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WSPA literature review on Energy Price Controls

Please find attached a literature review on energy price controls for CEC consideration.

Additional submitted attachment is included below.

Catherine H. Reheis-Boyd
President and CEO

California Energy Commission
Docket Unit, MS-4
Docket No. 23-OIIP-01
715 P Street
Sacramento, California 95814

(Uploaded/Submitted via email to docket@energy.ca.gov)

RE: WSPA Comments on Order Instituting Informational Proceeding on Maximum Gross Gasoline Refining Margin and Penalty [Docket # 23-OIIP-01]

Western States Petroleum Association (WSPA) appreciates an opportunity to submit to the docket a comprehensive literature review on windfall profits caps and price controls in energy markets. WSPA is a non-profit trade association representing companies that import and export, explore, produce, refine, transport and market petroleum, petroleum products, natural gas, and other energy supplies in California and four other western states.

As the California Energy Commission (CEC) pursues "potentially establishing" a margin cap under direction from SB X1-2 (Skinner, 2023), we asked Catalyst Environmental Solutions Corporation (Catalyst) to review the broad literature on the economic and policy impacts of regulatory intervention on fuel prices. WSPA asked Catalyst to provide a comprehensive review of economic and policy literature regarding market interventions and price setting in the oil and gas markets globally, and most specifically in the United States.

Attached, please find the annotated bibliography and brief policy analysis and summary of the literature from Catalyst. The review contains several key findings that the CEC should consider while potentially developing its own approach to price controls in California's transportation fuels markets.

Specifically, we ask that the CEC consider the following key findings from the Catalyst analysis:

- Federal market interventions in the 1970s and 1980s, especially under the Crude Oil Profit Tax Act of 1980 (Pub. L. No. 96-223), were found to be ultimately ineffective in lowering consumer prices.
- Excise taxes aimed at capturing "excess profits" have had the opposite effect of creating artificial constraints in supply, often resulting in higher prices for consumers.
- Price setting laws and regulations in Hawai'i and the United States, as well as experiments in limiting windfall profit caps in the United Kingdom, have resulted in increases in demand for foreign crude and refined products.
- Retail price controls (i.e., price setting at the pump) or spot market price controls are usually out of sync with global crude markets, resulting in hedging and other strategies that increase consumer costs.

These findings and conclusions should be carefully considered by the CEC before attempting to determine price controls at the wholesale, spot, or retail level.

Sincerely,

Catherine H. Reheis-Boyd
PRESIDENT and CEO

Annotated Bibliography of Literature Related to Energy Price Controls

Prepared for: Western States Petroleum Association

Prepared by: Catalyst Environmental Solutions

October 31, 2023

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Executive Summary

Introduction and Purpose

Senate Bill (SB) X 1-2 authorized the California Energy Commission (CEC) and the newly established Division of Petroleum Market Oversight (DPMO) to consider another round of regulatory actions on the state's oil refinery industry. CEC is presently considering various policy measures and led a workshop in August 2023 where a wide range of theoretical actions, from state-supported storage and storage mandates to a significant industry restructuring event to convert oil & gas companies into a public utility model, were presented. A specific policy measure CEC could administer, pursuant to Public Resources Code section 25355.5, is to set a Maximum Gross Gasoline Refining Margin (Max Margin) on refiners operating in the state. CEC adopted an Order Instituting Informational Proceeding on October 18, 2023, to collect information on the potential impacts of this specific policy framework. WSPA contracted Catalyst Environmental Solutions Corporation to prepare this literature review in order to provide a comprehensive body of technical literature to inform CEC's decision-making process.

The primary purpose of this literature review is to provide a review of economic literature regarding market interventions and price setting in the oil and gas markets. The nature of the regulatory actions being considered by CEC prompts the examination of lessons learned in past frameworks to lower consumer costs or capture profit during periods of volatility. The body of technical literature on oil market controls, carried forward by political and economic goals of lowered consumer prices, spans several decades of economic research and analysis. By identifying the outcomes of past price setting actions and temporary excise taxes, the verified pitfalls of this regulatory approach become clear. The primary period of examination for the use of margin profit caps and price setting controls comes from the only instance in the United States domestic market when a windfall profit tax (in the form of an excise tax; Sherlock 2022) was implemented between 1980-1988. The economic impacts and technical findings that emerged from this period are provided in the paragraphs below, with individual analyses and conclusions found in the accompanying literature review.

Summary of Technical Findings from Literature Review

In the United States, direct controls on oil prices have not occurred since the energy crisis of the 1970s, mainly brought about by abrupt shifts in the international commodity market and the Organization of Petroleum Exporting Countries (OPEC) oil embargo of 1973. There were many iterations of price setting throughout this period, whereas the regulatory basis for commodity price setting preceded the oil embargo, with widespread price controls on the domestic oil market enacted in 1971. Following the OPEC oil embargo of 1973, the Emergency Petroleum Allocation Act (EPAA) was signed into law, instituting the initial framework for price cap limitations. Expanding of the EPAA, the 1975 Energy Policy and Conservation Act broadened the government's authority to regulate oil and gas prices. Direct price controls on oil were gradually removed beginning in 1979, and from 1980-1988 the Crude Oil Windfall Profit Tax Act aimed to capture some of the increased profits following the initial results of market deregulation.

A consistent technical finding in the economic literature regarding direct federal regulation of energy prices throughout the 1970s is that inefficiencies in the market appeared as a response to price-setting. By setting domestic prices below the world market rate of oil, two primary impacts were identified: 1) overconsumption

of imported oil, and 2) underproduction of domestic oil (Arrow 1979). Under the 1970s price cap format, regulatory controls prevented domestic crude oil and petroleum prices from emulating the OPEC price of crude, and a lower-than-market domestic price of petroleum encouraged demand during periods of supply reductions or constraints, a two-fold economic impact (Kraft 1979). This buffer against scarcity led to increased reliance on foreign crude supplies as the preferred marginal source of supply to satisfy domestic demand. The market's response to the 1970s U.S. crude oil price controls was to 1) the monopolization of U.S. crude oil producers; 2) increased dependence on imported oil, and 3) the subsidization of domestic consumption (Erickson 1978). From 1973-1976, price ceiling schedules were substantially varied across suppliers, but domestic wholesale gas prices were not constrained by the world market price for oil – a notable market inefficiency that has systemic economic effects. When direct price caps began to be removed (e.g., late 1970s), the impact of the Entitlements Program upon U.S. refined product pricing was not decidedly positive (Deacon 1980).

The transition away from direct price setting at the federal level was found to contribute to a lowering of gasoline prices by reintroducing market efficiency and competition measures. The removal of this disruptive market intervention framework allowed operational changes by gasoline wholesalers and retailers that were consistent with the pace of innovation, with the emerging technology and consumer demands propelling them. Fostering economic efficiency directly contributed to lower gasoline prices after price caps were removed (Fenili 1985). Knoll (1987) provided analysis for the transition period from direct price controls to an excise tax structure under the Crude Oil Windfall Profit Tax Act, considering the incumbent structure, the phase-out nature of the de facto excise tax, and the three-tiered system of rate setting. This analysis found there to be more oil extracted under the lifetime of the Windfall Profit Tax era compared to the same period had the price controls remained in place. Contemporary analysis of the federal period of direct price caps between 1973 through 1980 often found that price regulation and product allocation system set in place by the Energy Policy and Conservation Act of 1975 (EPCA) raised prices or had no effect (Rogers 2003).

The Crude Oil Windfall Tax of 1980 (COWT) was effectively a temporary excise tax that replaced the price cap regulatory structure of the 1970s and was not successful in its primary goal to generate revenue for the federal government following the first stages of market deregulation. By 1988, low revenue and administrative burden for the IRS led to repeal of the COWT (Lazzari 2006). A cornerstone review of this period of policy includes research conducted by the Congressional Research Service that quantified the reduction of domestic production during the federal Windfall Tax era (1980 to 1988) to be between 1.2% and 8.0%. Dependence on imported oil also grew because of this excise tax, and the tax revenue was significantly less than anticipated (Lazzari 2006). Recent analysis using updated well production data has reinforced the conclusion that the Windfall Tax period reduced domestic production in the 1980s (Sherlock 2022).

Beyond the 1970s and 1980s, Hawaii is the only state to ever introduce legislation regarding direct price controls as a response to high consumer prices. This regulatory framework was in place from 2005-2006 and yielded varied economic results. The technical assessments done on behalf of the state indicated that a potential wholesale price cap would not directly achieve the goal of lowering retail prices for consumers (Brown 2003, Stillwater 2003). The original approach involved setting a maximum allowable wholesale price for gasoline across Hawaii and was eventually converted to a price cap on retail prices. In 2008, following the termination of the gas cap program, economic analysis was performed using proprietary data from oil refiners on the islands, and found that the spot pricing mechanisms required under price control schemes are difficult to mirror to the global price of crude (ICF 2008). Because of the inability to mimic conditions that contribute to

spot pricing, the setting of a price cap acted as an artificial control to the conditions setting prices in the local spot market for gasoline. Further, the fluctuation in global crude oil prices was not functionally accounted for in the price cap formula in Hawaii, and analysis showed a continuation of the gas caps between 2006 and 2008 would have resulted in lower prices during global highs but also resulted in delayed market responses (price decrease) to global market price drops (ICF 2008). The analysis from Hawaii's gas cap law revealed the difficulties in regulating the price of oil at a local (state) level, whereas spot pricing of oil and the global market cannot be easily accounted for, and the implementation of a retail price cap did not significantly lower retail gas prices when compared to an unregulated commodity market.

Key Findings and Conclusions

The economic analyses of past interventions in the U.S. domestic oil market largely centers on the federal market intervention frameworks of the 1970s and 80s. Lowering consumer prices was the goal of these policy actions, while the Crude Oil Profit Tax Act was an excise tax meant to capture excess profit as the federal price caps were phased out. The goal of SB X 1-2 shows a historic parallel to the Crude Oil Profit Tax period: to capture a perceived excess in profit and lower consumer prices. However, the prevailing finding from the numerous economic analyses of this regulatory approach is that an excise tax is ineffective in lowering consumer/retail prices. The regulatory approach of imposing excise taxes in the face of "windfall" profits has not historically resulted in a less volatile market for consumers. The literature is consistent in the assessment of price-setting in the primary energy market: both retail price controls and profit taxes can contribute to reductions in domestic supply, by incentivizing consumption during low supply periods and through the variety of disincentives created by this market intervention. As documented, excise taxes and price setting has resulted in an increased dependence on foreign oil to supplement a strong domestic market generated by the market inefficiency created by the intervening regulations. Therefore, the use of excise taxes to capture a perceived excess in profit has not historically resulted in achieving a goal of lowering consumer prices.

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SECTION 1 Introduction

On March 28, 2023, Gavin Newsom signed bill Senate Bill (SB) 1-2 as a means to increase oil producer transparency and reduce the consumer cost (at the pump) of oil/gas for Califonria residents. Fundamentally, the bill proposes a reduction in refiner profit margins as a means to reduce overall prices/costs. Currently, the California Energy Commission is undertaking the rulemaking process to develop regulations to implement the bill. On behalf of the Western States Petroleum Association, Catalyst Environmental Solutions Corporation (Catalyst) conducted a literature review of peer-reviewed literature, third-party studies, and governmental analyses related to energy price controls. This annotated bibliography presents the results of our literature review, with complete citations for each study along with an excerpt of the paper abstract. Brief summaries are also provided in those instances wherein the published abstract did not fully present the conclusions stated in the paper. Catalyst did not conduct additional independent analysis of any of the studies and makes no warranties as to the validity of any of the methods or conclusions presented in any of the listed studies. Electronic copies of all the cited studies can be downloaded via this link: References

This literature review is organized as follows:

- Section 2 - Complete List of Articles and Reports
- Section 3 - Price Caps & Margin Profit Caps
- Section 4 - Excise, Severance, and other Taxes
- Section 5 - Windfall Profits Taxes
- Section 6 - Domestic GDP & Investment Impacts

SECTION 2 Complete List of Articles and Reports

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Zhang, Y.-J., & Yan, X.-X. (2020). The impact of US economic policy uncertainty on WTI crude oil returns in different time and frequency domains. *International Review of Economics and Finance, 69*, 750-768. Retrieved October 2023, from https://doi.org/10.1016/j.iref.2020.04.001

SECTION 3 Price Caps & Margin Profit Caps

Arrow, K. J., & Kalt, J. P. (1979). Petroleum Price Regulation. Should We Decontrol? Washington, D.C: American Enterprise Institute for Public Policy Research. Retrieved October 2023, from https://www.aei.org/wp-content/uploads/2023/07/AEI-STUDIES-EnergyPolicy-256-compressed.pdf?x91208

This analysis found that federal regulation of energy prices (as was the case at the time of publishing) prevents the market from operating efficiently. This happens as a result of below world market rate oil in the domestic market; resulting in overconsumption of imported oil, and an underproduction of domestic oil as a result of manipulated market signals. The analysis advocates for decontrol based on the potential for efficiency gains over the smaller potential of distributional losses.

Key Conclusions:

1. Federal regulation of energy prices prevents the market from operating efficiently.

2. Below world market rate oil in the domestic market results in an overconsumption of imported oil and underproduction of domestic oil, as a result of manipulated market signals.

Excerpt: This study finds that current regulation of the petroleum industry causes significant inefficiency in our use of resources. This inefficiency is a real cost for the economy and is not offset by real economic benefits. A significant portion of the costs of current price controls arises from the underproduction of domestic petroleum and over consumption of imported petroleum induced by artificially low prices. Substantial costs are also associated with impairments to the economy's ability to adjust to sharp increases in world energy prices, the implicit regulatory support for the OPEC cartel and its pricing objectives, and the administration and enforcement of present policies. The avoidance of all of these costs by moving to an uncontrolled market would represent a major source of gain to the nation. Such a policy change would have distributional consequences that might be regarded as inequitable. Even with assumptions that are generous to such a judgment, however, the case is strong that decontrol of petroleum prices would be preferable to the current policy. This conclusion emerges because the repressiveness and magnitude of the net redistributions of income that would occur under decontrol would be mollified by certain attributes of current regulation and tax policy. Still, those who object to these prospective redistributions would want to accompany decontrol with a windfall profits tax, the proceeds of which accrue to the Treasury's general revenues.

Brown, M., Rewey, C., & Gagliano, T. (2003). Findings on Hawaii Gasoline Prices and Policies. Honolulu: NCSL Energy Program. Retrieved October 2023, from https://energy.hawaii.gov/wp-content/uploads/2011/10/HIGasPricesPolicies_2003.pdf

In the early 2000s, the state of Hawaii reached a critical issue in their energy market, which was widely felt due to the state's heavy reliance on oil for all energy production on the islands. The National Conference of State Legislatures (NCSL) Energy Program conducted a policy analysis for the state legislator on the potential effects of a retail gas cap, finding that the existing price cap formula may lead

to higher prices in some situations, potentially lead to gas shortages, and decrease future investment. Additionally, in using mainland U.S. benchmarks, the price cap would not reflect the market of Hawaii. The cap formula was changed after this report was published, targeting the wholesale market instead of the retail market; benchmarks were still based on mainland (including CA) markets, which would not accurately reflect the global market price.

Key Conclusions:

1. Hawaii's existing price cap formula may have lead to higher prices in some situations, potentially lead to gas shortages and decrease future investment.

2. Price caps using mainland U.S. benchmarks would not reflect the market of Hawaii

Excerpt: Hawaii's almost total dependence on imported oil for so much of its energy sector is unique within the United States, demonstrating the interdependence among energy markets. The price cap formula developed under A 77 was based on a weekly average of spot gasoline prices in Los Angeles, the Gulf Coast, and New York Harbor. This formula linked Hawaii to the Mainland's more volatile markets. It also included adjustments for transportation, marketing margin and other factors. Prices for the Neighbor Islands were found to be above Oahu prices because of the higher costs to transport gasoline to these markets. The long-term profitability of Hawaii's refineries was called into question, with higher operating costs than mainland sites and smaller margins for sweet crude. Many examples were found in which the price caps resulted in clear disadvantages to the consumer. The Act 77 price cap was found to potentially result in several undesirable consequences for Hawaii. The caps would bring volatility, market distortions, and opportunities for profiteers to game the market. They would be difficult to administer, and there would likely be small retailers in remote areas who would no longer be able to provide services.

Carranza, J. E., Clark, R., & Houde, J.-F. (2015). Price Controls and Market Structure: Evidence from Gasoline Retail Markets. Journal Of Industrial Economics, 63(1), 152-198. Retrieved October 2023, from https://onlinelibrary.wiley.com/doi/10.1111/joie.12071

Excerpt: In this paper, the effect of price floor regulations on the organization and performance of markets is studied. The standard interpretation of the effects of these policies is concerned with short-run market distortions associated with excess supply. Since price controls prevent markets from clearing, they lead to higher prices. While this analysis may be correct in the short-run, it does not consider the dynamic equilibrium consequences of price controls. We demonstrate that price floor regulations can have important long-run effects on the structure of markets by crowding them and creating endogenous barriers to entry for low-cost retailers. Moreover, we show that these factors can indirectly lower productivity and possibly even prices. We test this in the context of an actual regulation imposed in the retail gasoline market in the Canadian province of Québec and show that the policy led to more competition between smaller/less efficient stations. This resulted in lowered sales, and, despite the reduction in efficiency, did not increase prices.

Key Conclusions:

1. Price floor regulations can have important long-run effects on the structure of markets and create internal barriers to entry for low-cost retailers.

2. These factors can indirectly lower productivity and possibly, prices, leading to more competition between smaller/less efficient gas stations.

California Energy Commission. (2019). Additional Analysis on Gasoline Prices in California. Sacramento: State of California. Retrieved from https://www.energy.ca.gov/sites/default/files/2019-11/Gas_Price_Report.pdf

California Governor Gavin Newsom called on the California Energy commission (CEC) to perform an in-depth analysis on the increased differential between California and national gasoline prices. The CEC concluded that California and United States refiner margins have remained consistent, and the primary cause of price increase was due to gasoline outlets increasing their retail margins.

Key Conclusions:

1. California and U.S. refiner margins have remained consistent from 2010 to 2018.

2. The primary cause of gasoline price increase was due to gasoline outlets increasing their retail margins.

Excerpt: Refiner margins for both California and the United States maintained a steady relationship from 2010 to 2018. Except for the Torrance Refinery outage spiking margins in 2015, California and U.S. refiner margins rose and fell together. From 2004 to 2014 and from 2016 thereafter, the difference between California and national refiner margins averaged about 11 cents, which is close to the industry's estimate (10 cents) of the cost of producing gasoline to meet California's specifications. The CEC identified California and national retailer margins diverging in 2015 identifying a stark contrast high-priced gasoline retailer brand increasing margins by roughly twice their low-price competitors. attributing California high-cost retailers doubling their margin compared to low-cost retailers and the national average. The CEC identified steady market shares of high-priced retailers amidst price increases and a survey by the National Association of Convenience Stores showing a 12% decrease in consumer preference for cheaper gasoline during this period.

Casarin, A. (2014). Productivity throughout regulatory cycles in gas utilities. Journal of Regulatory Economics, 45, 115-137. Retrieved October 2023, from https://doi.org/10.1007/s11149-013-9239-2

Excerpt: This paper examines productivity patterns in price cap regulated utilities around price reviews. We specify a variable cost function that we estimate using alternative specifications of technical change. Results show that the pattern of pure technical change differs within and between regulatory cycles. They also provide evidence that exogenous investment reduces the ratchet-problem, that strategic cost cutting behavior is reduced when regulatory cycles are short and that, absent these two features, industry productivity is consistent with strategic cost cutting behavior.

Key Conclusions:

1. Outside investment in gas utilities reduces potential ratchet-problem (i.e. an economic process that is difficult to reverse once it is underway or has occurred)

2. Strategic cost-cutting behavior is reduced when regulatory cycles are short.

Crowley, N., & Meitzen, M. (2021). Measuring the price impact of price-cap regulation among Canadian electricity distribution utilities. Utilities Policy, 72, 101275. Retrieved October 2023, from https://doi.org/10.1016/j.jup.2021.101275

Excerpt: Price-cap regulation is a form of performance-based ratemaking that offers electric distribution utilities a fundamental alternative to traditional rate-of-return regulation. Economic theory suggests that price caps, which set annual rate changes based on industry-wide productivity, should incentivize improved performance within the regulated utility. This analysis tests that theory by comparing rate outcomes among a control group of firms regulated under the traditional rate-of-return method against rate outcomes under price caps in Alberta and Ontario across time. The findings suggest a downward effect on the annual escalation of customer rates under price-cap regulation.

Key Conclusions:

1. Findings suggest a downward effect on the annual escalation of customer rates for electricity under price-cap regulation.

Deacon, R. M. (1980). Price Controls and International Petroleum Product Prices. U.S. Department of Energy. Retrieved October 2023, from https://www.osti.gov/biblio/5359202/

Excerpt: The effects of Federal refined-product price controls upon the price of motor gasoline in the United States through 1977 are examined. A comparison of domestic and foreign gasoline prices is made, based on the prices of products actually moving in international trade. There is also an effort to ascribe US/foreign market price differentials to identifiable cost factors. Primary emphasis is on price comparisons at the wholesale level, although some retail comparisons are presented. The study also examines the extent to which product price controls are binding and attempts to estimate what the price of motor gasoline would have been in the absence of controls. The period under consideration is from 1969 through 1977, with primary focus on price relationships in 1970-1971 (just before US controls) and 1976-1977. The foreign-domestic comparisons are made with respect to four major US cities, namely, Boston, New York, New Orleans, and Los Angeles.

Key Conclusions:

1. Certain areas of disagreement remain, particularly regarding the effect of the Entitlements Program upon U.S. refined products prices

2. The primary conclusion reached is that price ceiling schedules may have varied substantially across various firms.

3. During 1973-1976, domestic gasoline prices (at wholesale) were not constrained by prices in world trade markets

Erickson, E., Peters, W., Spann, R., & Tese, P. (1978). The Political Economy of Crude Oil Price Controls. Natural Resources Journal, 18(4), 788-800. Retrieved October 2023, from https://digitalrepository.unm.edu/nrj/vol18/iss4/8/

Excerpt: Prior to the oil embargo on the US brought about by the political economy of the (as of 1978) newly created OPEC cartel. Price controls were in place (on commodities including oil) before the embargo; oil controls remained as a result of the global volatility of oil. The actual extent of the ultimate resource base can only be determined from the results of drilling and recovery investment projects. Since a price control system reduces future drilling and investment incentives, it also reduced the flow of information necessary to determine future levels of investment. At the time of the analysis in 1978, the effect of U.S. crude oil price controls has been to monopolize U.S. crude oil producers, increase U.S. dependence upon imported oil, and subsidize domestic consumption.

Key Conclusions:

The effect of the U.S. crude oil price controls in 1978 was monopolization of U.S. crude oil producers, increased dependence on imported oil, and subsidization of domestic consumption.

Fenili, R. (1985). The Impact of Decontrol On Gasoline Wholesalers and Retailers. Contemporary Economic Policy, 3(3), 119-130. Retrieved October 2023, from https://doi.org/10.1111/j.1465-7287.1985.tb00813.x

Excerpt: Since decontrol of the U.S. gasoline market in January 1981, substantial changes in operations of gasoline retailers (dealers) and wholesalers (jobbers) have occurred. This paper analyzes decontrol impacts on the operations of these two classes of firms. A primary conclusion is that removing regulations allowed dealers to profit by cutting prices and margins for self-service gasoline, while increasing prices and margins for full-service gasoline. In addition, decontrol resulted in lower jobber margins and profitability, which in turn caused a substantial number of jobbers to exit from the market. Overall, removal of the regulations allowed operational changes which were consistent with emerging technology and consumer demands, but which had been constrained by a decade of pervasive federal regulation of the U.S. gasoline market. Thus, decontrol fostered greater economic efficiency in the marketing of gasoline, which contributed to lower gasoline prices during a time of rising gasoline taxes and increasing general inflation.

Key Conclusions:

1. Removal of federal regulations allowed operational changes at gasoline wholesalers and retailers which were consistent with emerging technology and consumer demands.

2. Decontrol of the gasoline market fostered greater economic efficiency, which contributed to lower gasoline prices.

Gülen, G., & Soni, M. (2013). The Impacts of Raising the Energy Price Cap in ERCOT. The Electricity Journal, 26(7), 43-54. Retrieved October 2023, from https://doi.org/10.1016/j.tej.2013.07.002

Excerpt: In order to ensure resource adequacy, the Public Utility Commission of Texas raised the energy price cap from $3,000 per MWh to $4,500 starting Aug. 1, 2012, and decided to gradually increase it to $9,000 by 2015. An economic dispatch model was used to evaluate the impacts of the price cap increase. When the price cap is raised, investment in new power generation facilities increases due to the chance at increasing profits; a correlation that is most pronounced in the earliest years following lifting the cap. With a higher price cap in place, more retirement of old power plants takes place, attributed to the higher cost of electricity on the market (and thus reduced electricity demand). This study identified a higher price cap resulting in a surge of new power plant construction, with a strong emphasis on addressing electricity demand during peak periods. The change is likely to increase average electricity prices, it also has the potential to fall short of demand; the average cost of electricity remains stable over the study period. A higher price cap also allows for a more robust reserve margin, and the surplus generated contributes to the overall stability of the power supply.

Key Conclusions:

1. The higher price cap on utilities in Texas resulted in a surge of new power plant construction to address demand during peak periods.

2. The higher price cap is likely to increase average electricity prices.

Hardy, A., Glew, D., & Gorse, C. (2019). Assessing the equity and effectiveness of the GB energy price caps using smart meter data. *Energy Policy, 127*, 179-185. Retrieved October 2023, from doi.org/10.1016/j.enpol.2018.11.050

Excerpt: Keeping homes at a comfortable temperature and reducing household fuel bills are priorities for many governments. In the UK, several interventions have been implemented to achieve these objectives. This paper investigates one such policy lever - the Energy Price Cap - to understand if it has been designed and implemented efficiently and equitably. The price cap was introduced for customers on prepayment meters to combat increased levels of fuel poverty and a lack of competition in this group. However, the price cap was based on several assumptions of how energy is used. In this work, we assess how well the price cap accounts for real energy use using smart meter data. Households on economy 7 (EC7) tariffs were found to spend more than those on standard rate tariffs, as EC7 customers use more electricity during peak hours than assumed in government calculations. Additionally, many of the EC7 customers in this sample still use a considerable amount of gas, suggesting the EC7 heating product is either not sufficient, or is not being utilized in a cost-effective manner. Revisions to the input assumptions in government models for EC7 customers would therefore be beneficial in future price cap levels.

Key Conclusions:

The Great Britain energy price cap was based on several assumptions on how energy was used. The study found that the assumptions were not completely accurate and revisions to the input assumptions in government models would be beneficial to future price cap levels.

ICF International. (2008). 2008 Report on the Hawaiian Petroleum Market under the Petroleum Industry Monitoring, Analysis, and Reporting Program. Honolulu: Hawaiian Public Utilities Commission. Retrieved October 2023, from https://puc.hawaii.gov/wp-content/uploads/2013/10/PIMAR-Program-Summary-Report-for-2008.pdf

This report was conducted as part of oversight driven legislation that came into effect after the removal of the gas cap in Hawaii. The study period began when the Gas Cap was enacted on September 1, 2005, and went through June 30, 2008. The global fluctuation in crude prices was not easily accounted for in the price cap formula; therefore, the continuation of gas caps would have resulted in lower consumer prices during high global market pricing, and a lag during global pricing decreases. Overall, the wholesale price to retail stations would have been lowered by 5-10 cents/gallon if the gas cap had stayed in place, assuming retail margins were not adjusted. Retail margin calculation was not part of the gas cap of Hawaii, but comparison with other state retail markets shows approximately 10 cents per gallon or more above service stations in other states.

Key Conclusions:

The global fluctuation in crude prices was not easily accounted for in the price cap formula in Hawaii; therefore, continuation of gas caps between 2006 and 2008 would have resulted in lower consumer prices during high global market pricing, and a lag during global pricing decreases.

Excerpt: The prices Hawaii consumers are paying for gasoline are determined by global gasoline markets but influenced by Hawaii market conditions. Since suspension of the gas caps in May 2006, wholesale gasoline prices in Hawaii have remained relatively close or below prices had the gas caps stayed in place. Since the gas caps were suspended, Hawaii suppliers have maintained DTW prices relatively close to what the modified gasoline price cap would have required. Prices have tended to fall above the calculated cap in falling markets and fall below the cap in rising markets. However overall refiners and suppliers are maintaining prices at levels at or near where the gas cap would have been. Suppliers have tended to increase DTW price premiums over regular gasoline for premium and midgrade above levels seen during the gas cap period. Initial increases in 2006 and 2007 were substantial but these gradually reduced in 2008. Premium grade values over regular in Hawaii appeared in line with the U.S. Mainland premiums in 2008.

Johnson, S., Lukasz, R., & Wolfram, C. (2023). A Theory of Price Caps on Non-Renewable Resources. National Bureau of Economic Research. Retrieved October 2023, from https://www.nber.org/papers/w31347

Sanctions against Russian oil went into effect in December 2022 as a response to the invasion of Ukraine by the United States, European Union, with potential fallout from a per barrel price cap in the form of steeply declining Russian exports. This analysis found that Russian oil exports have in fact stayed consistent, indicating the price cap has not resulted in Russian sources withholding supply, but rather cooperating with the cap on oil. The “leaks” of this system

Key Conclusions:

Following U.S. and E.U. sanctions against Russian oil in 2022, Russian oil exports remained consistent, indicating the price cap has not resulted in Russian sources withholding supply, but rather cooperating with the cap on oil.

include Russian shadow fleets, or buyers outside of the EU/G-7 Coalition and price setting measures. Lack of overall enforcement also impacts the effectiveness of a Russian oil price cap. Drafted research from NBER provided a theoretical and quantitative analysis of price caps on oil at an international level. Used by the G-7 coalition to impose restrictions on Russian exported energy, they found the quantity exported by the producer stays constant even as market conditions (and hence the reference price) vary, as long as the cap is binding.

Excerpt: Since the extraction rate is constant and the producer receives a fixed price (equal to the cap), the revenues and hence the profits are essentially constant even as market conditions fluctuate. This capping of profits – and the associated inability to enjoy any of the upside of future energy shocks – significantly reduces the welfare from having oil. The reductions in welfare from a $60 and a $45 price cap is equivalent in welfare terms to the loss of 40% and 60% reduction in reserves, respectively. With the worked example of G-7 activity towards Russia, simulations suggested that a lower price cap, around $45 per barrel, could significantly impact Russia's revenue flows.

Johnson, S., Lukasz, R., & Wolfram, C. (2023). Design and implementation of the price cap on Russian oil exports. Journal of Comparative Economics, 1, 9. Retrieved October 2023, from https://doi.org/10.1016/j.jce.2023.06.001

Key Conclusions:

1. Russia's oil production increased after the E.U. price cap as put in place.
2. The advent of the E.U. embargo did not result in a spike in world oil prices.
3. Most western service providers have remained engaged with Russian trade.

Excerpt: The first goal of the price cap on Russian oil is part of a broader sanctions package designed to reduce Russia's foreign exchange revenues and reduce its capacity to wage war in Ukraine. The second goal of the price cap was to make it possible for Russian oil to stay on the world market in the face of an impending complete European Union (EU) embargo and services ban. In contrast to any dire predictions, setting a price cap on Russian oil at $60 per barrel seems to have had four broad effects. First, the Kremlin's oil-related revenues have fallen by 49% compared to the March to November 2022 period and 23% compared to the January 2021 to January 2022 period. Specifically, the blue vertical bars in Fig. 2 reflect Russian government revenue from the mineral extraction and export taxes by month. The orange bars reflect averages during the pre-war, post-war and pre-price cap and post-price cap period (see also, Babina et al., 2023). Second, Russia's oil production has if anything increased. Third, the advent of the EU embargo (for crude in December and refined products in February) did not result in a spike in world oil prices. Fourth, most western service providers have remained engaged in the Russia trade. Data from CREA suggest that about 60% of crude oil shipments and 75% of product shipments from Russia's ports in April 2023 were covered by insurers from the EU, G7 or Norway."

Kalu, T. 1995. A uniform profit margin policy and its effects on mineral producing firms the case of the oil industry. Resource Policy. 21(1) 61-72. Retrieved October 2023, from https://doi.org/10.1016/0301-4207(95)92253-N

Excerpt: This paper highlights the lack of any framework for the analysis of the effects of current methods of rate of return regulation on the target firms and proposes an alternative method based on the market cost of the capital invested in a regulated firm. Using a framework developed from an earlier model, the effects of a uniform profit margin on the efficiencies of oil firms are examined. The results show that the effects depend on the type of firm and on whether the uniform profit margin is below or above the firm's capital expansion rate. Essentially, uniform profit margin will make the most efficient firms operate at a lower or higher efficiency level depending on whether they are below or above their capital expansion rate; make accelerated cost firms more inefficient in terms of higher supernormal profits at the expense of society; and make accelerated production firms more efficient, provided there are no restrictions on the firms' choice of method of adjusting production rates, in general, the approach encourages firms that have less than desirable investment levels to raise the level, and discourages excessive investment for the sole aim of reaping higher profits.

Key Conclusions:

1. The effects of a uniform profit margin policy on the oil industry depends on the type of firm and whether the uniform profit margin is above or below the firm's capital expansion rate:

- accelerated cost firms will become more inefficient in terms of higher supernormal profits

- accelerated production firms will become more efficient

Kalu, T., & Lambo, E. (1994). Government pricing policy and multinational oil companies in Nigeria. Resource Policy, 20(1), 23-33. Retrieved October 2023, from https://doi.org/10.1016/0301-4207(94)90038-8

Excerpt: Multinational oil companies and the Nigerian National Petroleum Corporation, an agency of the government, have disagreed on current government pricing policy on the operations of the multinational oil companies. While the multinational oil company executives have contended that the current government pricing policy adversely affects their efficiency, the Nigerian National Petroleum Corporation has often accused the multinational oil company executives of escalating their operating costs, thereby depriving the country of the maximum benefits from its oil resources. This paper employs a multiperiod goal programming model to determine the impact of the government pricing policy on the operations, efficiency, and effectiveness of the multinational oil companies. Among other things, the model results support the claims of both the multinational oil company executives and the Nigerian National Petroleum Corporation. However, because cost escalation is perceived as induced by the government pricing policy, it is suggested, for effectiveness, that the government pricing policy be reviewed to harmonize the goals of the partners.

Key Conclusions:

Model results support both the claims that Nigerian pricing policy adversely affects operational efficiency AND that multinational oil companies escalate their operating costs, depriving the country of the maximum benefits from its oil resources.

Kang, L., & Zarnikau, J. (2009). Did the expiration of retail price caps affect prices in the restructured Texas electricity market? Energy Policy, 37(5), 1713-1717. Retrieved October 2023, from https://doi.org/10.1016/j.enpol.2008.12.037

Key Conclusions:

Expiration of the price-to-beat price caps for electricity may have led to a reduction in the average prices charged by competitive electric retail providers.

Excerpt: On January 1, 2007, the Electric Reliability Council of Texas market became the first restructured market in the US to completely remove caps on the prices which could be charged to residential energy consumers by the retailers associated with the traditional or incumbent utility service providers. This analysis suggests that the expiration of the price-to-beat price caps may have led to a reduction in the average prices charged by competitive retail electric providers. One explanation involves the manner in which the price-to-beat was adjusted by the Texas Public Utilities Commission. As often discussed in Open Meetings of the Texas Public Utilities Commission, the price-to-beat had to be set high enough to provide sufficient "headroom" (i.e., profit opportunities) in order to attract competitive REPs into the market. Further, since affiliated retail electric providers had some control over the timing of applications to change the price-to-beat, the changes often were based on relatively high fuel prices. A spike in natural gas prices would prompt filings, but a decline in fuel prices would not.

Kidokoro, Y. (2002). The Effects of Regulatory Reform on Quality. Journal of the Japanese and International Economies, 16, 135-146. Retrieved October 2023, from https://doi.org/10.1006/jjie.2001.0490

Key Conclusions:

1. Imposing price limits on energy, while lowering prices, can result in degradation of service quality.

2. Without incentive to continue investing in the energy industry, investment will slow, and quality will decline.

Excerpt: A theory-based paper that shows with price-cap regulation in place, energy regulation does not allow for price increase even with investments made. With the incentive to upgrade service quality removed, service quality decreases as the regulation approaches the price-cap; the decrease in service quality is the mechanism to a lower price in this scenario. This paper argues that imposing price limits, while effectively lowering prices, can result in the degradation of service quality; without incentive to continue investing in a potentially lucrative asset (any energy driven industry), investment will slow, and quality will begin to decline (Spence 1975, Noam 1991, Rovizzi and Thompson 1992, Vickers and Yarrow 1988 as cited in Kidokoro 2002).

Kisswani, K. (2012). The Effects of the U.S. Price Controls on OPEC: Lessons from the Past. *The Journal of Applied Business Research, 28*(3), 347-358. doi: https://doi.org/10.19030/jabr.v28i3.6954

Key Conclusions:

1. The analysis of the U.S. price control policy in the domestic market shows some evidence that OPEC cut production during some periods and increased production levels in others.

2. The results show some evidence that OPEN includes political support as part of its objective function when it comes to oil extraction.

Excerpt: In 1973-1974, the U.S. faced the so-called "Energy Crisis" due to the Arab oil embargo and a quadrupling of world crude oil prices by OPEC. This led the U.S. to use a" Price Control" policy in the domestic energy market. The effects of such policy are explored and well documented. However, the responses of OPEC producers to such a policy need further attention. This paper examines the effects of these price controls on OPEC's extraction path and the relation between the harm function and the change in OPEC production. The results show some evidence that OPEC did respond differently to price controls applied by the U.S. For some periods it cut production, while in other periods production levels increased. The results also show some evidence regarding Wirl (2008) that OPEC includes political support as part of its objective function when it comes to oil extraction.

Kraft, J., & Rodekohr, M. (1979). Crude Oil Price Controls: Their Purpose and Impact. Denver Law Review, 56(1), 315-333. Retrieved October 2023, from https://digitalcommons.du.edu/cgi/viewcontent.cgi?article=3088&context=dlr

Key Conclusion

The evidence suggests that the price cap regulations in 1979, couple with environmental restrictions, created a negative impact on the supply of petroleum in the U.S.

Excerpt: This analysis from 1979, during the only period of U.S. history with federal control of oil prices, is consistent among the literature. Under a price cap scheme, controls prevent crude oil and petroleum product prices from reflecting the OPEC price of crude. This lower-than-market domestic price of petroleum encourages demand (during supply reductions), reduces domestic production, and increases imports of foreign crude as the marginal source of supply to satisfy domestic demand, and thus increases the United States' dependence on an uncertain supply of crude oil. These regulations appeared to prevent owners of lower cost oil with fixed production costs from seeking the world price of crude oil as established by the Organization of Petroleum Exporting Countries (OPEC). The evidence suggests that these regulations, coupled with environmental restrictions, create a negative impact on the supply of petroleum in the United States.

Polemis, M., & Stengos, T. (2023). Does markup regulation restrict price hikes? Evidence from the oil industry. Letters in Spatial and Resource Sciences, 16(15). Retrieved October 2023, from https://link.springer.com/article/10.1007/s12076-023-00339-7

Excerpt: Using price data on three oil products (gasoline, automotive diesel, and heating oil) that have been recently affected by maximum markup regulation in Greece (implemented in March 2022) and employing the prices of the same products in Italy that have not been affected by regulation, we find that employing markup regulation led to a significant increase in both net and final prices equal to 13.8% and 2.4% respectively. The empirical findings postulate that the markup ceiling may act as a focal point for facilitating tacit collusion by monitoring prices and thus enabling a "trigger strategy" mechanism among the market participants in the Greek fuel industry.

Key Conclusions:

Employing markup regulation in Greece led to a significant increase in both net and final prices of oil products.

Roeger, W., & Welfrens, P. (2022). Gas price caps and electricity production effects in the context of the Russo-Ukrainian War: modeling and new policy reforms. International Economics and Economic Policy, 19, 645-673. Retrieved October 2023, from https://link.springer.com/article/10.1007/s10368-022-00552-7

Excerpt: The merit-order approach in the electricity market, which is in widespread use across the EU27 and the UK, has proven to be somewhat economically problematic in the context of the Russo-Ukrainian War. The massively increased gas prices since summer 2022—in the context of Russian supply cuts to the EU—has led to an abnormally high electricity price. Using the merit order approach, the price of electricity increases enormously if, as is often the case, gas is the last type of energy still realized in power generation; this leads to artificial increases in returns for all other types of energy providers whose output is used in power generation. Gas price increases by Russia or Russian supply cuts to the EU can increase the price of electricity and also the rate of inflation, as well as depress real income. The electricity price shock can be countered by switching—temporarily—to a modified regulation of the electricity market for a few years with a gas price subsidy in the electricity market. In a macroeconomic analysis, we identify both the output losses and adverse distributional effects of a gas price hike and find that a gas price subsidy is superior in stabilizing output and employment compared to a transfer; it also at least partially addresses certain distributional issues by reducing windfall profits in the electricity market. The study advocates a combination of gas price subsidies only in the electricity market and targeted transfers to households to meet both efficiency and distributional targets. The macro-analysis findings presented herein should be considered carefully, as they could minimize the welfare losses in the EU and the UK. As regards the expansion of renewable energy-based electricity, it is shown herein

Key Conclusions:

1. Increased gas prices since summer 2022 has led to abnormally high electricity prices in the EU and UK.

Employing markup regulation in Greece led to a significant increase in both net and final prices of oil products.

2. The study advocates a combination of gas price subsidies only in the electricity market and targeted transfers to households.

that the cost-differential between gas-fired power stations and renewable electricity is critical—large cost differentials imply barriers for the expansion of electricity generation from renewables unless there is a price regulation of electricity. There is the potential for an inefficient adjustment path due to nonlinearities. With a proposed narrow gas price cap for the electricity market only, the associated initial deficit related to necessary subsidies is, of course, much smaller than in the case of a general gas price cap.

Rosenberg, E., & Van Nostrand, E. (2023, May 18). The Price Cap on Russian Oil: A Progress Report. United States: U.S. Department of the Treasury. Retrieved October 2023, from https://home.treasury.gov/news/featured-stories/the-price-cap-on-russian-oil-a-progress-report

Summary: In December 2022, the G-7 Coalition set the price cap on Russian crude oil at $60 per barrel. Immediately following its illegal invasion, Russia was earning over $100 per barrel on its oil sales, with world spot prices rising higher than $140 per barrel in the spring of 2022. The price cap policy allows maritime services to continue supporting the transport of Russian oil, but only if the oil is sold at or below the specified price cap level. Companies from Coalition countries are significant players in maritime insurance, reinsurance, shipping, and finance, and their involvement is crucial to the functioning of the global oil trade. According to data from the International Energy Agency (IEA), since the Russian oil price cap has been put in place, the average price of Russian Urals crude oil has been below $60 per barrel on a monthly basis. While Coalition members have largely prohibited seaborne oil imports from Russia, the price cap policy benefits emerging market and lower-income countries that import oil from Russia. It allows them to negotiate lower prices for Russian oil, benefiting their economies while still lowering Russia's profitability on the global market.

Key Conclusions:

The price cap policy benefits emerging market and lower-income countries that import oil from Russia. It allows them to negotiate lower prices for Russian oil, benefiting their economies while still lowering Russia's profitability on the global market.

Excerpt: The price cap policy incentivizes the continued sale of oil and petroleum products on to the market at a steep discount from Russia's wartime premium. In December 2022, the Coalition set the price cap on Russian crude oil at $60 per barrel. Immediately following its illegal invasion, Russia was earning over $100 per barrel on its oil sales, with world spot prices rising higher than $140 per barrel in the spring of 2022.According to data from the International Energy Agency (IEA), since the Russian oil price cap has been put in place, the average price of Russian Urals crude oil has been below $60 per barrel on a monthly basis.

In response to the price cap, Russia has been forced to alter the way it taxes oil such that it institutionalizes the discounted value of Russian crude—essentially writing into law the steep discount the price cap has helped cement. This new taxation has the potential to threaten Russia's future oil production capacity by reducing the incentive for companies to invest in equipment, exploration, and existing fields. This change comes on top of the impacts already being felt by U.S. sanctions and export controls against Russian energy firms.

Sen, A., Clement, A., & Jonker, L. (2011). Retail Gasoline Price Ceilings and Regulatory Capture: Evidence from Canada. American Law and Economics Review, 13(2), 532–564. Retrieved October 2023, from https://doi.org/10.1093/aler/ahr008

Key Conclusions:

Enactment of price ceilings on retail gas prices is significant correlated with higher prices, possibly because price ceilings act as focal points, enabling firms to set higher prices.

Excerpt: We evaluate the efficacy of price ceiling legislation by employing weekly data on retail gasoline prices for eight cities in Eastern Canada between 1999 and 2007. The use of these data allows us to pool "treatment" cities in the Atlantic provinces with "control" cities in Ontario and Quebec. Ordinary least squares and instrumental variables estimates demonstrate that the enactment of such regulation is significantly correlated with higher prices. A potential explanation for these results is that price ceilings act as "focal points" enabling firms to set higher prices, thus suggesting the possibility of regulatory capture.

Stillwater Associates LLC. (2003). Study of Fuel Prices and Legislative Initiatives for the State of Hawaii. Honolulu: Hawaii Department of Business, Economic Development and Tourism. Retrieved October 2023, from https://energy.hawaii.gov/wp-content/uploads/2011/10/2003_HawaiiFuelsStudy.pdf

Key Conclusions:

1. Recommended Hawaii not pass a gas cap based on evidence they would result in a more restrictive environment, and the existing price cap formula resulting in caps above historic prices.

2. A gas cap was not likely to lower the price of retail gasoline.

Summary: This report outlines historical regulated gas markets (as of 2003) and evaluated the potential of a price cap on retail gas prices among the islands of Hawaii. This analysis was carried out as part of Act 77, which included legislation for an oversight agency and market controls for the oil market in Hawaii. The conclusions were presented to the Department of Business, Economic Development, and Tourism of Hawaii along with the NCSL report conducted in tandem (section 3.2). They recommended that the state not pass a gas cap based on evidence they would result in a more restrictive environment, and the existing price cap formula likely resulting in caps above historical prices. The retail level of price setting was the source of increased prices, with a competitive wholesale and retail market; a gas cap was therefore not likely to lower prices. This report includes a number of international examples on markets either entering or exiting a regulated pricing market.

Excerpt: High gasoline prices in this immediate period were caused by: (1) an intrinsically high cost of manufacture, distribution, and marketing. This included a higher refining cost, higher distribution cost, and higher dealer cost for a combined factor of 30-35 cpg (cents per gallon) over the U.S. average. (2) The tax rate for the state was 12 cpg higher than the average US market at the time. (3) Market power was flexed in concentrated markets, with only two refiners and five total marketers. Import parity at the wholesale level was not being passed down into branded retail; high prices were an indicator of a disconnect between the international crude market. (4) Consumer preferences to small volume retailers for proximity and service quality, regardless of price or necessity, was also directly contributing to the elevated gas prices in Hawaii in the 2003 evaluation period. Overall, Hawaii's wholesale gasoline and

retail markets were found to be competitive, with the exchange from wholesale to resale as the cause of market breakdown. Overall, the report recommended to the legislature to not pass a gas cap, as extensive evaluation of price caps implemented in other markets had failed to identify examples where clear consumer benefits were achieved.

Tsai, C.-H., & Tsai, T.-L. (2018). Competitive retail electricity market under continuous price regulation. Energy Policy, 114, 274-287. Retrieved October 2023, from https://doi.org/10.1016/j.enpol.2017.12.012

Key Conclusions:

Most regulators in states with retail choice maintain their interventions on retail electricity rates, particularly for residential consumers.

Excerpt: The introduction of retail competition in various states in United States was expected to lower electricity bills, expand the choice set of consumers, and encourage horizontal differentiation by providing value-added services. However, to date, most regulators in states with retail choice often maintain their interventions on retail electricity rates, particularly for residential consumers. In this paper, data from the State of Connecticut is used as a case study to describe a competitive retail electricity market under continuous price regulation and discuss policy implications.

Vann, A. (2022). Gasoline Price Increases: Federal and State Authority to Limit "Price Gouging". Congressional Research Service. Retrieved October 2023, from https://crsreports.congress.gov/product/pdf/R/R47072

Key Conclusions:

Although there is no federal law related to price gouging, several regulations have been proposed in this Congress and past Congress (that have not passed) addressing price gouging of retail gasoline. Various anti-trust laws could include provisions for pricing behavior on gasoline during emergencies.

Summary: This Congressional Research Service report presents the legal basis of “price gouging” laws at the state and federal level. Existing state laws are aimed at controlling pricing behavior during emergencies and can take the form of interpretive levels (e.g., excessive) or percentage increases. There are no federal laws that deal with price gouging; the FTC is the investigating body for anti-trust behavior which could include pricing behavior on gasoline (during emergencies). H.R. 7099, a proposed 2022 Congressional bill that did not ultimately pass, would have imposed a 50% tax on large crude oil producers on “the excess of the adjusted taxable income of the applicable taxpayer for the taxable year 2022 over the reasonably inflated average profit for such taxable year” (H.R. 7099). It would have addressed the sale of wholesale and retail gasoline, during periods of “international crisis affecting the oil markets” as declared by the President.

Excerpt: Fluctuations in gasoline prices, including supply chain concerns related to international events, have renewed focus on the role of the government in discouraging gasoline “price gouging,” a term commonly used to refer to sellers increasing prices to take advantage of certain circumstances that trigger decreases in supply, including emergencies. Past federal legislative efforts to address gasoline price gouging and price fixing would bar certain commercial practices and mandate studies of gasoline pricing. The federal government has not enacted legislation aimed specifically at price spikes for retail

gasoline, while a majority of states have enacted statutes to curtail price gouging for certain critical goods and services, including gasoline, during emergencies. Some of these statutes bar pricing during emergencies considered to be "unconscionable" or "excessive", or otherwise violates a subjective standard. Other statutes place a hard cap on prices during periods of emergency based on percentage increases from prices charged for the good or service in question prior to the emergency. These state statutes generally allow sellers to show that the price increases are the result of increased costs rather than simply changes in the marketplace. Multiple bills introduced in the 117th Congress would explicitly address price gouging for retail gasoline or other practices that might impact retail pricing during emergencies at the federal level. This has been the case in previous Congresses as well. Some of the legislation proposes limitations on pricing during emergencies similar to the state statutes, while others choose a different approach. Although there is no federal law aimed specifically at price gouging or at retail gasoline pricing, federal antitrust laws do forbid various types of anticompetitive business practices. For example, Section 1 of the Sherman Act prohibits unreasonable restraints of trade. It is possible that a group of gasoline retailers or other retailers collaborating to set prices unreasonably high during an emergency could violate Section 1 of the Sherman Act. In addition, federal statutes addressing monopolies and vertical integration may play a role in evaluating retail gasoline price changes.

Wang, Z., Wei, W., Luo, J., & Calderon, M. (2019). The effects of petroleum product price regulation on macroeconomic stability in China. Energy Policy, 132, 96-105. Retrieved October 2023, from https://doi.org/10.1016/j.enpol.2019.05.022

Key Conclusions:

1. Petroleum product price regulation in China can reduce oil price volatility and macroeconomic volatility under various regimes, but is more effective in the mild fluctuation regime.

Excerpt: China has undertaken measures to regulate the prices of petroleum products since 1998 in order to deal with the world oil price shocks on its macro-economy. However, the effects of price regulation are yet unknown, especially when the world oil price fluctuates in different regimes. The study first analyses the mechanisms of petroleum product price regulation (in the case of gasoline) and the crude oil-gasoline price fluctuation transmission, followed by the identification of regimes and their time intervals using regime-switching vector autoregressive model, and then estimates the effects of gasoline price regulation in reducing macroeconomic volatility. It is found that the world crude oil fluctuates in different regimes (the mild-fluctuation regime and the violent-fluctuation regime), the petroleum product price regulation can reduce oil price volatility and then macroeconomic volatility, but it is more effective in the mild-fluctuation regime. The findings present a deeper understanding of the stabilization effect of petroleum product price regulation on the macroeconomy, provide evidence for sustaining China's petroleum product price regulation for the purpose of macroeconomic stability, and offer policymakers new information for petroleum product pricing reforms.

Wolak, F., Nordhaus, R., & Shapiro, C. (2000). An Analysis of the June 2000 Price Spikes in the California ISO's Energy and Ancillary Service Markets. Market Surveillance Committee of the CAISO. Retrieved October 2023, from http://www.caiso.com/Documents/AttachmentG-Analysis-June2000PriceSpikesinCaliforniaISOsEnergyandAncillaryServicesMarkets.pdf

Summary: One of the main conclusions of this analysis was that price caps are of limited effectiveness in constraining market power during high demand periods. In May and June 2000, lowering the price cap from $750 to $250 would have decreased the State's market power index by about 20%. Monthly average prices during June 2000, when the price cap was $750/MWh, were lower than monthly energy prices in August of the same year when the price cap was $250/MWh. The California electricity market was a complex set of causes and effects; this state led analysis concluded price caps played a part.

Key Conclusions:

Price caps are of limited effectiveness in constraining market power during high electricity demand periods.

Excerpt: Given the current market design, price caps at $250 for real-time energy and all ancillary services other than Replacement Reserve do not effectively constrain the exercise of market power in the current California market. In fact, monthly average energy prices during June 2000, when the price cap was $750/MWh, were lower than monthly average energy prices during August 2000, when the price cap was $250/MWh. This result occurred despite the fact that virtually the same amount of energy was consumed in California during these two months. Market design changes must be implemented to alter the incentives faced by several classes of market participants.

Wolfram, C., Johnson, S., & Lukasz, R. (2022). The Price Cap on Russian Oil Exports Explained. Cambridge: Harvard Kennedy School Belfar Center for Science and International Affairs. Retrieved October 2023, from https://www.hks.harvard.edu/sites/default/files/centers/mrcbg/files/Brief_Russian%20Oil%20Price%20Cap_FINAL1.pdf

Summary: This policy brief gives an overview of the structure and hopeful impact of the price cap placed on Russian oil implemented by G7 countries and their allies, also referred to in literature as the coalition. A complete embargo on Russian oil in the European Union (EU) was set to take place between December 2022 and February 2023 as one of the sanctions put into place. The price cap on Russian oil reflects a novel approach to sanctions and the world is just beginning to understand its impacts on Russian oil revenues, geopolitical alignments, and oil trade. For example, in the months before it was implemented, reports suggested that the prospect of the price cap likely led Russia to offer crude oil at a cut-rate to importers in Indonesia.

Key Conclusions:

Report provides an explanation of the price cap policy and not an analysis of the effects of the price cap itself.

Excerpt: The price cap on Russian oil reflects a novel approach to sanctions and the world is just beginning to understand its impacts on Russian oil revenues, geopolitical alignments, and oil trade. For example, in the months before it was implemented, reports suggested that the prospect of the price cap

likely led Russia to offer crude oil at a cut-rate to importers in Indonesia. In addition, in the coming months, without a price cap, EU sanctions would likely take millions of barrels off the market daily and thereby put pressure on global prices. Oil traders, oil service providers, analysts, journalists, and sanctions officials will watch these developments carefully, but one thing is sure: economic incentives are powerful and given the large dollar volumes at play in the oil markets, it is particularly crucial to understand how they might shape decisions going forward.

Zhang, X.-B., Fei, Y., Zheng, Y., & Zhang, L. (2020). Price ceilings as focal points to reach price uniformity: Evidence from a Chinese gasoline market. Energy Economics, 92, 104950. Retrieved October 2023, from https://doi.org/10.1016/j.eneco.2020.104950

Excerpt: This paper studies the price uniformity in the Chinese gasoline market, using station-level data of Hohhot city, Inner Mongolia. We first document that the mode prices of the gasoline stations are consistent with the price ceilings set by the government, implying that the price ceiling regulation in the Chinese gasoline market may serve as a focal point for the gasoline stations to reach price uniformity. We corroborate the focal point hypothesis by providing evidence showing that some stations would "jump" to the ceilings as their prices approach the ceilings. Also, we find that local market structure, distance between stations, station capacity, market characteristics, and past pricing behavior could affect the probability of gas stations to price at the ceilings. Moreover, a higher price ceiling would reduce the probability that stations reach price uniformity. Our results provide another piece of evidence to the literature regarding the unintended effect of price ceiling regulation.

Key Conclusions:

1. The price ceiling for gasoline in China resulted in some stations increasing prices to the ceiling, so stations reach price uniformity.

2. A higher price ceiling would reduce the probability that stations reach price uniformity.

Zhang, Q., Hu, Y., Jiao, J., & Wang, S. (2023). Is refined oil price regulation a "shock absorber" for crude oil price shocks? Energy Policy, 173, 11369. Retrieved October 2023, from https://doi.org/10.1016/j.enpol.2022.113369

Excerpt: This paper explores whether the government's control of refined oil prices can slow down crude price shocks and play a "shock absorber" function. Using China's petroleum market as the study basis, it is found that the degree of price regulation of refined oil is very high before May 2009. A primary conclusion is that price regulation seriously hinders economic growth when the oil price falls. After May 2009, the degree of refined oil price control has been greatly reduced, and price control promotes the increase in industrial investment and GDP to a certain extent when oil prices rise and fall and plays the function of "shock absorber". Based on this study,

Key Conclusions:

1. Price regulation seriously hinders economic growth when the price of oil falls.

2. Continuing to implement refined oil price control measures is in line with China's short-term economic goals, and gradually releasing oil price control in the long run will form a market price reflecting the relationship between supply and demand.

continuing to implement refined oil price control measures is in line with China's short term economic goals, and gradually release oil price control in the long run will form a market price reflecting the relationship between supply and demand.

Zhang, Y., Nie, R., Shi, X., Qian, X., & Wang, K. (2019). Can energy-price regulations smooth price fluctuations? Evidence from China's coal sector. Energy Policy, 128, 125-135. Retrieved October 2023, from https://doi.org/10.1016/j.enpol.2018.12.051

Key Conclusions:

1. Lagging coal price and coal demand play a positive role in regulating coal prices.

2. Coal supply and marketization have significant negative effects on coal price fluctuations.

Excerpt: Due to the dominance of coal in China's energy mix, coal prices have always been a challenging part of pricing reform. By proposing a novel classification of coal pricing policies and introducing an expectation and forward-looking coefficient, the paper examines the relationship between coal price fluctuations and pricing policies using the generalized method of moments method. It shows that the lagging coal price and coal demand play a positive role in regulating coal prices, while coal supply and marketization have significantly negative effects on coal price fluctuations. The heterogeneous impacts of price policies are due to differences in market players' expectations, policy instruments and the methods of policy release. In addition, China's coal pricing policy portfolio from 2013 to 2016 exerted synergy effects on the restraint of coal price fluctuations. As the forward-looking coefficient was considerably low, the government's intervention behaviors were obviously biased towards ex post facto responses. The paper suggests short run and long run policies to advance marketization of coal prices amid the energy transition.

SECTION 4 Excise, Severance, and other Taxes

Boyd, R., & Uri, N. (1991). An assessment of the impacts of energy taxes. Resources and Energy, 13(4), 349-379. Retrieved October 2023, from https://doi.org/10.1016/0165-0572(91)90003-L

Excerpt: This paper examines the impact of an increase in the gasoline tax and the imposition of a tax on crude oil and natural gas on the United States economy. The analytical approach used in the analysis consists of a general equilibrium model composed of 12 producing sectors, 13 consuming sectors, and six household categories classified by income, and a government. The effects of a 10 cents per gallon and a 25 cents per gallon increase in the tax on gasoline and the impact of a $1.00 per barrel and a $5.00 per barrel tax on crude oil and natural gas on prices and quantities are examined. The results are revealing. For example, a 10 cents per gallon tax increase on gasoline would result in lower output by the producing sectors (by about $5.795 billion), lower consumption of goods and services (by about $5.910 billion), and a reduction in welfare (by about $7.607 billion). The government would realize an increase in revenue of about $4.970 billion. In the case of a $1.00 per barrel tax on crude oil and natural gas, there would be lower output by the producing sectors (by about $5.238 billion), lower consumption of goods and services (by about $5.093 billion), and a reduction in welfare (by about $4.992 billion). The government would realize an increase in revenue of $3.964 billion.

Key Conclusions:

1. A 10 cents per gallon tax increase on gasoline would result in lower output by producing sectors (by $5.7 billion), lower consumption of goods and services (by $5.9 billion), and reduce welfare (by $ 7.6 billion). The government would realize an increase in revenue of $44.9 billion.

Brown, J., Maniloff, P., & Manning, D. (2020). Spatially variable taxation and resource extraction: The impact of state oil taxes on drilling in the US. Journal of Environmental Economics and Management, 103, 102354. Retrieved October 2023, from https://doi.org/10.1016/j.jeem.2020.102354

Summary: There are two hypotheses asserted by this article. First, the article estimates how oil drilling responds to oil prices and severance taxes. It uses 30 years of spatially explicit data on drilling in 91 reservoirs across 17 oil-producing states to show that a one dollar decrease in tax leads to at least an 8 percent increase in wells drilled. This is larger than estimates of the effect of a change in price. Second, the article provides a theoretical basis for the finding that local tax changes have a larger effect than global price changes.

Key Conclusions:

1. A one dollar decrease in severance tax leads to an 8% increase in wells drilled.

2. Local tax changes have a larger effect on gas price than global price changes.

Excerpt: We estimate the responsiveness of nonrenewable resource firms to taxes on output using spatially explicit data from the oil sector in the United States. Using a model of resource firm capital allocation over space, we show that responses to spatially-varying taxes differ from responses to equivalent changes in the common output price. A larger response to tax rates occurs because the tax

change only affects the returns to drilling in a single state, whereas a price change affects both the returns to drilling in a state and the opportunity cost of not drilling in other states. Econometrically, we estimate the effect of severance taxes on oil drilling. We find that the response to a one dollar increase in tax per unit of production has an effect at least eight times as large as the effect of an equivalent decrease in output price. The tax response is inelastic, implying that an increase in state tax rate would increase revenue. We do not find evidence of spillovers between states in the local areas near state borders.

Chouinard, H., & Perloff, J. (2003). Incidence of federal and state gasoline taxes. Economic Letters, 83(1), 55-60. Retrieved October 2023, from https://doi.org/10.1016/j.econlet.2003.10.004

Summary: The premise of this article is to present a theoretical explanation of the expectations of federal and state gasoline tax incidence. The findings support the hypothesis that the consumer incidence of a state specific gasoline tax would exceed that of a federal tax, and that the state consumer incidence would fall with the share of national gasoline sales in a state.

Key Conclusions:

1. Consumer incidence of a state-specific gasoline tax would exceed that of a federal tax.

2. State consumer incidence would fall with the share of national gasoline sales in the state.

Excerpt: The federal specific gasoline tax falls equally on consumers and wholesalers; whereas state specific taxes fall almost entirely on consumers. The consumer incidence of state taxes is greater in states that use relatively little gasoline. Using a simple competitive model of tax incidence, we formulated two hypotheses: that the consumer incidence of a state specific gasoline tax would exceed that of a federal tax, and that the state consumer incidence would fall with the share of national gasoline sales in a state. These predictions were based on the result that the residual supply elasticity is greater for state than for federal taxes and greater for small than for large states.

Cox, J., & Wright, A. (1978). The Effects of Crude Oil Price Controls, Entitlements and Taxes on Refined Product Prices and Energy Independence. Land Economics, 54(1), 1-15. Retrieved October 2023, from https://www.jstor.org/stable/3146198

Summary: This article presents an economic analysis of domestic crude oil price controls and entitlements based on the Emergency Petroleum Allocation Act of November 1973 (from ’74 to ’75) and the energy Policy and Conservation Act of November 1975 (from ’75 to ‘79). The article first found that the entitlements program under the EPAA policy of 1974-75 achieved its stated objective for the equalization of refiners' average costs for crude oil. Second, the price controls and entitlements under both EPAA and EPCA have reduced the market prices of most refined products,

Key Conclusions:

1. The entitlements program under the EPAA policy of 1974 achieved its stated objective for equalization of refiners’ average costs for crude oil.

2. Price controls and entitlements reduced the market prices of most refined products, including gasoline.

3. Price controls and entitlments increased independence in some refined products and did not affect others.

including gasoline and (under EPCA) residual fuel oil. Third, the controls and entitlements have increased independence in some refined products and not affected it in others; the effect on independence in residual fuel oil is qualitatively indeterminate. Finally, comparing the phased decontrol, called for under the current EPCA policy with the Carter administration's proposed new crude oil price controls and "equalization tax," we find that the two policies would have similar price and independence effects on refined products.

Excerpt: In this paper we present an economic analysis of domestic crude oil price controls and entitlements that permits us to spell out their effects on both the "price at the pump" and oil independence. We analyze how the controls and entitlements change the total, average, and marginal crude oil costs of a representative refiner. The analysis is applied to both the "old oil/new oil" controls under the Emergency Petroleum Allocation Act (EPAA) of November 1973, and the current, more complicated "average- price" controls under the Energy Policy and Conservation Act (EPCA) of November 1975. In the process we point out several theoretical empirical flaws in previous work which have contributed to the confusion on the effects of crude oil price policy. Finally, we examine the new price controls and the "crude oil equalization tax" proposed as part of the Carter administration's "National Energy Plan."

Doyle Jr., J., & Samphantharak, K. (2008). $2.00 Gas! Studying the effects of a gas tax moratorium. Journal of Public Economics, 92(3-4), 869-884. Retrieved October 2023, from https://doi.org/10.1016/j.jpubeco.2007.05.011

Key Conclusions:

Some evidence suggests that short-run pass-through estimates are smaller near state boards, with tax reinstatements associated with relatively higher prices up to an hour's drive into neighboring states.

Excerpt: There are surprisingly few estimates of the effects of sales taxes on retail prices, especially at the firm level. We consider the temporary suspension, and subsequent reinstatement, of the gasoline sales tax in Illinois and Indiana following a price spike in 2000. Earlier laws set the timing of the reinstatements, providing plausibly exogenous changes in the tax rates. Using a unique dataset of daily prices at the gas-station level, 70% of the tax suspension is passed on to consumers in the form of lower prices, while 80–100% of the tax reinstatements are passed on to consumers. Some evidence suggests that these short-run pass-through estimates are smaller near the state borders, with the tax reinstatements associated with relatively higher prices up to an hour's drive into neighboring states.

Groth, C., & Schou, P. (2007). Growth and non-renewable resources: The different roles of captial and resource taxes. *Journal of Environmental Economics and Management, 53*, 80-98. doi:https://doi.org/10.1016/j.jeem.2006.07.004

Key Conclusions:

When non-renewable resources are a necessary input in the sector where growth is ultimately generated, interest income taxes and investment subsidies can no longer affect the long-run growth rate.

Excerpt: We contrast effects of taxing non-renewable resources with the effects of traditional capital taxes and investment subsidies in an endogenous growth model. In a simple framework we demonstrate that when non-

renewable resources are a necessary input in the sector where growth is ultimately generated, interest income taxes and investment subsidies can no longer affect the long-run growth rate, whereas resource tax instruments are decisive for growth. The results stand out both against observations in the literature from the 1970's on non-renewable resources and taxation—observations which were not based on general equilibrium considerations—and against the general view in the newer literature on taxes and endogenous growth which ignores the role of non-renewable resources in the "growth engine".

Kunce, M., Gerking, S., Morgan, W., & Maddux, R. (2003). State Taxation, Exploration, and Production in the U.S. Oil Industry. Journal of Regional Science, 43(4), 749-770. Retrieved October 2023, from https://doi.org/10.1111/j.0022-4146.2003.00319.x

Summary: This paper makes use of a standard theoretical model of natural resource supply (Pindyck, 1978) to simulate effects of changes in state production (severance) taxes on the level and timing of exploration and production in the Wyoming oil industry. Comparative estimates also are presented for California. The central conclusion of this paper is that oil production is quite inelastic with respect to changes in state severance taxes. While the price elasticity of production is estimated to be close to unity for Wyoming and California, the article states comparatively large percentage tax changes result in only comparatively small changes in the net price of oil seen by operators.

Key Conclusions:

Comparatively large percentage tax changes result in only comparatively small changes in the net price of oil seen by operators.

Excerpt: How do firms in nonrenewable resource industries respond to changes in state taxes? This paper presents simulations of changes in state production (severance) tax policy on the timing of exploration and output in Wyoming. The framework developed allows for interactions between taxes levied by different levels of government. Results suggest that oil production is highly inelastic with respect to changes in production taxes. Policy implications suggest that increases in production taxes on oil risk little loss in future production. The extent to which these results may generalize to other oils.

Kunce, M. (2003). Effectiveness of Severance Tax Incentives in the U.S. Oil Industry. International Tax and Public Finance, 10, 565-587. Retrieved October 2023, from https://link.springer.com/article/10.1023/A:1026122323810#citeas

Excerpt: This paper develops a dynamic empirical framework that can be used to test the effectiveness of state-level severance tax incentives in the U.S. oil industry. The framework embeds U.S. state-level panel data estimates into Pindyck's (1978) widely received theoretical model of exhaustible resource supply and can be applied to any of 20 states that produce significant quantities of oil. The model allows for interactions between taxes levied by different levels of government and for the first time addresses potential interstate differences in exploration costs, extraction costs, and reserve additions. In general, results show that severance tax

Key Conclusions:

Severance tax incentives (in the form of tax rate reductions) substantially reduce state tax revenue collected but yield moderate to little change in oil drilling and production activity.

incentives (in the form of tax rate reductions) substantially reduce state tax revenue collected but yield moderate to little change in oil drilling and production activity. This outcome suggests that states should be wary of arguments asserting that large swings in oil field activity can be obtained from changes in severance tax rates.

Lin, C., & Prince, L. (2009). The optimal gas tax for California. Energy Policy, 37(12), 5173-5183. Retrieved October 2023, from https://doi.org/10.1016/j.enpol.2009.07.063

Excerpt: This paper calculates the optimal gasoline tax for the state of California. According to our analysis, the optimal gasoline tax in California is $1.37/gal, which is over three times the current California tax when excluding sales taxes. The Pigovian tax is the largest part of this tax, comprising $0.85/gal. Of this, the congestion externality is taxed the most heavily, at $0.27, followed by oil security, accident externalities, local air pollution, and finally global climate change. The other major component, a Ramsey tax, comprises a full $0.52 of this tax, reflecting the efficiency in raising revenues from a tax on gasoline consumption due to the inelastic demand of this consumption good.

Key Conclusions:

The optimal gasoline tax in California is $1.37 per gallon, which is over three times the current California tax when excluding sales taxes.

These predictions are confirmed by our empirical study. The consumer incidence is half for the federal tax but nearly one for the average size state. The consumer incidence is much smaller in the larger states than in smaller ones.

Lindholt, L. (2021). Effects of higher required rates of return on the tax take in an oil province. Energy Economics, 98, 105265. Retrieved October 2023, from https://doi.org/10.1016/j.eneco.2021.105265

Excerpt: For different reasons the oil companies might apply higher required rates of return than they did some years ago, and this has consequences for investments and tax revenue in oil provinces. By applying various required rates of return as well as various oil prices, this study derives future Norwegian tax revenue during 2018–2050 by using a partial equilibrium model for the global oil market. An important contribution is a detailed modelling of the supply side including the complete petroleum tax system. The model explicitly accounts for reserves, development and production. Both investment in new reserves and production are profit driven. With rising required rates of return fewer of the high cost reserves become profitable to develop and investments decline. Intuitively one would think that lower activity and investments will lead to lower tax income for the government. However, because the government in practice carries a large fraction of the investments because of favorable possibilities for deductions of capital expenses for the oil companies, less investment in a period increases the tax base and the tax income. The initial effect is offset by a subsequent reduction in production which has a negative effect on future taxes. The result is that increasing required rates of

Key Conclusions:

1. Gradually lower oil production has a negative effect on tax revenue.

2. Rising required rate of return will generally lead to small variations in tax take.

return will lead to small variations in net present value of total tax revenue. Further, with lower oil prices, tax take increases significantly when required rates of return rise.

Metcalf, G. (2016). The Impact of Removing Tax Preferences for U.S. Oil and Gas Production. Council On Foreign Relations. Retrieved October 2023, from https://www.jstor.org/stable/resrep16758

Key Conclusions:

The estimated effects of removing the preferences on energy prices, domestic production and global consumption suggests that none of the above preferences directly and materially improve U.S. energy security or mitigate climate change. If eliminated, they could enhance U.S. influence to advocate for international climate action and generate fiscal savings.

Excerpt: Policymakers considering this issue need a thorough understanding of the potential consequences of tax reform in the new energy context. Unfortunately, existing studies either fail to seriously analyze the economic effects of removing tax preferences or are not transparent or publicly available.

To fill the gap, this study models firm behavior in response to the potential loss of each of the three major tax preferences, which collectively cost the government roughly $4 billion annually. It finds that domestic oil drilling activity could decline by roughly 9 percent, and domestic gas drilling activity could decline by roughly 11 percent, depending on natural gas prices. These declines in drilling would in turn lead to a long-run decline in domestic oil and gas production. As a result, the global price of oil could rise by 1 percent by 2030 and domestic production could drop 5 percent; global consumption could fall by less than 1 percent. Domestic natural gas prices, meanwhile, could rise between 7 and 10 percent, and both domestic production and consumption of natural gas could fall between 3 and 4 percent.

These results make it possible to assess each tax preference against three policy objectives: improving U.S. energy security, mitigating climate change, and saving taxpayer dollars. The estimated effects of removing the preferences on energy prices, domestic production, and global consumption suggest that none of the three preferences directly and materially improve U.S. energy security or mitigate climate change. If eliminated, however, they could enhance U.S. influence to advocate for international climate action and generate fiscal savings.

Madowitz, M., & Novan, K. (2013). Gasoline taxes and revenue volatility: An application to California. Energy Policy, 59, 663-673. Retrieved October 2023, from https://doi.org/10.1016/j.enpol.2013.04.018

Key Conclusions:

1. Implementation of 2010's Gas Tax Swap reduced retail fuel price volatility and tax revenue volatility.

2. Greater benefits can be achieved by going beyond the tax swap and eliminating the gasoline sales tax entirely.

Excerpt: This paper examines how applying different combinations of excise and sales taxes on motor fuels impacts the volatility of retail fuel prices and tax revenues. Two features of gasoline and diesel markets make the choice of tax mechanism a unique problem. First, prices are very volatile. Second, demand for motor fuels is extremely inelastic. As a result, fuel expenditures vary substantially over time. Tying state revenues to these expenditures, as is the case with a sales tax, results in a volatile stream of revenue which imposes real costs on agents in an economy. On July 1,

2010, California enacted Assembly Bill x8-6, the "Gas Tax Swap", increasing the excise tax and decreasing the sales tax on gasoline purchases. While the initial motivation behind the revenue neutral swap was to provide the state with greater flexibility within its budget, we highlight that this change has two potentially overlooked benefits; it reduces retail fuel price volatility and tax revenue volatility. Simulating the monthly fuel prices and tax revenues under alternative tax policies, we quantify the potential reductions in revenue volatility. The results reveal that greater benefits can be achieved by going beyond the tax swap and eliminating the gasoline sales tax entirely.

Provornaya , I., Filimonova, I., Nemov, V., Komarova, A., & Dzyuba, Y. (2020). Features of the Petroleum Products Pricing in Russia, in the USA, and Saudi Arabia. Energy Reports, 6(6), 514-522. Retrieved October 2023, from https://doi.org/10.1016/j.egyr.2020.09.029

Summary: This analysis, using a data range from 2010 to 2018, identified factors that affect the pricing of petroleum products in three different regions of the world. In the United States, the price of petroleum is closely tied to the cost of oil production.

Excerpt: According to this research, we can conclude that: the main factor affecting the cost structure of gasoline in 2010-2018 in Russia is the tax burden, which currently accounts for 62.8 % of the oil product's cost; the price of petroleum products in the United States is dependent on the cost of oil production; and the prices of oil products in the domestic market of Saudi Arabia currently depend on the cost of oil production and refining costs.

Key Conclusions:

1. The main factor affecting the cost structure of gasoline in 2010-2018 in Russia is the tax burden.

2. The price of petroleum products in the U.S. dependent on the cost of oil production.

3. The prices of oil products in the domestic market of Saudi Arabia currently depend on the cost of oil production and refining costs.

Reimer, M., Guettabi, M., & Tanaka, A.-L. (2017). Short-run impacts of a severance tax change: Evidence from Alaska. Energy Policy, 107, 448-458. Retrieved October 2023, from https://doi.org/10.1016/j.enpol.2017.05.014

Excerpt: Energy states face a fundamental tradeoff when increasing severance tax rates: potential gains in tax revenues versus potential losses in exploration, development, and production activity. Despite the significant implications of this tradeoff, there is very little empirical evidence on the short-run responsiveness of extraction-related activities to changes in severance taxes. We conduct a comparative case study to evaluate the short-term impact of a severance tax increase on oil-related activities and development in Alaska. In 2007, the introduction of "Alaska's Clear and Equitable Share" (ACES) more than tripled the tax liability for much of the oil already under production in Alaska. We construct a synthetic Alaska from a set of U.S. energy states, with the purpose of estimating the counterfactual evolution of oil production, exploration and development wells, gross state product, and employment, in the absence of ACES.

Key Conclusions:

1. There is little difference in Alaska oil-related activity and the control unit after tax rate increase.

2. Severance taxes had minimal effects on oil-related development in the short run.

Overall, our results indicate that there is no discernible difference in the outcome variables of interest between Alaska and its synthetic control after the implementation of ACES, suggesting that ACES had a minimal effect on Alaskan oil-related activity and development in the short run.

Rogers, R. (2003). The Effect of the Energy Policy and Conservation Act (EPCA) Regulation on Petroleum Product Prices, 19776-1981. The Energy Journal, 24(2), 63-93. Retrieved October 2023, from https://www.jstor.org/stable/41322990

Key Conclusions:

In most petroleum product markets the Energy Policy and Conservation Act regulations either raised prices or left them unchanged.

Summary: The premise of this article is to determine the impact of the Energy Policy and Conservation Act and its regulation on petroleum prices. “This paper focuses on two issues: first which of the two theories, the pure Kalt hypothesis or the inefficiency hypothesis, is the most consistent with the results, and second what do the results imply for policy”. “Essentially, these results imply that determining the Impacts of complicated regulatory systems is problematic.” “This paper suggests that in most petroleum product markets these regulations either raised prices or at best left them unchanged.”

Excerpt: Recent events have led to renewed interest in the petroleum industry. Over the years, the American government has imposed a number of regulatory regimes on this industry. One of the most interesting was the price regulation and product allocation system set in place by the Energy Policy and Conservation Act of 1975 (EPCA) which lasted from 1976 until 1981. To determine the impact of this regime, supply and demand equations are used to derive a reduced form model to test whether the other-things-equal prices of petroleum products were significantly lower or higher during the EPCA period than during the comparatively unregulated 1980s. With some exceptions, the results indicate that the EPCA regulation system either raised prices or had no effect. These results should lead to caution on the part of policy-makers. Even the immediate goal of the policy, lowering prices, did not usually occur.

SECTION 5 Windfall Profits Taxes

Knoll, M. (1987). The Crude Oil Windfall Profit Tax Act of 1980: An Economic Analysis of Its Effect on Domestic Crude Oil Production. Resources and Energy, 9(2), 163-185. Retrieved October 2023, from https://doi.org/10.1016/0165-0572(87)90016-8

Excerpt: In this paper, a framework is developed to examine the effects of the Crude Oil Windfall Profit Tax Act of 1980 on domestic production of crude oil that specifically takes into account both the pre-existing system of price controls the Act replaced and the temporary nature of the tax. The Act established three categories of oil, called tiers, which are taxed at different rates on the difference between the removal price and an adjusted base price. Tiers two and three comprise most of the oil that was not controlled prior to 1980, whereas tier one comprises essentially all oil that was subject to price controls before 1980. Assuming that the market for oil is competitive, and given reasonable assumptions about extraction costs, the Act will increase the production of crude oil from tier one above the level that would have been produced had the price controls remained in effect for the same length of time, although less than the socially optimal amount of oil will be extracted from tier one while the tax is in effect. Because the tax is temporary — it is scheduled to expire by 30 September 1993 at the latest — production after the tax is phased out is relatively more attractive than it would otherwise be. Thus, before it is phased out, the Act will reduce production of oil from tiers two and three below the socially optimal level of extraction.

Key Conclusions:

1. The Crude Oil Windfall Profit Tax increased crude oil production above levels that would have been produced had the price controls remains in effects for the same length of time, although less than the socially-optimal amount of oil was extracted while the tax was in effect.

2. Because the windfall tax is temporary, production after the tax is phased out is relatively more attractive.

Lazzari, S. (2006). The Crude Oil Windfall Profit Tax of the 1980s: Implications for Current Energy Policy. Congressional Research Service. Retrieved October 2023, from https://liheapch.acf.hhs.gov/pubs/oilwindfall.pdf

Excerpt: From 1980 to 1988, the Windfall Profit Tax may have reduced domestic oil production anywhere from 1.2% to 8.0% (320 to 1,269 million barrels). Due to the deductibility of the Windfall Profit Tax against the income tax, cumulative net Windfall Profit Tax revenues were about $38 billion, significantly less than the $175 billion projected. Dependence on imported oil grew from between 3% and 13%. The tax was repealed in 1988 because (1) it was an administrative burden to the Internal Revenue Service, (2) it was a compliance burden to the oil industry, (3) due to low oil prices, the tax was

Key Conclusions:

1. The windfall profit tax reduced domestic supply below what it would have been without the tax.

2. The Windfall Profit Tax was a excise tax on oil produced domestically in the United States; such taxes increase marginal production costs, and profit maximizing firms respond to the tax by reducing output and raising prices.

generating little or no revenues in 1987 and 1988, and (4) it made the United States more dependent on foreign oil.

A windfall profit tax could have several adverse economic effects. If imposed as an excise tax, the Windfall Profit Tax would increase marginal production costs and be expected to reduce domestic oil production and increase the level of oil imports, which today is at nearly 60% of demand. Crude prices would not tend to increase. Some have proposed an excise tax on both domestically produced and imported oil as a way of mitigating the negative effects on petroleum import dependence. Such a broad-based Windfall Profit Tax would tend to reduce import dependence, but it would lead to higher crude oil prices and likely to oil industry profits, potentially undermining its original goals. The Windfall Profit Tax had the effect of reducing the domestic supply of crude oil below what the supply would have been without the tax. This increased the demand for imported oil and made the United States more dependent upon foreign oil as compared with dependence without a Windfall Profit Tax. Nevertheless, oil price decontrol, by increasing prices should have increased domestic production and made the U.S. less import dependent. And further, while a Windfall Profit Tax made the U.S. more dependent on imported oil, decontrol and a Windfall Profit Tax made the U.S. less dependent than controls without Windfall Profit Tax. The Windfall Profit Tax was a excise tax on oil produced domestically in the United States; it was not imposed on imported oil. In economic terms, such taxes increase marginal production costs, and profit maximizing firms respond to the tax by reducing output and raising prices.

McDonald, S. (1981). The Incidence and Effects of the Crude Oil Windfall Profit Tax. Natural Resources Journal, 21(2), 331-339. Retrieved October 2023, from https://www.jstor.org/stable/24882428

Key Conclusions:

1. Domestic demand for domestically produced oil is perfectly elastic at the world price determined by OPEC, which is unlikely to be significantly affected by the tax.

2. The burden of the tax will be borne entirely by the oil operators and landowners.

Excerpt: The crude oil windfall profit tax, effective February 29, 1980, is officially described as "a temporary excise, or severance, tax applying to taxable crude oil produced in the United States…" From this description some may infer that the burden of the tax will be borne by domestic consumers of oil in the form of higher prices, with the usual effect – small in this instance, due to an inelastic demand – of reduced domestic production. It is the purpose of this article to show that such an inference is unjustified. In fact, the domestic demand for domestically produced oil is perfectly elastic at the world price determined by OPEC, a price which, in our judgement, is unlikely to be significantly affected by the tax. If this judgment is correct, the burden of the tax will be borne entirely by the oil operators and landowners, with the landowners' share increasing as time passes. Furthermore, the effect on domestic output will be substantial, due to the perfectly elastic effective demand. Domestic oil price deregulation, which is supposed to be completed by October 1, 1981, is resulting in a sudden and large rise in price to the world level. It should be remembered in what follows that this increase was the occasion for the windfall profits tax.

Mead, W., & Deacon, R. (1979). Proposed Windfall Profits Tax on Crude Oil: Some Major Errors In Estimation. The Journal of Energy and Development, 5(1), 32-43. Retrieved October 2023, from http://www.jstor.org/stable/24806972

Excerpt: In the long run, as the oil industry moves toward a new equilibrium position, the increase in crude oil costs to refiners will reduce domestic supplies of refined products and lead to price increases.

Key Conclusions:

The increase in crude oil costs to refiners will reduce domestic supplies of refined products and lead to price increases.

The proposed windfall profit tax is not structured to produce tax revenue as a function of profit. Rather, it is an excise tax. Because the tax is to be computed on the difference between uncontrolled crude oil selling prices and three arbitrarily determined "base prices," it will generate the desired amount of tax revenue even though decontrol profits are substantially less than the $395 billion estimated by the Administration. (Mead & Deacon, 1979)

Pirog, R., & Sherlock, M. (2011). Oil Industry Financial Performance and the Windfall Profits Tax. Congressional Research Service. Retrieved October 2023, from https://crsreports.congress.gov/product/pdf/RL/RL34689

Excerpt: Since the 109th Congress, numerous bills have been introduced seeking to impose a windfall profits tax on oil. An excise-tax based windfall profits tax would tax only domestic production and, like the one in effect from 1980-1988, would increase marginal oil production costs. Theoretically, such a policy could reduce domestic oil supply, which could raise petroleum imports, making the United States more dependent on foreign oil, undermining goals of energy independence and energy security. By contrast, an income-tax based WPT would likely be more economically neutral (less economic distortion) in the short-run. Sizeable tax revenues could potentially be raised without reducing domestic oil supplies. Neither the excise-tax based nor income-tax based windfall profits tax are expected to have significant price effects. Neither tax would increase the price of crude oil, which means that refined petroleum product prices, such as pump prices for gasoline, would likely not increase. In lieu of these two types of windfall products tax, an administratively simple way of increasing the tax burden on the oil industry, and therefore recouping some of any excess or windfall profits, particularly from major integrated producers, would be to raise the effective corporate tax rate. One option would be repealing or reducing the domestic manufacturing activities deduction under IRC § 199. The 112th Congress voted on this measure as part of the Close Big Oil Tax Loopholes Act (S. 940). Going forward, in the context of deficit reduction, the 112th Congress may continue evaluating various methods for increasing taxes on the oil and gas industry to address concerns surrounding possible windfall profits.

Key Conclusions:

1. Neither the excise-tax based nor income-tax based windfall profit tax are expected to have significant price effects.

2. Neither tax would increase the price of crude oil, which means that refined petroleum product prices would likely not increase.

Rao, N. (2018). Taxes and U.S. Oil Production: Evidence from California and the Windfall Profit Tax. American Economic Journal: Economic Policy, 10(4), 268-301. Retrieved October 2023, from https://www.jstor.org/stable/26529061

Excerpt: The recent boom in US oil production has prompted debates on levying new taxes on oil. This paper uses new well-level production data and price variation from federal oil taxes and price controls to assess how taxes affected production. After-tax price elasticity estimates range between 0.295 (0.038) and 0.371 (0.025). Response along the shut-in margin is minimal. There is no evidence of spatial shifting of production to minimize tax liabilities. Taken together, the results suggest that taxes reduced domestic production in the 1980s, and the response largely came from wells that continued to pump oil, but at a reduced rate.

Key Conclusions:

Taxes reduced domestic production in the 1980s, and the response largely came from wells that continued to pump oil, but at a reduced rate.

Sherlock, M., Gravelle, J. 2022. Crude Oil Windfall Profits Taxes: Background and Policy Considerations. Congressional Research Service. Retrieved October 2023 from, https://sgp.fas.org/crs/misc/IF12064.pdf

Excerpt: This 2022 policy brief explains the two tax approaches: income tax and excise tax. An excise tax on domestic production, like the windfall profits tax of the 1980s, would tend to reduce domestic production, although effects are likely to be moderated by several factors. If the tax were only imposed on domestic production, the decline in domestic production could lead to increased imports. When oil prices are determined in global markets, an excise tax on domestic producers would likely reduce the price producers receive (i.e., be borne by firms that are producers), and not be passed forward to refiners or petroleum consumers. If, however, changes in domestic production contribute to reduced global market supply, there could be consumer price effects. If the tax is temporary, it would be unlikely to affect longer-term drilling or the number of wells in production (although it may cause producers to pause drilling activity or shift production to a later time period).

Key Conclusions:

1. When oil prices are determined in global markets, an excise tax on domestic producers would likely reduce the price producers receive, and not be passed forward to refiners or petroleum consumers.

2. If changes in domestic production contribute to reduced global market supply, there could be consumer price effects.

3. If the tax is temporary, it would be unlikely to affect longer-term drilling or the number of wells in production.

SECTION 6 Domestic GDP & Investment Impacts

Bogmans, C., Pescatori, A., & Prifti, E. (2023). The Impact of Climate Policy on Oil and Gas Investment: Evidence from Firm-Level Data. International Monetary Fund. Retrieved October 2023, from https://www.imf.org/en/Publications/WP/Issues/2023/06/30/The-Impact-of-Climate-Policy-on-Oil-and-Gas-Investment-Evidence-from-Firm-Level-Data-535491

Summary: A perceived increase in the exposure of oil and gas firms to climate policies has led to a 6.5 percent global decline of their capital expenditures between 2016 to 2019 (i.e., a -1.45 percent annual rate), after controlling for oil market tightness (i.e., spot oil prices), global factors, and other typical firm-level control variables. The investment gap is even more significant relative to the non-energy control group.

Key Conclusions:

A perceived increase in the exposure of oil and gas firms to climate policies has led to a 6.5% global decline of their capital expenditures between 2016 and 2019.

Excerpt: Using a text-based firm-level measure of climate policy exposure, we show that climate policies have led to a global decline of 6.5 percent in investment among publicly traded oil and gas companies between 2015 and 2019, with European companies experiencing the most significant impact. Similarly, climate policy uncertainty has also had a negative impact. Results support the Neoclassical investment model, which predicts a pre-emptive cut in investment in reaction to downward shifts in prospective demand, in contrast with the "green paradox" that predicts an increase in current investment to shift production toward the present.

Brown, P., Pirog, R., Vann, A., Fergusson, I., Ratner, M., & Ramseur, J. (2014). U.S. Crude Oil Export Policy: Background and Considerations. Congressional Research Service. Retrieved October 2023, from https://crsreports.congress.gov/product/pdf/R/R43442

Summary: The appendix of this crude oil export policy research report from the Congressional Research Service compares four separate reports on crude oil export policy economic impact studies. The general findings are that (1) U.S. domestic and international oil prices will likely converge, (2) there is expected to be downward pressure on U.S. gasoline and petroleum product prices, and (3) U.S. oil production and exports are expected to increase, along with economic activity needed to support this increase. The magnitude of these effects varies, in some cases considerably. This also comes with a caveat that it is "quite difficult to assess, … how the Organization of Petroleum Exporting Countries (OPEC) might respond (i.e., maintaining production and accepting potentially lower prices or reducing production levels as a means of possibly maintaining oil price levels) to additional crude oil in the international oil market."

Key Conclusions:

1. U.S. domestic and international oil prices will likely converge.

2. There is expected to be downward pressure on U.S. gasoline and petroleum product prices.

3. U.S. oil production and exports are expected to increase along with economic activity.

Excerpt: The effect on domestic gasoline prices is a major consideration, among several, associated with allowing crude oil exports. Commercial studies and federal government analysis suggests that gasoline prices are correlated to international crude oil prices—since gasoline and other petroleum products can be exported without restriction—and U.S. gasoline prices could possibly decrease if crude oil exports were allowed. However, the projected decreases—assuming ~$100 per barrel crude oil prices—are relatively small and range from $0.02 to $0.12 per gallon.

Brueckner, M., Hong, H., & Vespignani, J. (2023). Regulation of Petrol and Diesel Prices and their Effects on GDP Growth: Evidence from China. Tasmanian School of Business and Economics. Retrieved October 2023, from https://www.utas.edu.au/__data/assets/pdf_file/0010/1649206/2023-02_Brueckner_Hong_Vespignani.pdf

Excerpt: This paper presents estimates of the effects that government regulation of diesel and petrol prices has on GDP growth. Theory suggests that when supply curves are convex, a decrease in the regulatory price has a larger effect on output than a tantamount increase in the regulatory price. Motivated by this theoretical insight, we specify VAR models with asymmetric effects of positive and negative changes in the regulatory prices of diesel and petrol. We estimate the VAR models on quarterly data from China's national accounts statistics during the period Q1 1998 to Q4 2018. Our main findings are that: (i) negative growth rates of regulatory diesel and petrol prices significantly reduce GDP growth; (ii) positive growth rates of regulatory diesel and petrol prices have a positive, but quantitatively small and statistically insignificant effect on GDP growth.

Key Conclusions:

1. Negative growth rates of regulatory diesel and petrol prices in China significantly reduced GDP growth.

2. Positive growth rates of regulatory diesel and petrol prices in China have a positive but quantitatively small and statistically insignificant effect on GDP growth.

Carlstrom, C., & Fuerst, T. (2006). Oil Prices, Monetary Policy, and Counterfactual Experiments. Journal of Money, Credit and Banking, 38(7), 1945-1958. Retrieved October 2023, from https://www.jstor.org/stable/3838971

Summary: This article addresses the premise that recessions are associated with both rising oil prices and increases in the federal funds rate, asking the question if recessions are caused by the spikes in oil [prices] or by the sharp tightening of monetary policy. How much of GDP decline, with respect to oil price increases, is due to oil [prices] and how much is due to the fact that interest rates also tend to rise. This paper responds to a previous paper (BGW 1997, 2004) that "a 10% oil price increase is associated with a 150 basis point increase in the funds rate and a peak output decline of 0.7%" The conclusion of the BGW paper finds that "approximately half of this decline is due to oil [prices] and approximately half is due to the increase in funds rate." The conclusion of this paper addresses the methods in which the BGW article assessed "neutral policy" and determined that

Key Conclusions:

All of the output decline associated with oil prices is due to oil and none of the decline is attributable to monetary policy.

"all of the output decline associated with oil prices is due to oil and none of the decline is attributable to monetary policy."

Excerpt: Recessions are associated with both rising oil prices and increases in the federal funds rate. Are recessions caused by the spikes in oil prices or by the sharp tightening of monetary policy? This paper discusses the difficulties in disentangling these two effects.

Gugler, K., & Liebensteiner, M. (2019). Productivity growth and incentive regulation in Austria's gas distribution. Energy Policy, 134, 110952. Retrieved October 2023, from https://doi.org/10.1016/j.enpol.2019.110952

Key Conclusions:

The projected rate of productivity growth is the critical determinant of the price cap in incentive regulation, but regulatory authorities generally lack sophisticated industry total factor productivity studies to set an optimal cap.

Excerpt: The projected rate of productivity growth is the critical determinant of the price cap in incentive regulation. However, the regulatory authorities generally lack sophisticated industry total factor productivity studies to set an optimal cap. We thus estimate productivity growth in the Austrian gas distribution sector in a translog cost function framework. A key feature is our unique panel database on costs and outputs of regulated utilities for the period 2002–2013, covering six years prior and during incentive regulation as introduced in 2008. We find a modest TFP growth rate in the early sample years, followed by a decline to zero or even slightly negative rates in recent years. We also find a significant potential for returns to scale, which is left unexploited, indicating that utilities could significantly save on costs by merging. As essential investments have already been undertaken in the past, opportunities for technological progress seem to be limited in recent years.

Oladosu, G. L.-M. (2022, November). Sensitivity of the U.S. economy to oil prices controlling for domestic production and imports. Energy Economics, 115, 1-12. Retrieved October 2023, from https://doi.org/10.1016/j.eneco.2022.106355

Key Conclusions:

The risks of large up and down movements in global oil prices remain significant, an asymmetric ARDL model is used to evaluate U.S. GDP sensitivity to oil price shocks, the analysis controls for important U.S. oil market and macroeconomic variables, and oil price shocks are found to have significant long-run impacts on the U.S. GDP.

Excerpt: This article investigates the sensitivity of U.S. economic performance to oil price changes, accounting for changes in the domestic petroleum supply-demand balance over the last decade. A non-linear (asymmetric) autoregressive distributed lag model is used to estimate the U.S. GDP elasticity with respect to the oil price, controlling for oil production, consumption and imports, and macroeconomic variables. The positive and negative components of the oil price both have statistically significant long-run impacts on the real U.S. GDP. The parameter estimates imply that a 1% positive and permanent oil price shock, all else the same, would have a long-run impact of −0.045% on the U.S. economy (an elasticity of −0.045), but short-run parameters on the positive oil price terms are not significant at the 10% level. The long-run parameter on the negative oil price component term implies an elasticity of −0.034. Thus, controlling for domestic

U.S. oil production and oil trade, the long-run oil price elasticity of the U.S. GDP remains within the range of estimates from previous studies. The results also show that domestic oil production and consumption have short-run impacts on the U.S. GDP. The potential extent of interactions among these variables, and implications for the net economic impacts, under an oil price shock are subjects of future research." Primary conclusions established: risks of large up and down movements in global oil prices remain significant, an asymmetric ARDL model is used to evaluate U.S. GDP sensitivity to oil price shocks, the analysis controls for important U.S. oil market and macroeconomic variables, and oil price shocks are found to have significant long-run impacts on the U.S. GDP.

Smith, R., Bradley, M., & Jarrell, G. (1986). Studying firm-specific effects of regulation with stock market data: an application to oil price regulation. *Rand Journal of Economics, 17*(4), 467-489. doi: https://doi.org/10.2307/2555476

Key Conclusions:

1. U.S. oil production and refiner access to price-controlled crude oil were sources of capital gains.

2. U.S. and foreign refining were sources of capital losses.

Excerpt: Regulations are often introduced and reformed in response to unanticipated changes in market forces. In late 1973, for example, OPEC quadrupled the world price of oil and U.S. policy makers responded by imposing oil price regulation. Such events pose a fundamental problem of interpretation for studies that use stock prices to identify the economic effects of regulation. What portion of the capital gains or losses experienced by investors in regulated firms is due to regulation and what portion is due to unanticipated economic events? To answer these questions we use macroeconomic theory to derive hypotheses about how the capital gains and losses created by OPEC pricing and U.S. regulatory policies are related to the underlying characteristics of petroleum firms. We test the hypotheses by including a model of firm- specific abnormal returns in the standard market models of common stock returns earned by investors in petroleum firms. The results indicate that U.S. oil production and refiner access to price-controlled crude oil were sources of capital gains and that U.S. and foreign refining were sources of capital losses.

Zhang, Y.-J., & Yan, X.-X. (2020). The impact of US economic policy uncertainty on WTI crude oil returns in different time and frequency domains. International Review of Economics and Finance, 69, 750-768. Retrieved October 2023, from https://doi.org/10.1016/j.iref.2020.04.001

Key Conclusions:

Almost all the U.S. economic policy uncertainty indices and West Texas Intermediate returns are negatively correlated during the sample period. Regulation policy uncertainty is one of the strongest indicators of negative West Texas Intermediate returns based on the mean impact.

Excerpt: This paper explores the potential impact of economic policy uncertainty on crude oil prices using the DCC-GARCH model to measure the dynamic conditional correlation between U.S. economic policy uncertainty and West Texas Intermediate crude oil returns based on historical data from February 1985 to May 2019, and then employs the network connectedness method to further analyze the impact of various U.S. economic policy uncertainty indices on West Texas Intermediate

returns over time and frequency. The empirical results show that almost all the U.S. economic policy uncertainty indices and West Texas Intermediate returns are negatively correlated during the sample period. At frequency bands between 1-6 months, and up to 12 months, all the economic policy uncertainty indices may significantly affect West Texas Intermediate returns. Regulation policy uncertainty is one of the strongest indicators of negative West Texas Intermediate returns based on the mean impact.