The Effect of Gas Prices on Voter Behavior: Turnout and Punishment

Teo Richard

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Abstract

Thou shalt not raise gas prices. The politicians seem to believe so, but how exactly do gas prices shape voter behavior? This paper investigates two distinct mechanisms: voter turnout and vote share for the incumbent party. Using a first-differences model, I find that high gas prices do not mobilize new voters, but is associated with a decreased vote share for the incumbent party. In other words, my findings suggest that gas prices affect not whether an individual chooses to vote, but does affect who they vote for. Understanding this channel matters for both electoral forecasting and for politicians deciding whether economic concerns warrant policy intervention.

1 Introduction

We all know the feeling of staring at the gas pump and watching in dread as the displayed cost continues to rise with no end in sight. Gas prices are one of the most salient prices we see and elicit heavy sighs from millions of Americans every day. While prior research has established that gas prices do affect electoral outcomes, the mechanisms remain unclear.

This paper examines the effect of gas prices on voter behavior through two channels: changes in voter turnout and changes in the vote share the incumbent receives. I ask if increases in gas prices lead to greater mobilization and if increases in gas prices affect which party the voter actually votes for.

The answers to these questions are important for various reasons. Economists have long enjoyed studying the impacts of gas prices, and for good reason. Such a salient part of the economy is bound to affect individuals, and understanding those effects can inform policy design. First, disentangling mobilization from persuasion helps to clarify if voters hold politicians accountable for conditions beyond the control of the politician. In addition, understanding how voters respond to highly visible prices informs the political

feasibility of climate policy. If salience is more important than cost, then interventions should prioritize less salient mechanisms to improve environmental reforms, even if the actual cost burden to consumers is slightly larger.

I find no statistically significant effect of gas prices on voter turnout but I do find a significant negative association between gas prices and the vote share the incumbent party receives in gubernatorial elections. A 50-cent gas price increase reduces incumbent gubernatorial vote share by approximately 5 percentage points. This implies that gas prices do not influence the voter behavior of people who would not have voted given no change in gas, but it does push existing voters to punish the incumbent.

2 Background

There are various studies looking into the effect of gas prices on voter behavior regarding the incumbent. Arezki et al. (2020) analyzes 207 elections over 50 democracies and finds that increases in gas prices are associated with systemically lower odds of the incumbent party being reelected. Arezki et al. (2022) shows similar results when looking at oil import prices over 48 countries. This paper finds that oil import price shocks are also associated with lower odds of reelection of the incumbent party. At the U.S. sub-national level, Metz and Barzilay (2024) inspect swing counties in the 2020 presidential election and find that gas consumption was associated with a decreased vote share for Biden, who was the incumbent. Taking the approach of machine learning at the national level, Gupta et al. (2025) uses random forests to inspect gas prices and presidential approval ratings and demonstrates that gas prices have a significant predictive effect on approval ratings. While this prior work establishes that gas prices affect electoral outcomes, two gaps remain. First, existing studies focus primarily on presidential elections or cross-national comparisons, leaving state-level gubernatorial contests underexplored. Second, these studies do not distinguish between voter mobilization and vote choice as mechanisms. This paper addresses both limitations by analyzing county-level gubernatorial elections and separately estimating gas prices' effects on turnout and incumbent vote share.

On the topic of mobilization, there is not much literature investigating the effect of gas prices on voter turnout. However, there are some studies relating economic hardship and voter turnout, but the literature has mixed findings. For example, Charles and Stephens (2013) find that greater wages and employment lower turnout in governor, senator, Congress, and House elections while Rosenstone (1982) simply finds that economic adversity decreases voter turnout. Carrera and Caseñadas (2016) find that the effect of a bad economy actually depends on the individual voter and will have greater mobilization on those more vulnerable to the downturn. Park (2023) instead takes the view of the "hedonoic treadmill" and suggests

that voters compare their economy to economies of other nations and finds that a relatively poor economy will lower turnout while a relatively good economy has no effect on turnout. Given gas prices' high salience, it seems natural to think that increases in gas prices will mobilize voters. Higher gas prices may cause marginal voters to become emotional to actually make it to the polls or make it to their mailbox. While the broader economic voting literature examines turnout effects, the specific relationship between gas prices and voter mobilization remains underexplored. I attempt to fill in some of this gap by investigating this exact question.

3 Data

My analysis combines county-level election data with state-level gas prices and demographic controls spanning 2008-2024 (excluding 2020).

I use gasoline data from SEDS, which gives me the annual gas averages for all 50 states. These prices are adjusted to be in 2024 dollars. While gas prices vary at a state level instead of at county-level, there is still substantial variation:

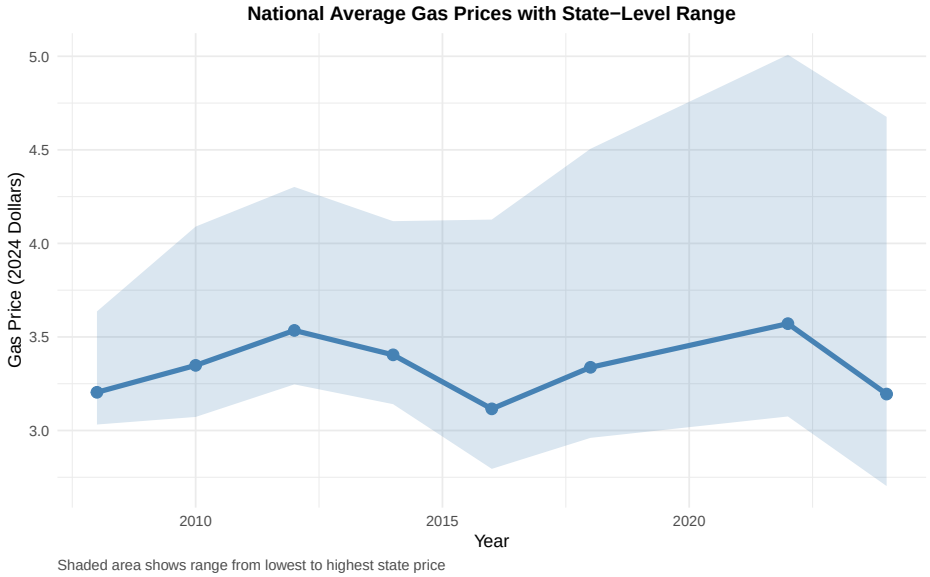


Figure 1: Gas Prices: National Average and State-Level Range (2008-2024)

Data on voter turnout come from the National Neighborhood Data Archive (NaNDA), which provides county-level voter information about November general election turnout. Turnout is calculated as the share of eligible voters that voted. Two observations with invalid turnout coding (marked as -1) were recoded as missing values.

Gubernatorial elections come from the Harvard Dataverse, recorded at the county-level. It includes

information regarding which party was the incumbent, how many votes the incumbent received, and total votes, which I am able to use to extract the proportion of votes that the incumbent received.

For control variables, which include various demographic and economic indicates, I use data from the 1-year ACS, which restricts county size to at or above a population of 65,000. and limits reliable data availability to 2008 and onward. I must also omit 2020 from my analysis due to a lack of Census data.

Both the voter turnout and gubernatorial data were then merged with the SEDS gasoline data and control data, giving me two final datasets. I then converted to first-difference, which the main analysis uses.

After merging and converting to first-differences, I have: (1) in the voter turnout data, 1770 observations from 446 unique counties and (2) in the gubernatorial data, 627 observations from 344 unique counties.

Table 1: Summary Statistics: Gubernatorial Data

Statistic	Δ Gas Price	Δ Incumbent Vote
Min.	-0.47	-0.39
1st Qu.	-0.16	-0.07
Median	0.02	-0.01
Mean	0.00	-0.02
3rd Qu.	0.11	0.03
Max.	0.45	0.22
SD	0.21	0.08

Figure 2: Histogram of Incumbent Vote Share

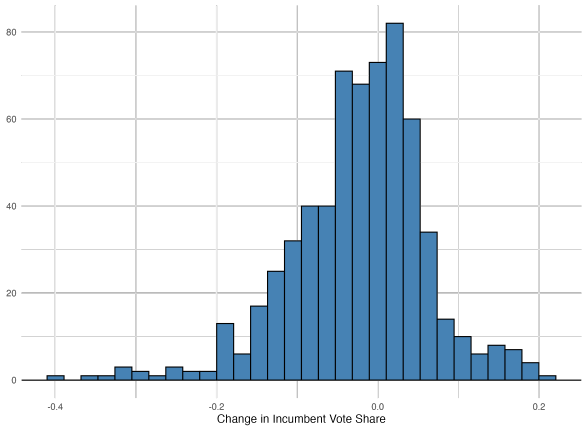
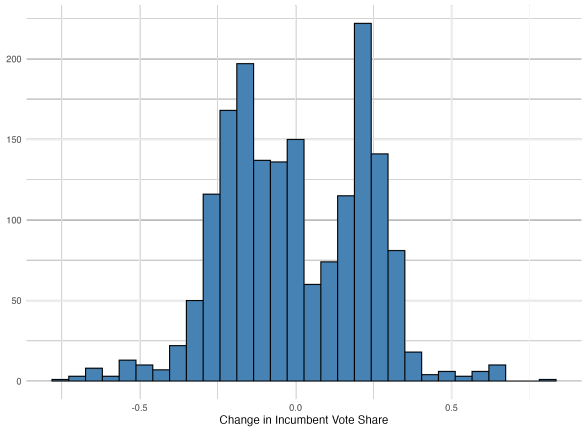


Table 2: Summary Statistics: Turnout Data

Statistic	Δ Gas Price	Δ Turnout
Min.	-0.55	-0.74
1st Qu.	-0.16	-0.18
Median	0.12	-0.02
Mean	0.03	0.00
3rd Qu.	0.21	0.20
Max.	0.98	0.82
SD	0.24	0.23

Figure 3: Histogram of Turnout



The final sample is limited by ACS data availability and the first-differences transformation. The guber-

natorial sample is particularly small due to the Harvard Dataverse containing fewer counties and additional observations lost during merging. While this limits statistical power, the counties included represent diverse geographic and political contexts.

I employ a first-differences specification for two reasons. First, first-differencing allows time invariant characteristics to drop out of the model. Second, voters are likely reference dependent—they evaluate conditions relative to their recent experience rather than in absolute terms. This suggests that voters respond more to changes in gas prices rather than to static levels.

4 Method

I estimate two separate models with identical specifications, differing only in the outcome variable: voter turnout for the first analysis and incumbent vote share for the second. In either case, the outcome variable is a percentage bounded by $[0, 1]$.

For county c in year t, I model the outcome variable $\Delta Y_{c,t}$ as:

$$\Delta Y_{c,t} = \beta_0 + \beta_1 \Delta X_{c,t} + \gamma \Delta Z'_{c,t} + \alpha_s + \delta_t + \varepsilon_{c,t}$$

Where:

- $\Delta X_{c,t} = X_{c,t} - X_{c,t-1}$ is the difference in gas price for county c between periods
- γ is a vector of coefficients for the controls
- $\Delta Z'_{c,t}$ is a vector of controls
- α_s is state fixed effects
- δ_t is year fixed effects
- $\varepsilon_{c,t}$ is the error

Because my gas prices vary only at the state level, I am unable to use state-year fixed effects. In this specification, each state-year dummy would absorb the average outcome for that state-year, leaving no gas price variation left over. Instead, I include separate state and year fixed effects. In a first-differences model, these fixed effects have a different interpretation than in a level model. Since I am using a first-differences

model, time invariant characteristics cancel out. In the first-differences specification, state and year fixed effects compare counties' outcomes within a given state or year to the average change in that state or year.

While these fixed effects may seem redundant as first-differences is already subtracting out time invariant characteristics, they are necessary to avoid confounding. Different states and years have different trends due to differences in hard to measure variables like culture. This will account for systemic differences across states and over time that can correlate with gas prices and voter behavior. Examples of this could include political culture, industry-specific influences, or national electorate trends. Without state and year fixed effects, these trends can bias my estimates.

5 Results

All regressions include state and year fixed effects and control for partisan lean, economic variables such as unemployment and income, demographic variables such as marriage status and population density, and incumbent party. Standard errors are clustered at the state level throughout as this is the level at which gas prices are analyzed.

5.1 Incumbent Vote Share

I find a statistically significant relationship between gas prices and the gubernatorial incumbent vote share. With p = 0.03, the effects are significant at the conventional $\alpha = 0.05$ level.

Table 3: Regression of Gubernatorial Incumbent Vote Share on Gas Prices

	ΔVote Share
ΔGas Price	-0.10 (0.05)*
Num. obs.	625
Num. groups: state	40
Num. groups: year	5
R^2 (full model)	0.35
R^2 (proj model)	0.15
Adj. R^2 (full model)	0.27
Adj. R^2 (proj model)	0.12

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

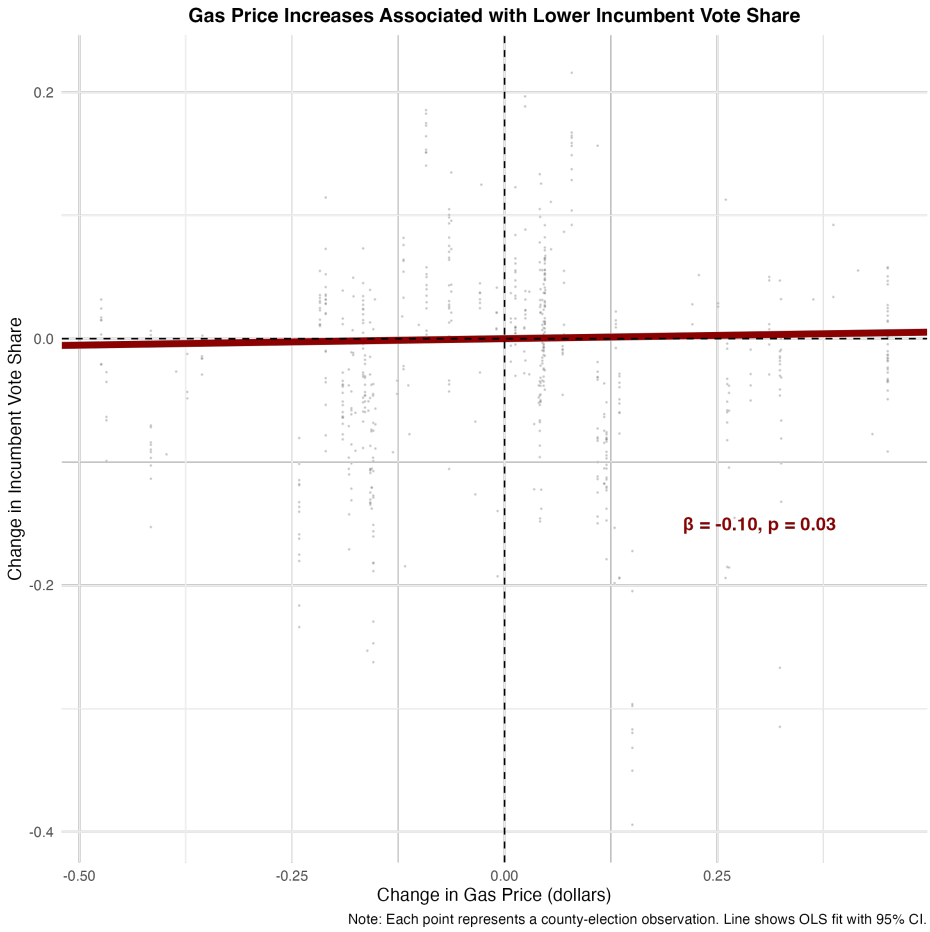


Figure 4: Relationship Between Gas Price Changes and Incumbent Vote Share

While much of the variation in vote share is not explained by my model, gas prices themselves are still an important factor in that variation. A 50 cent increase in state gas price is associated with a 5 percentage point decrease in the incumbent gubernatorial party's county-level vote share, on average. This is quite economically significant as a small percent change in vote share can push a swing county over the edge (or back from the edge, depending on your perspective).

In addition, this effect size is plausible. Garz and Martin (2020) inspect "milestones" related to unemployment and find that good milestones increases incumbent governor vote share by around 3.7-5.7 percentage points and bad milestones decrease the vote share by about 10.2 to 11.3 percentage points. Gas prices, while salient, are more specific than general unemployment, so a slightly lower decrease may be expected. In addition, gas prices are not typically associated with "milestones" and therefore may not include the "fear-factor" that comes with reaching a bad unemployment milestone that would drive a larger decrease in vote share.

These results suggest that voters do punish incumbents at the state level for gas prices. This makes sense

intuitively as gas prices are highly salient and get much (perhaps too much) media attention.

I also ran various other model specifications as robustness checks.

Dependent Variable:	Change in Incumbent Party Vote Share				
	Main	County FE	2-Way Cluster	No Swing	Log Spec
Model:	(1)	(2)	(3)	(4)	(5)
Variables					
Δ Gas Price	-0.0991**	-0.1220*	-0.0991*	-0.1045*	-
	(0.0451)	(0.0634)	(0.0389)	(0.0557)	-
Δ Log Gas Price	-	-	-	-	-0.3058*
	-	-	-	-	(0.1693)
Fixed-effects					
State	Yes	No	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
County	No	Yes	No	No	No
Fit statistics					
Observations	625	553	625	421	625
R^2	0.34669	0.45830	0.34669	0.35956	0.34336
Within R^2	0.14931	0.21557	0.14931	0.09376	0.14497

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

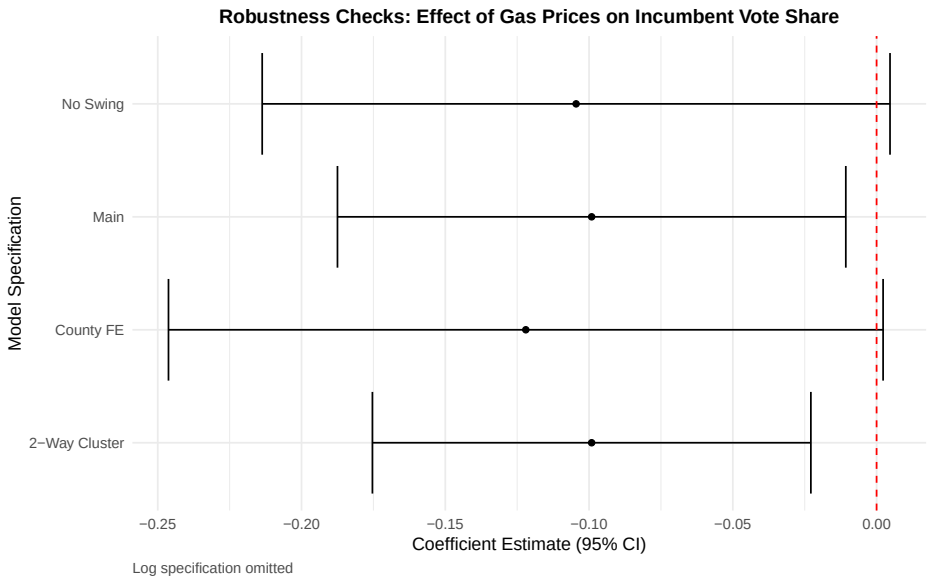


Figure 5: Confidence Intervals for Robustness Checks

In model (2), instead of using state and year fixed effects, I used county and year fixed effects. I found this to be marginally significant with a similar coefficient as my main model, with β = -0.12 and p = 0.062. From this I find that my results are robust to using county fixed effects despite county fixed effects being more conservative.

I also used two-way clustering of standard errors with both state and year in model (3), which accounts for correlation within states and within years, making my standard errors even more robust. With β = -0.1 and again p = 0.063, this test is marginally significant and the effect size is similar to my main model, implying my results are robust to this different clustering mechanism.

In addition, I was worried that swing states would be driving the effects of gas prices. In model (4) I therefore excluded nine swing states and found marginally significant results with a coefficient of -0.1 and p = 0.083. As the coefficient is nearly the exact same as my main model and the p-value is marginally significant, I find that the swing states are not the main drivers of the effect of gas prices on the incumbent's vote share.

Finally, I was also interested in looking at gas price changes as percentages changes and therefore altered my variable for change of gas to be the change in the log of gas. With β = -0.31 and p = 0.079, I find the main model is robust to changes in specification of the gas price variable. For a ten percent change in gas prices, the vote share for the incumbent is predicted to decrease by about 3.1 percentage points. If we assume gas prices are around \$3.5, then for a fifty cent increase, the log specification predicts an average decrease in incumbent vote share of about 4.4 percentage points, which roughly aligns with the main model's

prediction of about 5 percentage points.

Despite a significant main model, none of the robustness checks achieved p-values less than 0.05. This is likely due to changes in specifications that increased standard errors. However, the similar magnitudes of the coefficients and the marginal p-values do imply robustness of the main model.

In addition, both my placebo tests also pass cleanly. My placebo using future gas prices returns a future gas coefficient with p = 0.424 and my placebo using lagged gas prices has a lagged gas coefficient with p = 0.715.

So, my robustness checks are all marginally significant and result in similar magnitudes as my main model, and my placebo tests raise no red flags. These results suggest that gas prices do have an effect on the vote share of the incumbent. In general, I find that a ten cent change in gas prices is associated with an approximately one percentage point decrease in the vote share the gubernatorial incumbent party receives.

Additionally, I explored the possibility that there is a quadratic relationship between gas price and incumbent vote share. When adding a squared change in gas price term onto my main model, I did find a significant effect (β = -.633, p = 0.0124), and significant (p < 0.05) coefficients for all robustness checks except the one in which I used two-way state and year clustering for standard errors. However, the coefficients varied dramatically, ranging from -0.41 to -0.80. In addition, the sign of the coefficient of the linear term varied depending on the model specification. Given this instability, I keep the linear model as my main model but believe the quadratic specification merits further investigation with a larger sample size or higher-frequency data.

5.2 Voter Turnout

I find no significant effect of gas prices on voter turnout ($\beta = 0.194$, p = 0.119). While the positive coefficient sign is as expected (higher prices means voters on the margin become emotional enough to vote), the effect is statistically indistinguishable from $\beta = 0$.

Table 4: Regression of Turnout on Gas Price

	ΔTurnout
Δ Gas Price	0.19 (0.12)
Num. obs.	1540
Num. groups: State	46
Num. groups: Year	5
R^2 (full model)	0.61
R^2 (proj model)	0.04
Adj. R^2 (full model)	0.59
Adj. R^2 (proj model)	0.02

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

The model with just gas prices explains almost none of the variation in turnout ($R^2 = 0.04$).

Placebo tests yield mixed results. When using future gas prices to predict current turnout, future gas prices were significant at p = 0.0123. This likely reflects the moderate correlation (ρ = -0.4) between current gas prices and future gas prices, which is enough to affect the placebo. Furthermore, by nature of using the future change in gas prices, the placebo dataset has less data than the main model data, which may also affect the placebo. When using the main specification on this smaller dataset, the p-value drops to marginally significant at p = 0.102, indicating that the significance of the future placebo is in large part due to a lack of data.

Lagged gas prices show no significant relationship with current turnout (p = 0.991). Overall, the placebo tests do not invalidate the null finding.

The null result for turnout suggests that while gas prices influence how people vote, they do not mobilize marginal voters who would otherwise abstain. This could reflect that existing voters are more politically engaged and attentive to economic conditions, whereas nonvoters may be less responsive to economic signals.

6 Conclusion

I find that changes in gas prices do not affect changes in voter turnout from year *t-1* to year *t*, but are associated with a decrease in the vote share the incumbent gubernatorial candidate receives—an increase of 50 cents is associated with a 5 percentage point decrease. This indicates that gas prices act as a preference-shifting mechanism and not a mobilization mechanism. One reason gas prices shift preferences but do not

act to mobilize nonvoters could be simply that people who already vote are the type of person to intrinsically care more about economic indicators such as gas prices.

This analysis provides evidence that voters punish officials for things beyond their control. While this is understandable given the information constraints voters face—lack of information, misinformation, and disinformation can all obscure correct attribution—it raises important questions about democratic accountability when voters systematically punish officials for conditions beyond their control. It is also interesting that even state governors are punished for higher gas prices, as state gas variation as a whole is due in large part to oil import price shocks. This may indicate that voters do not distinguish much between different levels of politicians when deciding who to punish for changes in highly salient economic indicators. Due to a lack of data, I was unable to find the specific mechanics of the effect of gas prices on the presidential incumbent vote share, but further research in this area would be informative.

This analysis supports the general consensus among politicians that one must think very carefully before supporting a policy that raises gas prices. This is a problem as there are often justifiable reasons to raise gasoline costs. For example, carbon taxes, CAT programs, or LCFS programs can all act to increase consumer side gasoline prices and all of these programs have the overall goal to reduce pollution. In fact, in January 2025, the IEMAC reported that California's GFG Cap and Trade program increased 2023 gasoline prices by approximately 26 cents per gallon (Fowlie and Burtraw 2025). My results suggest that this alone could cost an incumbent governor over two percentage points in the vote share, which a governor in a swing state would be afraid of. Economic theory also suggests the U.S. gas tax is far too low (Perry and Small 2005), which creates tension between forming policy that forces individuals to internalize externalities and incentives that push policymakers towards inaction.

There are similar implications with respect to electric vehicles. With electric vehicles becoming increasingly prevalent, a natural extension of this analysis is to ask how increases in electricity prices affect voter behavior. As the electricity grid decarbonizes, EVs are becoming more beneficial/less damaging (Holland et al 2019). This indicates that EVs will become an increasingly popular solution, but this will have impacts on electricity prices that will likely impact voter behavior as well. This is an important question as electricity prices are much less salient than gas prices so understanding if electricity prices result in the same electoral backlash is essential to forming solutions that policymakers find themselves able to support. If changes in voter preference depend on visibility, then environmental reforms focusing on actions like grid improvements or infrastructure may face less electoral resistance than actions that directly increase gasoline costs, even if those actions are more economically efficient.

However, this analysis does come with several limitations. Perhaps the most obvious is the data limitation. My chosen datasets contain a limited number of counties and ACS1 restrictions mean that I am limited to

large counties. The effect could change when including smaller and more rural counties. In addition, the SEDS gasoline data is only an annual average—the effect may change if analysis was run on the gas average in the months leading up to an election. Presidential elections were also neglected in this analysis due to lack of data, so this analysis cannot be extended to this level of elections. The effect of gas prices on the incumbent vote share presidential candidates receive may not mirror the effect on gubernatorial candidates. Finally, I document only correlation, not causation. I cannot definitively state a causal mechanism, so it could be that general economic dissatisfaction is a confounding variable in this analysis. Overall, these results should be taken as suggestive evidence. The consistent direction and magnitude of the effects of gas prices on the incumbent vote share across specifications, combined with theoretical plausibility, suggests that gas prices likely do affect incumbent vote share. However, replication with larger samples, finer geographic variation in gas prices, and additional years of data would strengthen confidence in these conclusions.

Ultimately, in the context of a democracy, environmental policy that can raise gas prices will affect the behavior of individuals within that democracy, which must be taken into account. Gas prices are a particularly salient indicator among other economic conditions, and my findings suggest that this visibility affects voters. This has broad implications: as new technology emerges and environmental reform becomes an increasingly popular topic, understanding how voters process salient vs hidden costs will shape climate policy. Perhaps the path to effective climate policy lies in keeping costs low, but communicating with voters properly and managing visibility and properly framing the justification of these policies. Or perhaps politicians should simply hope oil prices cooperate during election years.

7 Appendix

Table 5: Full Model - Incumbent Vote Share

	Model 1
Δ Gas Price	−0.10 (0.05)*
Δ Pct. Commute by Public Transport	−0.33 (0.51)
Δ Partisan Lean	−0.18 (0.14)
Δ Unemployment	−0.01 (0.00)
Δ Income	0.00 (0.00)
Δ LFPR	0.00 (0.00)*
Δ Age	0.00 (0.01)
Δ Education	0.36 (0.21)
Δ Pct. White	−0.00 (0.08)
Δ Pct. Black	0.15 (0.40)
Δ Pct. Asian	−0.43 (0.73)
Δ Pct. Native	−1.06 (0.87)
Δ Pct. Homeowner	0.00 (0.00)
Δ Home Value	0.00 (0.00)
Δ Pct. Family Household	−0.00 (0.00)
Δ Pct. Married	−0.01 (0.01)
Δ Avg. Household Size	−0.03 (0.04)
Δ Commute Time	−0.00 (0.00)
Δ Population	0.00 (0.00)
Δ Population Density	−0.00 (0.00)
Num. obs.	625
Num. groups: State	40
Num. groups: Year	5
R^2 (full model)	0.35
R^2 (proj model)	0.15
Adj. R^2 (full model)	0.27
Adj. R^2 (proj model)	0.12

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 6: Full Model - Voter Turnout

	Model 1
Δ Gas Price	0.18 (0.12)
Δ Pct. Commute by Public Transport	−0.12 (0.29)
Δ Partisan Index (Dem)	0.24 (0.30)
Δ Unemployment	0.01 (0.01)
Δ Income	−0.00 (0.00)
Δ LFPR	−0.00 (0.00)
Δ Age	−0.00 (0.01)
Δ Education	0.58 (0.64)
Δ Pct. White	0.05 (0.10)
Δ Pct. Black	0.57 (0.53)
Δ Pct. Asian	−0.11 (0.63)
Δ Pct. Native	2.11 (1.28)
Δ Pct. Homeowner	0.00 (0.00)
Δ Home Value	0.00 (0.00)
Δ Pct. Family Household	0.01 (0.00)*
Δ Pct. Married	−0.01 (0.01)
Δ Avg. Household Size	0.00 (0.00)
Δ Commute Time	0.00 (0.01)
Δ Population	−0.00 (0.00)
Δ Population Density	0.00 (0.00)
Num. obs.	1542
Num. groups: State	46
Num. groups: Year	5
R^2 (full model)	0.58
R^2 (proj model)	0.03
Adj. R^2 (full model)	0.57
Adj. R^2 (proj model)	0.02

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

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