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The Politics of the Gas Tax: Exploring State Politics and the Oil Industry

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Abstract

The gas tax in the United States has significant implications for the environment and for infrastructure funding. In contrast to federal inaction for over two decades, many states have recently increased their own state-level gas taxes. This study explores the politics behind state-level policymaking on the gas tax, and looks at why some states act and others do not. This could additionally help advocates better understand federal inaction. To do so, this study performs a regression analysis to determine what factors are most important in determining whether a state has increased their gas tax in recent years. This study finds that the greater presence the oil industry has in a state, the less likely it is to increase its gas tax. Additionally, it finds that the lower a state's tax burden, the less likely it is to increase taxes with an increase in the gas tax. Policymakers and advocates interested in increasing the gas tax should understand both the oil industry and the tax burden as key obstacles.

Introduction

From increasing global temperatures, to rising sea-levels, to the acidification of oceans, the evidence and effects of climate change are clear and consequential. Swelling levels of greenhouse gases, of which carbon dioxide is a large component, are a principal cause of climate change. The United States is responsible for roughly 15% of the world's carbon emissions—action taken by the United States to decrease carbon emissions could significantly affect the climate (Ge, Friedrich & Damassa, 2014).

There is no simple solution, but seeking to mitigate carbon emissions from automobiles, which account for roughly 1/5th of U.S. carbon emissions, could have a significant effect (Union of Concerned Scientists, 2018). One way to address automobile emissions is the gas tax. The "gas tax," or fuel tax, is a per-gallon excise tax on gasoline at the pump. There is a federal gas tax which has been set at 18.4 cents per gallon, but that number is not indexed to inflation and has not increased since 1993, resulting in recent years in a decreased value of the federal gas tax (New York Times Editorial Board, 2017). Each state also has its own gas tax, which ranges from an additional 12.25 cents in Alaska to 58.2 cents in Pennsylvania. Advocates for the gas tax fall under two camps, environmental and economic. First, environmental activists argue that it creates a greater opportunity cost to buying gas, making it more expensive and thus decreasing demand for gas. This leads consumers to respond with more carpooling and greater use of public transportation. Environmentally, the gas tax results in a decrease in carbon emissions from automobiles (Keane, 2015).

The economic objective of the gas tax, and what gives it political weight, is that it raises money to fund infrastructure spending (Baltimore Sun Editorial Board, 2017). Funding from the gas tax is often earmarked for infrastructure spending. As inflation has significantly devalued gas

tax revenue, infrastructure spending has slowed and the United States' roads and bridges have faltered, with deficiencies in the infrastructure system estimated to cost $4 trillion over the next decade (Hunt, 2017). Lawmakers, both at the state and federal level, are seeking ways to increase funding to address the nation's crumbling infrastructure, and increasing the gas tax is one of those ways. Democrats have traditionally been in favor of a gas tax increase, and President Trump has recently endorsed an increase in the federal gas tax by 25 cents-per-gallon to fund his infrastructure plan (Gardner, Snyder, & Gurciullo, 2018). Additionally, prominent interest groups on both sides of the aisle, including the conservative Chamber of Commerce, representing business interests, and the liberal AFL-CIO, representing labor interests, have both lobbied for a gas tax increase (Beech, 2014).

However, as the fuel tax is a tax, it has both political and policy risks. The gas tax is considered to be a regressive tax, since it applies equally to everyone regardless of economic standing and so affects those with lower incomes the most. Regressive taxes are often disliked by liberals (Chait, 2017). Increasing taxes is also unpopular; public opinion is generally against tax increases, and it is a risky vote for politically-vulnerable lawmakers (Brown, 2013). Opposition from fiscal conservatives has been the strongest obstacle against a gas tax increase. Combining these policy and political negatives of the gas tax, opponents have successfully prevented any increase over the past 25 years. As Speaker of the House Paul Ryan said in response to President Trump's support of increasing the gas tax, "Well, we're not going to raise gas taxes […] We're just not going to do that here" (Shelbourne, 2018).

However, inaction at the federal level contrasts with spurts of recent action at the state level, where roughly 80% of states have increased their own gas taxes since the last federal increase in 1993 (Institute on Taxation and Economic Policy, 2017). Additionally, only four

states have a lower state gas tax than the 18.4 cents that is set federally (Drenkard, 2017). By analyzing the factors that cause states to increase their gas taxes, one can understand the overall politics of the gas tax. This study undertakes a quantitative analysis to explore which political and economic factors help predict which states are most likely to increase their gas tax.

Literature Review

Literature that has explored public opinion and political factors associated with gas prices and the gas tax is robust. But before understanding how public opinion differs on the gas tax, first it is crucial to understand how lawmakers vote on such fuel taxes. Goel and Nelson's (1999) study sought to identify whether state legislators voted on the gas tax dependent on political factors, rather than economic factors. The authors developed a theoretical model of how a vote-maximizing politician, a lawmaker who voted exclusively on political benefit to themselves, would approach the gas tax. After analyzing more than three decades of both political and economic state data, the authors found evidence to support the theory that politics influences gas tax prices. It is politically expedient for politicians to support lower gas prices, and this negative relationship between increased gas taxes and vote-maximizing shows that "political influences seem as important as economic factors in shaping gas tax policy" (p. 57). Furthermore, lawmakers have the least to lose politically at times when gas prices are lowest. Lawmakers are affected by political motivations to get themselves re-elected, which could be influenced more by either public opinion or special interests.

In exploring these political motivations, it is important to understand public opinion differences on the gas tax and how it varies between demographics. Hsu (2010) attempted to

uncover why there exists a significant difference between the opinion of economists and the opinion of the public when it comes to the gas tax—economists generally favor the gas tax, but the public is generally against it. Hsu used empirical and survey evidence in order to address various psychological theories that lead to the gas tax being less popular in North America. Hsu's study finds that demographic characteristics shape attitudes about a gas tax. The study found that better economic standing leads to higher support for the fuel tax. Women and individuals with higher education also had an increased willingness for a gas tax hike. Additionally, respondents who did not own a car or had shorter weekly commuting distances were more in favor of the fuel tax increase. Hsu's study sheds light on demographic differences in financial status and commuting time.

While demographics might affect opinion on the gas tax, Fisher and Wassmer (2017) wanted to determine how much perception affected opinion. Their research paper sought to address whether people knew how much they paid in gas taxes, and whether that perception or misperception affected their support for funding highway improvements. To reveal both what people knew about the gas tax and then what their opinion of it was, the researchers fielded a survey of Michigan and California citizens and asked them a series of questions about the cost of the gas tax in their state and whether they would support an increase in the tax in order to support infrastructure improvements. They then performed a regression analysis to show that, in fact, most people hold severe misconceptions about the cost of the fuel tax, in general believing they pay a lot more than they actually do. Since they believed they were paying a high amount already, this made them unwilling to support increased gas taxes. Misperception and the belief that people already pay too much in gas prices push Americans against the fuel tax.

Diving deeper into how the public responds to the gas tax, Li, Linn & Muehlegger (2012) tried to attain a greater understanding of fuel tax perception and consumption effects. Their analysis attempted to analyze a difference in the mind of consumers between an increase in gas prices and an increase in the gas tax. They compiled empirical data on vehicle mileage, gas consumption, miles per gallon from state and household-level data, and then performed a regression analysis. They found that consumption is more affected by a tax than it is by an equal level of price increase—therefore, an increase in taxes can significantly affect consumption. By analyzing price and tax increases similarly, prior research may have underestimated the inelasticity of the gas tax, and so underestimated the extent to which a gas tax increase could cut carbon emissions. The authors found significant differences between the effects of tax perceptions versus price perceptions in consumer response to the gas tax, signifying an important role for the concept of taxes overall in terms of fuel tax support.

Further exploring the issue of the tax and public opinion, politico-economic factors are significant when it comes to taxes, so the distributional effects of a gas tax must be understood. One criticism of the gas tax is often that it is a regressive tax, meaning it disproportionally hurts low-income consumers by costing a greater portion of their total income. Poterba (1991) pushes-back at this narrative and suggests that the gas tax is actually much less regressive than typically believed. Poterba calculates how regressive the tax is by analyzing fraction of expenditures, rather than fraction of income, spent on gas. The author uses empirical evidence from the Consumer Expenditure Survey to compute the share of total expenditures on gas from different income brackets. The findings are that the gas tax, using this method of calculation, is much less regressive than originally thought. But this study further complicates how economic factors may play in to the political calculation made by lawmakers. Hsu's (2010) study showed that lower

economic standing leads to a lower willingness to raise the gas tax, and Goel and Nelson's (1999) study showed that lower gas prices provided ideal circumstances for lawmakers to raise the fuel tax with relatively low political cost. There are clear economic factors, such as tax perception and existing prices and economic standing, that affect public opinion of the gas tax and could be factors that policymakers account for when facing gas tax legislation.

But political motivations extend beyond public opinion, which does not always get its way. There are also special interest groups. Specifically, the powerful oil industry has a particularly extensive hold on the economy of gas taxes. Republican presidential victories boost the value of the oil industry by 3.5%, so the stakes are large for the industry during elections (Zitzewitz, 2013)**.** Since gas prices are an unavoidable and omnipresent factor in the lives of many Americans, altering gas prices can have significant political effects. Zitzewitz (2013) explored whether firms in the oil industry distorted prices ahead of Presidential elections in order to boost their future profit**.** By looking at oil price data in swing states in a period before each presidential election, as well as data on European countries, the author concluded "that relative gas prices vary in swing states before U.S. Presidential Elections in a manner that would be consistent with an attempt to influence the election in favor of the Republican candidate" (Zitzewitz, p. 19). The oil industry raises prices with a Democratic incumbent, but decrease prices with a Republican president to attempt to sway voters. Zitzewitz highlights that in these time periods wholesale gas prices change, while price distortions in "products sold primarily to industrial users" do not. This is used to defend his claim that the price distortions are directed at swaying public opinion. While this is a preliminary study, there are significant implications for the power of the oil industry.

Research literature surrounding the gas tax has been extensive, but there are gaps. Most of the research on the gas tax has focused on the consumer reaction and public opinion aspect, but few have explored the influence of industry and the factors that affect policy outcomes. But Goel and Nelson (1999) and Zitzewitz (2013) suggest that lawmakers make decisions concerning the gas tax based on political benefit, and that the oil lobby in a state may have a significant influence on what is politically beneficent. In this study, I seek to answer the question: does the power of the oil industry in a state affect whether or not a state will be successful in raising their gas tax?

Methods

Dependent Variables

To analyze the data, two continuous linear regressions are run on the primary and additional independent variables to determine: does the power of the oil industry affect whether or not a state will be successful in raising their gas tax? The unit of analysis are the fifty states. There are two continuous linear regressions on two separate dependent variables, as the research question requires approaching the issue from two angles. One dependent variable is the years since the state last increased its gas tax, which is a continuous variable. This variable was chosen because it captures whether action to increase the gas tax has been taken in each state legislature in recent years. The second dependent variable is the per gallon rate of each state's gas tax, also a continuous variable. This variable captures how high each state has set their tax. By capturing both the size of the gas tax and the time since the gas tax has increased in each state, the study is able to more fully understand the legislative tendencies surrounding the fuel tax in state legislatures.

Independent Variables

The independent variable of primary interest is the Average Annual Crude Oil Production in each state since 2000. The oil industry has a large role in gas prices (Zitzewitz, 2013), and this study, using oil production in each state as a means to determine the strength of the oil industry, seeks to determine if the presence and power of the oil industry influences state politics of the gas tax. Data for total energy production per capita is also inputted as an independent variable to highlight if there is a significant difference between oil production and energy production in general.

The study also examines a number of other independent variables to test various economic and political factors. The state's tax burden is tested to explore how an already existing weight of taxes can affect the atmosphere and willingness to further increase the gas tax. The cost of gasoline and gasoline consumption per capita in each state are tested to explore how already high economic expenditures on gasoline can determine whether a state legislature will increase the fuel tax. Furthermore, the additional annual maintenance cost per driver due to poor road conditions in each state is tested as a way to study how anger with poor infrastructure is correlated with state action to increase infrastructure spending through a gas tax hike.

Political and demographic factors are also tested. As there is a partisan divide between support for the gas tax, with Democrats generally more in favor, the political tilt of a state is tested as an independent variable to determine what role partisanship has. Demographic factors of an urban-rural split are also tested. Those without a car or those less likely to drive much are more likely to support a gas tax increase (Hsu, 2010), making an urban-rural split quite possible. Taking Census data, the average commute time in minutes for each state is tested, as well as the

percentage of the state that lives in an urban location. Table 1 shows the variable summary statistics of the dependent and independent variables used for the study.

Table 1: Variable Summary Statistics

Variable	Min	Max	Mean	Std. dev.	Source
Time Since Gas Tax Increase (years)	0	47.75	9.96	11.75	Institute on Taxation and Economic Policy (2017); National Conference on State Legislatures (2018)[1]
Size of Gas Tax ($)	12.25	58.2	28.93	9.01	Tax Foundation (2017)
Oil Production (trillion BTUs)	0	$3.5x10^3$	$2.0x10^2$	$5.7x10^2$	EIA (2018)[2]
Total Energy Production (trillion BTUs)	4	$1.8x10^4$	$1.6x10^3$	$3.0x10^3$	EIA (2018)[3]
Gas Consumption (trillion BTUs/capita)	$3.3x10^{-5}$	$7.2x10^{-5}$	$5.4x10^{-5}$	$8.6x10^{-6}$	EIA (2018)[4]
Commute Time (mins)	17	33	24.06	3.71	Social Explorer (2016)
Urbanization (%)	38.7	95	73.59	14.57	U.S. Census Bureau (2010)
Tax Burden (%)	6.5	12.7	9.46	1.34	Tax Foundation (2012)
Partisanship (score)	-25	18	-3.48	10.6	Cook Political Voting Index (2017)
Maintenance Costs ($)	278	763	467.74	122.34	Ingraham (2015)
Total Cost of Gas ($)	2.28	3.49	2.54	0.25	American Automobile Association (2018)

[1] The National Conference on State Legislatures information was used to update the Institute on Taxation and Economic Policy's data, and the date of the most recent state's increase was used as time = 0.

[2] Total crude oil production in each state was totaled from 2000-2017, converted from barrels to BTUs, and then was averaged to a per year number

[3] Total energy produced per state was divided by the state's population

[4] Total motor gasoline for transportation per state was divided by the state's population

Results

Three independent variables were at least marginally significant in a regression analysis with the dependent variable of time since the gas tax was increased (see Table 2). First, the overall cost of gas in each state was marginally significant with the time since the gas tax has been increased, with a p-value of .066. States that had a higher cost of gasoline at the pump were more likely to have increased their gas tax in recent years. The tax burden in each state was also significant, and had the smallest p-value at .021. The higher the tax burden in a state, the more likely that state was to have recently revisited their gas tax. Finally, the primary independent variable of interest, oil production, was marginally significant with a p-value of .076. States with greater oil production were *less* likely to have increased their gas tax in recent years. The R^2 value of this test was 0.324, which means that 32.4% of this data can be explained by the model, a reasonable R^2 value for social science research.

Table 2: Results of Regression Analysis

	Size of the Gas Tax		Time Since Gas Tax Increase	
Independent Variable	**Coefficient**	**Significance**	**Coefficient**	**Significance**
Oil Production	$-3.0x10^{-3}$	0.084^{+}	$6.0x10^{-3}$	0.076^{+}
Energy Production	$1.5x10^{2}$	0.765	$-1.0x10^{2}$	0.899
Gas Consumption	$-8.4x10^{4}$	0.690	-4.6^10^{5}	0.184
Commute Time	$5.1x10^{-1}$	0.182	-5.0^10^{-1}	0.414
Urbanization	$8.0x10^{-3}$	0.936	$-3.2x10^{-2}$	0.852
Tax Burden	$2.1x10^{0}$	0.055^{+}	$-4.177x10^{0}$	0.021*
Partisanship	$-1.4x10^{-1}$	0.384	$2.6x10^{-1}$	0.309
Infrastructure Costs	$-6.3x10^{-5}$	0.995	$2.0x10^{-2}$	0.183
Gas Price	$1.8x10^{1}$	0.002**	$-1.7x10^{1}$	0.066^{+}
Coefficient of Variance	$R^2 = 0.566$		$R^2 = 0.324$	

+ p<0.1, * p < 0.05, ** p < 0.01

All three of these independent variables remained the only significant or marginally significant variables when the regression was run again with a dependent variable of each state's size of the gas tax. As before, states with a higher tax burden were more likely to have a higher gas tax (p-value of .055), states with higher total gas costs were more likely to have higher gas taxes (p-value of .002), and states with more oil production were less likely to have a high gas tax (p-value of .084). The R^2 value of this regression was higher, with a value of .566, meaning 56.6% of the data can be explained by the model.

For both regressions, the same three variables were significant or marginally significant: the total gas price, the tax burden, and oil production. The coefficients of these three variables are in the opposite direction depending on which dependent variable is being looked at—this

makes sense since we expect that those who have revisited their gas tax more recently (i.e. – smaller elapsed time), have a higher gas tax.

Analysis

The independent variable of interest, oil production, was found to be marginally significant. The hypothesis was that states with high oil production, and thus a higher presence of the oil lobby, would be less willing to revisit or raise their gas tax due to pressure from the oil interests. This could mean that the oil lobby as a special interest group is powerful in dissuading its state legislators, or it could be explained by a public that is more reliant on oil for jobs and so a public opinion that causes state legislators not to hurt the oil industry. Regardless, the analysis from this study is that oil production does have a marginally significant role in determining whether a state will raise its gas tax, which supports the literature review that the oil industry has a significant role in energy pricing and politics (Zitzewitz, 2013).

Total cost of gas was also found to be significant, but the study does not separate this from the size or time since increase, and so little analysis can be drawn from that besides states that have higher cost of gas are more likely to have recently increased their gas tax. The tax burden was also significant; Li Linn & Meuhlegger (2012) argued that the public has a different mindset when it comes to general prices and taxes themselves. The study shows that states who have a high tax burden, and so more likely to have a public that accepts higher taxes, are also more willing to increase their gas taxes.

Only three independent variables had statistically significant results, meaning most did not. The partisanship of the state was not significant. While conventional wisdom says that Republicans are less likely to support a gas tax increase, the study did not find that Republican states were less likely to revisit the gas tax; this may be because Republicans have control over

more state legislatures and so are more capable of passing tax increases on their own terms or without the political costs that more competitive states would incur on such a vote. There are more intricate partisanship factors that could be tested in further research, such as whether there is a significant difference in competitive versus non-competitive states.

Energy production per capita was also not significant, a factor which was a control variable to distinguish between the oil industry and overall energy production. Thus, the findings are not surprising and support the theory of excised influence from the oil industry. Gas consumption per capita, average commute time, and percent urbanization of a state were all intended to explore different trends in how use of cars and gasoline would relate to the gas tax; interestingly, none of these were significant. Such differences may not be known enough or a concern to state legislatures. Finally, average additional maintenance costs for vehicles due to poor road conditions was not significant. The public may not necessarily correlate poor road conditions with the gas tax, which supports Fisher and Wassmer's (2017) findings that there are many public misperceptions about the gas tax.

This paper's findings support most of the literature review's findings about lack of knowledge on the gas tax and on how much individuals pay, and the role of the oil industry in the gas tax. Political factors are not supported, but some of this can be explained by a need for future research to explore the nuances of different partisanships.

Conclusion

The gas tax has not moved at the federal level in a quarter-century, but action at the state level has varied significantly. The purpose of this study was to determine what economic and political factors are significant, and particularly if a state's oil production was a major factor in determining whether a state would increase its gas tax. The results supported the idea, showing

that greater oil production leads to a lower gas tax. The presence of the oil industry in a state has political power to prevent an increased gas tax. This could stem from two causes that would require further research. First, the oil industry might successfully lobby politicians, thus showing a powerful special interest group that supporters of a gas tax increase should consider. Second, public opinion may oppose gas tax increases in states where oil is present because jobs and livelihood are affected by the success of the industry, and so advocates should consider and address those concerns if they wish to gain support for a gas tax increase. This is an excellent opportunity for future research on which aspect of the oil industry is more salient. Regardless, this study shows how the oil industry is a force in state-level gas tax politics. A state's tax burden was also significant, with a greater tax burden suggesting a greater readiness to increase the gas tax. The conclusion might be that states with high taxes are more willing to further increase their taxes, suggesting that concerns with increasing the fuel tax stem from places with lower taxes. State-level policymakers who seek to raise the gas tax should consider that a gas tax is a heavier lift in states that have a lower overall tax burden and a large presence of the oil industry.

Many of the same politics could be important at the federal level as well. The consistent lack of action, regardless of party control, indicates that there are powerful political factors to consider. At the federal level, a stronger concentration of the oil and gas lobby may help explain why we have not seen a change, and that an increase is more likely when the oil and gas lobby has relatively lower strength. Additionally, it is potentially more likely to see a gas tax increase during an administration where all taxes are under consideration for an increase, as opposed to one that supports other tax cuts. Advocates for an increased gas tax at the federal level should consider these two factors.

This study has also opened opportunities for future research. While this study explored partisan score, it did not consider other political factors, such as if a state was politically-competitive. Additionally, the role that infrastructure condition plays in increasing the gas tax requires more study. This paper used the average additional maintenance costs per driver to determine each state's infrastructure conditions, but a study or survey that more directly tied opinions on road conditions to opinions on the gas tax would help clarify the point. Particularly, a split survey that contrasted gas tax opinions based on whether information that the money would go towards infrastructure was presented or not could confirm that a lack of knowledge on the gas tax is a significant hindrance to its passage. In terms of the oil industry, a case study could explore if the industry itself has lobbied to stop gas tax increases at the state-level. To examine the other aspect of oil's presence in a state, a survey that determined if public opinion on the gas tax depended on if a respondent knew someone whose livelihood was dependent on the oil industry could help clarify *how* the oil industry affects the gas tax.

Other case studies could produce interesting research. Michigan's state legislature provides an interesting case study for how politicians interact with public opinion. Voters, in a referendum, rejected a bill passed under a Republican governor that increased the gas tax to fund infrastructure investments, forcing the legislature to pass a second bill to do so. Michigan's gas tax is now one of the highest in the country. A case study here could bring to light interesting political dynamics between politicians, interest groups, and public opinion**.** Additionally, there are future research opportunities that could explore case studies at the federal level to see how the oil industry has wielded their political power on the gas tax.

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