

Learning to Coordinate: A Study in Retail Gasoline

Bryne & Roos (AER 2019)

Motivation

- Research Question:
 - How do rival firms collude in a market without direct communication?
- Why this is important:
 - No theory about how collusive behavior begins without explicit organization
 - Coordinated effects from tacit collusion can be economically significant

Approach

- Empirical analysis of the retail gasoline industry in Perth, Western Australia
 - Daily station-level prices for unleaded fuel for 15 years
 - Covers every establishment in the market
 - Observe how pricing behavior changes over a 3-year period
- Almost entirely descriptive exercise; DiD to check that results are robust to variations in definitions of price changes and market cycles

Data and Setting

“...our setting maps well into the benchmark repeated games model of collusion with simultaneous price competition and perfect monitoring.”

- ‘Fuelwatch’ price transparency program in Western Australia
 - All gas stations required to submit next-day prices by 2pm
 - ‘Nearly perfect’ daily compliance
 - Firms have perfect monitoring of prices over time
- + Terminal Gate Price (TGP) for wholesale gasoline from six terminals (daily lowest TGP assumed to be retailers’ marginal cost)

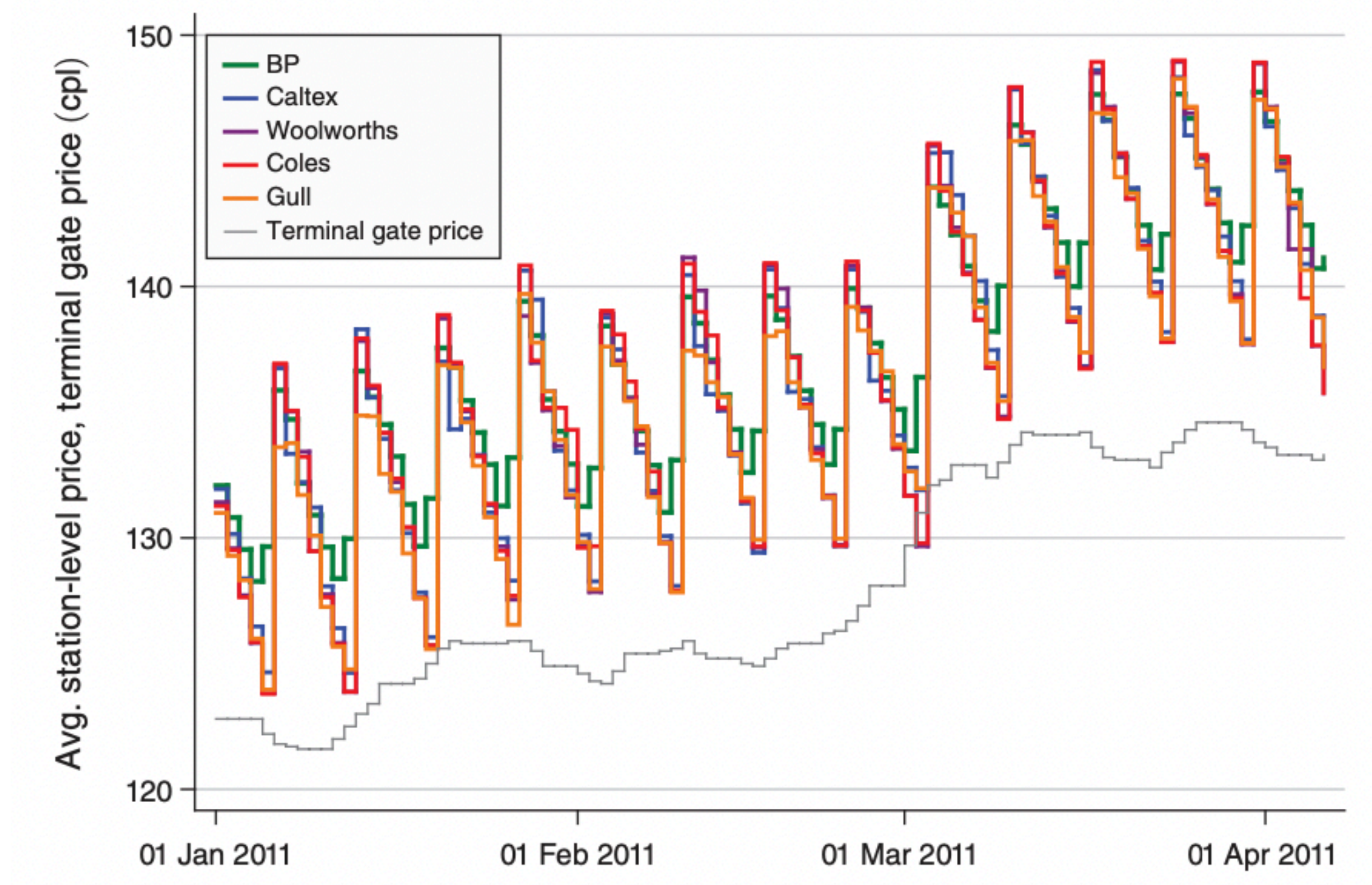
Oligopoly in Retail Gas Market



- BP: Largest retailer, operates 22% of stations on average between 2005 and 2015
- Followed by Caltex (16%), Coles (16%) and Woolworths (14%); others (32%) belong to independent firms
- 2009-2012: BP conducts price leadership and market experiments
- August 2012: all major players adopt the same pricing structure

Prices

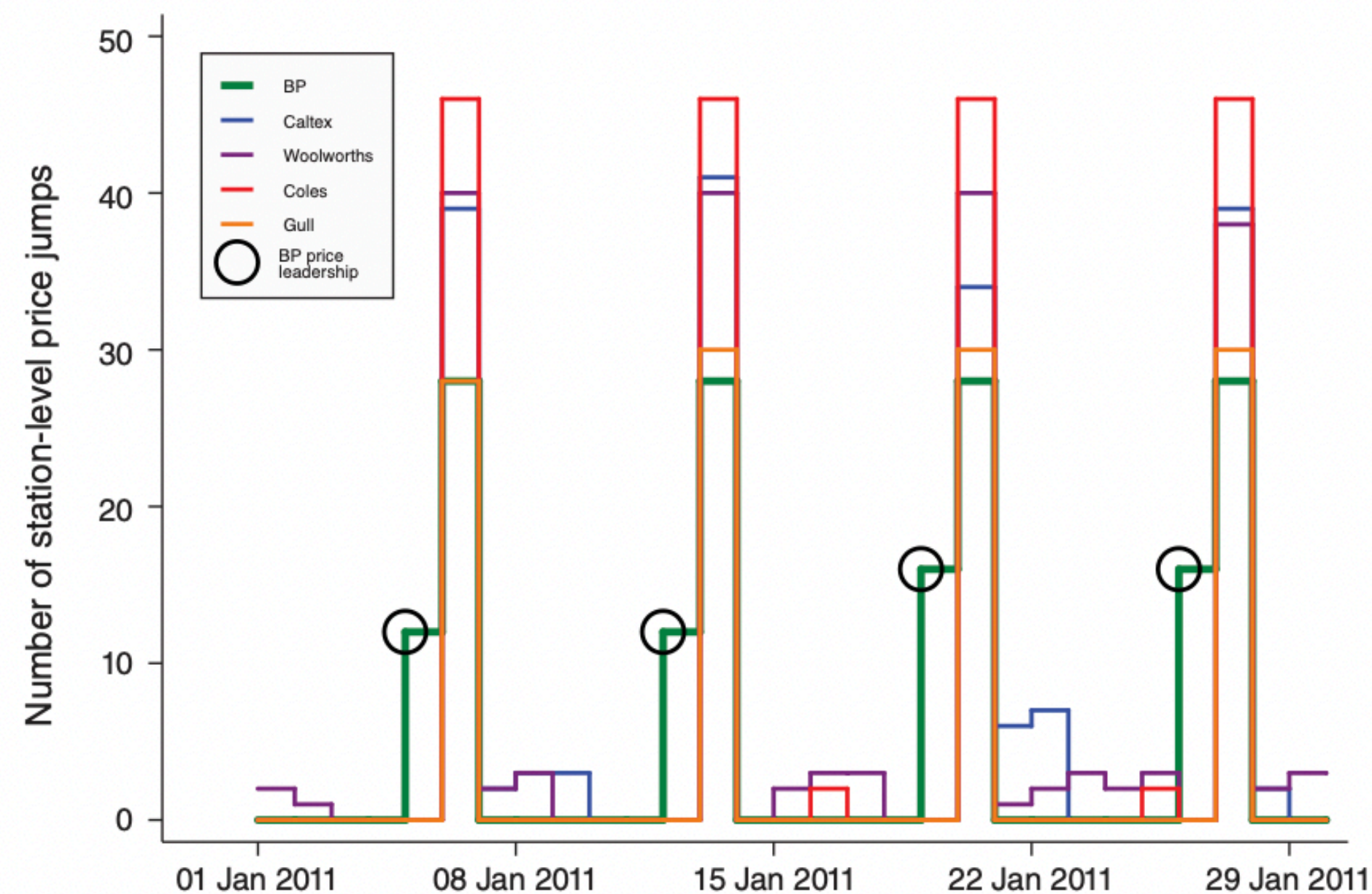
- Retail gas prices follow an asymmetric cycle that begin with market-wide price jumps followed by daily price cutting until prices jump again



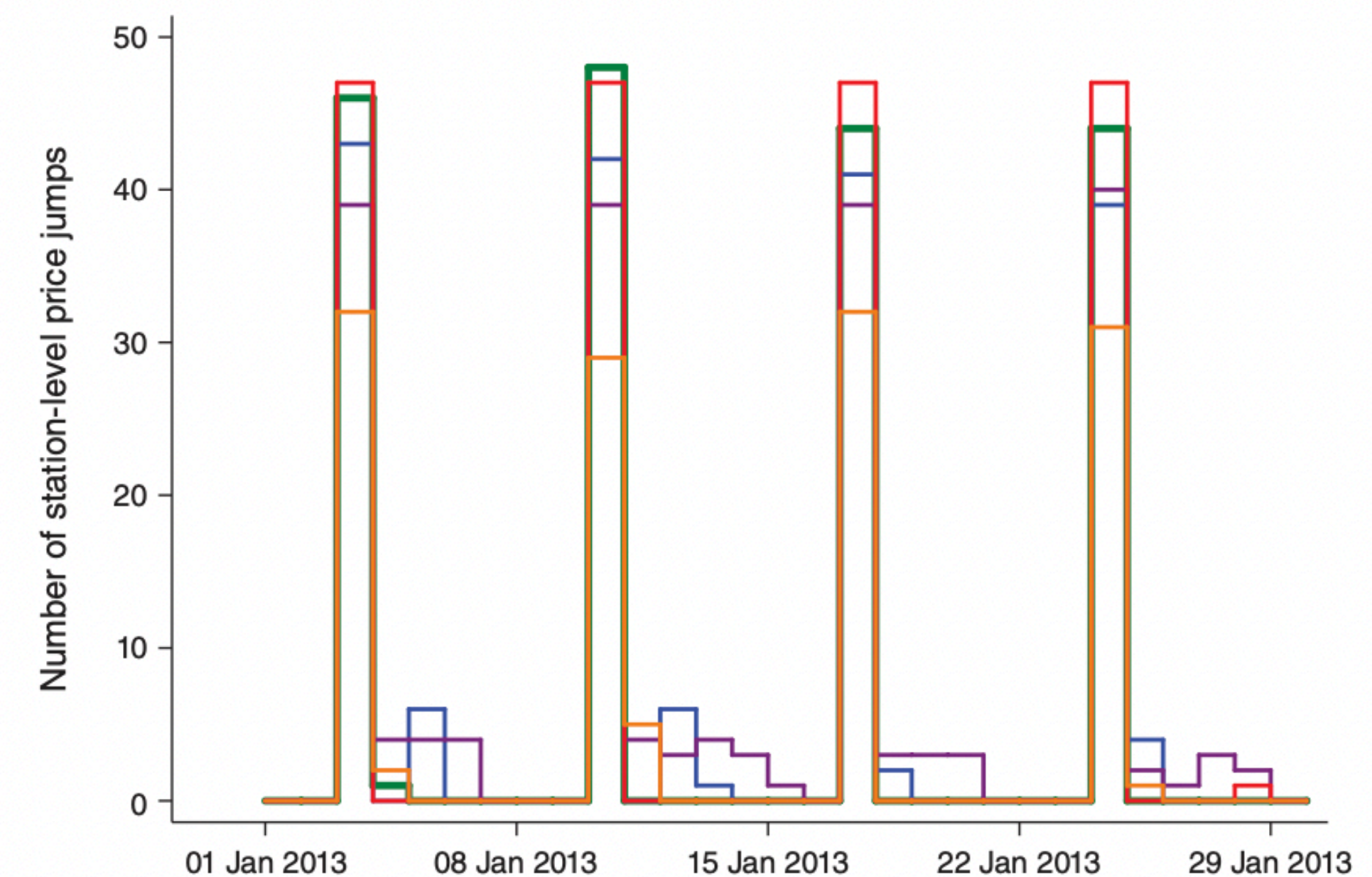
How did firms learn to coordinate?

- March 2009: price jumps occur every Wednesday in a subset of BP stations, followed by all other BP stations on Thursday
- This initiates a market-wide price jump on Thursday, as rival firms follow BP's lead

Panel A. Price jumps by firm: BP Wednesday price jump leadership



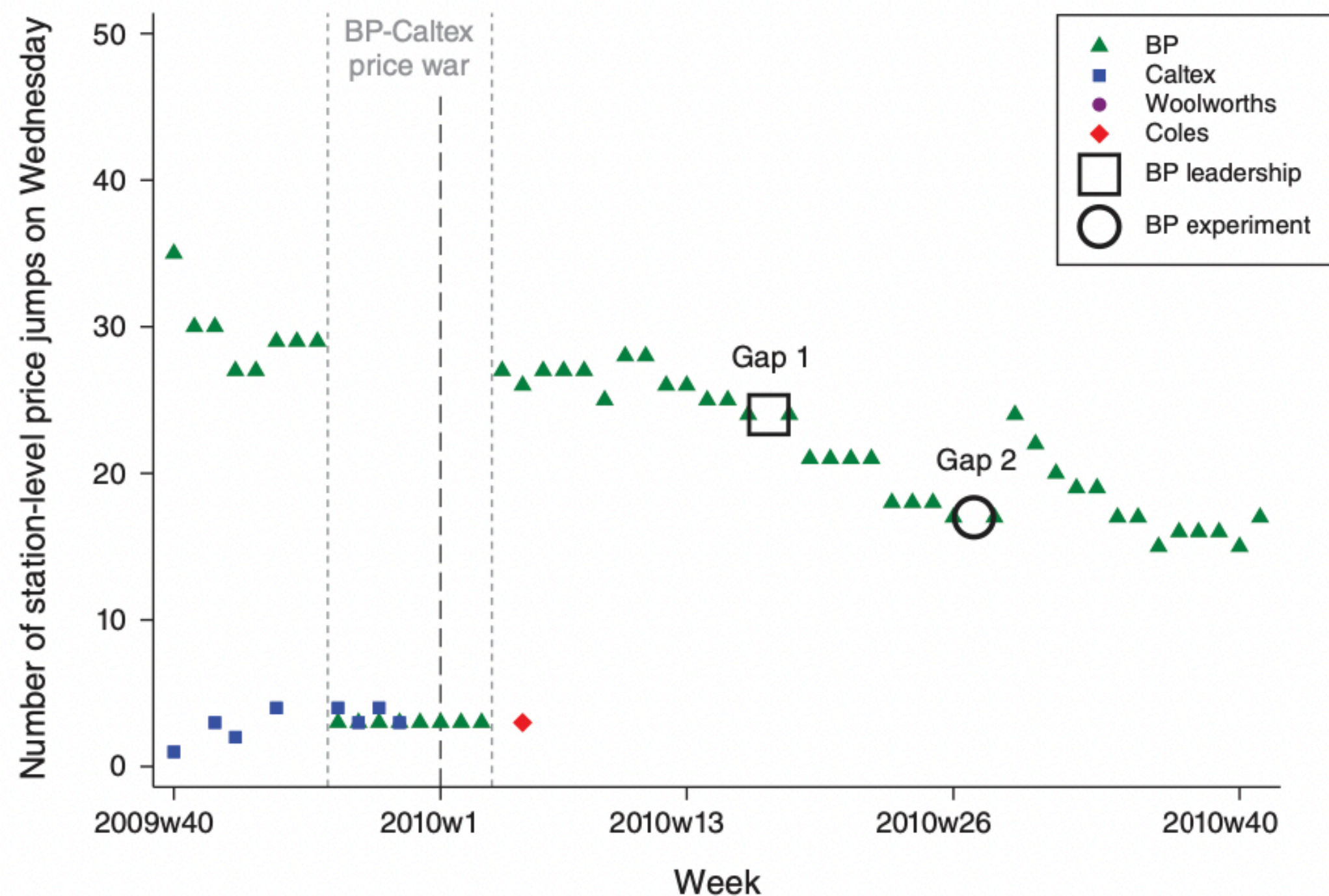
Panel B. Price jumps by firm: No BP Wednesday price jump leadership



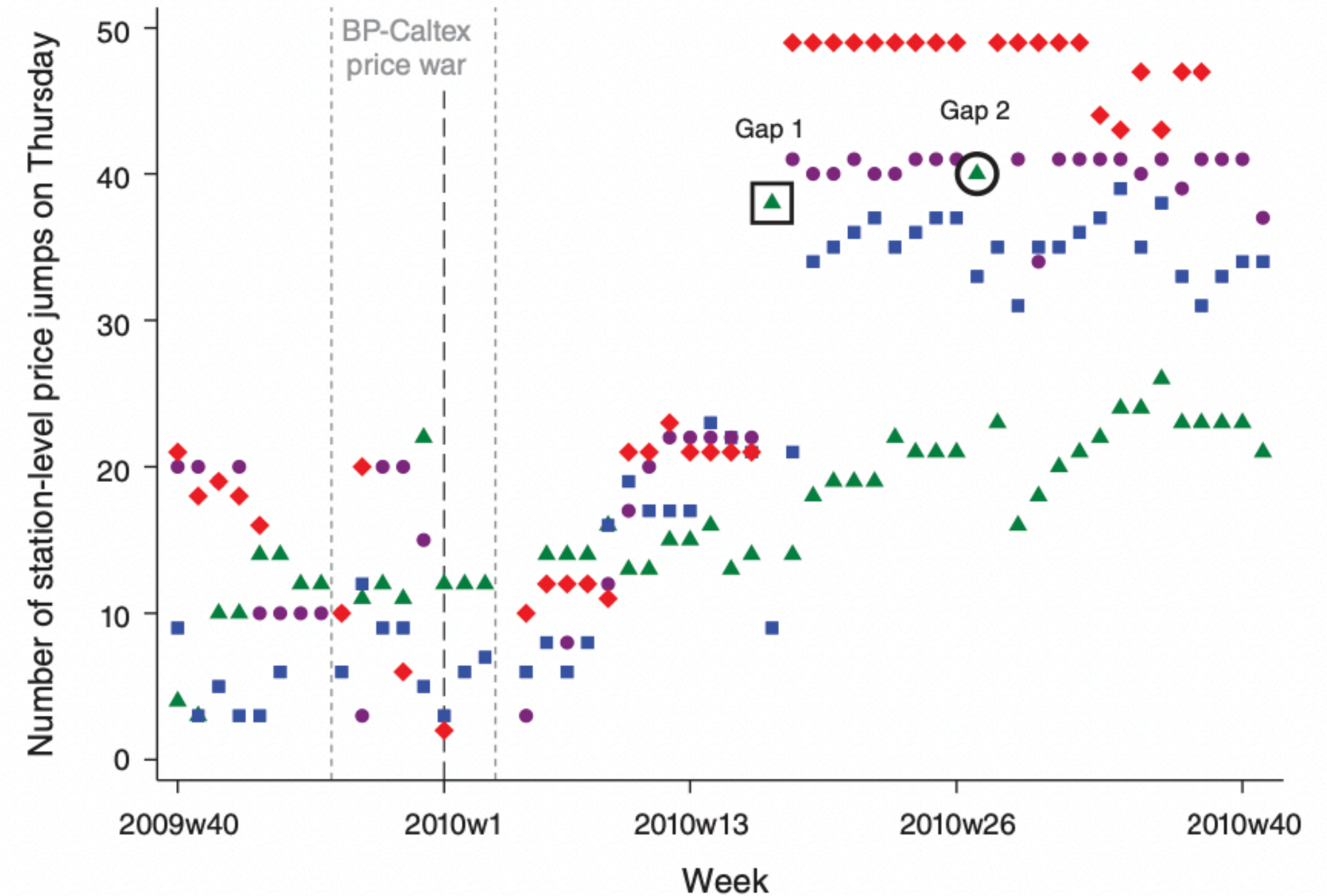
Gradual transition to new pricing equilibrium

- BP selectively deviates from Wednesday price jumps to anchor the market onto Thursday price jumps as its rivals learn from its behavior

Panel A. Number of station-level price jumps on Wednesdays by firm and week



Panel B. Number of station-level price jumps on Thursdays by firm and week

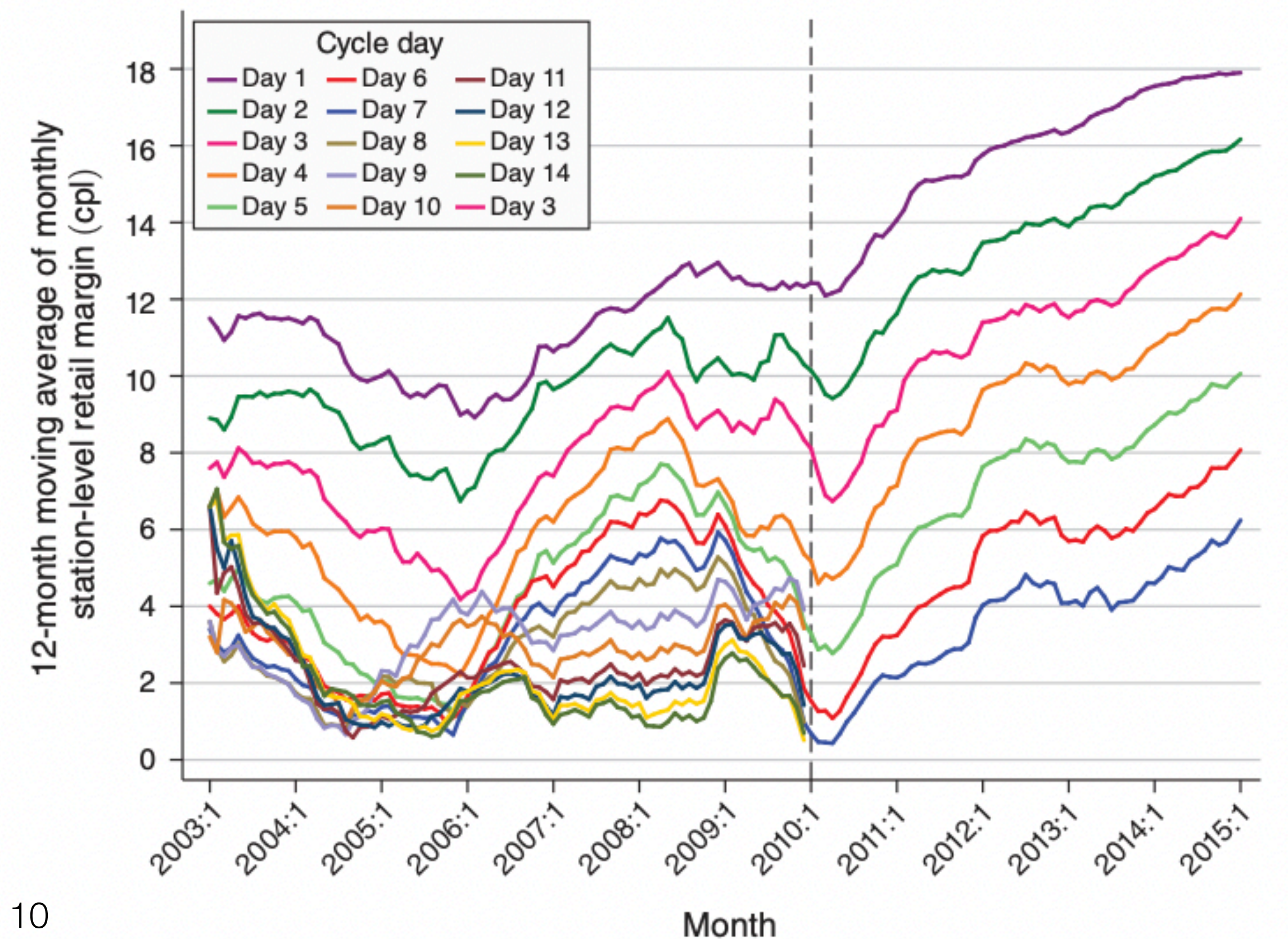
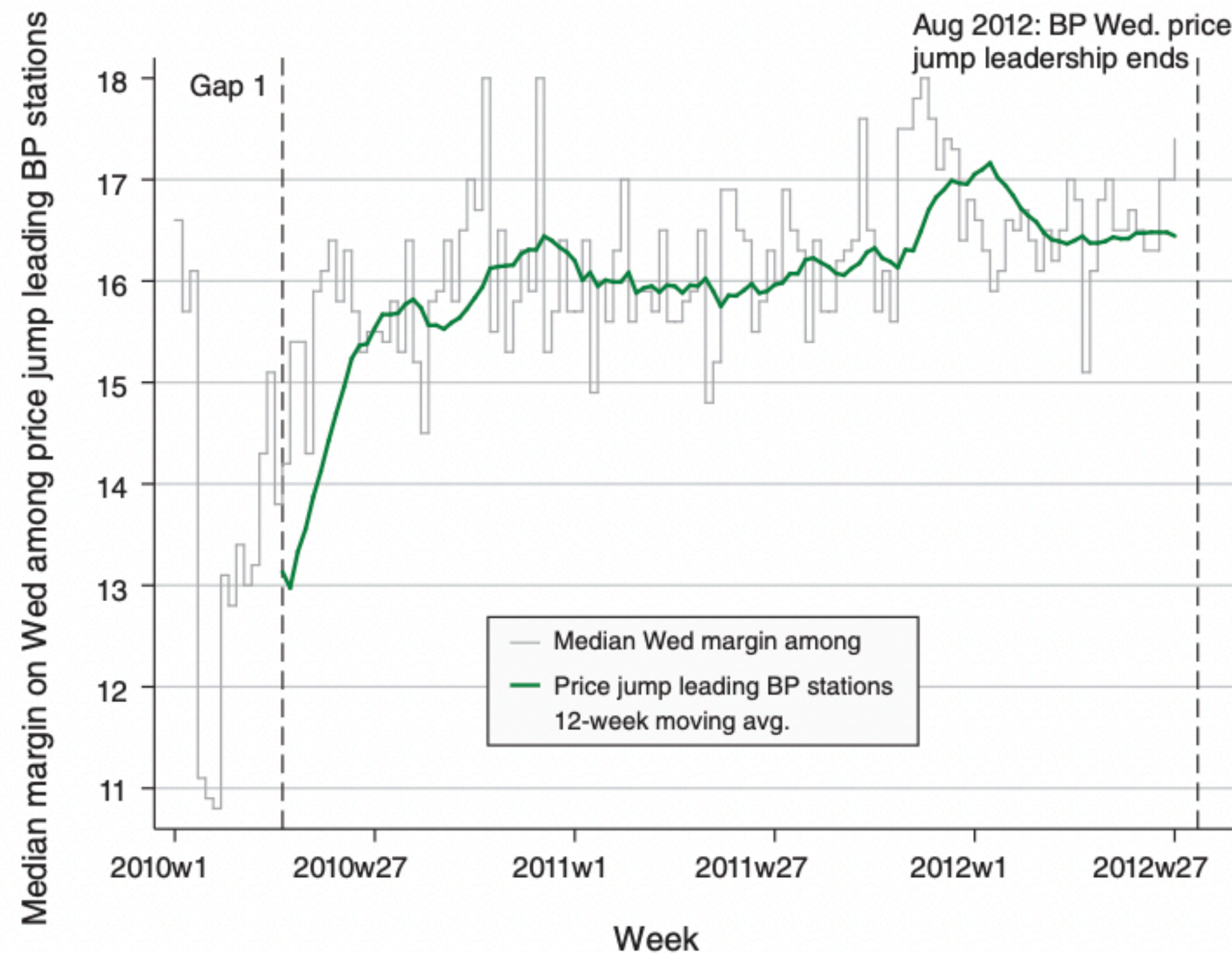


Collusive benefits

- BP effectively sets the market price: Wednesday price jump sends a signal that BP will increase its prices on Thursday (and by how much)
 - When rivals follow, BP can increase profit margins for all by setting higher prices at the start of each cycle
- BP also posts a daily cuts of 2 cents per liter until the next cycle, which leads to limited price undercutting between price jumps
 - Profit margins are increased throughout the cycle

Empirical analysis of profit margins

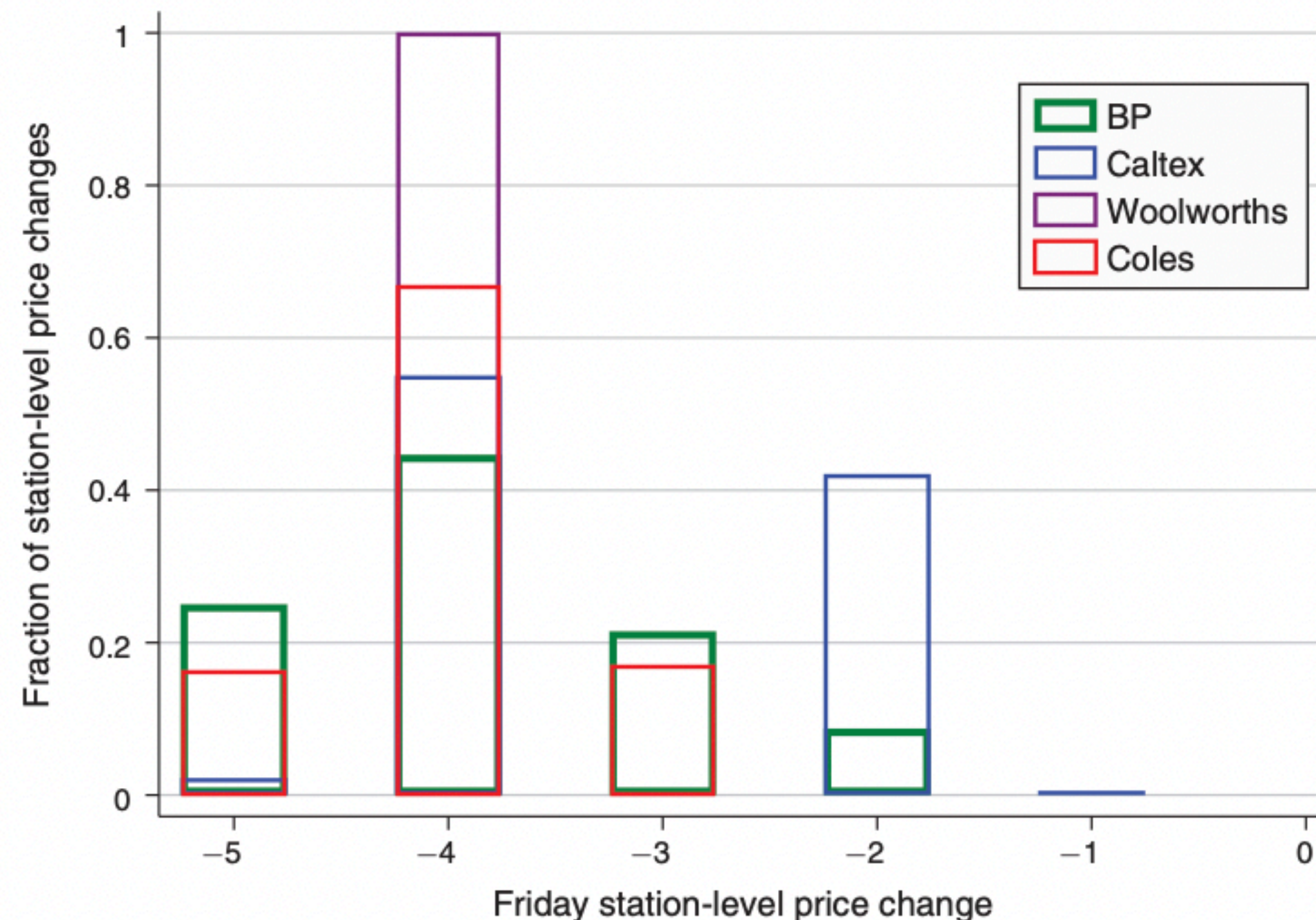
- New pricing structure leads to (i) price jumps that yield higher profit margins and (ii) limited undercutting by rivals



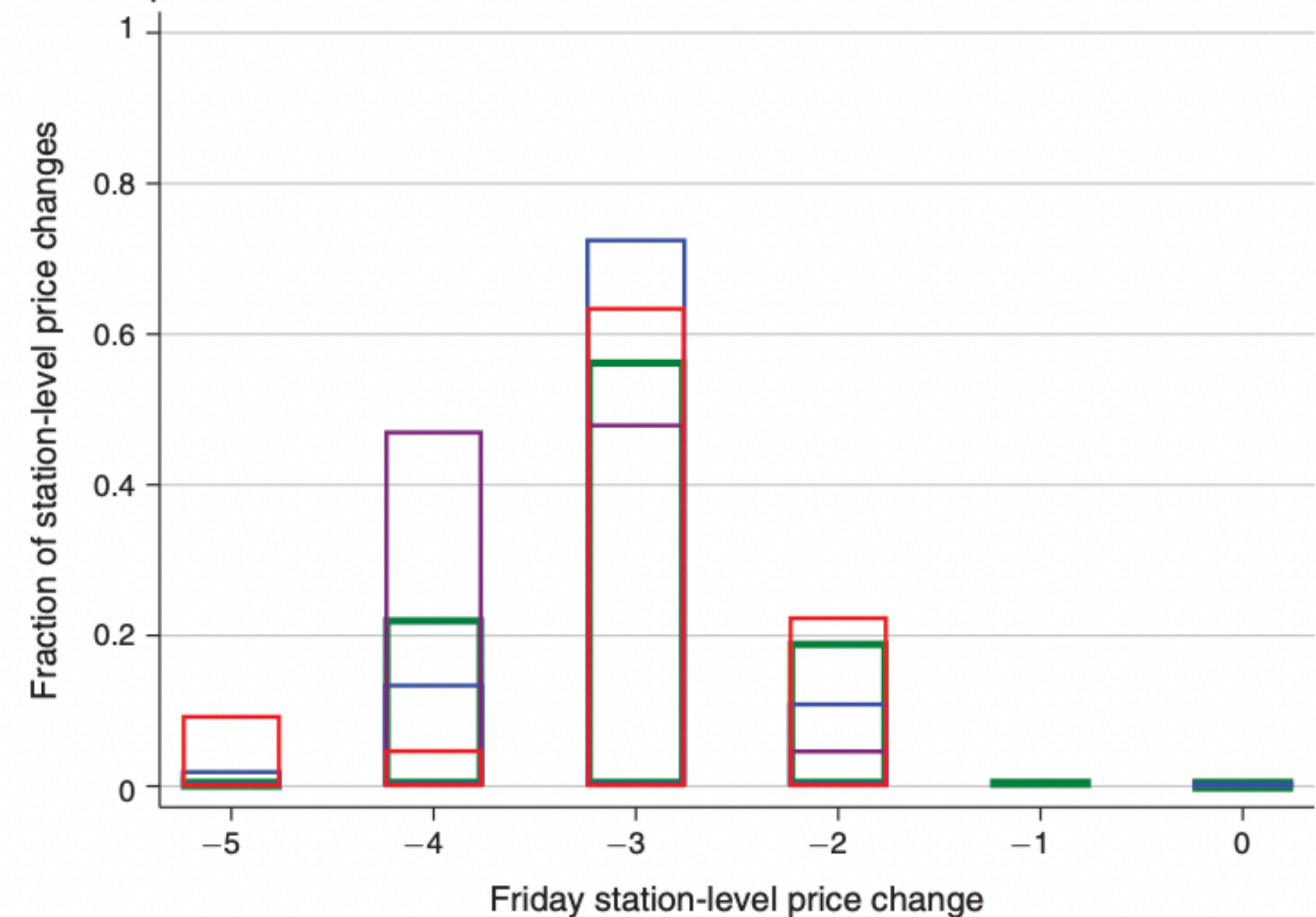
Price coordination without signals

- BP removes Wednesday price signals after new pricing structure is anchored; rivals can now infer the “correct” price by themselves

Panel A. Station-level Friday price adjustments if 2-cpl above the Thursday median price



Panel B. Station-level Friday price adjustments if 1-cpl above the Thursday median price



Summary

- Prices have communicative power in an oligopolistic setting with repeated interaction and complete information, facilitating tacit collusion
- How should antitrust law deal with such coordinated effects?