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Economic Perspectives on Maximum Gross Gasoline Refining Margin and Penalty

CEC Workshop, April 11, 2024

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Division of Petroleum Market Oversight

Imperfect Competition in Gasoline Refining

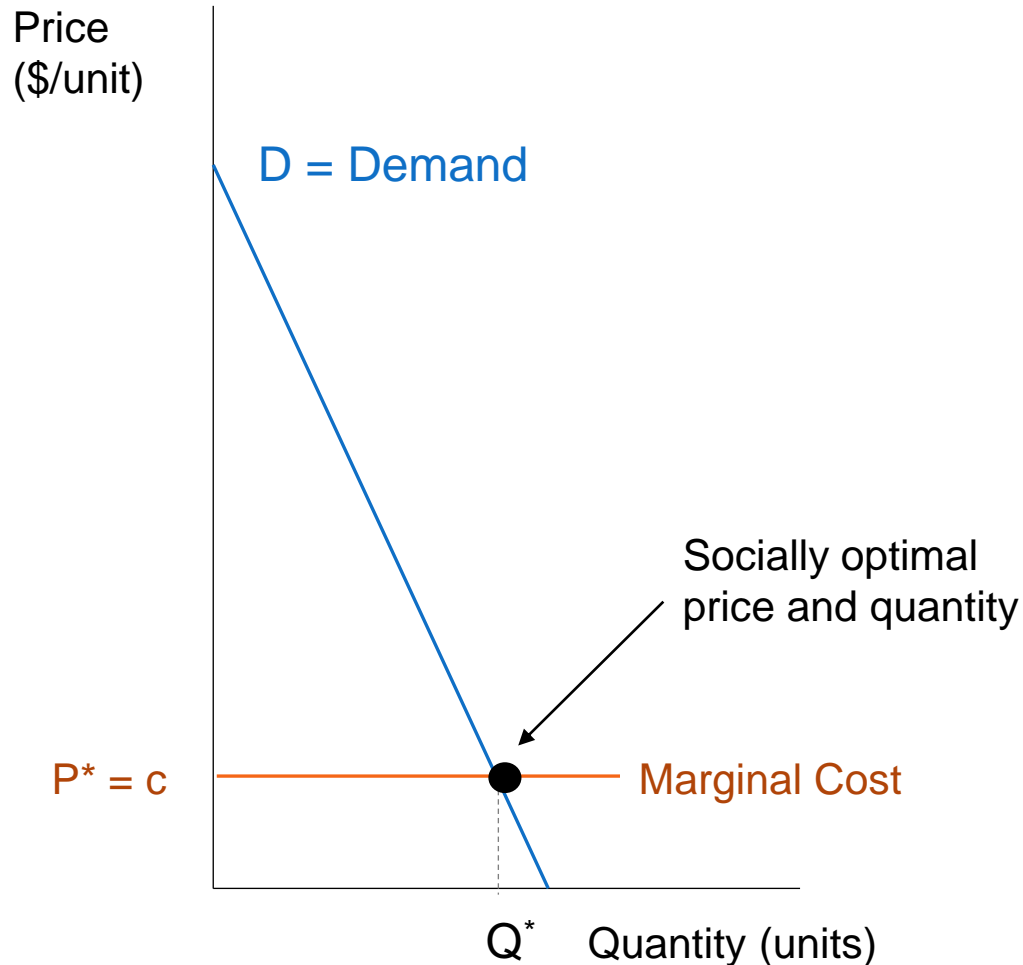
- High fixed costs create barrier to entry
- Demand for gasoline is shrinking
- A few large firms dominate market
- Interdependence among firms
- Profit incentives may deviate from consumer and societal well-being



Examples of High Fixed Cost Imperfectly Competitive Industries

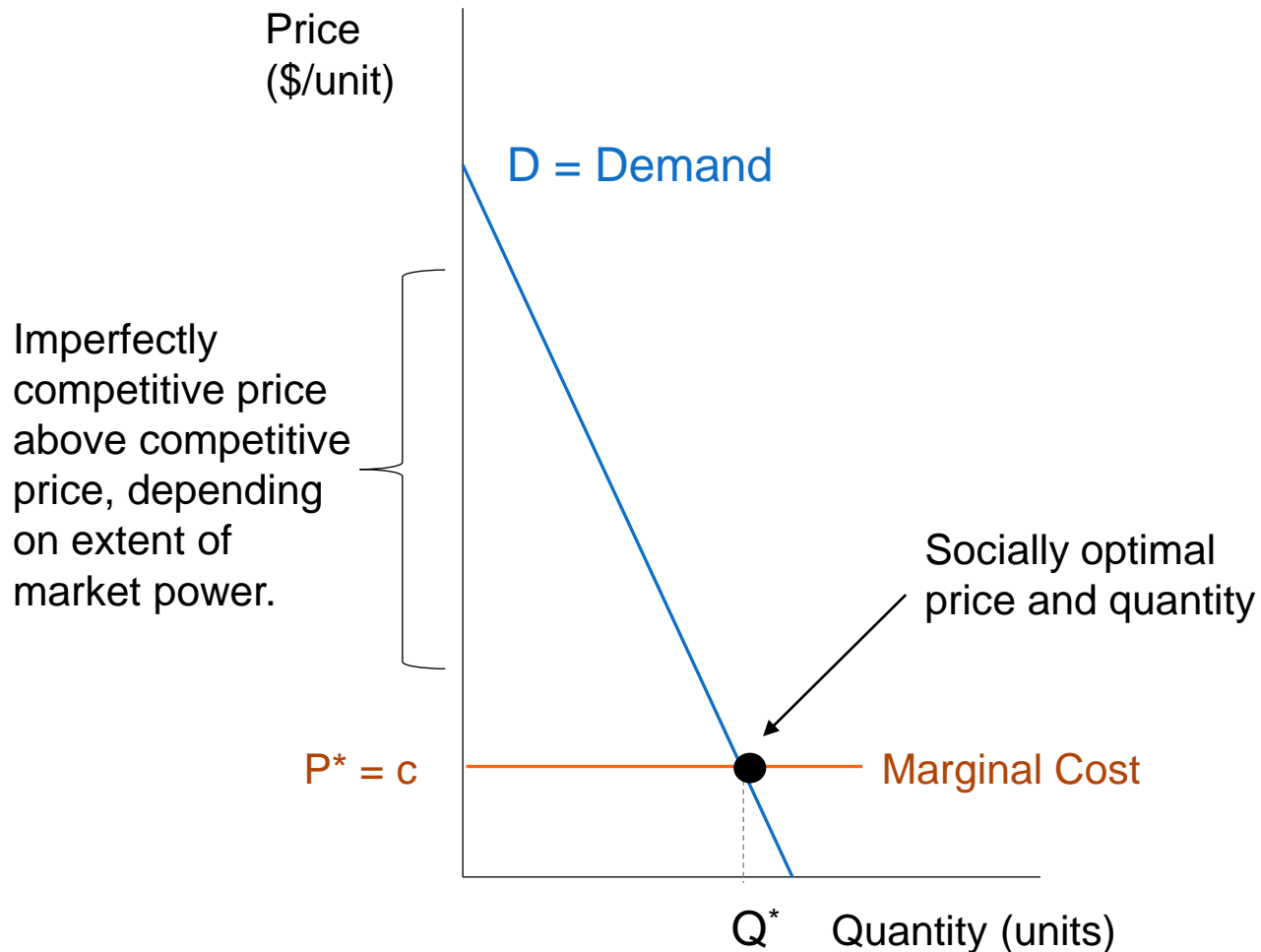


Stylized representation of the market



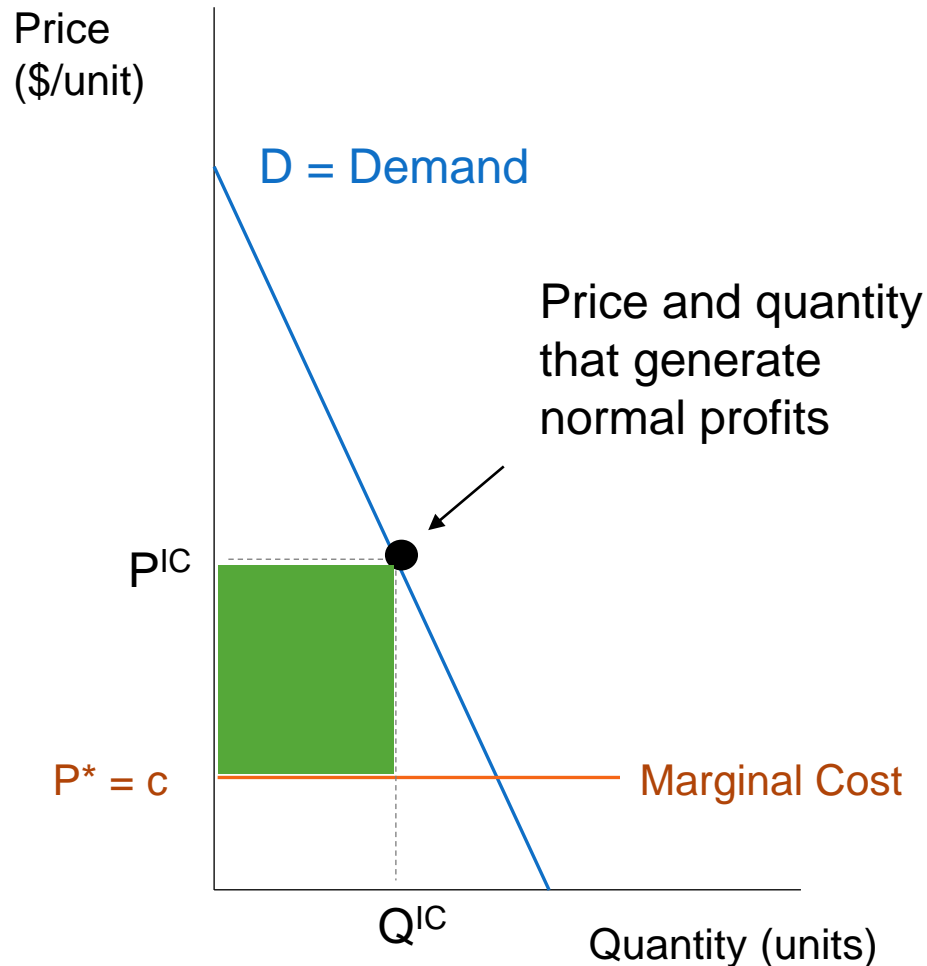
- In perfectly competitive markets, the “invisible hand” of price signals assures socially optimal level of price and output with no oversight
- “Invisible hand” requires
 - ✓ Market with free entry/exit
 - ✓ Complete information/no uncertainty
 - ✓ No externalities
- When assumptions fail, we have imperfectly competitive markets

Imperfectly Competitive Markets Need Oversight



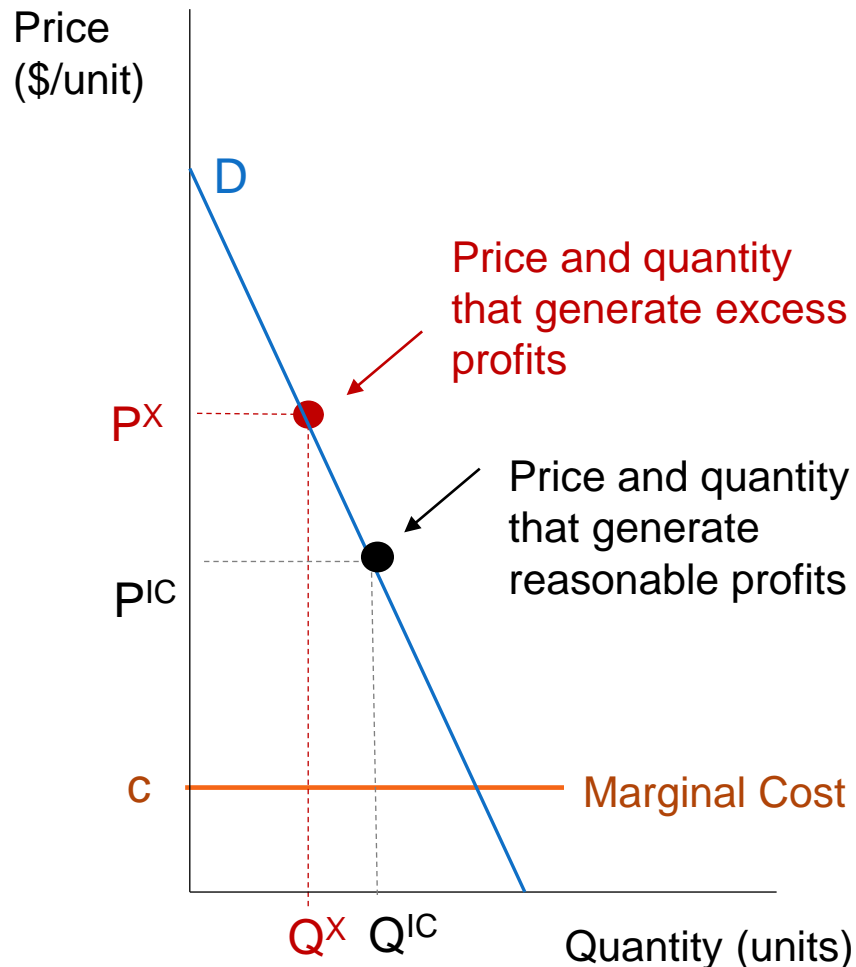
- In an imperfectly competitive market, individual firms may exercise market power to set prices and influence market outcomes
- Social optimum will not be achieved if market is left to its own devices
- Imperfectly competitive markets may need oversight to promote competition and innovation, and to protect consumers

“Normal” Profits in Imperfectly Competitive Markets




- “Normal” Profits
 - Reasonable rate of return
 - Similar markets using same resources or in a different location
 - Historical outcomes in this industry
 - Expected given costs
- Market price, quantity and profits in imperfectly competitive markets may be “reasonable” but economically inefficient.

Excess Returns Calls for Oversight and Intervention



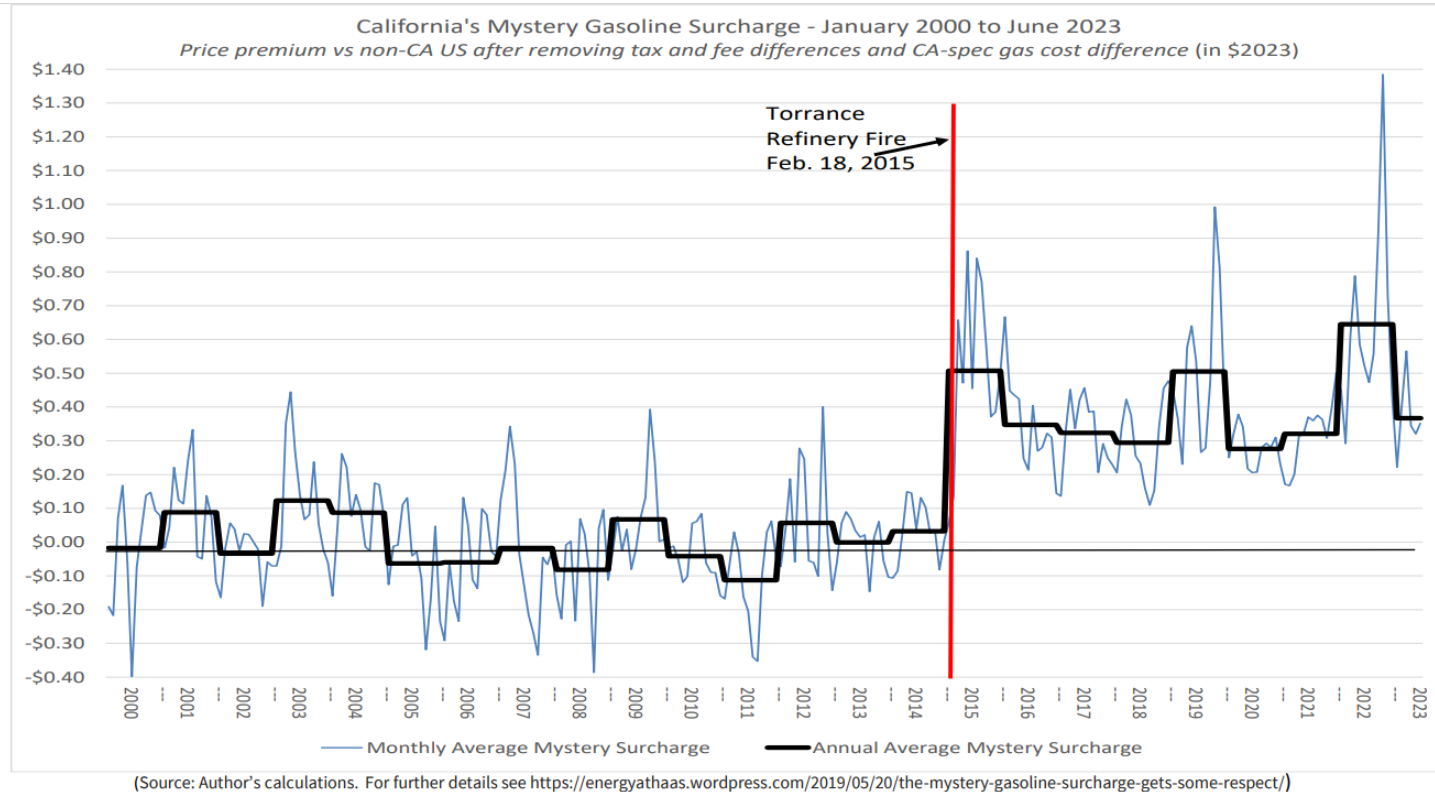
- Deviations from reasonable rate of return are “excess” profits
- Persistent excess profits raise concerns that firms have pricing power and may be abusing it
- May require oversight and intervention to realign incentives

How do we know when profits in “real world” markets are excessive and require realignment?





Mystery Gasoline Surcharge Suggests Persistent Excess Margins



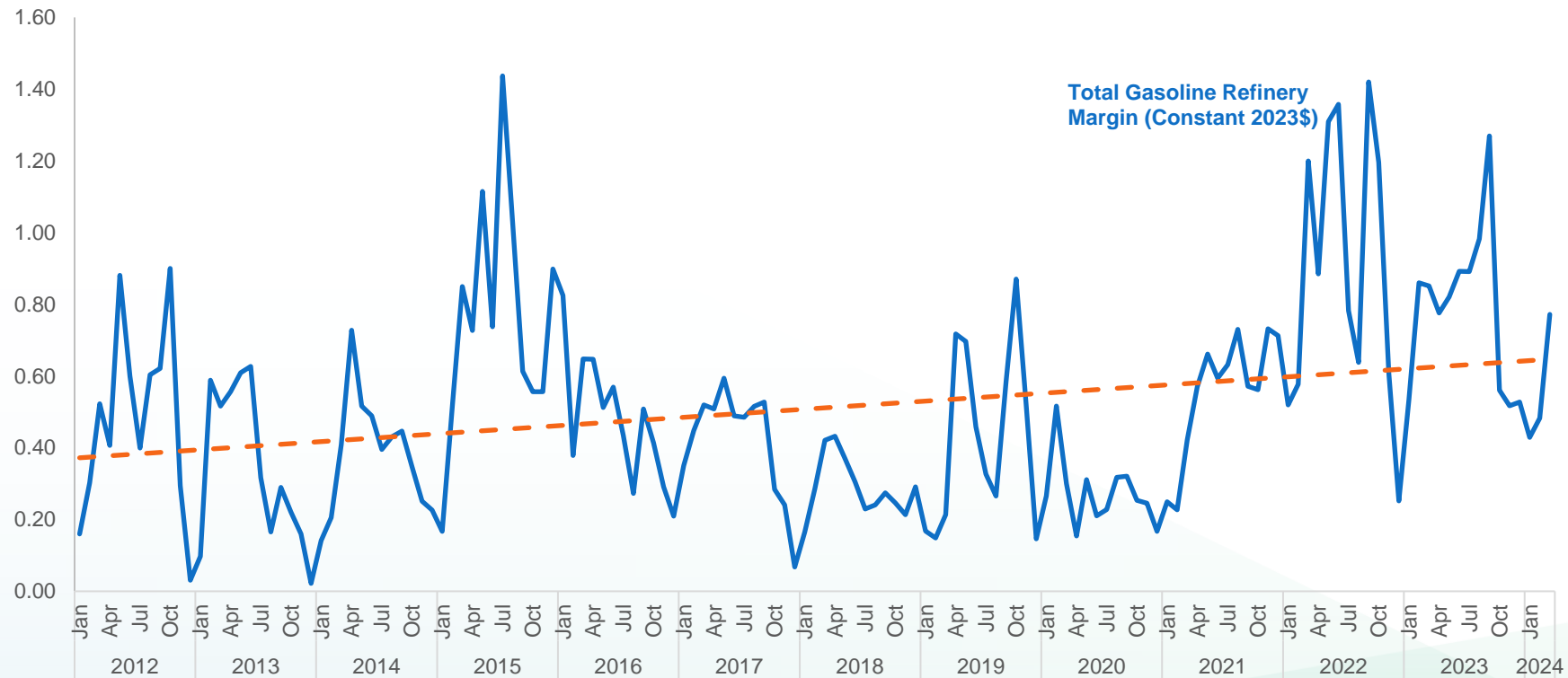
- UC Berkeley Professor Borenstein observed
 - California gasoline prices persistently exceeds US prices after 2015 *after accounting for cost and regulatory differences*
 - “Mystery gasoline surcharge” or MGS
- Professor Borenstein’s plot clearly shows a sharp increase in MGS after February 2015

Chart available from California Energy Commission : Docket Log,
[https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-SB-02, 8/18/2023](https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-SB-02,8/18/2023).



California Gasoline Refining Market Margins Increasing in Real Dollars

Total Gasoline Refinery Margin (Constant 2023\$)
Dollars per Gallon

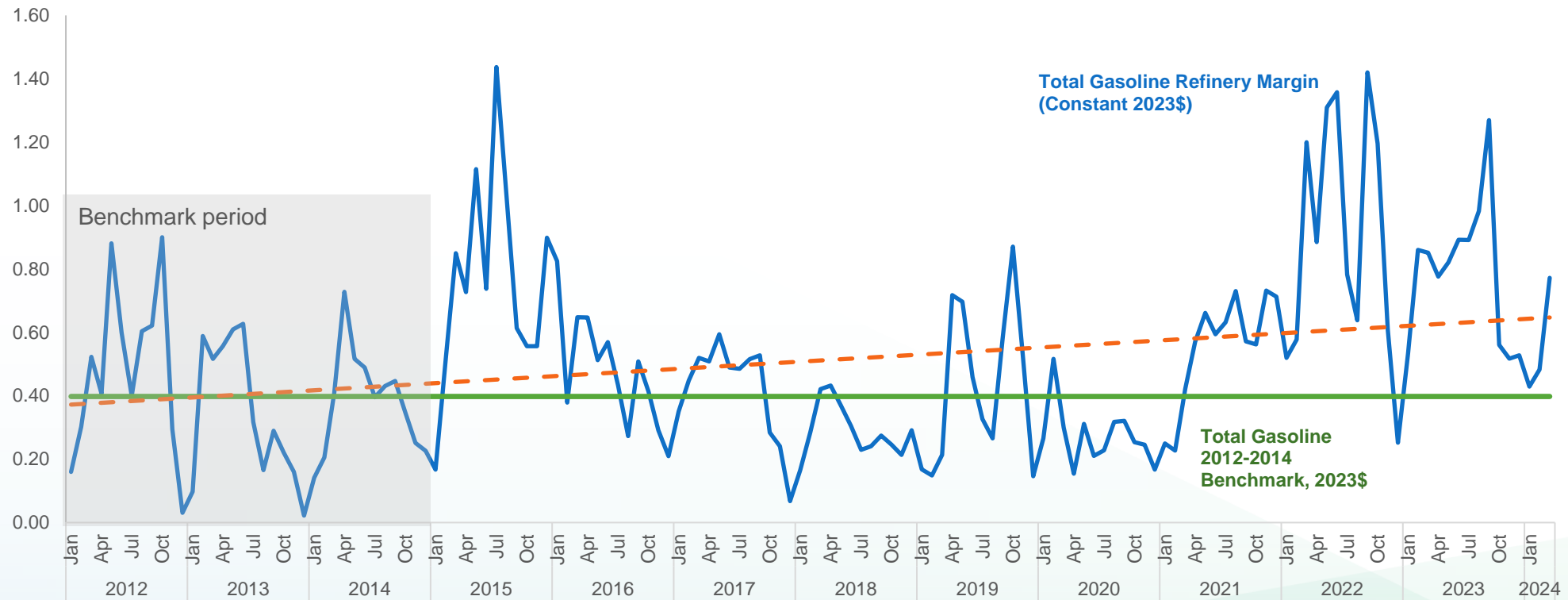


Sources: California Energy Commission, California Gasoline Price Breakdown and Margins, <https://www.energy.ca.gov/estimated-gasoline-price-breakdown-and-margins>. Discount factor based on CPI excluding food and energy, Bureau of Labor Statistics, <https://data.bls.gov/>.



California Gasoline Refining Market Margins Increasing in Real Dollars

Total Gasoline Refinery Margin (Constant 2023\$) and 2012-2014 Benchmark
Dollars per Gallon

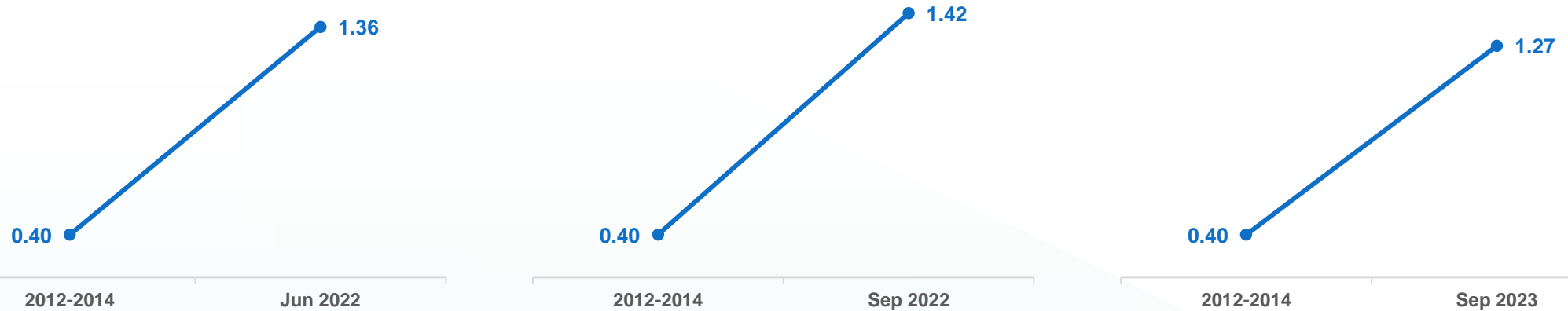


Sources: California Energy Commission, California Gasoline Price Breakdown and Margins, <https://www.energy.ca.gov/estimated-gasoline-price-breakdown-and-margins>. Discount factor based on CPI excluding food and energy, Bureau of Labor Statistics, <https://data.bls.gov/>.



Real Margin Growth Exceeds Benchmark and Disproportionate to Cost of Crude

Refinery Margins at Recent Peaks vs. Benchmark Average (2012-2014) *Dollars per Gallon, Constant 2023\$*



- Jun 2022 Refinery Margin is 241% larger vs benchmark period.
- Cost of crude changed by -8.6% vs benchmark period

- Sep 2022 Refinery Margin is 257% larger vs benchmark period.
- Cost of crude changed by -30.2% vs benchmark period

- Sep 2023 Refinery Margin is 219% larger vs benchmark period.
- Cost of crude changed by -32.2% vs benchmark period

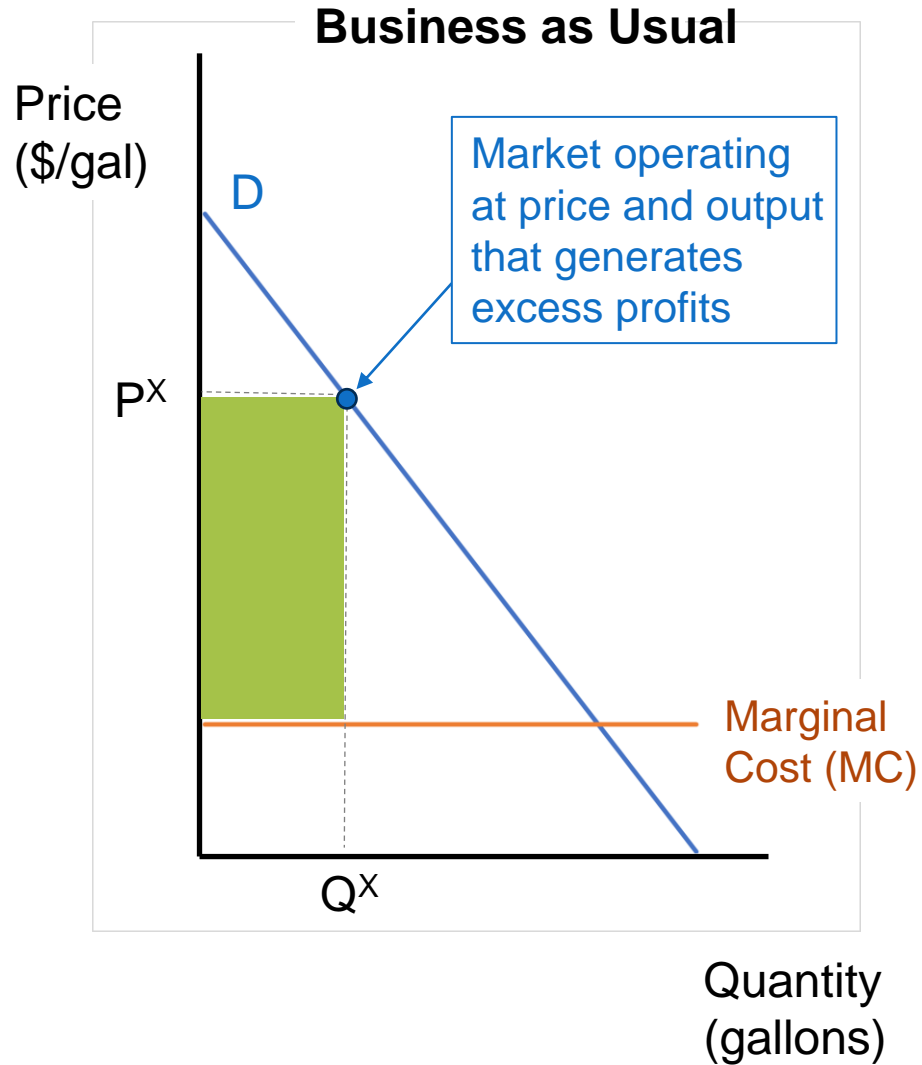
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Maximum Gross Gasoline Refining Margin and Penalty Can Mitigate Impacts of Excess Margins

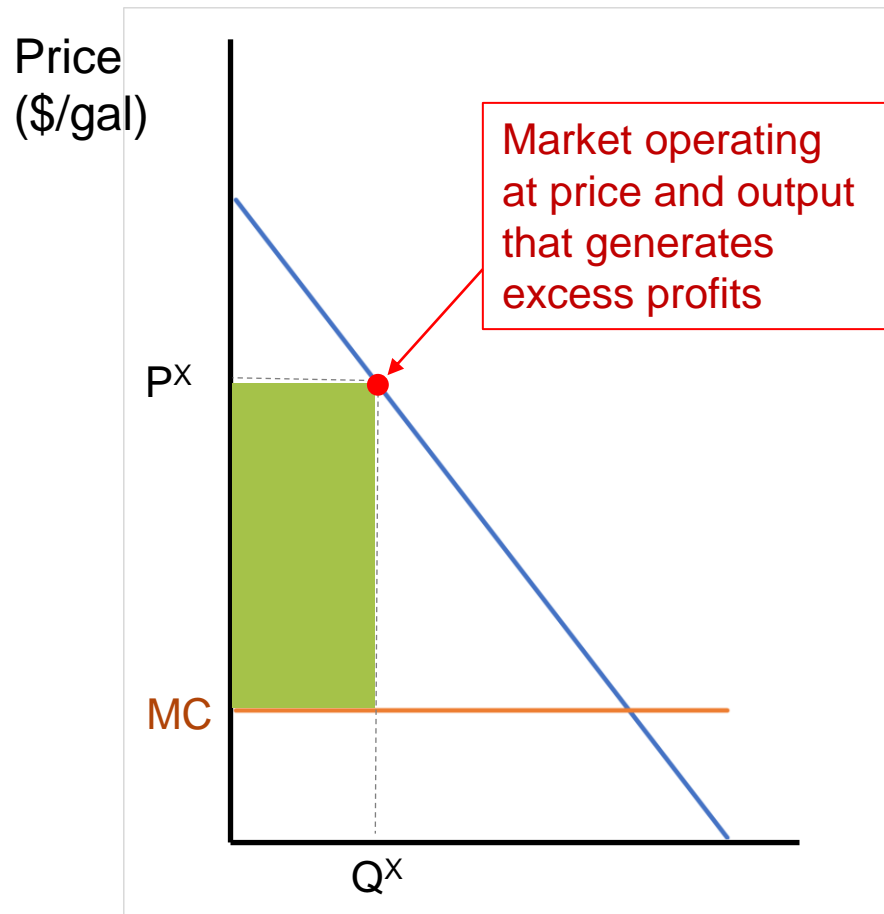
- Excess margins signal a misalignment between producer incentives and consumer well-being
- Maximum GGRM and penalty
 - Reduces incentive to strategically limit production
 - Provides incentive to increase output, *if capacity is available*, and decreases price.
 - Does not dictate price, producers set price based on output decisions
- Penalty collected benefits consumers harmed by excess margins

How Does a Maximum Gross Gasoline Refining Margin with Penalty Work?

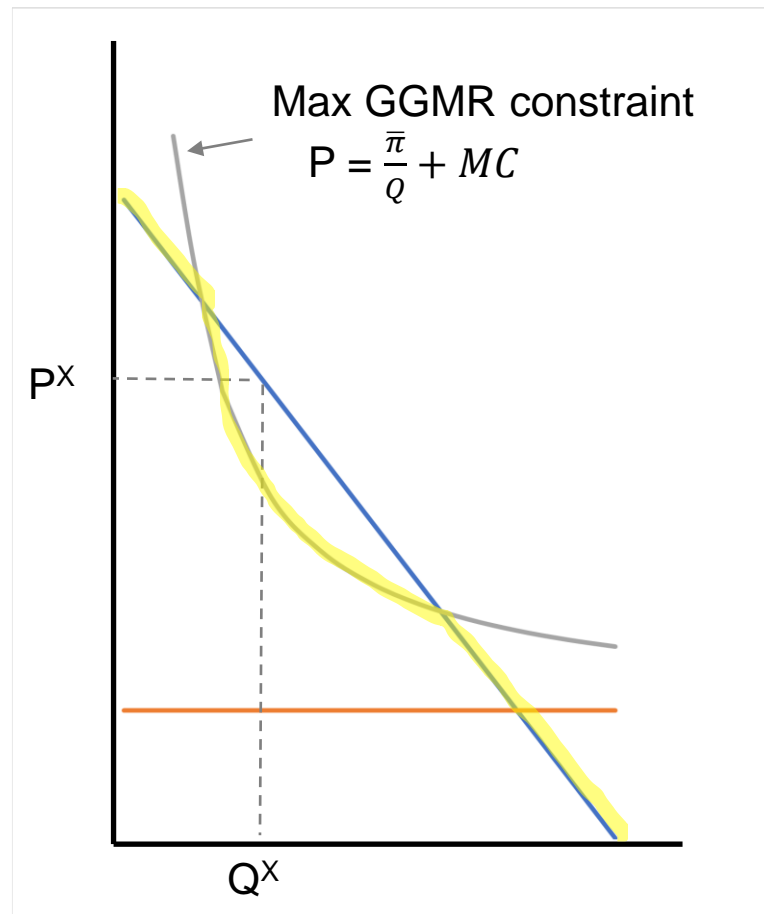


How Does a Maximum Gross Gasoline Refining Margin with Penalty Work?

Business as Usual



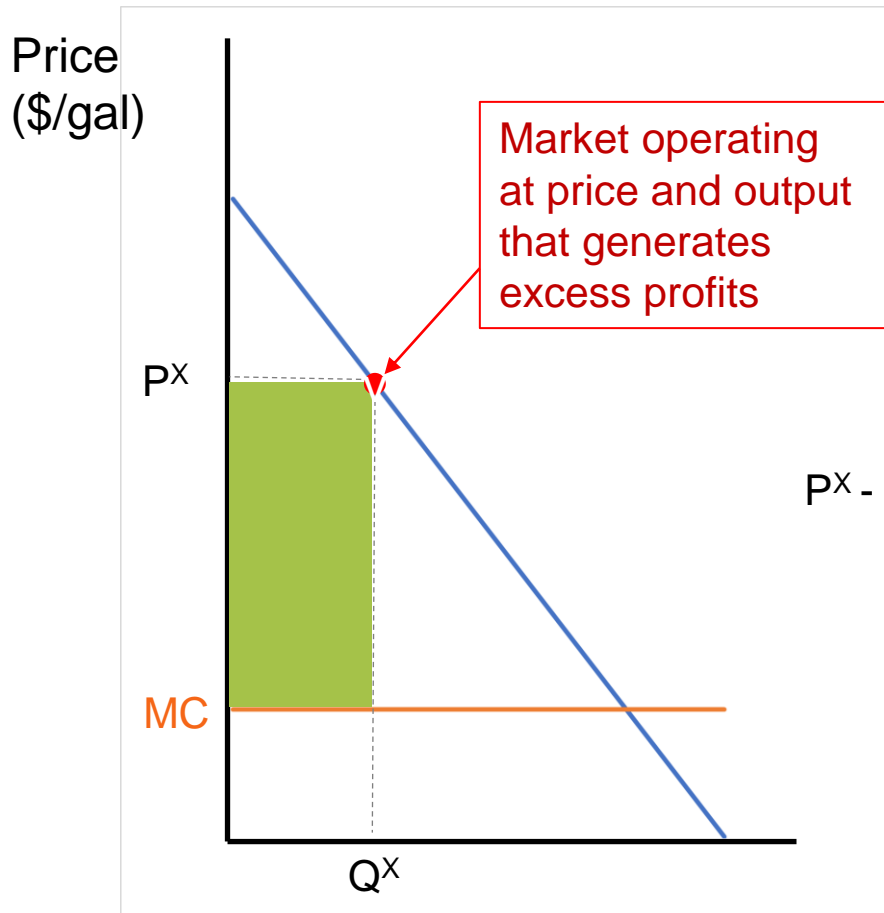
Market with Max GGRM + Penalty



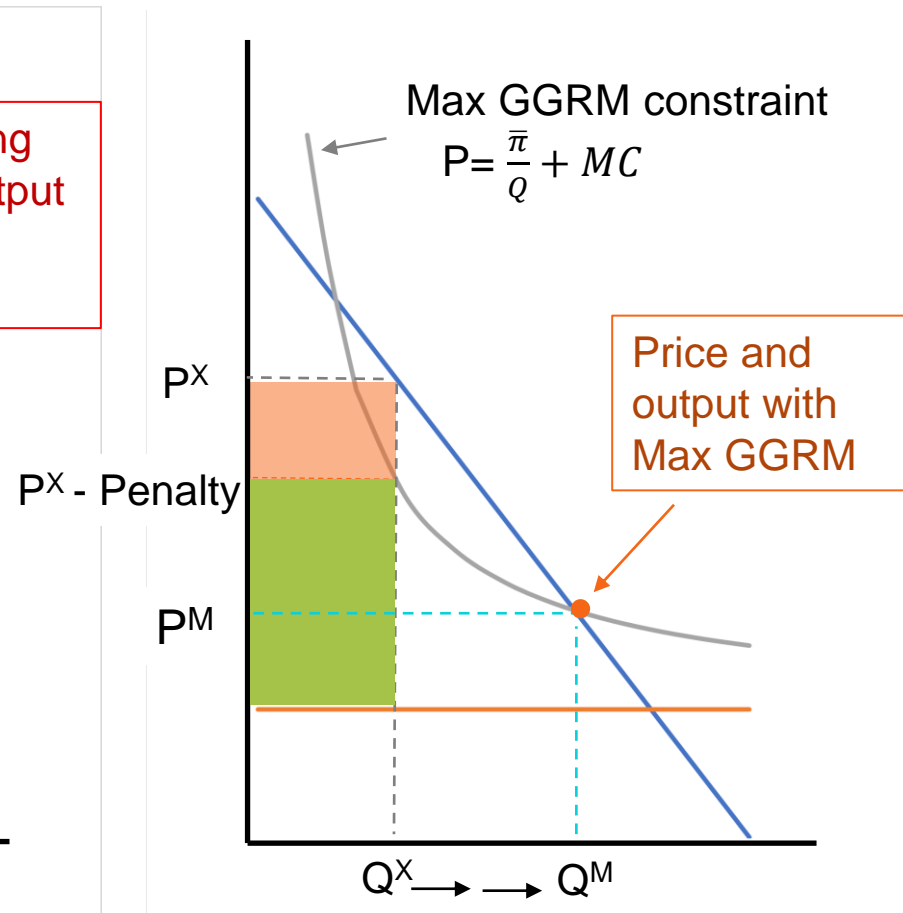
Quantity
(gallons)

How Does a Maximum Gross Gasoline Refining Margin with Penalty Work?

Business as Usual



Market with Max GGRM + Penalty



- Firms can increase profits by increasing output if they produce along Max GGMR constraint, driving prices down.
- State collects penalty (amount in orange)
- Consumers benefit from lower prices and compensation from penalty collected.

Quantity (gallons)



Concluding Thoughts

- Petroleum refining industry is an imperfectly competitive market that requires oversight
- Excess margins are margins that persistently exceed a reasonable rate of return (e.g., measured by a benchmark)
- A policy that sets a maximum GGRM and penalty can be an effective way of realigning industry and consumer incentives when capacity is available
- Assessing how California would benefit from a maximum GGRM requires us to look at data about the industry, for example, output, prices, margins, costs, etc.
- Essential to consider factors important to stakeholders when implementing a maximum GGRM and penalty



Thank you!