

DOCKETED

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Project Title:	Order Instituting Informational Proceeding on Maximum Gross Gasoline Refining Margin and Penalty
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SB X1-2 Workshop: Maximum Gross Gasoline Refining Margin and Penalty

September 12, 2024



Housekeeping

- Meeting is being recorded.  **REC**
- Attendees may participate today by:
 - Making comments during public comment period
 - Submitting written comments, **due by 5 p.m. September 27.**



Max Margin and Penalty Timeline

- **Mar 2023:** SB X1-2 signed (went into effect in June)
- **Oct 2023:** CEC opened proceeding to investigate whether to establish a max margin and penalty.
- **Nov 2023:** CEC hosted workshop to begin discussion on max margin and penalty.
- **Apr 2024:** CEC hosted workshop to explore structures for determining a maximum margin and penalty.



Purpose of Today's Workshop

- Provide a brief update on current gasoline market conditions.
- Share key data sources and inputs to the maximum margin and penalty analysis.
- Review history of market conditions, margins, and drivers of price spikes.
- Discuss CEC's analytical approach to determining whether to set a maximum gross gasoline refining margin.



Agenda

- Opening Comments from the Dais
- Presentations
 - Jeremy Smith, Energy Assessments Division
 - Gigi Moreno, Division of Petroleum Market Oversight
 - Esther Shears, Division of Petroleum Market Oversight
 - Matthew Zaragoza-Watkins, Consultant
- Comments from the Dais
- Public Comment
- Adjourn



Opening Comments from the Dais





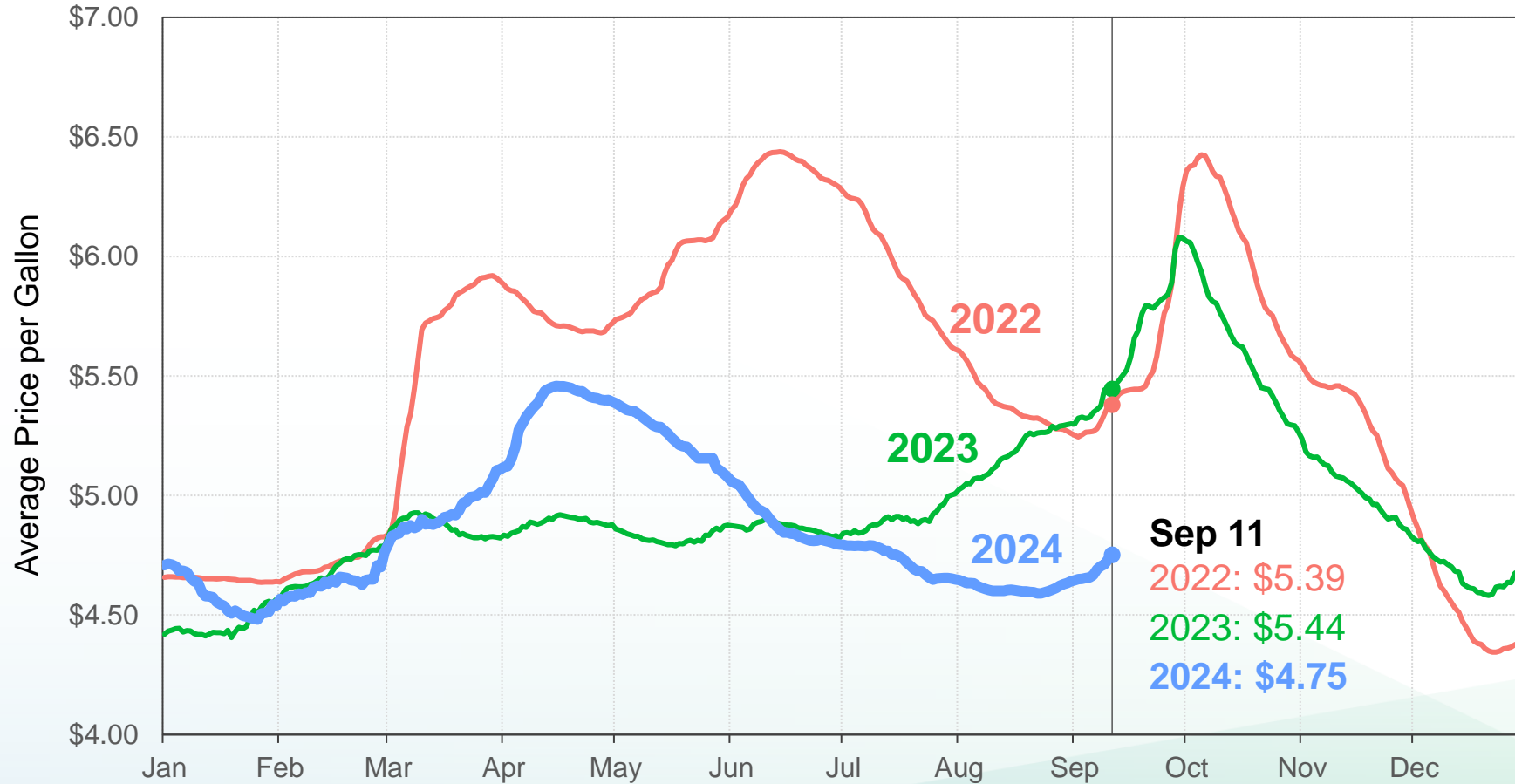
Gasoline Market Update

Jeremy Smith
Deputy Director, Energy Assessments Division



California Gasoline Prices

California Gasoline Prices Compared (2022-Current)

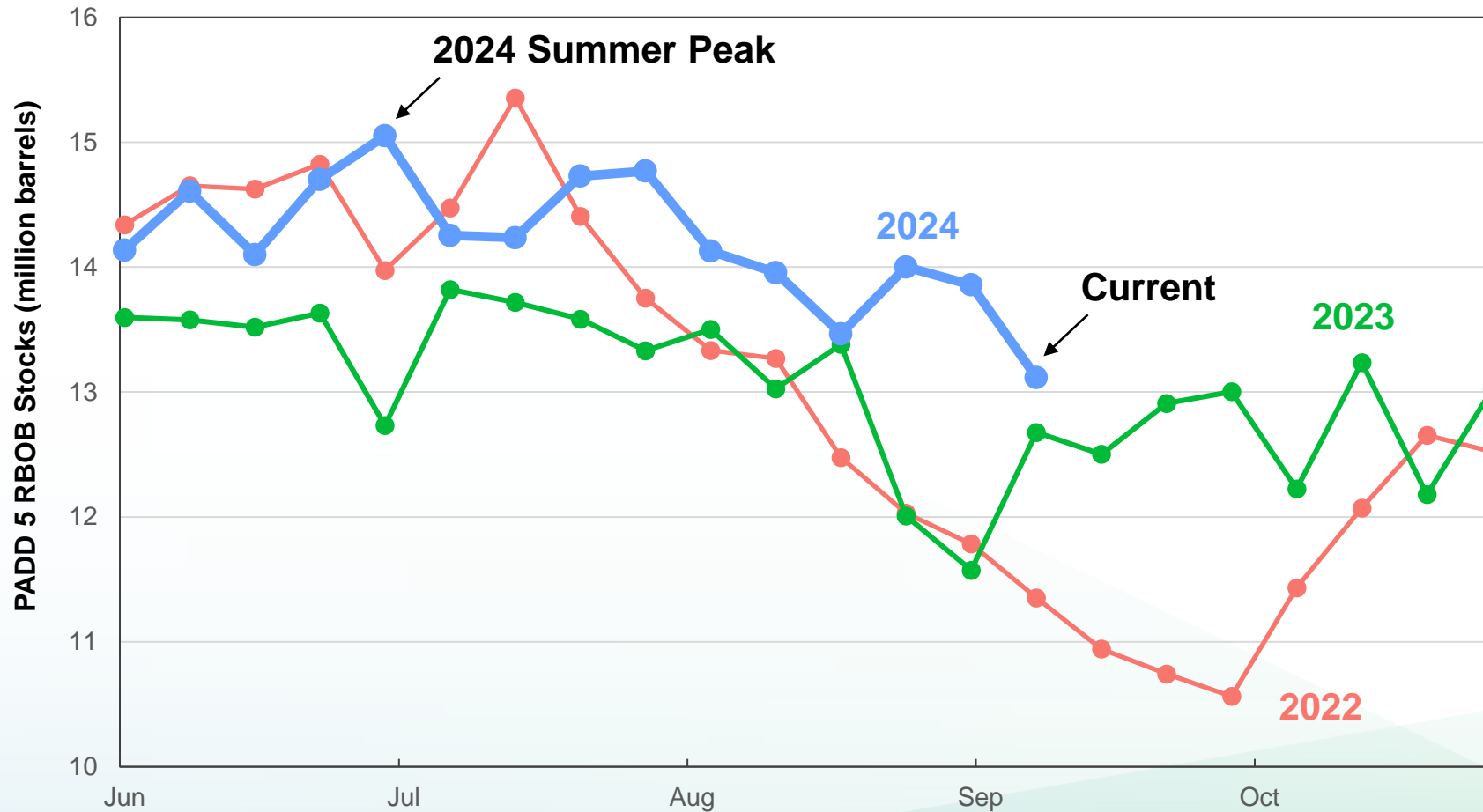


Source: CEC Analysis of OPIS data



California Gasoline Supply

Weekly Gasoline Stocks in Summer (2022-Current)

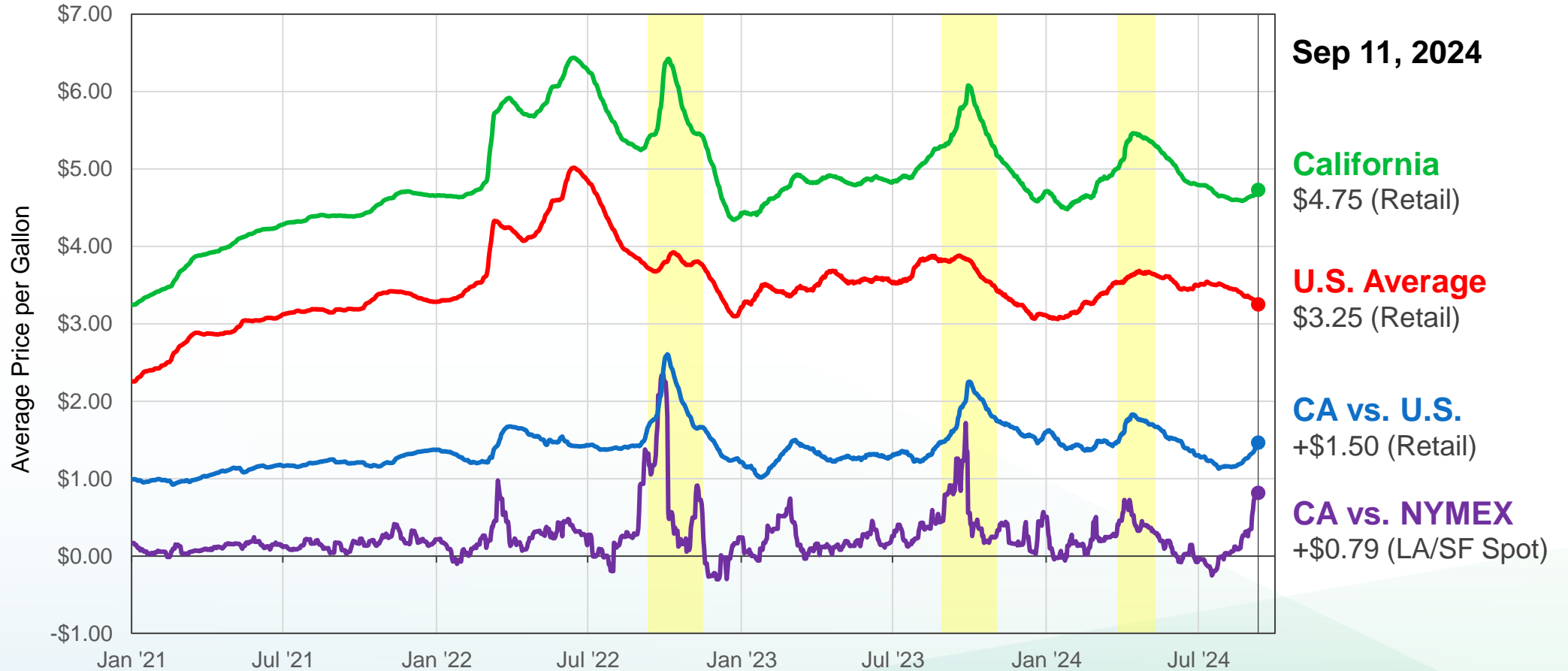


Source: CEC Analysis of EIA data



California Gasoline Spot Market

Retail and Spot Price Differentials (2021-Current)



Source: CEC Analysis of OPIS data



Data Sources for Maximum Gross Gasoline Refining Margin (MGGRM) Analysis

Jeremy Smith
Deputy Director, Energy Assessments Division



Data Sources for MGGRM Analysis

- 1 California Monthly Refining Margin Report**
(CEC-M1322)
- 2 California Sales Monthly Report**
(CEC-M782B)
- 3 Monthly Refinery Report**
(EIA-810 and CEC-M810)



Overview of CEC-M1322

M1322

1

Data Collected

- Sales volumes by channel
- Prices by channel
- Gross and net margins
- Cost information (taxes, fees, and operational costs)

2

3

Reporting Entities

- 9 California refineries that produce gasoline



Data Collected in CEC-M1322

Gross Gasoline Refining Margin

*Volume-weighted Gasoline Sales –
Volume-weighted input cost*

M1322

1

Net Gasoline Refining Margin

*Gross Gasoline Refining Margin – Allocated
Gasoline Refining Operational Costs*

2

3

Wholesale Gasoline Volumes & Prices

- By Sales Channel
- LCFS & Cap at the Rack costs

Operational Costs

- Specific cost items
- Total refining costs and costs allocated to gasoline

Note: Data collected is specific to the California specification of Gasoline



Overview of CEC-M782B

Data Collected

- Fuel Product Sales
- Sale Types (end-use customer type)
- Points of Sale
- Volumes and Prices

Reporting Entities

- Refiners, Petroleum Product Marketers

M782B

1

2

3



Data Collected in CEC-M782B

- Broader range of reporters
- Captures multiple product types
 - Motor Gasoline (All Grades)
 - No. 2 Distillates
 - Propane
 - Aviation
 - Residuals
- Breakdown of End-Use Customer: Residential, Commercial, Industrial, Retail

M782B

1

2

3



Overview of EIA-810/CEC-M810

Data Collected

- EIA810 form and CEC M810 form
- Product stocks
- Receipts
- Inputs
- Shipments
- Fuel Uses and Losses
- Operating Capacities (informs utilization rates)

Reporting Entities

- California refineries

1

2

3

810/M810



Data Collected in EIA-810/CEC-M810

- Inputs:
 - Crude by source (Alaskan, Domestic, Foreign)
 - Blending Components
- Stocks:
 - Beginning of Month and End of Month Totals
- Products Include: Hydrogen, Various Natural Gas Liquids, Distillates, Kerosene Jet Fuel, Renewable Fuels
- CEC M810 report breaks down into CARB/AZ/NV blends

1

2

3

810/M810



Thank You

Jeremy Smith
Deputy Director, Energy Assessments Division



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MARKET OVERSIGHT**

Gasoline Market Overview and Price Spike Analysis

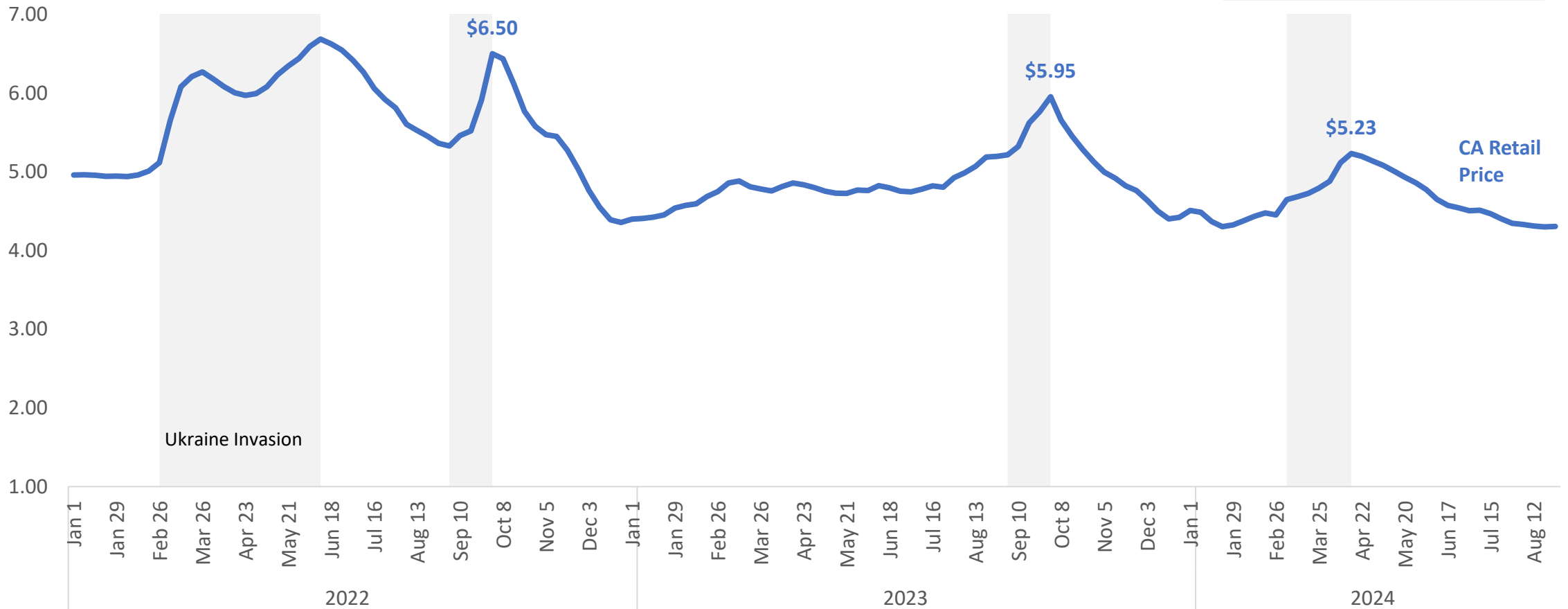
Gigi Moreno, Ph.D.

Chief Economist, Division of Petroleum Market Oversight



California Gasoline Retail Prices and Recent Price Spikes

Weekly Retail Prices and Cost of Crude, 2023\$/Gallon

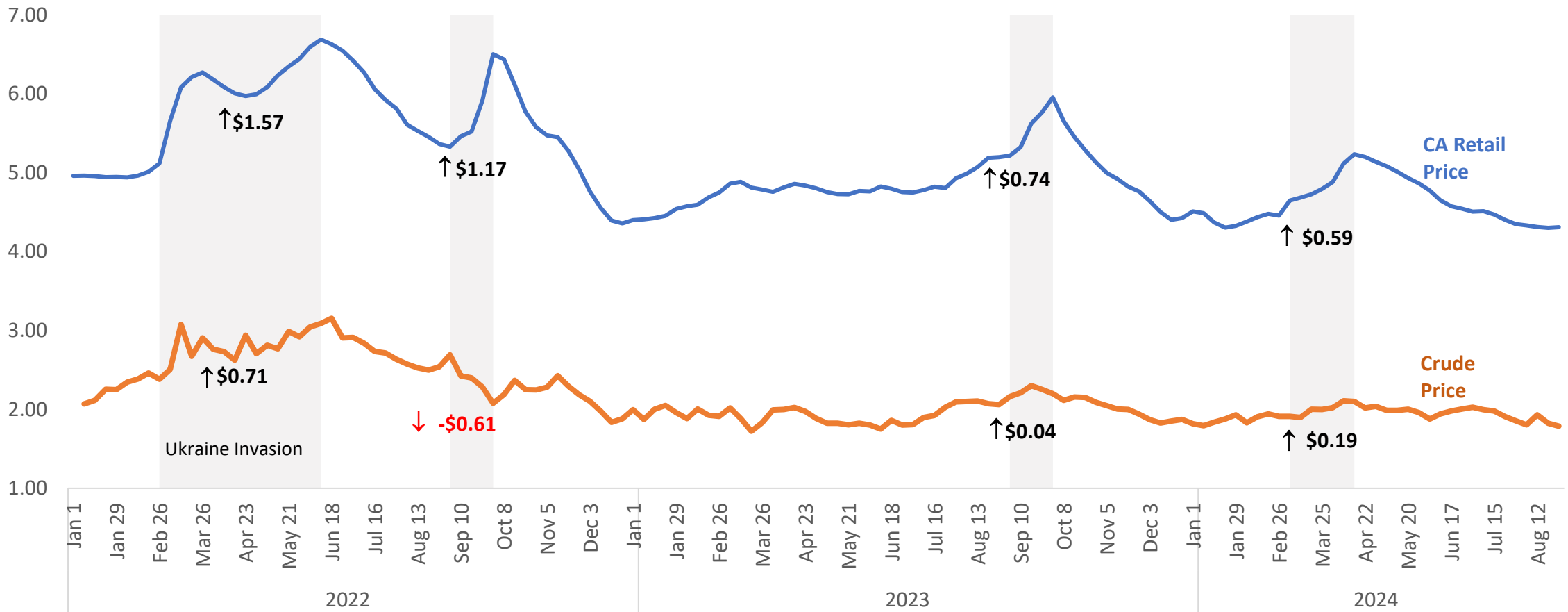


Notes and Sources: Shaded regions highlight time periods with sustained price increases. Retail prices from EIA. Cost of crude (Alaska North Slope) from Alaska Dept of Revenue. Price deflator from BLS, Consumer Price Index for all goods excluding energy.



Recent Gasoline Price Spikes Not Driven by Crude Costs

Weekly Retail Prices and Cost of Crude, 2023\$/Gallon

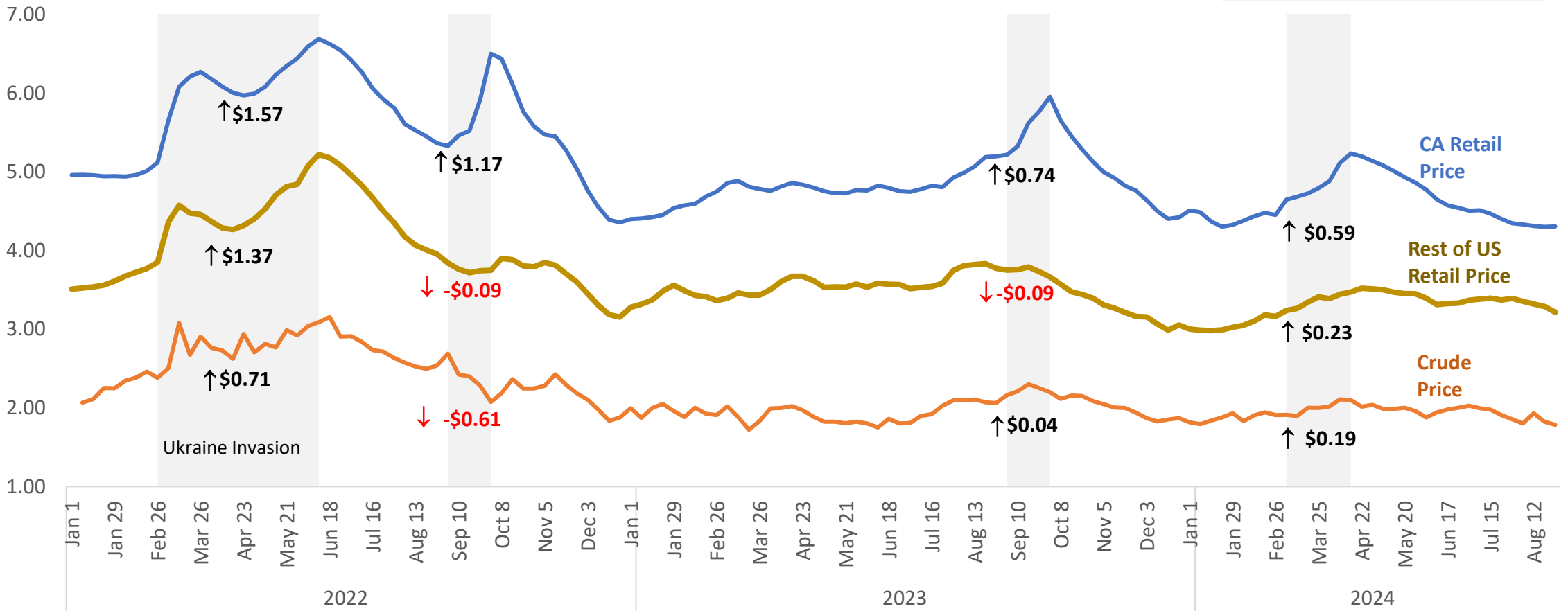


Notes and Sources: Shaded regions highlight time periods with sustained price increases. Retail prices from EIA. Cost of crude (Alaska North Slope) from Alaska Dept of Revenue. Price deflator from BLS, Consumer Price Index for all goods excluding energy.



California Gasoline Price Spikes 2022-2023

Weekly Retail Prices and Cost of Crude, 2023\$/Gallon

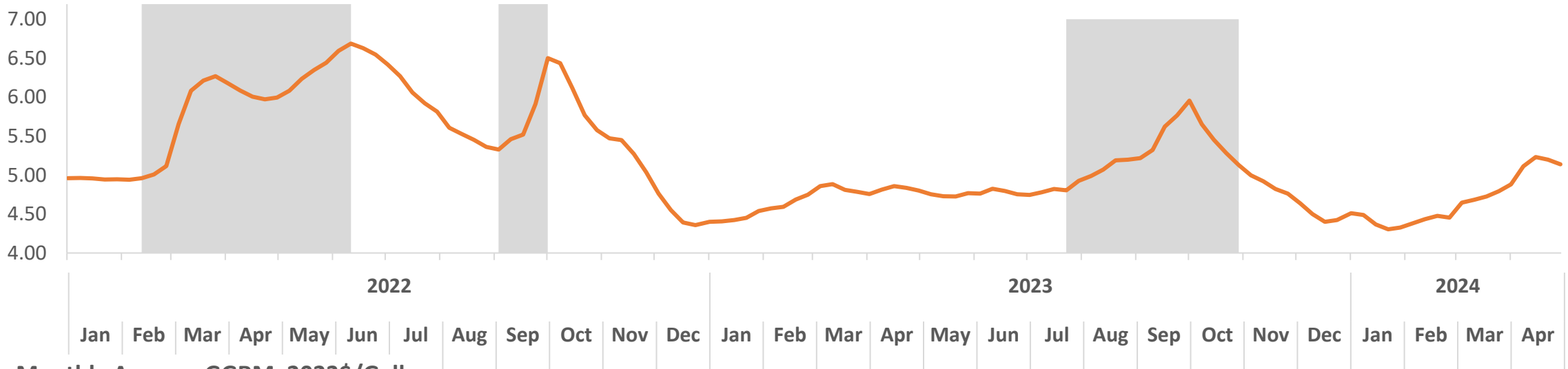


Notes and Sources: Shaded regions highlight time periods with sustained price increases. Retail prices from EIA. Cost of crude (Alaska North Slope) from Alaska Dept of Revenue. Price deflator from BLS, Consumer Price Index for all goods excluding energy.

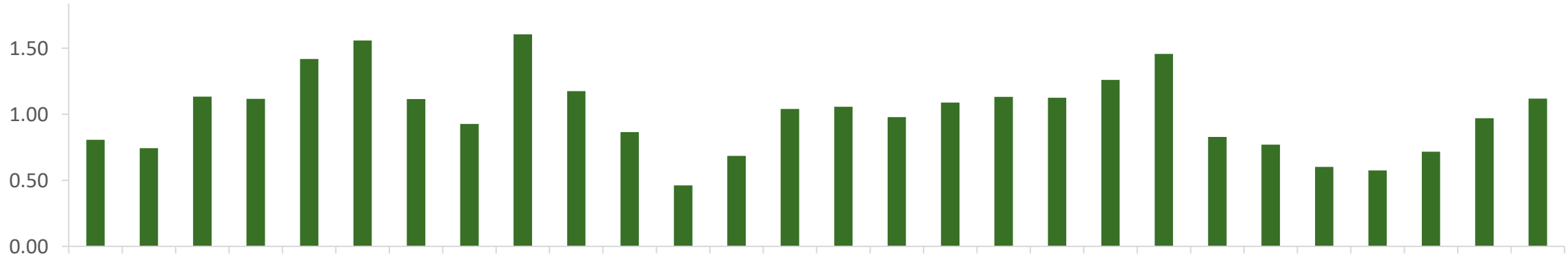


Industry-Reported Gross Refining Margins Spike with Price Spikes

Weekly Average Retail Price, 2023\$/Gallon



Monthly Average GGRM, 2023\$/Gallon



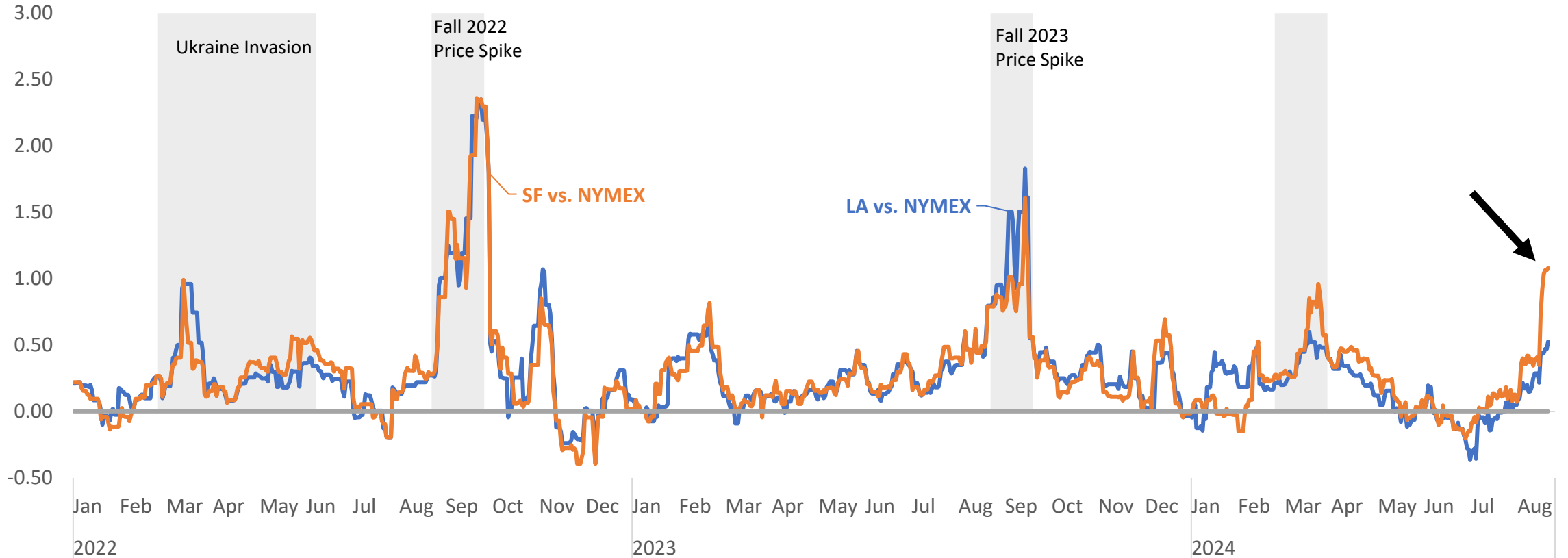
Notes and Sources: Monthly gross gasoline refining margins (GGRM) are industry-reported in CEC Form 1322 and are net of all taxes and fees. Retail prices from EIA. Price deflator from BLS, Consumer Price Index for all goods excluding energy.

9/12/2024



Spot Prices Indicative of Retail Price Spikes

LA and SF Spot Prices vs. NYMEX, 2023\$/Gallon

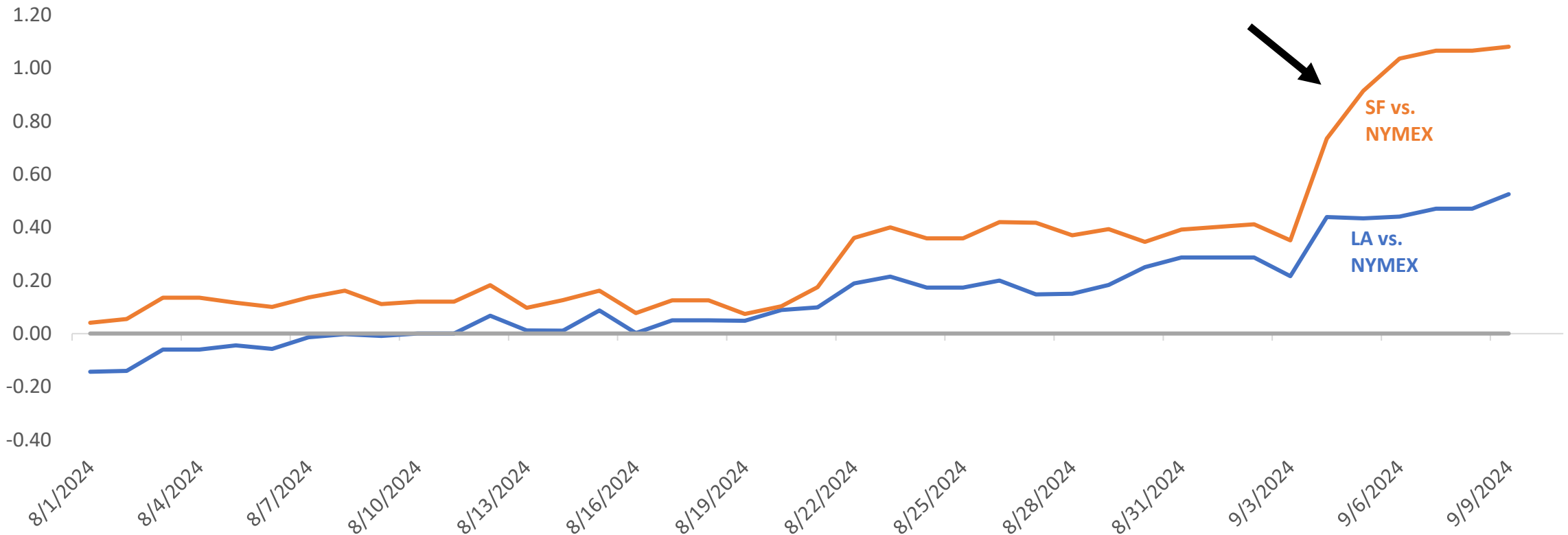


Sources: Daily Spot Prices based on OPIS Spot Reports.



Recent Spot Price Trends in San Francisco Market Signals a Developing Price Spike

2024 Daily Spot Prices vs NYMEX, Nominal \$/gallon

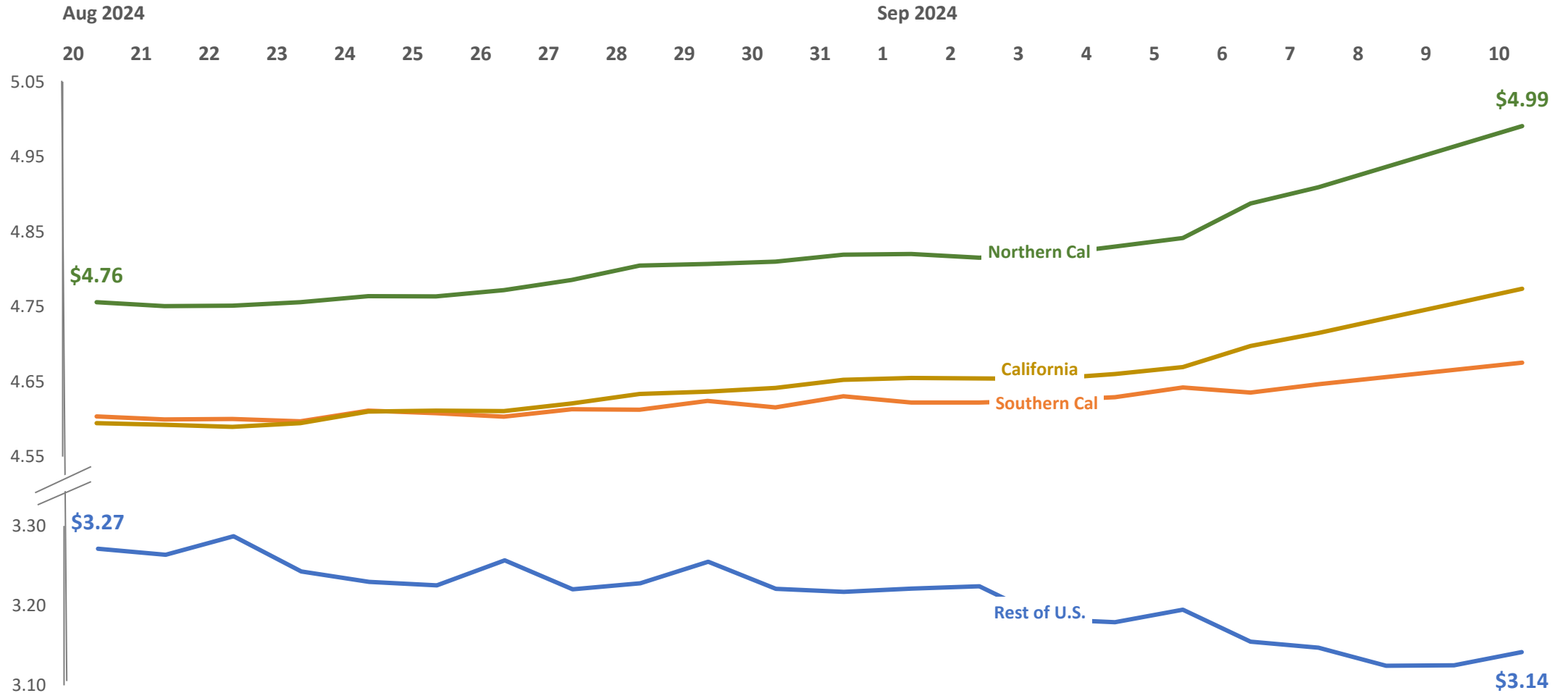


Source: Daily Spot Prices based on OPIS Spot Reports.



Retail Prices on a Sharp Upward Trend in Northern California

Average Price of Gasoline, \$/Gallon

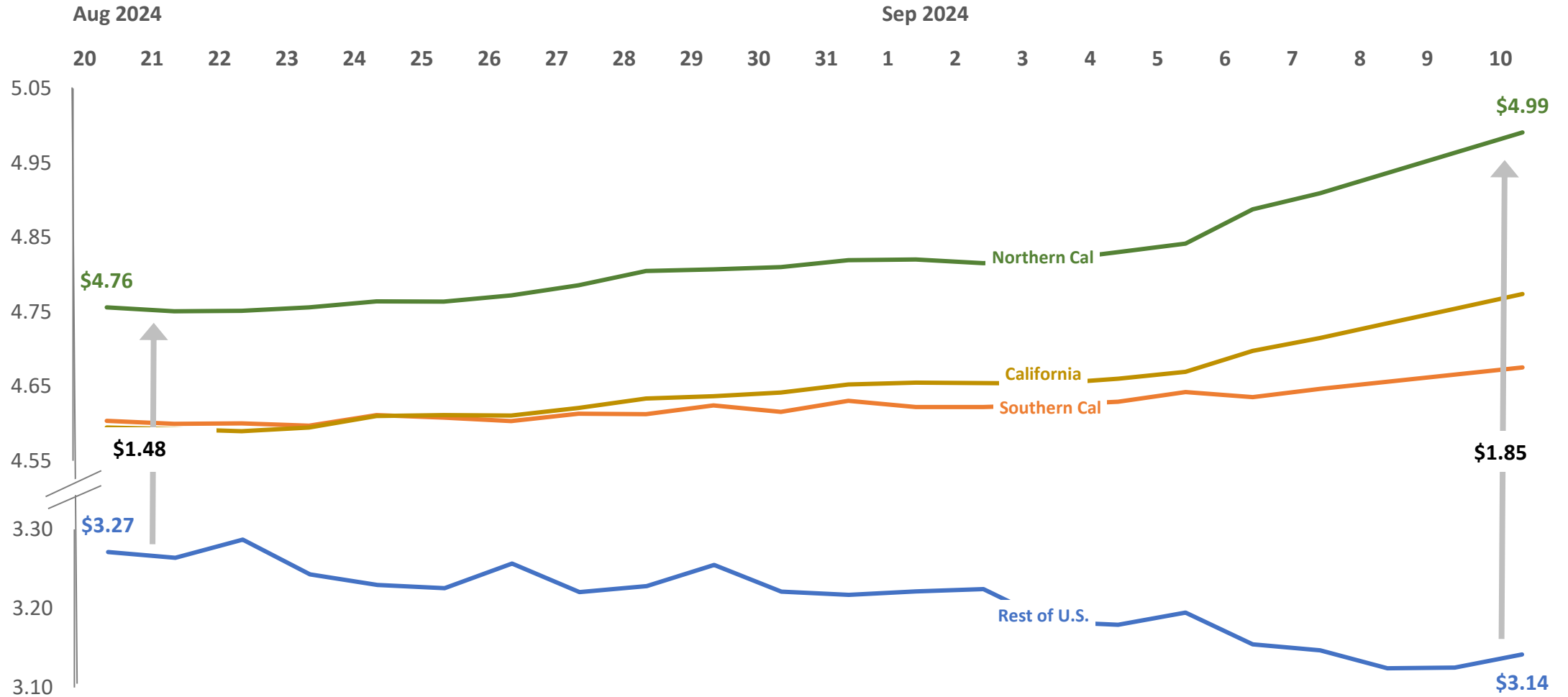


Source: Based on DPMO analysis of OPIS daily retail price reports.



Retail Prices on a Sharp Upward Trend in Northern California

Average Price of Gasoline, \$/Gallon

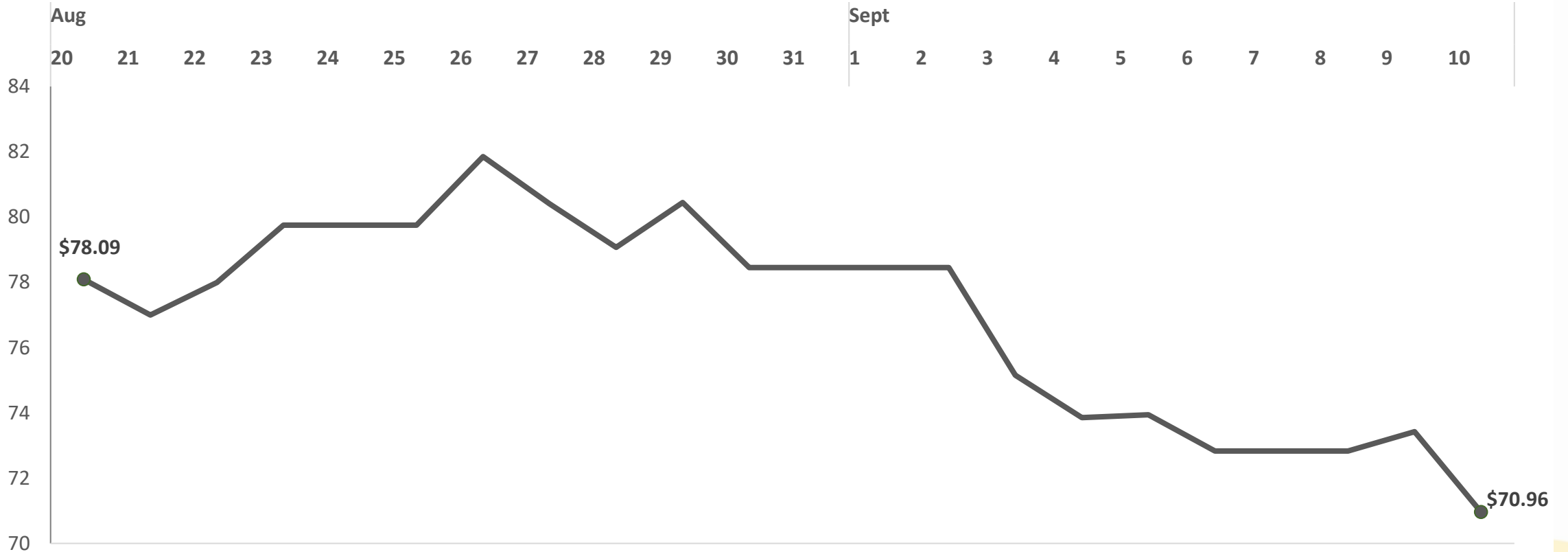


Source: Based on DPMO analysis of OPIS daily retail price reports.



Crude Prices on a Sharp Downward Trend

Price of Crude Oil (ANS West Coast) (\$/BBL)



Source: Crude prices for Alaskan North Slope crude from the Alaska Department of Revenue.



Concluding Thoughts

- Price spike developing in the northern California gasoline market while crude prices are at historical lows
- Developing price spike looks like previous price spikes
- Gross refiner margins spike during price spikes



Thank you!



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Market Conditions and the Maximum Gross Gasoline Refining Margin and Penalty

Esther Shears, Ph.D.

Deputy Chief Economist, Division of Petroleum Market Oversight



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California Gas Price Gouging and Transparency Law of 2023 (SB X1-2)

“Fundamental change is necessary to prevent future extreme price spikes and price gouging by oil companies, which are entitled to a reasonable return but are not entitled to reap exorbitant profits at the expense of Californians.”

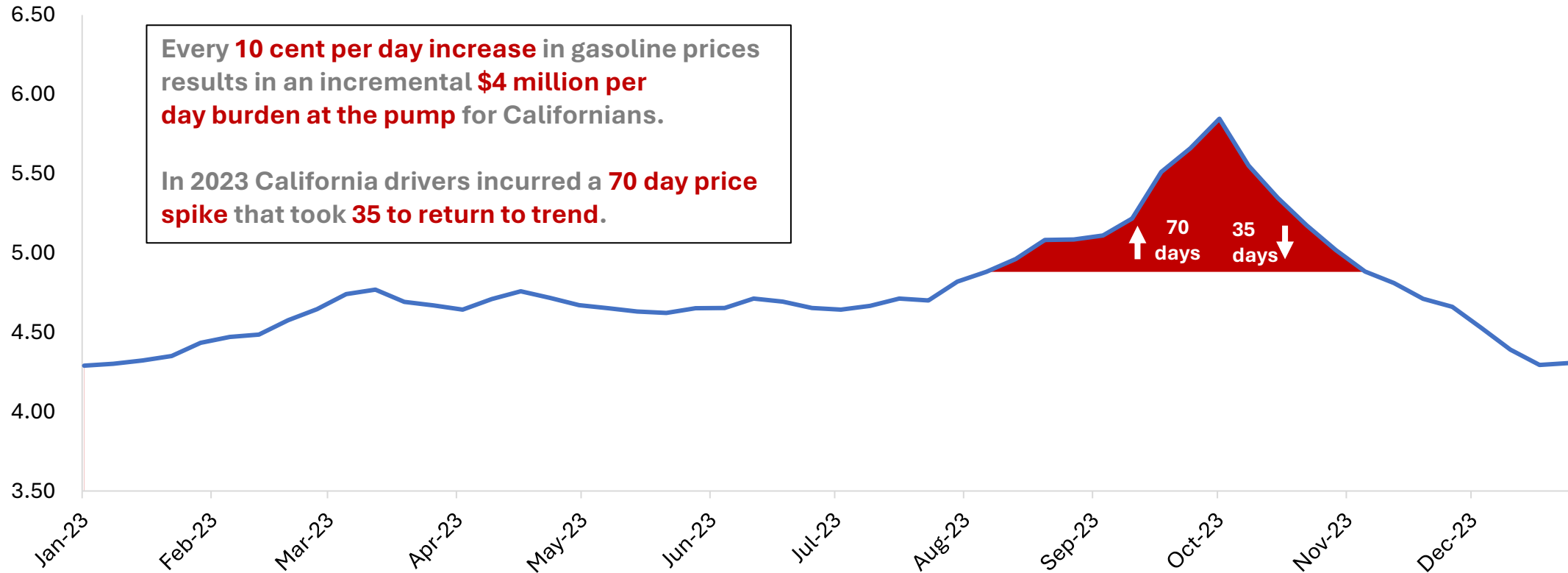


2023 Price Spike Harmed Consumers



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Weekly Retail Gasoline Prices (2023\$/gal)



Source: Dr. Gigi Moreno, "Planned Maintenance and Gasoline Prices," CEC Gasoline Summer Outlook Workshop, June 6, 2024.



Top 4 California Refiners Control 90% of State's Refining Capacity

California Refining Capacity is Highly Concentrated Among Top 4 Producers

Company	Total Crude Refining Capacity (BPD)	Percent of Total Crude Oil Refining Capacity	Cumulative Share of Refining Capacity
Chevron (El Segundo, Richmond)	514,271	32.4%	32%
Marathon (Los Angeles)	363,000	22.8%	55%
PBF (Torrance, Martinez)	316,400	19.9%	75%
Valero (Wilmington, Benicia)	230,000	14.5%	90%
Phillips 66 (Los Angeles)	139,000	8.7%	98%
Kern (Bakersfield)	26,000	1.6%	100%
Total	1,588,671		

Source: Data from CEC, "California's Oil Refineries," Sept. 1, 2023, <https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/californias-oil-refineries>.

Note: Table includes refineries with CARB Gasoline capacity, excludes refineries that do not produce CARB Gasoline and Phillips 66 Rodeo facility, which converted to renewable fuel in March 2024.

Features of CA Petroleum Refining Industry



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- A few large firms dominate market
- High fixed costs create barriers to entry
- Interdependence among firms
- Firms have some control over prices
- Long-term demand for gasoline is shrinking





Defining the GGRM

Gross gasoline refining margin (GGRM) = the difference between the volume-weighted average price of wholesale gasoline sold by a refiner and the average price of crude oil received by the refinery

GGRM = wholesale price – crude cost



Gross gasoline refining margins are the main indicator of profitability for gasoline refining.



Gross Refining Margins in Industry

- In the oil and gas sector, gross (not net) refining margins are the industry standard for reporting profitability.
- Crack spread – a close approximation of gross refining margins – captures margin ratio of multiple products

PBF Energy Inc. SEC 10-K 2023 Filing

Crack Spreads	2023
Dated Brent (NYH) 2-1-1	\$ 29.67
WTI (Chicago) 4-3-1	\$ 23.71
LLS (Gulf Coast) 2-1-1	\$ 29.13
ANS (West Coast-LA) 4-3-1	\$ 36.88
ANS (West Coast-SF) 3-2-1	\$ 36.89

How Gross Gasoline Refining Margins are Used



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Valero Energy Corp. SEC 10-K 2023 Filing

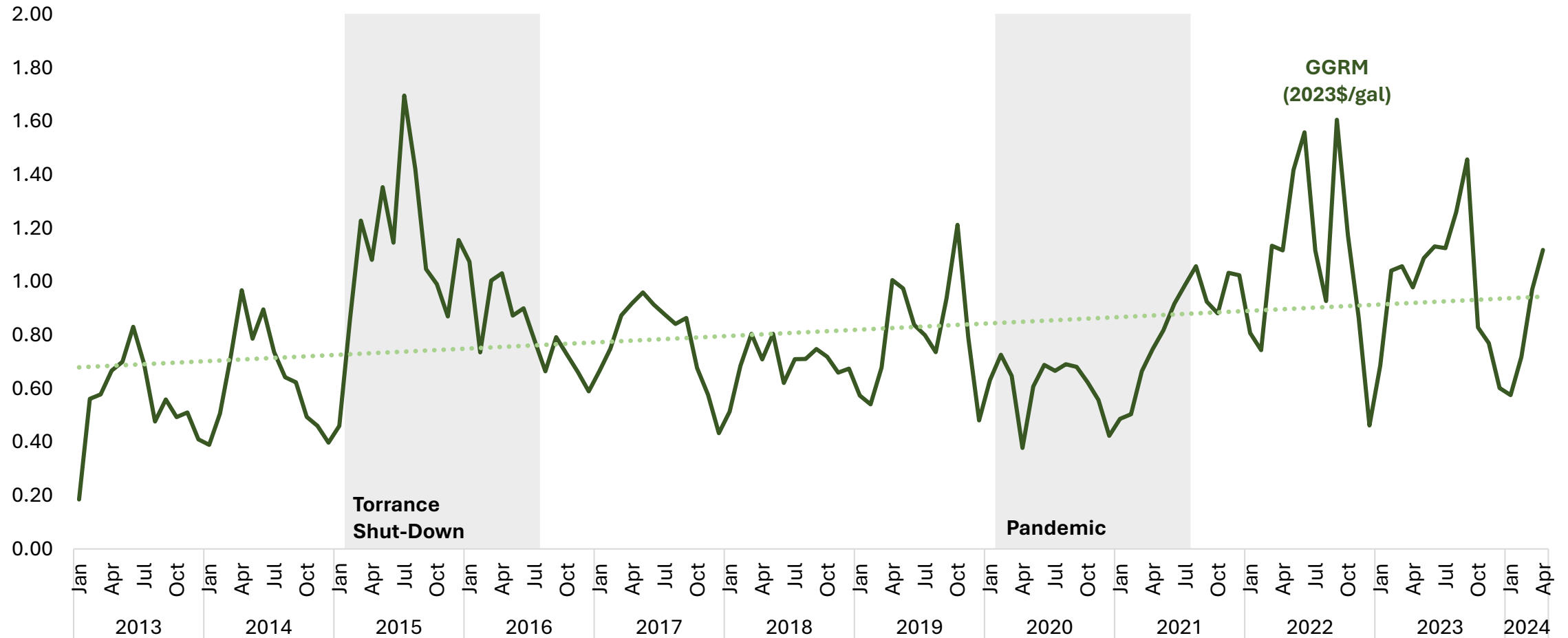
**Product margins (RVO adjusted unless otherwise noted)
(dollars per barrel)**

U.S. Gulf Coast:	2023
CBOB gasoline less Brent	8.83
Ultra-low-sulfur (ULS) diesel less Brent	25.06
Propylene less Brent (not RVO adjusted)	(47.47)
U.S. Mid-Continent:	
CBOB gasoline less WTI	17.70
ULS diesel less WTI	32.37
North Atlantic:	
CBOB gasoline less Brent	15.61
ULS diesel less Brent	29.47
U.S. West Coast:	
CARBOB 87 gasoline less Brent	28.45
CARB diesel less Brent	32.79



GGRM in CA Over Time

Monthly Average Gross Gasoline Refining Margins, 2023\$/Gallon



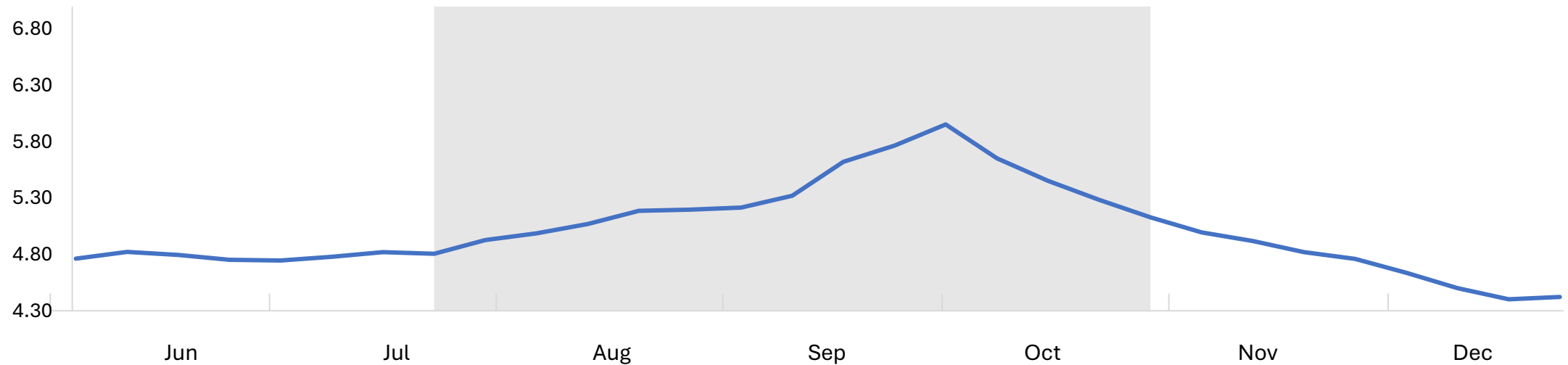
Source: M1322 (Industry-Reported) Data

Refining Margins Increase with 2023 Price Spike, as Price Increases

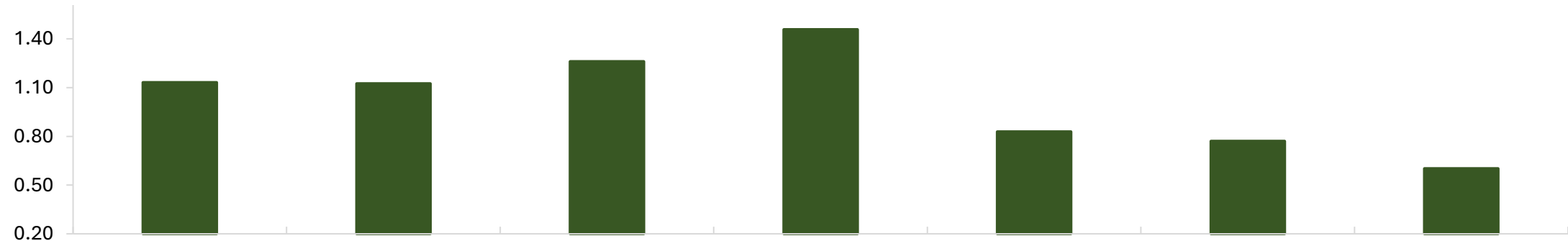


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Weekly Retail Price, 2023\$/Gallon



Monthly GGRM, 2023\$/Gallon



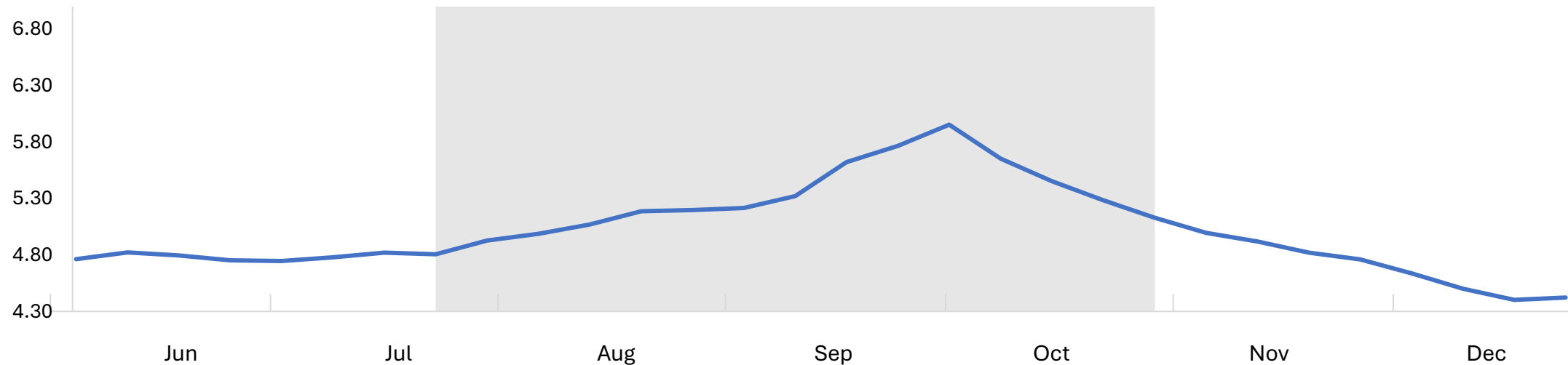
Source: M1322 (Industry-Reported) Data, U.S. Energy Information Administration

Retail Margins Increase with 2023 Price Spike, as Price Decreases

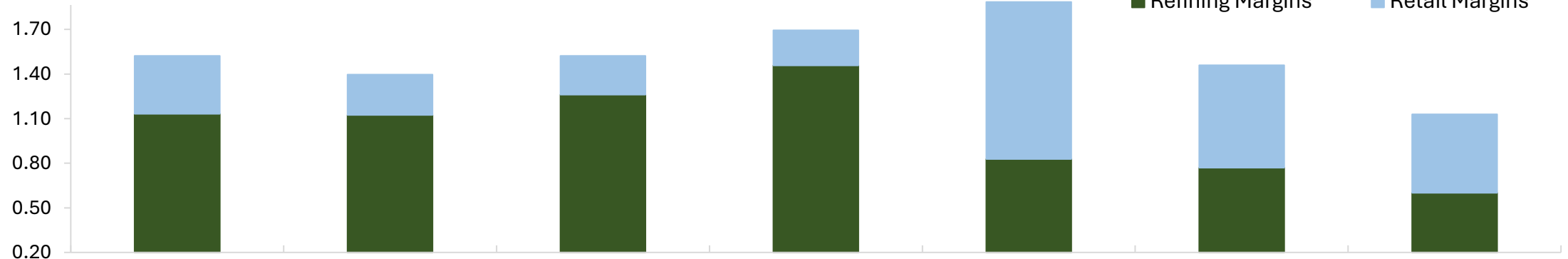


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Weekly Retail Price, 2023\$/Gallon



Monthly GGRM and Retail Margins, 2023\$/Gallon



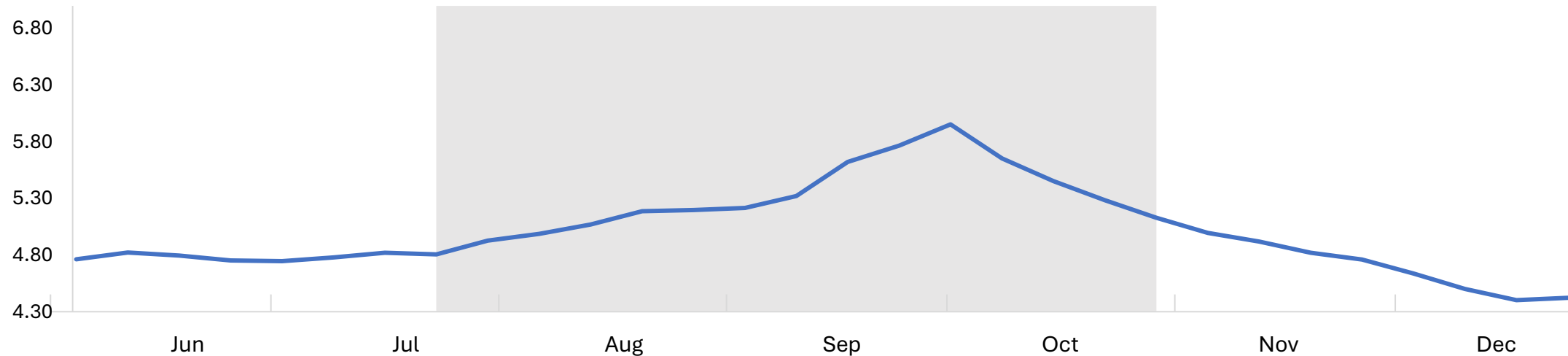
Source: M1322 (Industry-Reported) Data, U.S. Energy Information Administration

Refining Margins Increase with 2023 Price Spike

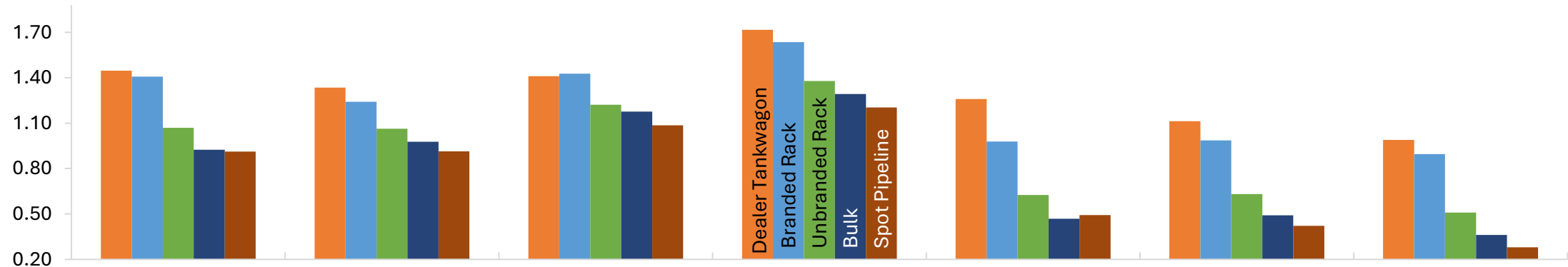


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Weekly Retail Price, 2023\$/Gallon



Monthly GGRM By Distribution Channel, 2023\$/Gallon



Source: M1322 (Industry-Reported) Data, U.S. Energy Information Administration



Evidence suggests need for policy

- Price spikes at the pump cost Californians billions of dollars each year.
- The petroleum refining industry in CA is heavily concentrated.
- During price spike periods, gasoline refining margins increase during the price increase, and retail margins increase as prices slowly fall.
- Addressing excessive gasoline refining margins through policy intervention is worth exploring further.



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California Gas Price Gouging and Transparency Law of 2023 (SB X1-2)

- Establishes the authority to implement a Maximum Gross Gasoline Refining Margin and Penalty
- Provides details about such a Penalty
- Defines the conditions under which a policy may be implemented



Identifying the Maximum GGRM

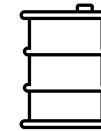
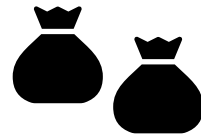
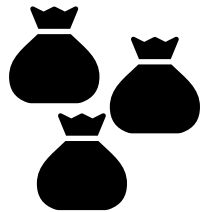
- The law provides flexibility on how the Max GGRM should be set.
- The Max GGRM level should be at the point where refiners choose to produce a quantity of gasoline optimal for market demand.
- As a result, the price for the gasoline set by refiners should also be such that refiners earn reasonable (not excessive) profits.
- Identifying the appropriate Max GGRM level is a core part of upcoming analysis.



Design of the Penalty

- The penalty shall be a percentage of the margins earned in excess of the Max GGRM.

*[Refiner GGRM – Max GGRM, \$/gal] * [gallons sold by refiner, per month]*



Penalty = % of excess margin amount 



Design of the Penalty

- The penalty will be progressive.
- The greater the excess of Refiner GGRM over Max GGRM, the greater the penalty percentage will be set.

Refiner A excess margins in Month X:  → penalty %

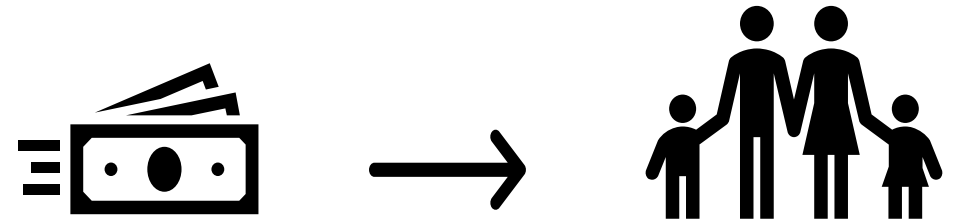
Refiner B excess margins in Month X:  → penalty %



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Design of the Penalty

- The Max GGRM and Penalty will only be applied towards sales within California.
- The penalty collected would benefit CA consumers harmed by excess margins.





Next Steps

The law specifies certain conditions under which the policy may be implemented. To know if these conditions apply, we need to better understand the gasoline refining market:

- We are evaluating California's gasoline refining market and the conditions that would merit policy intervention.
- We are working with the petroleum refiners on data reporting that will be critical in our assessment of the industry and any policy proposals.



Maximum Gross Gasoline Refining Margin and Penalty Analysis

Matthew Zaragoza-Watkins, Ph.D.
Consultant

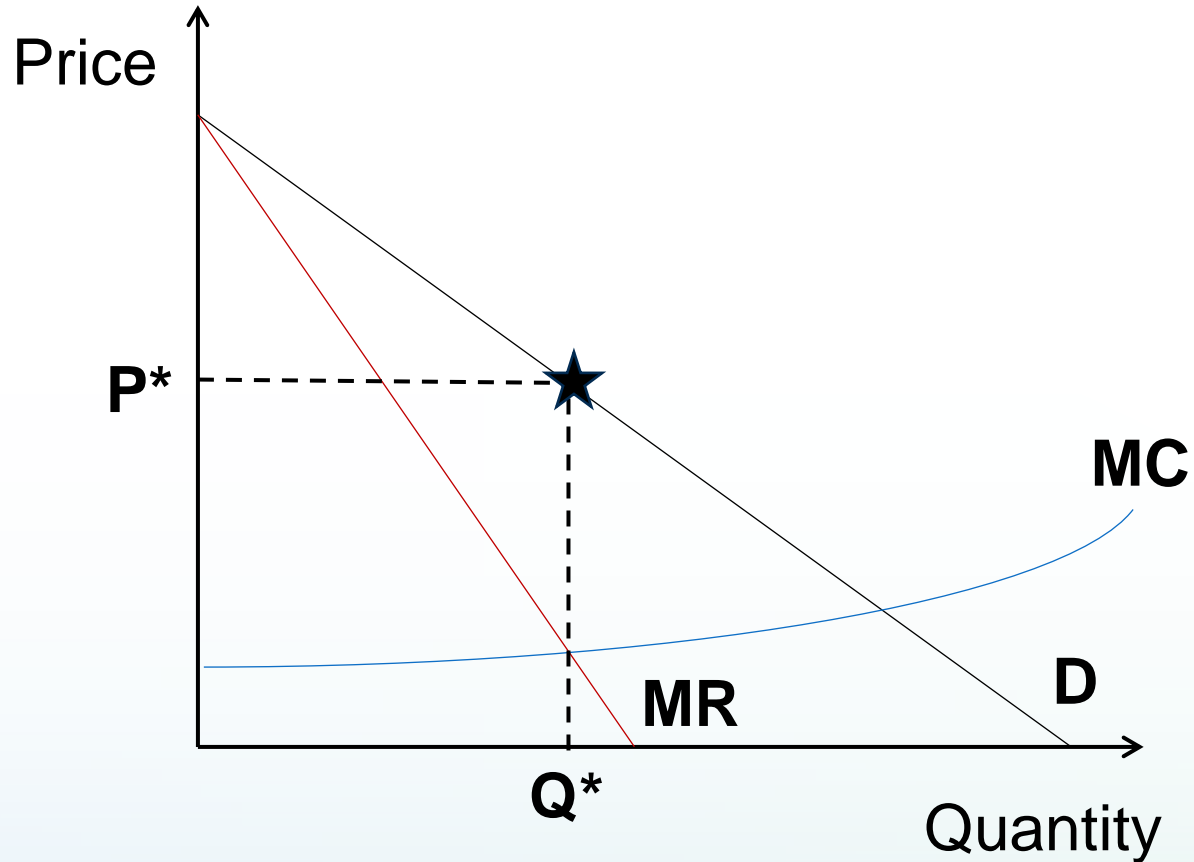


Overview

- Oligopoly theory and the design of an MGGRM and penalty
- SB X1-2 requirements for analyzing an MGGRM and penalty
- Empirical framework for analyzing an MGGRM and penalty



Market Inefficiency is Causing Higher Prices



- In oligopoly markets, firms price their goods above marginal cost
- This inefficient wedge between the market price and marginal cost results in lower quantity and higher prices
- More competitive firms would supply greater quantities at lower prices



California Gas Price Gouging and Transparency Law of 2023 (SB X1-2)

Establishes the authority to implement a MGGRM & Penalty:

- “The commission may... set a maximum gross gasoline refining margin.”
- “If the commission sets a maximum gross gasoline refining margin..., it shall also establish a penalty for exceeding that maximum margin, by regulation or order at a business meeting...”



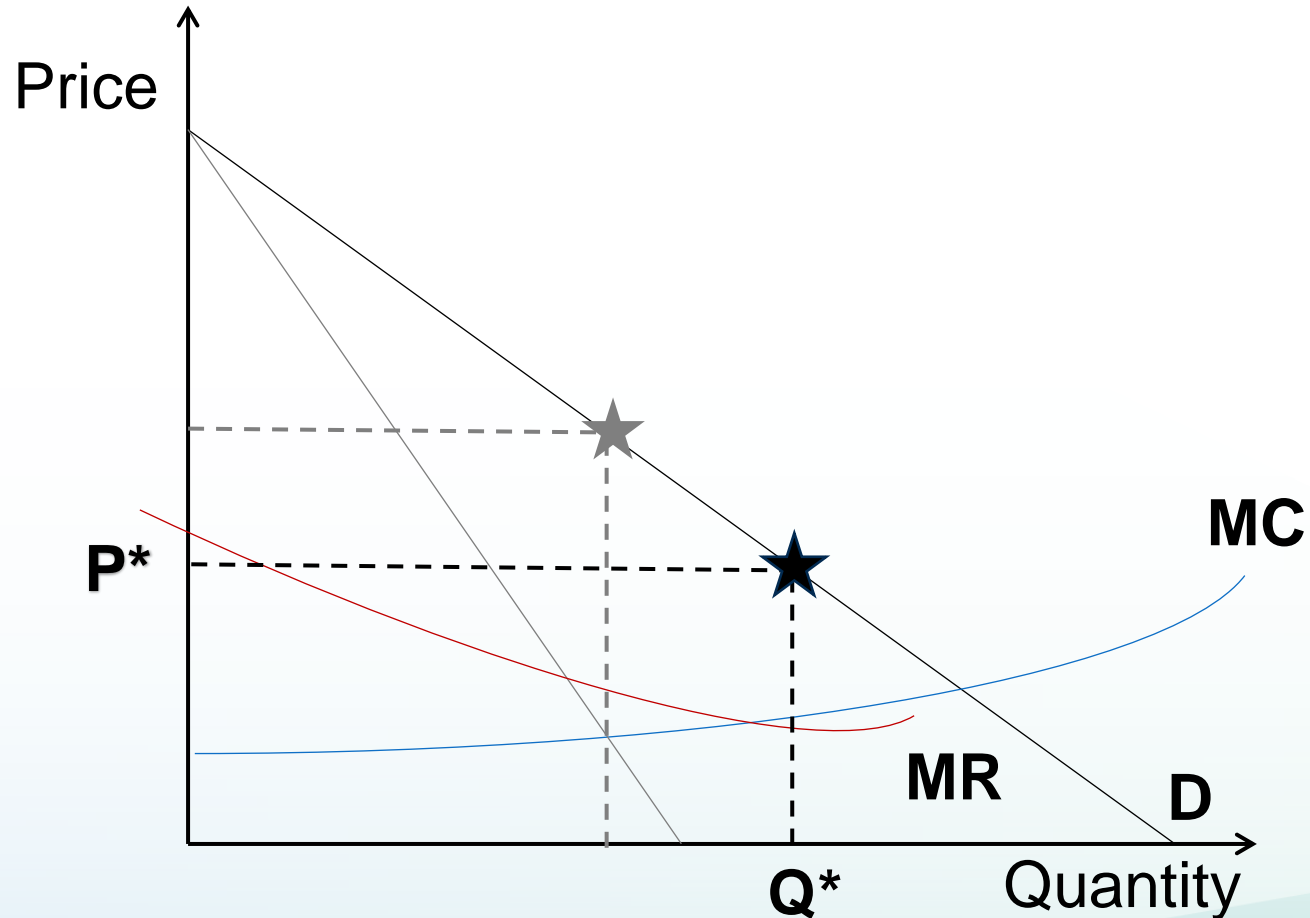
California Gas Price Gouging and Transparency Law of 2023 (SB X1-2)

Provides details about such a Penalty:

- “The penalty shall be a percentage of the amount by which the refiner’s gross gasoline refining margin excluding state program costs exceeds the maximum gross gasoline refining margin, converted from dollars per barrel to dollars per gallon, multiplied by the number of gallons sold by the refiner during the calendar month for all transactions...”
- “The penalty shall be tiered, such that the penalty percentage shall increase with the amount by which the refiner’s gross gasoline refining margin excluding state program costs exceeds the maximum gross gasoline refining margin...”



MGGRM and Penalty Aims to Reduce Inefficiency



- Under a well-designed MGGRM and penalty:
 - Marginal revenue falls more gradually as output rises
 - Firms are induced to supply greater quantities at lower prices
 - Gasoline supply and demand would balance at lower (less volatile) prices



California Gas Price Gouging and Transparency Law of 2023 (SB X1-2)

Defines conditions under which a policy may be implemented:

- “The commission shall not set a maximum gross gasoline refining margin or accompanying penalty..., unless it finds that the likely benefits to consumers outweigh the potential costs to consumers.”
- “In making that determination, the commission shall consider all factors that in its discretion it deems relevant, including at a minimum all of the following factors...”



Key Research Questions

- Is there an MGGRM and penalty design that would improve the gasoline supply-demand balance in California and lead to lower (not higher) average retail gasoline prices?
- Do firms have additional (profitable) importing, production, and storage capacity, relative to business-as-usual?
- How would an MGGRM and penalty affect the gasoline importing, production, storage, and marketing behavior of regulated firms?
- How would an MGGRM and penalty on California gasoline affect firm behavior in other refined product markets?



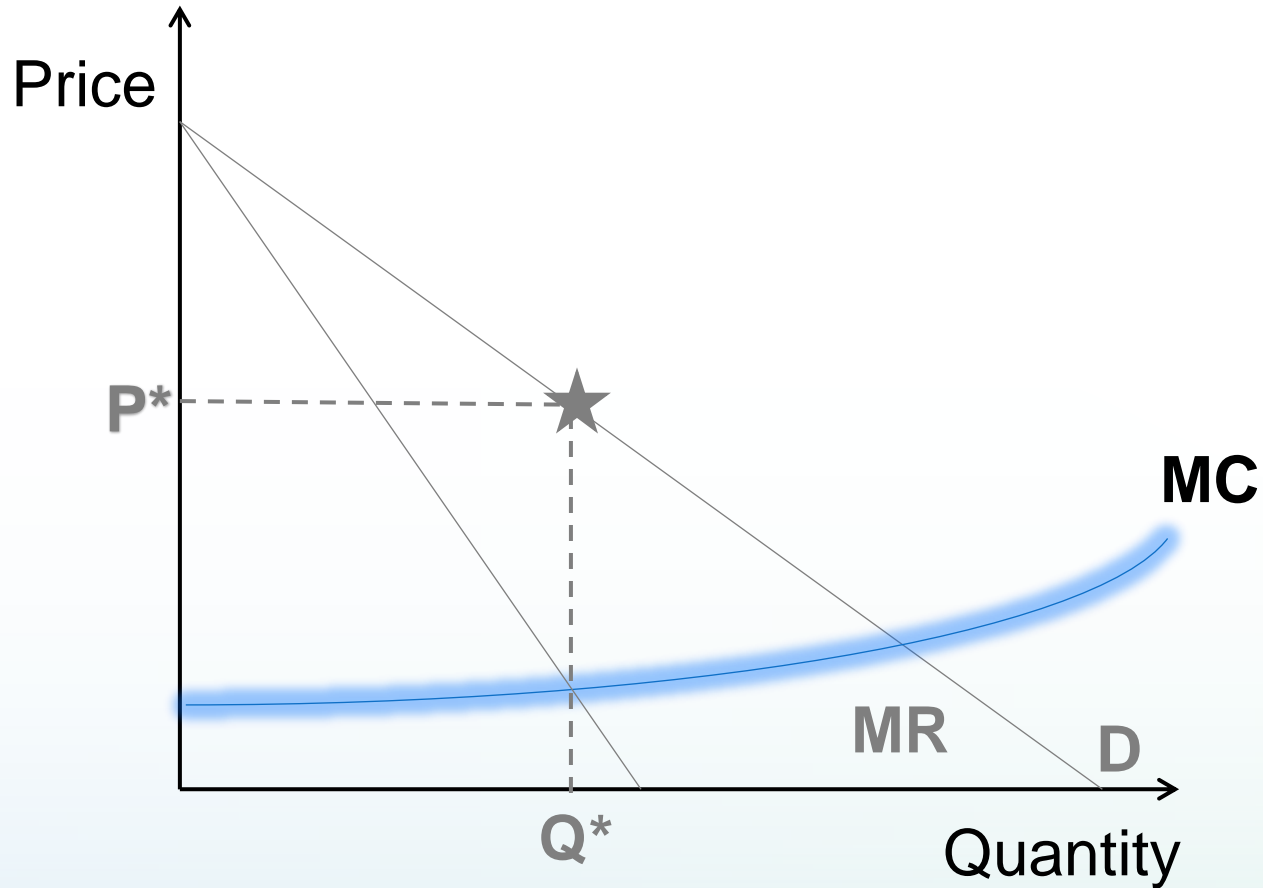
Analytical Framework

The main elements of this analysis are:

1. Estimate firm-level profit and product-level production and cost functions to model the relationships between inputs, outputs, and prices.
2. Estimate demand curves and construct aggregate supply to simulate business-as-usual refined product market outcomes.
3. Simulate product market outcomes under alternative MGGRM and penalty designs, focusing on average gasoline prices and volatility.



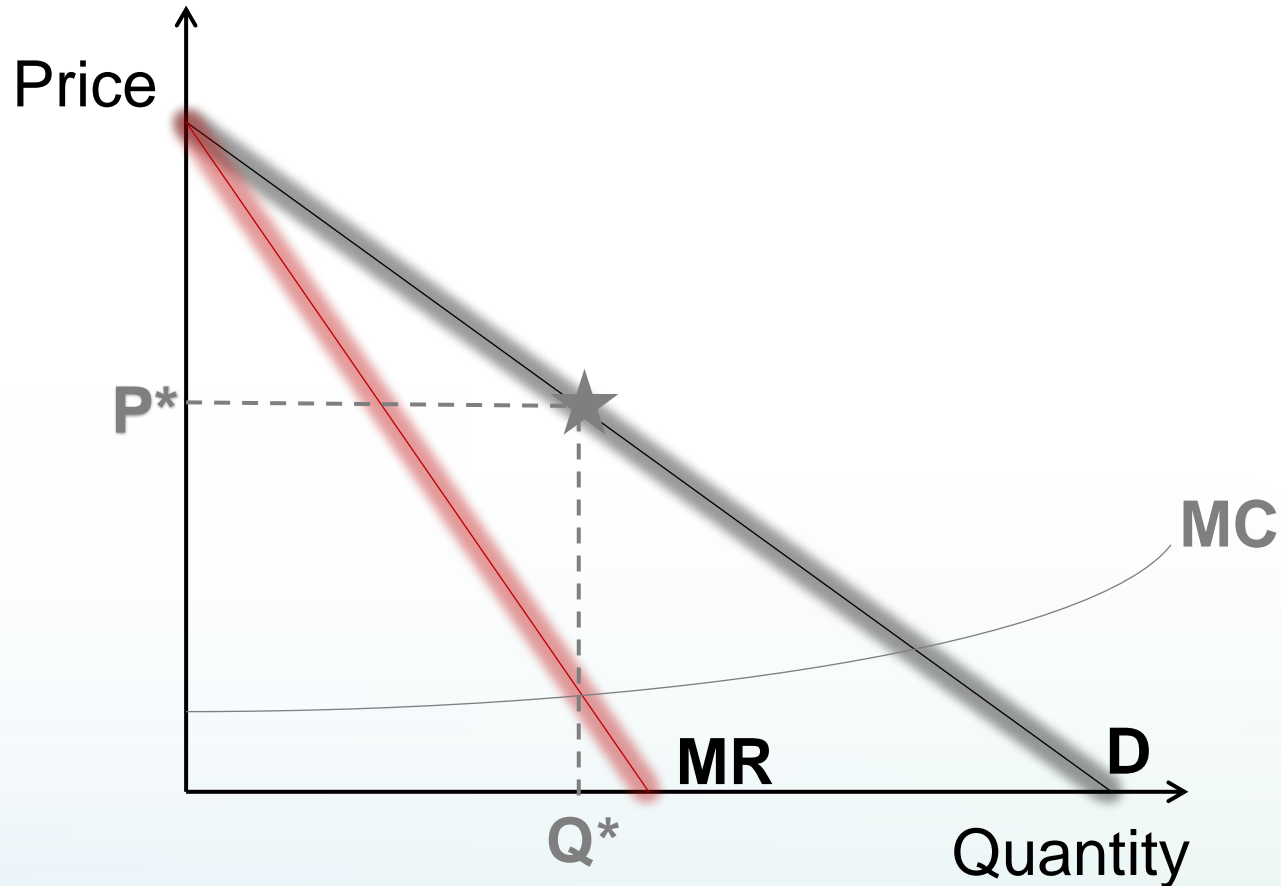
Estimating product-level production and cost functions for each firm



- **Objective:** To understand the relationships between input factors, outputs, and costs.
- **Methods:** Regression analysis modeling production and cost functions for multiple products, accounting for imports and storage.
- **Data:** CEC Forms 810 and 1322



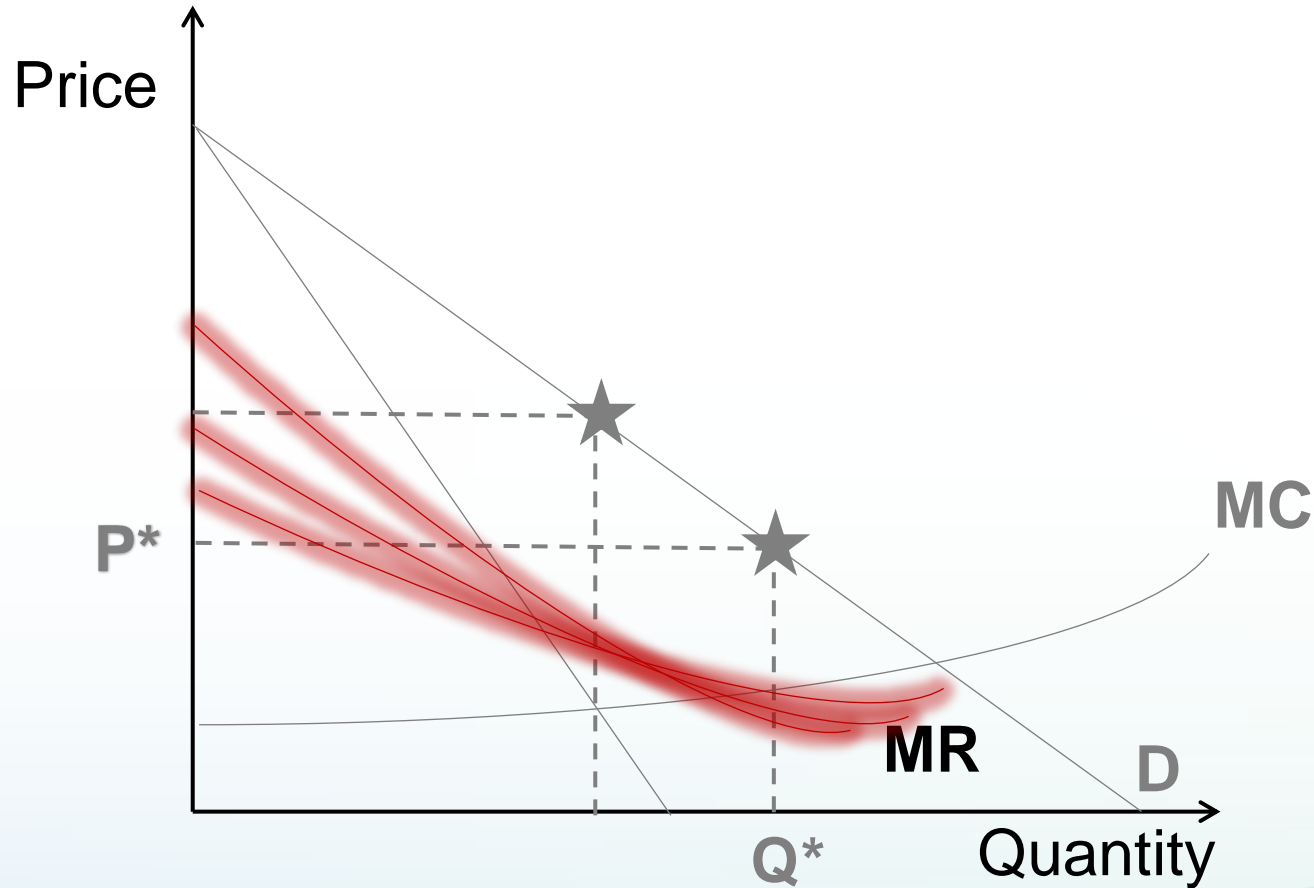
Estimating demand curves and constructing aggregate supply



- **Objective:** To simulate business-as-usual California gasoline and other refined product market outcomes.
- **Methods:** Regression analysis modeling aggregate demand to specify profit functions and equilibrium quantity supplied.
- **Data:** CEC Forms 782, 810, 1322, and OPIS



MGGRM and Penalty Simulation Analysis



- **Objective:** To understand the potential effects of alternative MGGRM and penalty designs on equilibrium California gasoline market prices and quantities.
- **Methods:** Structural model using estimated parameters to simulate effects of alternative MGGRM and penalty designs.



Comments from the Dais





Written Comments

Submit written comments to:

- Docket No. **23-OIIP-01**
- Due by **5:00 PM** on **Friday, September 27.**

Jeremy Smith

Deputy Director
Energy Assessments Division
California Energy Commission

Gigi Moreno, Ph.D.

Chief Economist
Division of Petroleum Market Oversight

Esther Shears, Ph.D.

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Thank You