and unbranded rack prices.
 - Average weekly price.
- Retail Price
 - From fleet cards – average weekly price
 - Retail price for city of Louisville and Chicago, Houston metro, and Northern Virginia.
- Census of Service Stations
 - New Image Marketing

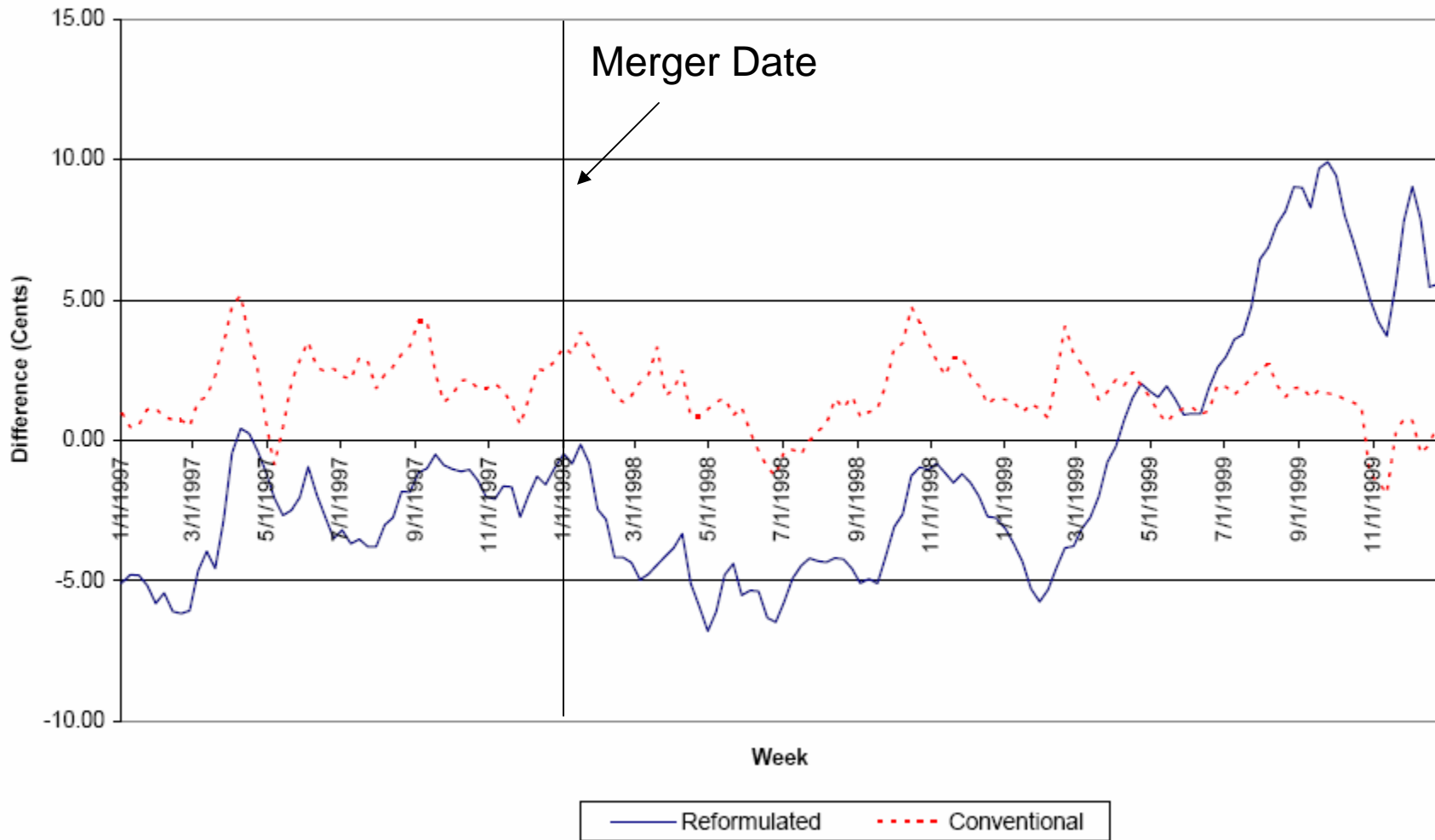
Data

- All retail prices are net of taxes.
- Rack and retail prices for both regular and premium gasoline.
- Data covers period from January 1, 1997 through December 31, 1999.
 - One year prior to merger date (1/1/98), two years following merger.
- Dropped data after 1999 because of shocks affecting gasoline prices in the Midwest.

Difference Between Louisville and Chicago Unbranded Regular RFG Rack Price, Retail Price, and Retail Margin



Difference Between Louisville and Chicago Rack Prices for Unbranded Regular RFG and Regular Conventional Gasoline



Difference in Difference Equation

$$P_{Lt} = \alpha_0 + \alpha_1 F_t + \alpha_2 \text{If1998}_t + \alpha_3 \text{If1999}_t + \sum_{m=1}^{11} \beta_m D_{mt} + \gamma_t + \varepsilon_{Lt}$$

P_{Lt} is the Louisville price at time t

F_t is the future price of oil at time t

IF1998 and IF1999 are indicators

D_{mt} are month dummies

ε is the autoregressive error term

$$P_{Ct} = \theta_0 + \theta_1 F_t + \sum_{m=1}^{11} \lambda_m D_{mt} + \gamma_t + \varepsilon_{Ct}$$

P_{Ct} is the Control city price at time t

$$P_{Lt} - P_{Ct} = (\alpha_0 - \theta_0) + (\alpha_1 - \theta_1) F_t + \alpha_2 \text{If1998}_t + \alpha_3 \text{If1999}_t + \sum_{m=1}^{11} (\beta_m - \lambda_m) D_{mt} + (\varepsilon_{Lt} - \varepsilon_{Ct})$$

Coefficients on Year Effects – Reformulated Regular Gasoline

Measure	Control City	Branded/Unbranded	Dummy:1998	T-Stat	Dummy: 1999	T-Stat
Margin	Chicago	Unbranded	-1.59	-1.28	-6.69	-6.01
Margin	Houston	Unbranded	-3.23	-2.26	-7.49	-5.70
Margin	Virginia	Unbranded	-0.91	-0.60	-2.35	-1.60
Rack	Chicago	Unbranded	3.27	2.17	6.91	2.61
Rack	Houston	Unbranded	1.53	1.46	4.38	3.03
Rack	Virginia	Unbranded	1.56	1.45	4.38	2.85
Retail	Chicago		0.73	0.52	0.10	0.07
Retail	Houston		-1.06	-0.72	-2.51	-1.66
Retail	Virginia		0.99	0.60	2.23	1.19

Summary of Empirical Results and Robustness Checks

- No systematic change in retail prices following MAP.
- No change in rack price of conventional gasoline.
- RFG rack prices increased in 1999, roughly 15 months following MAP.
- Implied retail margin of Louisville gasoline stations with RFG decreases in 1999.
- Robust to measures of price/margin:
 - Branded/Unbranded Rack
 - Premium/Regular Gasoline
 - Three Control Regions (Chicago, Houston, Northern Virginia)

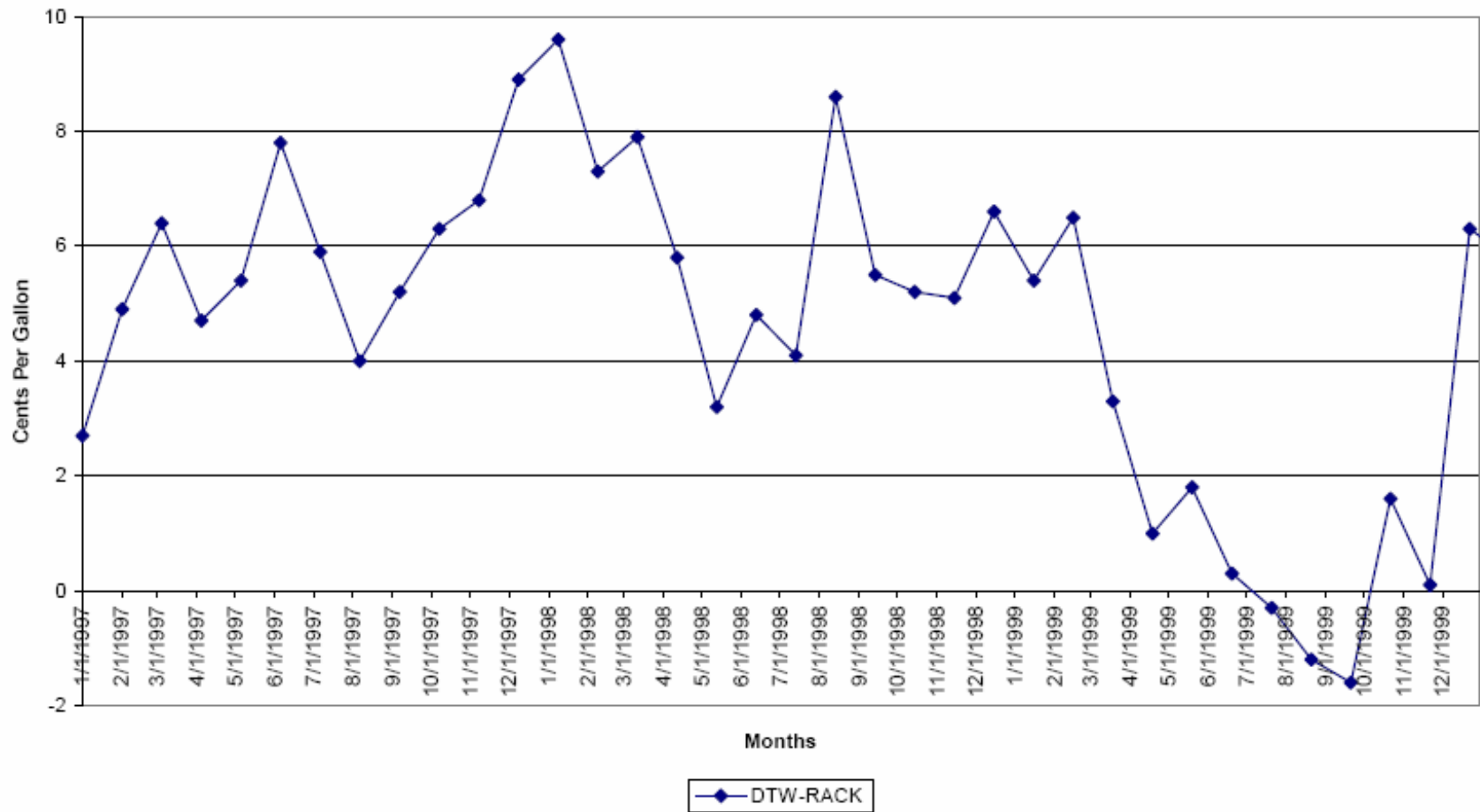
Two Remaining Questions

- Q1: Why did wholesale RFG prices increase in Louisville in 1999?
 - Maybe the result of a supply shock.
 - St. Louis entered RFG program at same time of wholesale price increase.
 - St. Louis used both RFG-MTBE and ethanol like Louisville, receives shipments from the Gulf.
 - St. Louis RFG demand equal to RFG demand in Kentucky – a sizeable change.

Two Remaining Questions

- Q2: Why was the rack price increase not passed through to retail prices?
 - Rack price only the wholesale price to 70% of stations. Remainder of stations may not have experienced a wholesale price increase for RFG.
 - Rack supplied stations compete with stations across the border in Indiana which sold conventional gasoline (which did not experience a price increase).
 - Regression analysis suggests that the retail price of rack supplied stations in Louisville increased about 0.6 cents per gallon in 1999 relative to DTW supplied stations.

Difference Between Kentucky Dealer Tank Wagon and Rack Prices (1997-1999)



Conclusion/Findings

- No systematic change in retail price (RFG or conventional).
- Appears merger not anticompetitive.
- Relatively large (3-5 cent) increase in wholesale price of RFG roughly 15 months after merger.
- No change in wholesale price of conventional.
- Large drop in implied retail margin (20%-30%)
- Wholesale price increase may have been caused by a supply shock.
- It is possible to have a sizeable change in rack prices with no change in retail prices.