Political Ideology and U.S. Electric Vehicle Adoption

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Abstract

The prospect for electric vehicles (EVs) as a climate change solution hinges on their widespread adoption across political lines. This paper uses county-level data to show that from 2012-2023, about half of all new EV registrations in the U.S. went to the 10% most Democratic counties. This correlation remains largely stable over time, though EV trucks show a lower correlation than other EV types. We also conducted a survey, finding little difference in the ability of Democrats and Republicans to answer questions about EVs. Overall, our results suggest that barriers to widespread U.S. EV adoption may be greater than anticipated.

JEL: D12, H23, Q48, Q50

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1 Introduction

The prospect for electric vehicles (EVs) as a climate change solution hinges on their widespread adoption by households across the political spectrum. Ambitious targets for U.S. decarbonization have EVs reaching 50%+ of new vehicle sales by the early 2030s (National Academies, 2021), so even ubiquitous adoption in left-leaning areas will simply not be enough.

In this paper, we examine the correlation between political ideology and U.S. EV adoption. Using detailed county-level data on new U.S. vehicle registrations from 2012-2023, we measure the degree to which EV adoption is concentrated in the most left-leaning counties, and how this concentration has changed over time.

The results point to a remarkably strong correlation. During this time period about half of all new EVs in the United States went to the 10% most Democratic counties, and about one-third went to the top 5%. Counties with affluent left-leaning cities like Cambridge MA, San Francisco CA, and Seattle WA, play a disproportionate role.

One might reasonably ask whether this correlation reflects other factors rather than political ideology. Yet when we control for household income, population density, gasoline prices, and state-by-year fixed effects the correlation remains strong and statistically significant. While we cannot rule out that there are additional omitted variables, the role of political ideology appears to be separate and distinct, above-and-beyond the role played by other observable factors.

Surprisingly, we find that the correlation between political ideology and EV adoption has decreased only a small amount over time. The overall scale of the EV market expands dramatically over our sample period, but even by the end of our sample period, 45% of EVs still went to the 10% most Democratic counties, and 32% still went to the top 5%.

An important exception is EV trucks and vans. Although these vehicles represent a small part of the EV market, we find that they are significantly less concentrated in Democratic counties compared to electric cars and SUVs.

We also conducted an online survey, showing images of various vehicle models and asking respondents to distinguish between EVs and non-EVs. Accuracy varies widely across vehicle models, e.g. 95% for Tesla Model Y versus 53% for Volkswagen ID.4, but Democrats and Republicans were equally accurate. We also find that Democrats have on average only slightly higher general understanding of EVs. It is hard to draw definitive conclusions from this type of survey, but the results suggest that information differences cannot explain the large and persistent gap in EV adoption.

These findings have significant policy implications. Probably most importantly, the enduring role of political ideology suggests that it may be harder than previously believed to achieve widespread U.S. EV adoption. Recently adopted U.S. fuel economy standards, for example, were designed to ensure that EVs reach more than 50% of new vehicle sales by 2032.[1] But, with EVs representing only 8% of new vehicle sales in 2023, achieving such an aggressive increase would require adoption patterns to broaden dramatically.

Our paper contributes to a small literature in economics on political ideology and "green" vehicle adoption.[2] While most previous studies focus on conventional hybrid vehicles like

[1]"Biden Plans an Electric Vehicle Revolution. Now the Hard Part." *New York Times*, Coral Davenport and Neal E. Boudette, April 13, 2023. "Biden Administration Announces Rule Aimed at Expanding Electric Vehicles" *New York Times*, Coral Davenport, March 20, 2024.

[2]In one of the first papers on this topic, Kahn (2007) finds that Census tracts in Los Angeles county with more registered Green Party voters are more likely to have hybrid vehicles. Kahn and Vaughn (2009) shows that zip codes in California with more registered Green Party voters are more likely to have hybrid vehicles, controlling for income and other household characteristics. Sexton and Sexton (2014) finds that zip codes in Colorado and Washington with more Democratic voters are more likely to have the Toyota Prius relative to less conspicuous hybrids like the Toyota Camry hybrid, consistent with what they call "conspicuous conservation". Further afield, Costa and Kahn (2013) finds that Democrats are more responsive than Republicans to energy-related peer comparisons.

the Toyota Prius (Kahn, 2007; Kahn and Vaughn, 2009; Sexton and Sexton, 2014), electric vehicles have thus far received less attention. Probably most closely related to our paper, Archsmith et al. (2022) shows that EV purchases as a share of sedan sales in 2017 and 2018 were higher in states where more people believe climate change is happening.[3] EVs are of significant independent and additional interest because of their higher media profile, very different requirements for charging/refueling, central position in many decarbonization plans, and because these adoption decisions are occurring during a period of rapid political change and ideological polarization. Our data and setting are also particularly well-suited for an empirical analysis given the national-level scope and unusually long 12-year sample period.

The paper is also related to a broader economics literature on EVs. Previous work has shown that EV adoption depends on charging stations (Li et al., 2017; Springel, 2021; Li, 2023), subsidies (Muehlegger and Rapson, 2022; Haan et al., 2023), household income (Borenstein and Davis, 2016; Gillingham et al., 2023), gasoline prices (Bushnell et al., forthcoming), and peer effects (Tebbe, 2023).[4]

The paper proceeds as follows. Section 2 discusses data sources. Section 3 describes the correlation between political ideology and U.S. EV adoption, and how this correlation has changed over time. Section 4 considers alternative explanations, testing to see how the correlation changes after controlling for household income and other factors. Section 5

[3]Archsmith et al. (2022) uses data from a survey of U.S. new vehicle purchasers conducted by MaritzCX (now Ipsos) in 2017 and 2018 to show that EV purchases are correlated with a number of demographic characteristics including household income, education, age, and race. In addition, the paper documents large differences in the geographic pattern of purchases for gasoline-powered sedans and trucks, which they argue points to "the importance of viable electric vehicle alternatives to conventional light trucks".

[4]There is also an analogous literature examining the role that many of these same factors played in driving adoption of conventional hybrid vehicles. See, e.g, Gallagher and Muehlegger (2011); Sallee (2011); Heutel and Muehlegger (2015). Further afield, there are also papers about what an EV replaces (Xing et al., 2021), how much EVs are driven (Burlig et al., 2021), and the environmental impact of EVs (Holland et al., 2016, 2020).

describes our online survey. Section 6 concludes.

2 Data

The core dataset for our analysis is the Experian North American Vehicle Database. This proprietary dataset was compiled by Experian using data from state department of motor vehicle offices and other sources, and describes the universe of U.S. new vehicle registrations.[5] Our primary measure of EV adoption is the "EV Share", which we define as the share of all new vehicle registrations that are EVs. We define EVs as including both battery EVs (like all Tesla models) as well as plug-in hybrid EVs (like the Prius Plug-In Hybrid). We observe shares at both the state- and county-level over the period 2012 to 2023. See Appendix Table 1 for descriptive statistics.

A valuable feature of the Experian data is that they include both sales and leases. Vehicle leasing is common in the United States, and the percentage of new vehicles that are leased varied widely during our sample period, increasing from 21% in 2012 to 30% in 2016, and then decreasing again to 27% in 2020, and to below 20% in 2022.[6] The Experian data provide a record of all new vehicles as they become initially registered, regardless of whether they are purchased or leased.

Another valuable feature of the Experian data is they record the state and county where the vehicle was initially registered, even if the vehicle was purchased or leased elsewhere. Consider, for example, a household that lives in Nevada but purchases a vehicle in Califor-

[5]See `https://www.experian.com/automotive/auto-vehicle-data` for details. New vehicle registrations include "retail" buyers, i.e., households and small businesses, as well as "non-retail" buyers, i.e., government, dealer, and fleet/commercial buyers. Non-retail as a share of all new vehicle registrations ranges from 12% to 19% across years.

[6]See "Car Buyers Shun Leases as Deals and Vehicles Dwindle" Nora Eckert, *Wall Street Journal* March 24, 2022, and "Car Leasing Plummeted During Pandemic, Could Take Years to Recover," Ryan Felton, *Wall Street Journal* January 28, 2023.

nia. Or consider a household that lives in a rural Pennsylvania county, but travels to an urban Pennsylvania county to lease a vehicle. In both cases these vehicles will appear in the Experian data based on the household's location of residence, which is what we want for a study correlating adoption decisions with state- and county-level characteristics.

Our primary measure of political ideology is Democrat vote share from the 2012 U.S. presidential election, using data from state and county voting records compiled by the MIT Election Lab. We use 2012 because this is the beginning of our sample period, though results are very similar using vote shares from 2016 or 2020.[7] In the 2012 election, there were 26 states plus Washington DC won by the Democratic party and 24 states won by the Republican party. Less than 2% of voters selected the Libertarian or other third parties.

In some specifications, we control for median household income. EVs have historically been more expensive than gasoline-powered vehicles, and previous research has shown that high-income households are much more likely to adopt EVs. See, e.g. Borenstein and Davis (2016); Gillingham et al. (2023); Borenstein and Davis (2025). We use county-level median household income estimates for 2012 from the U.S. Census Bureau Small Area Income and Poverty Estimates (SAIPE) Program.[8]

In some specifications we also control for population density. Densely populated urban areas tend to have more robust charging infrastructure which encourages EV adoption. In addition, shorter commuting distances and more frequent stop-and-go driving make EVs a

[7] An alternative to using vote shares would be to measure political ideology using opinion polls. Market research organizations like Ipsos and YouGov, for example, frequently run surveys asking respondents if they consider themselves a Democrat or a Republican. Although there are potentially some advantages with opinion polls, these data do not have the county-level granularity that we need for our analysis.

[8] `https://www.census.gov/programs-surveys/saipe/data/datasets.html`. In some some specifications, we use state-level median household income estimates for 2012 from the U.S. Census Bureau, Current Population Survey. `https://www2.census.gov/programs-surveys/cps/tables/time-series/historical-income-households/h08.xlsx`

practical and cost-efficient choice for households in more densely populated environments. We define population density as county-level population divided by total county land area. We obtain county-level population estimates for 2012 from the U.S. Census Bureau Population Estimates Program and information on land area for 2012 comes from the U.S. Census Bureau TIGER/Line Shapefiles.[9]

We also control for gasoline prices in some specifications. Previous research has shown that gasoline prices impact adoption decisions for gasoline-powered vehicles. See, e.g. Bento et al. (2009); Busse et al. (2013); Allcott and Wozny (2014); Sallee et al. (2016). So it would make sense that gasoline prices would also matter for households choosing between gasoline-powered vehicles and EVs (Bushnell et al., forthcoming). We use state-by-year average gasoline prices from 2012 to 2023 from the U.S. Department of Energy, Energy Information Administration, *State Energy Data System* (SEDS).[10]

Certain specifications also control for electricity prices. EVs are more cost-effective in areas with lower electricity prices, as charging costs directly affect the operating cost of EVs. Thus, lower electricity prices may spur more EV adoption. We use state-by-year average retail price of electricity to residential customers from 2012 to 2023 from the U.S. Department of Energy, Energy Information Administration.[11]

We also include counts of Level 3 Tesla charging stations in some specifications. Tesla may have planned and built its charging network in areas with high EV adoption potential, and the entry of Tesla stations may have contributed to EV adoption in those locations. We compiled county-by-year counts using data from the U.S. Department of Energy, Alterna-

[9] `https://www.census.gov/programs-surveys/popest/data/tables.html` and `https://www.census.gov/programs-surveys/geography.html`

[10] `https://www.eia.gov/state/seds/`

[11] `https://www.eia.gov/electricity/data/state/xls/861/HS861%202010-.xlsx`

tive Fuels Data Center (AFDC).[12]

State-level EV subsidies are included as additional control variables in some specifications. Direct subsidies to consumers lower the upfront cost of EVs, making them a more attractive choice for households. Battery EV and plug-in hybrid EV subsidies are defined as dummy variables that take on the value of one if a battery or plug-in hybrid EV subsidy was available at any point during that year in a given state and zero otherwise. Data on state-level government incentives from 2012 to 2023 were collected manually, using the AFDC page on "Federal and State Laws and Incentives" as a guide.[13]

Finally, we include heating degree days in some specifications to control for climate. Colder climates may deter EV adoption due to reduced battery range and performance in low temperatures, longer charging times, and increased energy use for cabin heating. We use county-level 12-month heating degree days between 2012 and 2023 from the National Oceanic and Atmospheric Administration, National Centers for Environmental Information.[14]

3 Main Results

This section describes the correlation between political ideology and U.S. EV adoption, and how this correlation has changed over time. We start in Section 3.1 looking at the more aggregated state-level data, before turning to the county-level data in Sections 3.2, 3.3, and 3.4.

[12] `https://afdc.energy.gov/data_download`
[13] `https://afdc.energy.gov/laws`
[14] `https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/county/mapping`

3.1 State-Level Scatterplots

Figure 1 is a scatterplot showing the relationship between EV adoption and political ideology. There are 51 observations, one for each state plus Washington DC. The x-axis is the Democrat vote share, ranging from near 25% in Utah and Wyoming to more than 65% in Vermont, Hawaii, and Washington DC. The y-axis is EVs as a share of all new vehicles 2012-2023. EV adoption was highest in California, with EVs representing over 8% of all new vehicles registered.

There is a clear positive correlation between EV adoption and Democrat vote share. The three West coast states (CA, WA, and OR) all have high Democrat vote shares and high EV adoption. But even if one were to exclude those three states, there is still a clear positive correlation with households in majority Democrat states (in blue) about twice as likely on average to adopt an EV than households in majority Republican states (in red).

Figure 2 is the same as the previous figure, except rather than a single scatterplot, we include twelve separate scatterplots, one for each year 2012 to 2023. In each case, the y-axis is EVs as a share of new vehicles registered during that year, and we use the same y-axis range throughout for comparison across years.

The figure reveals explosive growth in EV adoption during our sample period. In the early years of the sample, EV shares are near 0% in most states and below 5% everywhere. Adoption increases sharply year after year, with particularly notable growth in 2018, 2021, 2022, and 2023. By the end of the period, EVs represent more than 5% of the market for new vehicles in most Democratic states, while still less than 5% in most Republican states.

The scatterplots show an enduring relationship between EV adoption and political ideology. It is hard to say whether political ideology matters more or less in 2023 than it did in 2012, but it clearly does matter throughout the sample period, with a marked positive correlation in all years.

We have also examined this relationship separately by vehicle class, i.e., for EV trucks vs EV cars. EV trucks were introduced to the market more recently, starting in 2021, and they may appeal to a broader or different consumer group compared to EV cars. Indeed, we find that the correlation is lower for EV trucks than EV cars, but still positive. See Appendix Figure 1.

In the next section we turn to county-level data. The state-level patterns provide an intuitive starting point for the analysis, but they also obscure rich variation within states that can shed additional light on this relationship.

3.2 Top U.S. Counties for EVs

In the United States, EVs are highly concentrated among a relatively small number of counties. For example, the top twenty counties in EV share of new vehicles from 2012-2023 were responsible for 38% of all U.S. EV adoption, while representing only 12% of all new U.S. vehicle registrations.

The top U.S. counties for EVs are urban, high-income, and in Democratic states. The top four counties are all in California's Bay Area, and California features prominently more generally with nine of the top ten counties.[15] Top counties from outside California tend to include urban, left-leaning cities. Washington's King County, for example, is home to the city of Seattle. Other examples include Multnomah County, OR (Portland), and Middlesex County, MA (Cambridge).[16]

[15]The Bay Area is one of the primary "green" clusters shown by Kahn and Vaughn (2009) to have a disproportionate number of conventional hybrid vehicles, and this pattern clearly continues with EVs.

[16]See Appendix Table 2 for a list of the top twenty counties as well as, for comparison purposes, a list of the bottom twenty counties.

3.3 Quantifying the Concentration of EVs

We next examine the concentration of EVs in the most left-leaning counties. Table 1A reports from 2012 to 2023 the share of U.S. EV registrations that occur in the top 5% and 10% of counties with the highest Democrat vote share, as well as for all counties with a Democrat majority.

The table reveals a high degree of concentration in all years. During this time period about one-third of all new EVs went to the top 5% most Democratic counties, about half went to the 10% most Democratic counties, and more than two-thirds went to counties with a Democratic majority.

The table also reports the slope for each statistic across years. The slopes are negative, indicating lower concentration over time, but small in magnitude. Looking more closely, concentrations tend to increase during the first half of the sample and then decrease during the second half. Even by 2023, however, 32.5% of new EV registrations were still in the top 10%, while 45.6% were still in the top 5%.

Table 1B examines concentrations by vehicle class. Non-car EVs were uncommon early in our sample period, so for these calculations, we restrict registrations to 2021-2023. The table shows that EV adoption is concentrated in the most Democratic counties across all vehicle classes, though less so for trucks. In particular, 34.2% of EV cars during this period went to the top 5% most Democratic counties, compared to only 21.9% for EV trucks.

An alternative approach for understanding this concentration is to examine the cumulative distribution function (CDF) of EV adoption with respect to Democrat vote share. This approach is somewhat more flexible in that it does not emphasize the specific 5% and 10% thresholds, but yields very similar results overall. The CDF shifts modestly to the right during the second half of our sample, but across years the CDF is very steep, with a high degree of concentration among the most Democratic counties. See Appendix Figures 2 and 3.

3.4 Binned Scatterplots and Correlations

Yet another approach for examining the correlation between EV adoption and political ideology, while taking advantage of the rich, within-state variation, is to examine binned scatterplots. Appendix Figure 4 groups counties into twenty equal-sized bins on the basis of Democrat vote share, and then plots the mean EV share and Democrat vote share for each bin using data from 2012 to 2023.

The figure confirms the strong positive correlation that was apparent in the previous results. EVs average less than 0.5% (i.e. half of 1%) in counties with less than 40% Democrat vote share. EV shares then increase sharply between 40% and 60% Democrat vote share. Finally, EV shares continue to increase above 60% Democrat vote share, with shares between 1% and 2.5%. The relationship is nonlinear and convex, increasing faster than would be predicted with a linear model.

We also examine the county-level relationship between EV adoption and political ideology for each year separately from 2012 to 2023. Appendix Figure 5 shows that the overall level of EV adoption increases dramatically during this time period. The maximum observed county-level EV share increases from 0.4% in 2012 to 8% in 2023. The basic pattern from Appendix Figure 4 is persistent over time, with a strong positive correlation and convex shape in all years.

Finally, we have also calculated the correlation between county-level EV shares and Democrat vote share by year. For these correlations we no longer use the bins, we simply calculate the correlation using all 3,100+ counties. There is a positive correlation in all years. Correlations range from 0.24 to 0.39, and are strongly statistically significant in all years. We have also performed the same exercise at the state-level. Again, there is a positive correlation in all years. Correlations range from 0.37 to 0.70, and are strongly statistically significant in all years. We have also calculated correlations using vote shares from 2016 and 2020 (instead of 2012), and results are again very similar. See Appendix Tables 3, 4, and 5.

4 Alternative Potential Explanations

The previous section documents a strong and enduring correlation between political ideology and U.S. EV adoption. However, the most Democratic counties tend to have high household incomes, high population densities, and high gasoline taxes. As discussed in the introduction and documented in the literature, all three of these factors are positively associated with EV adoption. Thus one might reasonably ask whether the patterns in the previous section reflect these other factors – rather than political ideology itself.

In this section, we continue to examine the correlation between EV adoption and political ideology – while controlling for one or more of these other factors. Overall, the correlation between EV adoption and political ideology remains strong and statistically significant even after controlling for these other factors. While we cannot rule out that there are additional omitted variables, the evidence in this section shows that neither household income, population density, nor gasoline taxes can explain the results in the previous section.

4.1 Graphical Evidence

We start with household income. Appendix Figure 6 shows the correlation between EV adoption and political ideology, after controlling for county-level median household income. The pronounced positive correlation documented in the binned scatterplots from Section 3.4 remains even after controlling for household income. We have also examined binned scatterplots for this same relationship year-by-year, and the pronounced positive correlation remains in all years.

We next look at population density. Appendix Figure 7 is a scatterplot constructed by restricting the sample to counties above the 90th percentile for population density. Elsewhere, we prefer binned scatterplots for presenting county-level information, but the regular scatterplot works well here because of the smaller sample.

A strong positive correlation remains even after restricting the sample to high population density counties. Among Republican-majority counties, EV adoption tends to range between 0 and 2.5%, whereas among Democratic majority counties, EV adoption tends to range from 0% to 10%, with adoption above 10% in some outlier counties.

Appendix Figure 8 presents separate scatterplots by year. Continuing to restrict the sample to high population density counties, the figure shows the dramatic growth in EV adoption in Democratic counties. During the first half of the sample period, adoption tends to be below 10% almost everywhere, but there are clear bursts in EV adoption in Democratic counties in 2018, 2021, 2022, and 2023. The difference in adoption between Democratic and Republican counties remains pronounced throughout the sample period.

4.2 Regression Evidence

We now turn to evidence from regressions. Table 2 reports estimates from five separate least-squares regressions, adding control variables progressively. These regressions are estimated using county-by-year data from 2012 to 2023, and standard errors are clustered by state.

In Column (1) without any controls, a one percentage point increase in Democrat vote share (e.g. going from 45% to 46%) is associated with a 0.031 percentage point increase in EV adoption (e.g. from 0.500 percent to 0.531 percent). Mean EV share is less than 1 percent, so this is a large effect. The coefficient attenuates as controls are added – county-level median household income (Column 2), county-level population density (Column 3), state-level gasoline prices (Column 4), state-by-year fixed effects (Column 5) – but remains large in magnitude and strongly statistically significant. The estimate in Column (5) with all controls implies that a one percentage point increase in Democrat vote share is associated with a 0.023 percentage point increase in EV adoption.

These results illustrate that the correlation between EV adoption and political ideology remains strong even after controlling for household income, population density, and gasoline taxes. These other factors matter, but do not explain the correlations described in Section 3. Overall, the role of political ideology appears to be separate and distinct, above-and-beyond the roles played by income, population density and gasoline taxes.

See the Online Appendix for additional results and alternative specifications. Appendix Table 6 reports results from an alternative specification which weights observations using the population of the county. Appendix Table 7 reports results from an alternative specification which includes additional control variables including average retail electricity prices, Tesla station counts, state-level EV subsidies, and heating degree days. Results are quite similar in these alternative specifications.

We do not try to estimate models with county fixed effects. In theory, it would be possible to include separate fixed effects for all 3000+ U.S. counties and to estimate the effect of political ideology on EV adoption using variation in political ideology over time. However, this would require a reliable measure of how political ideology varies over time and we do not believe that such a measure exists. Democrat vote shares for U.S. presidential elections vary between the 2012, 2016, and 2020 elections, but this reflects preferences for particular individual candidates, differences in voting turnout between elections, and other idiosyncratic factors that mostly do not reflect true changes in political ideology.

4.3 ZEV Mandate

Another potential confounding factor is the zero emissions vehicle (ZEV) mandate. During the period 2012-2023, California and ten other states had a ZEV mandate requiring automakers to sell a quota of "zero emissions" vehicles.[17]

Automakers receive ZEV credits for selling EVs in ZEV states. These credits were highly lucrative for some automakers. McConnell and Leard (2021) estimates, for example, that Tesla in 2017 earned about $8,000 per vehicle in revenue from credit sales. Thus the ZEV mandate provides an alternative explanation for the high levels of EV adoption in California and the other ZEV states: New York, Massachusetts, Vermont, Maine, Connecticut, Rhode Island, Oregon, New Jersey, Maryland, and Colorado. Automakers were particularly motivated to sell EVs in these states so they may have targeted marketing

[17] See McConnell and Leard (2021) and Armitage and Pinter (2022) for details. Although fuel cell vehicles also qualified, EVs make up the vast majority of qualifying vehicles. Up until 2017, the mandate only applied to the largest automakers: Chrysler, Ford, GM, Honda, Nissan and Toyota, and partial credits were available for conventional hybrid vehicles like the Toyota Prius. Starting 2018, the mandate was expanded to include all automakers, conventional hybrids were no longer eligible, and cross-state trading rules were amended to eliminate double counting. ZEV credits can be traded across manufacturers and states, and banked for future years.

and discounts in ZEV states, or, alternatively, simply not made EVs available in non-ZEV states.

We report results in the Online Appendix from several additional specifications aimed at disentangling the effect of the ZEV mandate from the role played by political ideology. Appendix Table 8 lists the ZEV states and the year they initially adopted the mandate. Appendix Tables 9 and 10 report regression estimates restricting the sample to include only ZEV states and only non-ZEV states, respectively. Across all specifications, there continues to be a strong and statistically significant effect of political ideology, implying that the correlation between EV adoption and political ideology is not driven by the ZEV mandate nor by potential supply-side responses by automakers to offer different price or availability in ZEV states.

5 Additional Evidence from a Survey

In this section, we describe the results from an online survey that we conducted in January 2025. We wanted to find out if Democrats know more about EVs and can identify them better than Republicans. The previous sections document a strong and enduring correlation between EV adoption and political ideology, and we wanted to shed light on whether these differences could be related to Democrats and Republicans having different information.

We acknowledge upfront that it is hard to draw strong conclusions from this type of survey. Democrats and Republicans are different in many ways, so we are careful not to try to interpret these patterns causally. Moreover, there are always reasonable questions to ask about just how seriously respondents take a survey like this and/or about what other factors could be influencing participant responses.

In the survey, we showed respondents images of various vehicle models and asked respondents to identify each as either an EV or non-EV. We focused on the highest-selling sedans and crossover vehicles from 2020 and 2023 and included approximately an equal mix of EVs and non-EVs. We also asked respondents three multiple-choice questions about general EV knowledge (e.g., What is level-2 charging?) as well as three multiple-choice questions about general automotive knowledge (e.g., What is an alternator?). We conducted the survey with 1,000 participants on *Prolific*.[18]

Table 3 summarizes the survey results. Overall, Democrats and Republicans were equally able to distinguish EVs from non-EVs. Republicans were a bit better able to identify the Ford Mach-E and Democrats were a bit better able to identify the Volkswagen ID.4, but the differences are small in magnitude and not statistically significant at conventional levels (p-value 0.06 and 0.11, respectively).

Respondents' ability to accurately distinguish EVs from non-EVs varies widely across vehicle models. The highly conspicuous Tesla Model Y was most accurately identified, with 95% for both Democrats and Republicans. Hardest to identify was the Volkswagen ID.4, with 56% and 51% for Democrats and Republicans, respectively. Among non-EVs, both Democrats and Republicans struggled somewhat to correctly identify the Honda Civic Hatchback as a non-EV, with 69% and 67%, respectively.

We also find that Democrats have, on average, only slightly higher general understanding of EVs. The difference is statistically significant (p-value 0.01), but small in magnitude, 67% versus 62%. Democrats did better, in particular, answering questions about EV charging. This does not seem to reflect stronger overall automotive knowledge, with Democrats doing

[18]See Appendix Table 11 for descriptive statistics and Appendix Table 12 for survey results reported separately for red and blue states. The survey instrument can be downloaded from `https://faculty.haas.berkeley.edu/ldavis/DLS%20Survey%20Details.pdf`.

a bit worse than Republicans on questions about general automotive knowledge (p-value 0.12).

Despite the concerns mentioned previously, we think the survey is a first step for thinking about information as a potential underlying mechanism. Democrats adopt EVs at a much higher pace than Republicans, yet there does not appear to be a large informational difference. To the contrary, our survey shows that Republicans understand the EV market quite well and are overall quite accurate both at identifying EVs and at answering basic knowledge questions about EVs.

6 Conclusion

Many new technologies start off as niche products that appeal only to a relatively small subset of households. But it has now been 14 years since Nissan introduced the Leaf, and 16 years since Tesla introduced the original Roadster. Moreover, there are now over 100 different EV models for sale in the United States. Enough time has passed – one might have thought – for the U.S. EV market to have broadened considerably.

Yet, we find a strong and enduring correlation between political ideology and U.S. EV adoption. Despite dramatic growth in the overall size of the market, 45% of EVs still go to the 10% most-Democratic counties, and 32% go to the 5% most-Democratic counties. We also find that the correlation remains even after controlling for income, population density, gasoline prices, and state-by-year fixed effects. Finally, we conducted a survey finding that Democrats and Republicans are approximately equally accurate at answering questions about EVs.

Recent news coverage from 2025 further underscores the role political ideology plays in vehicle adoption decisions. For example, some left-leaning consumers in the U.S. have felt alienated by the political activities of Elon Musk and have moved away from Tesla.[19] Similar concerns have contributed to sharp sales declines for Tesla in Europe, even while EV sales overall have soared.[20] Although we find little evidence that the U.S. EV market has broadened across the political spectrum from 2012 to 2023, it will be interesting in future work to revisit our analyses using data from 2024, 2025, and beyond.

[19] "Tesla for Sale: Buyer's Remorse Sinks In for Elon Musk's E.V.-Owning Critics" *New York Times*, Neil Vigdor, March 3, 2025. `https://www.nytimes.com/2025/03/03/business/tesla-boycott-elon-musk.html`

[20] "Tesla's Sales Fall 76% in Germany Amid Musk's Electioneering" *Bloomberg*, Craig Trudell, March 5, 2025. `https://www.bloomberg.com/news/articles/2025-03-05/tesla-s-sales-plunge-76-in-germany-amid-musk-s-electioneering`

References

Allcott, Hunt and Nathan Wozny, "Gasoline Prices, Fuel Economy, and the Energy Paradox," *Review of Economics and Statistics*, 2014, *96* (5), 779–795.

Archsmith, James, Erich Muehlegger, and David S Rapson, "Future Paths of Electric Vehicle Adoption in the United States: Predictable Determinants, Obstacles, and Opportunities," *Environmental and Energy Policy and the Economy*, 2022, *3* (1), 71–110.

Armitage, Sarah and Frank Pinter, "Regulatory Mandates and Electric Vehicle Product Variety," *Working Paper*, 2022.

Bento, Antonio M, Lawrence H Goulder, Mark R Jacobsen, and Roger H Von Haefen, "Distributional and Efficiency Impacts of Increased U.S. Gasoline Taxes," *American Economic Review*, 2009, *99* (3), 667–699.

Borenstein, Severin and Lucas W Davis, "The Distributional Effects of U.S. Clean Energy Tax Credits," *Tax Policy and the Economy*, 2016, *30* (1), 191–234.

— and —, "The Distributional Effects of U.S. Tax Credits for Heat Pumps, Solar Panels, and Electric Vehicles," *National Tax Journal*, 2025, *78* (1), 263–288.

Burlig, Fiona, James Bushnell, David Rapson, and Catherine Wolfram, "Low Energy: Estimating Electric Vehicle Electricity Use," *AEA Papers and Proceedings*, 2021, *111*, 430–435.

Bushnell, James B, Erich Muehlegger, and David S Rapson, "Energy Prices and Electric Vehicle Adoption," *Journal of Political Economy Microeconomics*, forthcoming.

Busse, Meghan R, Christopher R Knittel, and Florian Zettelmeyer, "Are Consumers Myopic? Evidence from New and Used Car Purchases," *American Economic Review*, 2013, *103* (1), 220–256.

Costa, Dora L and Matthew E Kahn, "Energy Conservation "Nudges" and Environmentalist Ideology: Evidence from a Randomized Residential Electricity Field Experiment," *Journal of the European Economic Association*, 2013, *11* (3), 680–702.

Gallagher, Kelly Sims and Erich Muehlegger, "Giving Green to Get Green? Incentives and Consumer Adoption of Hybrid Vehicle Technology," *Journal of Environmental Economics and Management*, 2011, *61* (1), 1–15.

Gillingham, Kenneth T., Arthur A. van Benthem, Stephanie Weber, Mohamed Ali Saafi, and Xin He, "Has Consumer Acceptance of Electric Vehicles Been Increasing? Evidence from Microdata on Every New Vehicle Sale in the United States," *AEA Papers and Proceedings*, 2023, *113*, 329–335.

Haan, Peter, Adrián Santonja di Fonzo, and Aleksandar Zaklan, "Effectiveness and Heterogeneous Effects of Purchase Grants for Electric Vehicles," *DIW Berlin Discussion Paper*, 2023.

Heutel, Garth and Erich Muehlegger, "Consumer Learning and Hybrid Vehicle Adoption," *Environmental and Resource Economics*, 2015, *62* (1), 125–161.

Holland, Stephen P, Erin T Mansur, Nicholas Z Muller, and Andrew J Yates, "Are There Environmental Benefits from Driving Electric Vehicles? The Importance of Local Factors," *American Economic Review*, 2016, *106* (12), 3700–3729.

_ , _ , _ , and _ , "Decompositions and Policy Consequences of an Extraordinary Decline in Air Pollution from Electricity Generation," *American Economic Journal: Economic Policy*, 2020, *12* (4), 244–274.

Kahn, Matthew E, "Do Greens Drive Hummers or Hybrids? Environmental Ideology as a Determinant of Consumer Choice," *Journal of Environmental Economics and Management*, 2007, *54* (2), 129–145.

_ and Ryan K Vaughn, "Green Market Geography: The Spatial Clustering of Hybrid Vehicles and LEED Registered Buildings," *The BE Journal of Economic Analysis & Policy*, 2009, *9* (2).

Li, Jing, "Compatibility and Investment in the U.S. Electric Vehicle Market," *MIT Working Paper*, 2023.

Li, Shanjun, Lang Tong, Jianwei Xing, and Yiyi Zhou, "The Market for Electric Vehicles: Indirect Network Effects and Policy Design," *Journal of the Association of Environmental and Resource Economists*, 2017, *4* (1), 89–133.

McConnell, Virginia and Benjamin Leard, "Pushing New Technology into the Market: California's Zero Emissions Vehicle Mandate," *Review of Environmental Economics and Policy*, 2021, *15* (1), 169–179.

Muehlegger, Erich and David S Rapson, "Subsidizing Low-and Middle-Income Adoption of Electric Vehicles: Quasi-Experimental Evidence from California," *Journal of Public Economics*, 2022, *216*, 104752.

National Academies of Sciences, Engineering, and Medicine, "Accelerating Decarbonization of the U.S. Energy System," *Washington, DC: The National Academies Press*, 2021.

Sallee, James M, "The Surprising Incidence of Tax Credits for the Toyota Prius," *American Economic Journal: Economic Policy*, 2011, *3* (2), 189–219.

_ , Sarah E West, and Wei Fan, "Do Consumers Recognize the Value of Fuel Economy? Evidence from Used Car Prices and Gasoline Price Fluctuations," *Journal of Public Economics*, 2016, *135*, 61–73.

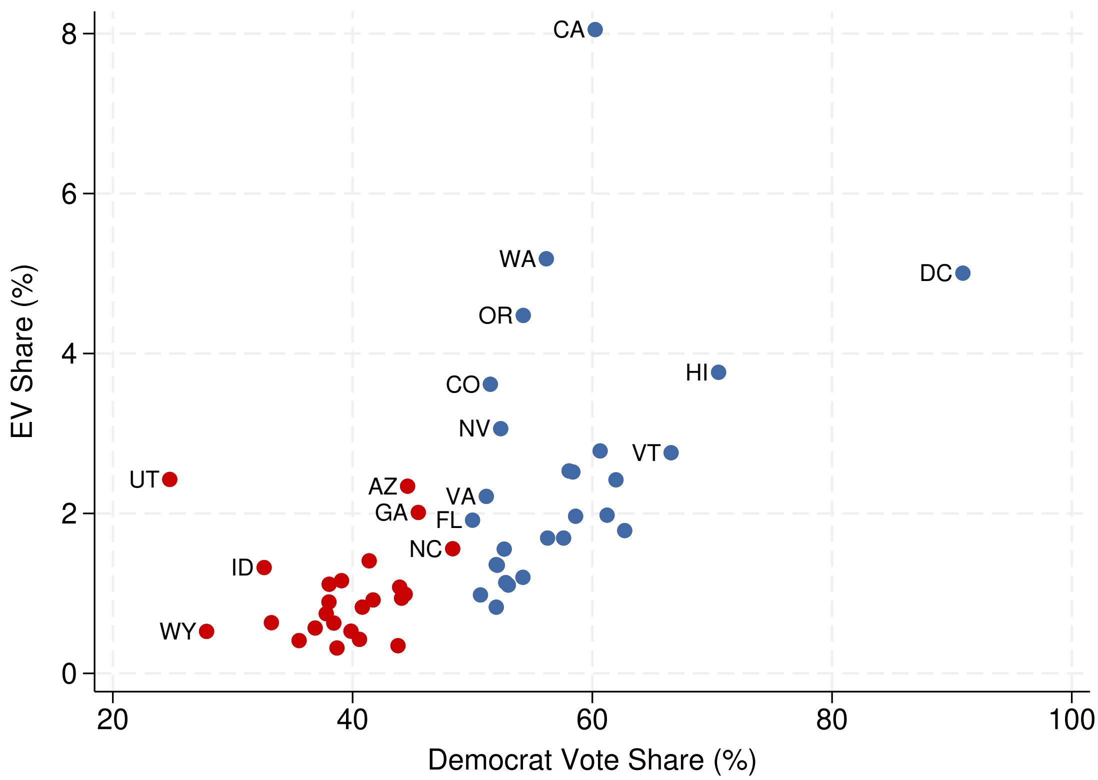
Sexton, Steven E and Alison L Sexton, "Conspicuous Conservation: The Prius Halo and Willingness to Pay for Environmental Bona Fides," *Journal of Environmental Economics and Management*, 2014, *67* (3), 303–317.

Springel, Katalin, "Network Externality and Subsidy Structure in Two-Sided Markets: Evidence from Electric Vehicle Incentives," *American Economic Journal: Economic Policy*, 2021, *13* (4), 393–432.

Tebbe, Sebastian, "Peer Effects in Electric Car Adoption: Evidence from Sweden," *Working Paper*, 2023.

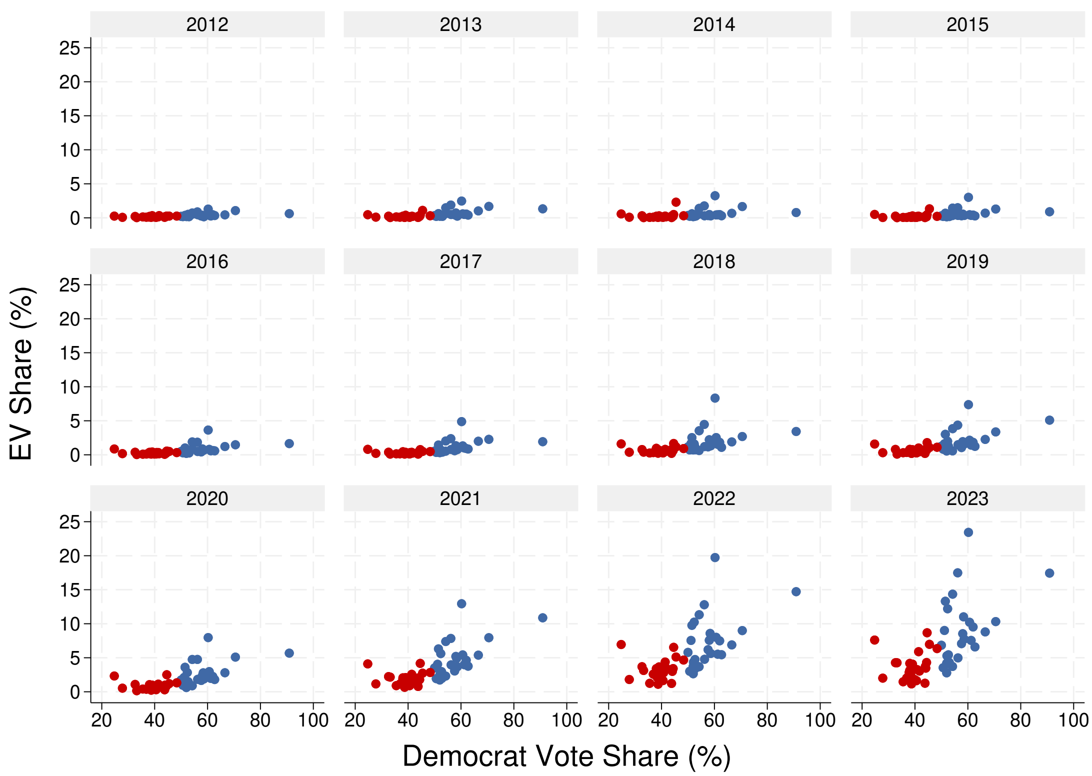
Xing, Jianwei, Benjamin Leard, and Shanjun Li, "What Does an Electric Vehicle Replace?," *Journal of Environmental Economics and Management*, 2021, *107*, 102432.

Figure 1: EV Adoption and Political Ideology



Notes: This scatterplot has 51 observations, one for each state and one for Washington, DC. The x-axis is the share of voters in the 2012 U.S. presidential election who voted for Barack Obama. The y-axis is EVs as a share of all new vehicles registered during the period 2012 to 2023. States with majority vote Democrat are in blue and states with majority vote Republican are in red.

Figure 2: EV Adoption and Political Ideology, by Year



Notes: These scatterplots are identical to Figure 1, except we include a separate scatterplot for each year. The x-axis in all years is the share of voters in the 2012 presidential election who voted for Barack Obama. The y-axis is EVs as a share of all new vehicles registered during that year. States with majority vote Democrat are in blue and states with majority vote Republican are in red.

Table 1: EV Adoption in the Most Democratic Counties

Panel A: Share of Registered EVs by Year			
Year	Top 5% Most Democractic Counties	Top 10% Most Democractic Counties	Counties with a Democratic Majority
2012	0.357	0.482	0.700
2013	0.408	0.521	0.729
2014	0.435	0.542	0.720
2015	0.463	0.562	0.748
2016	0.439	0.537	0.756
2017	0.446	0.544	0.750
2018	0.416	0.525	0.731
2019	0.393	0.508	0.722
2020	0.356	0.478	0.703
2021	0.321	0.447	0.677
2022	0.324	0.450	0.678
2023	0.325	0.456	0.681
Slope	-0.009	-0.007	-0.005
P-value	0.027	0.019	0.046
Panel B: Share of Registered EVs by Class, 2021-2023			
Cars	0.342	0.473	0.691
SUVs	0.321	0.448	0.681
Vans	0.267	0.400	0.584
Trucks	0.219	0.351	0.597

Notes: This table describes the concentration of newly registered EVs in counties with the highest Democrat vote shares (Columns 1 and 2) and in counties with a Democratic majority (Column 3). Panel (A) shows how this concentration has changed over time. The slope at the bottom of the panel comes from a regression with 12 observations, one for each year. We regress each statistic on a linear time trend and report the slope as well as a p-value from a test where the null hypothesis is that the slope is zero. Panel (B) shows how this concentration varies across vehicle class. Non-car EVs are uncommon early in our sample period, so we restrict this to registrations 2021-2023. For example, 34.2% of all EV car adoption occurred in the top 5% most Democractic counties during this period, while only 21.9% of all EV truck registrations happened in those same counties. During 2021-2023, the percentage of newly registered EVs in each class was 30%, 65%, 3%, and 2% for cars, SUVs, vans, and trucks, respectively.

Table 2: EV Adoption and Political Ideology, Regression Estimates

	(1)	(2)	(3)	(4)	(5)
Democrat Vote Share	0.031**	0.028**	0.027**	0.025**	0.023**
	(0.009)	(0.007)	(0.007)	(0.006)	(0.005)
County Median Household Income		0.051**	0.050**	0.046**	0.048**
		(0.010)	(0.010)	(0.008)	(0.008)
County Population Density			0.005	0.005	0.004
			(0.004)	(0.004)	(0.003)
State-Level Gasoline Prices				0.930**	
				(0.230)	
State-by-Year Fixed Effects	No	No	No	No	Yes
Observations	37,344	37,344	37,344	37,344	37,332
R-squared	0.060	0.158	0.160	0.251	0.672

Notes: This table reports coefficient estimates and standard errors from five separate least square regressions. All regressions are estimated using county-by-year observations for 2012 to 2023. In all regressions the dependent variable is the share of all new registered vehicles that are EVs. There are no additional controls other than the controls listed in the row headings. Standard errors are clustered by state. The number of observations is smaller in Column (5) because Washington DC is a single county, so those observations are dropped when state-by-year fixed effects are included. ** Significant at the 1% level, *Significant at the 5% level.

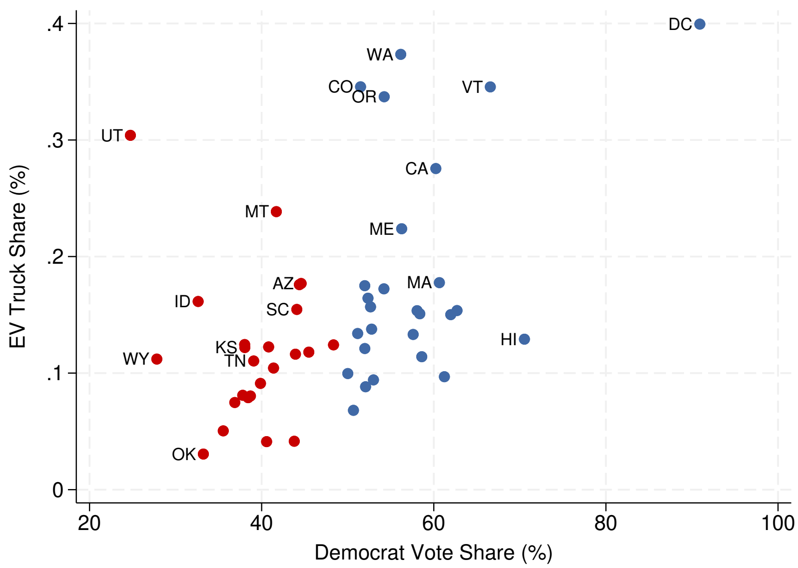
Table 3: Do Democrats Know More Than Republicans About EVs?

	(1) Democrats n=499	(2) Republicans n=498	(3) *p*-value (1) vs (2)
A. Distinguishing EVs from non-EVs			
Overall Percentage Correct	79%	78%	.98
Correctly Identified EVs as EVs	79%	78%	.75
Tesla Model Y 2023	95%	95%	.88
Ford Mach-E 2023	76%	81%	.06
Volkswagen ID.4 2023	56%	51%	.11
Nissan Leaf 2020	85%	83%	.33
Chevrolet Bolt 2020	82%	82%	.88
Correctly Identified non-EVs as non-EVs	78%	79%	.76
Toyota Rav 4 2023	84%	84%	.92
Honda CRV 2023	80%	84%	.19
Toyota Camry 2020	79%	81%	.59
Honda Civic Hatchback 2020	69%	67%	.44
B. Knowledge About EVs			
Overall Percentage Correct	67%	62%	.01
Correct Understanding Charging Time	41%	36%	.05
Correct Understanding Level 2 Charging	72%	64%	.01
Correct Understanding Batteries	86%	87%	.65
C. General Automotive Knowledge			
Overall Percentage Correct	69%	72%	.12
Correct Understanding Alternator	60%	67%	.04
Correct Understanding Wheel Alignment	77%	79%	.33
Correct Understanding Odometer	69%	69%	.96

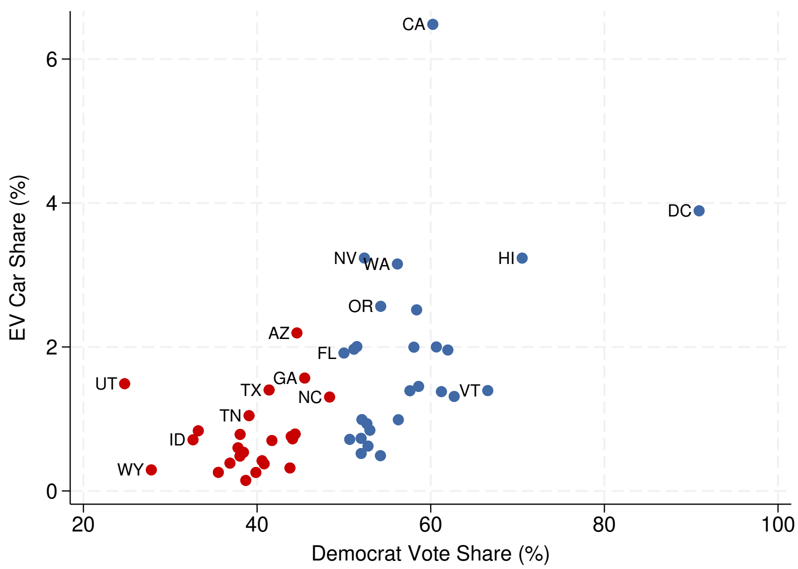
Note: This table reports results from the survey we conducted January 2025 on Prolific. See Appendix Table 11 descriptive statistics and additional details.

Appendix Figure 1: EV Adoption and Political Ideology, By Vehicle Class

(a) Trucks

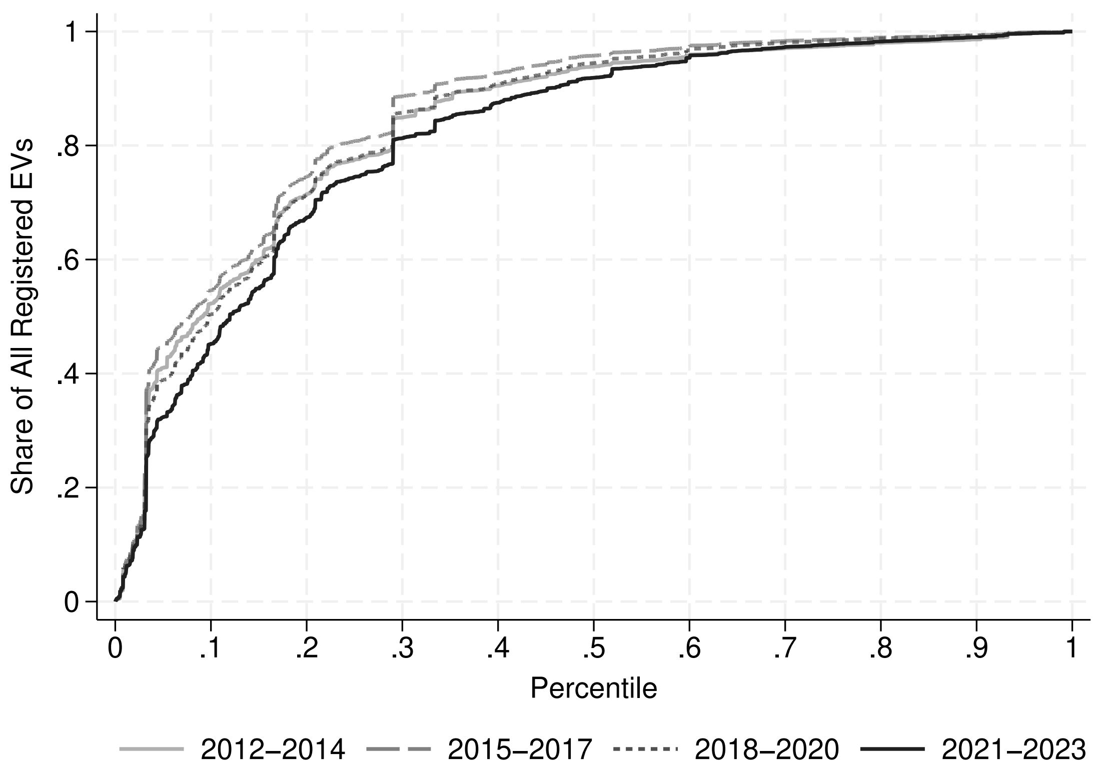


(b) Cars



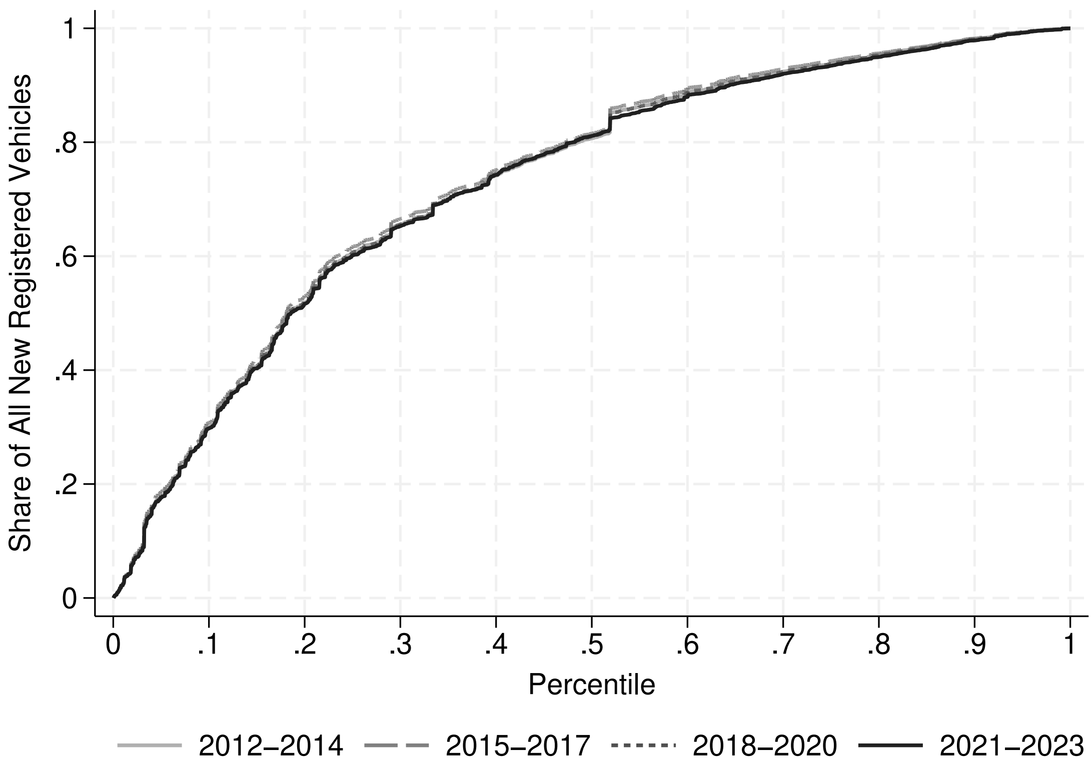
Notes: Each scatterplot has 51 observations, one for each state and one for Washington, DC. The x-axis is the share of voters in the 2012 U.S. presidential election who voted for Barack Obama. The y-axis is EV trucks or cars as a share of all new vehicles registered from 2021 to 2023, ranging from 0% to 100%. States with majority vote Democrat are in blue and states with majority vote Republican are in red.

Appendix Figure 2: EV Adoption and Political Ideology, Cumulative Distribution Function by Time Period



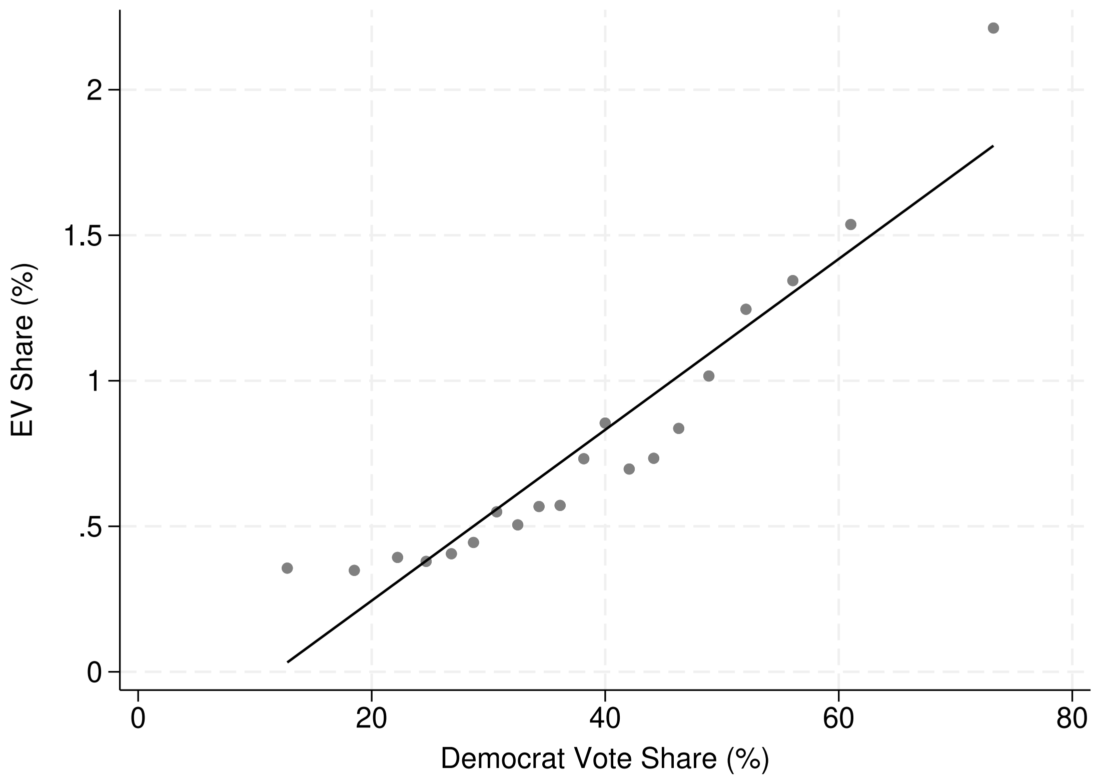
Notes: This figure plots the distribution of EV adoption across counties based on Democrat vote share and how this has changed over time. For example, in all 3-year time periods about 80% of EV adoption occurred in the 30% most Democratic counties. The x-axis is the percentile of counties based on Democrat vote shares, from those with the highest Democrat vote shares to those with the lowest, divided into percentiles. The y-axis is the share of all new registered EVs during that time period.

Appendix Figure 3: New Vehicle Registrations and Political Ideology, Cumulative Distribution Function by Time Period



Notes: The most Democratic counties are also some of the most populous counties, so the concentration in Appendix Figure 2 in part reflects higher overall levels of vehicle adoption. This figure is the same as Appendix Figure 2, except it is constructed using *all* new vehicle registrations, not just EVs. This figure shows, for example, that in all 3-year time periods about 80% of new vehicles are registered in the 50% most Democratic counties. The x-axis is, as before, the percentile of counties based on Democrat vote shares, from those with the highest Democrat vote shares to those with the lowest, divided into percentiles. The y-axis is the share of all new registered vehicles in the US during that time period. There is almost no change over time in the CDFs for all newly registered cars, as illustrated by the nearly completely overlapping CDFs across different time periods. The CDFs for all new vehicles are flatter compared to those for EVs, which indicates that the most left-leaning counties contribute much more to EV adoption in the U.S. than would be expected based on their overall share of new vehicle registrations.

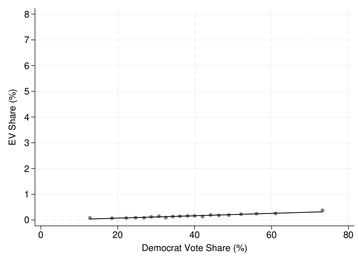
Appendix Figure 4: EV Adoption and Political Ideology, Binned Scatterplot



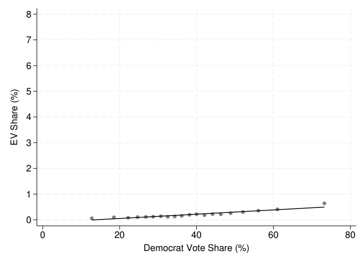
Notes: For this figure we group counties into twenty equal-sized "bins" on the basis of Democrat vote share, and then plot the mean EV share and Democrat vote share for each bin. We also plot a least squares linear regression line (in black). The x-axis is the share of voters in the 2012 presidential election who voted for Barack Obama. The y-axis is EVs as a share of all new vehicles registered during the period 2012 to 2023.

Appendix Figure 5: The Relationship Between EV Adoption and Political Ideology, by Year

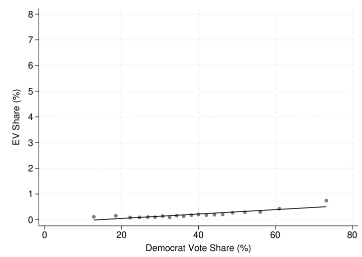
(a) 2012



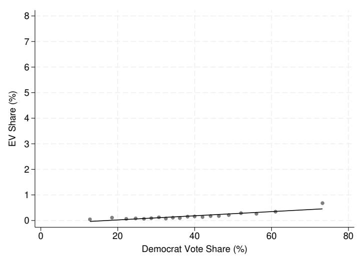
(b) 2013



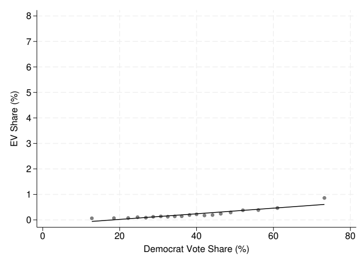
(c) 2014



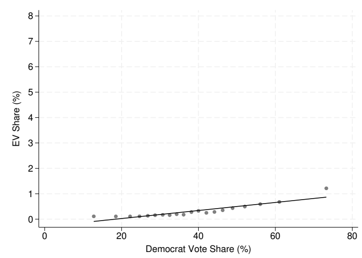
(d) 2015



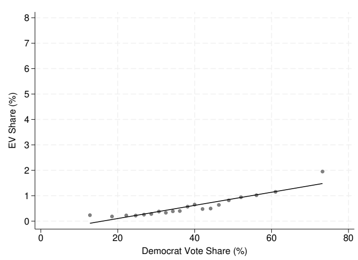
(e) 2016



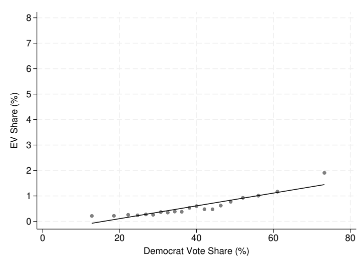
(f) 2017



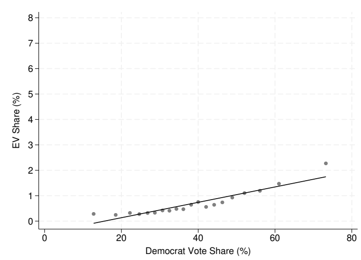
(g) 2018



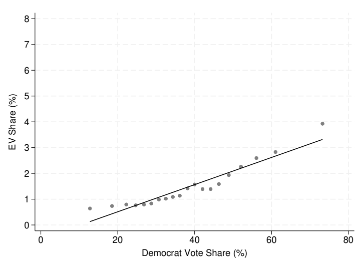
(h) 2019



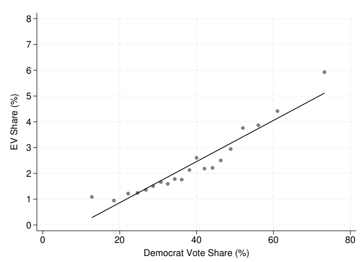
(i) 2020



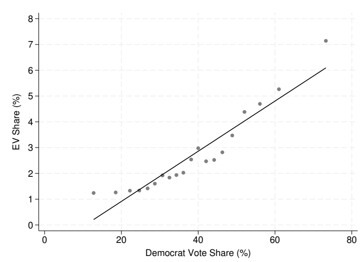
(j) 2021



(k) 2022

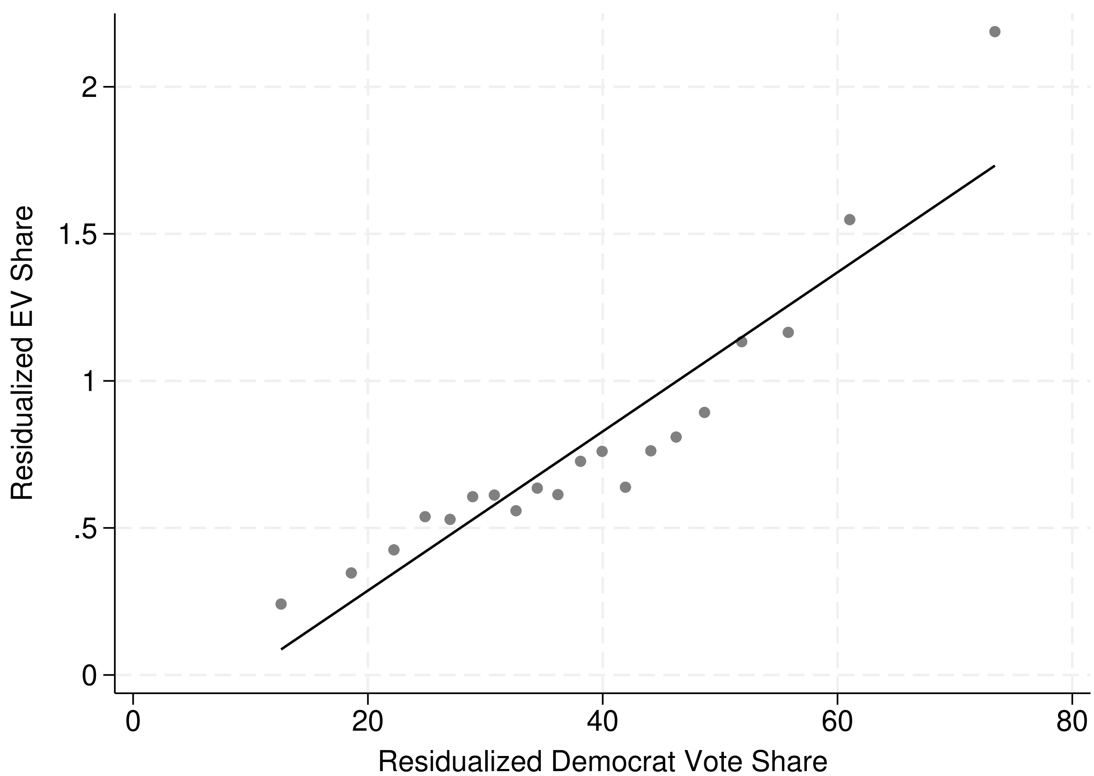


(l) 2023



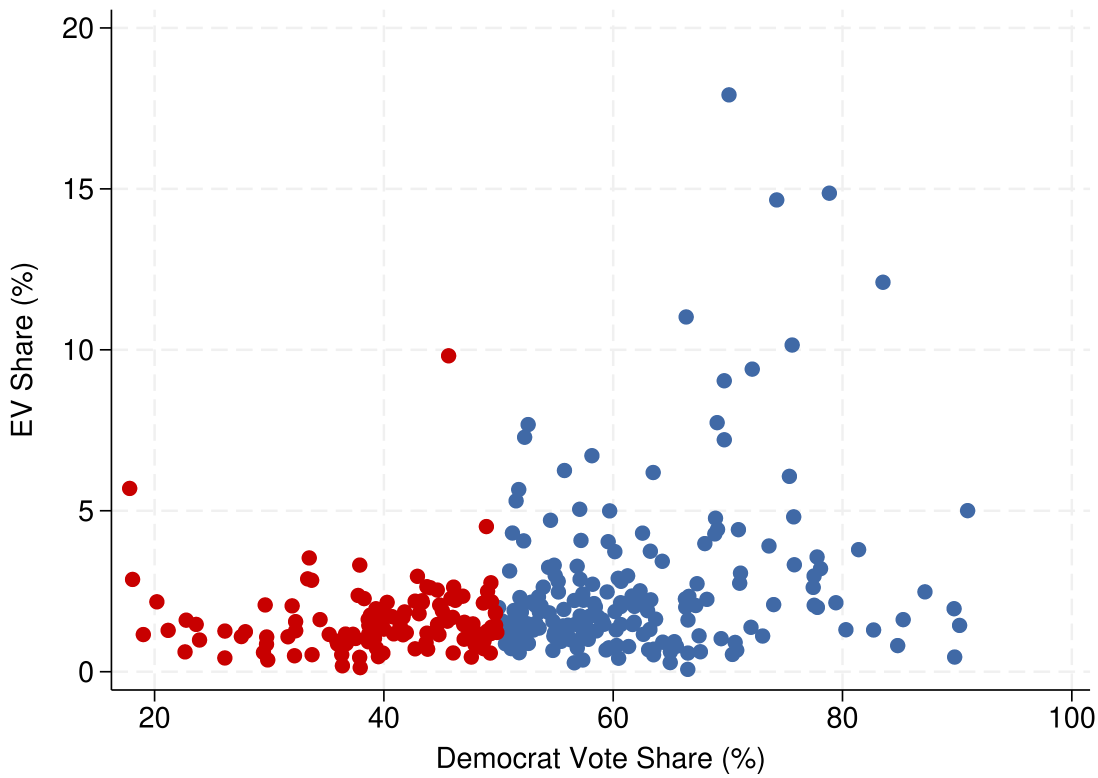
Notes: These binscatter plots are identical to Appendix Figure 4, except we include a separate scatterplot for each year.

Appendix Figure 6: The Relationship Between EV Adoption and Political Ideology After Controlling for Income



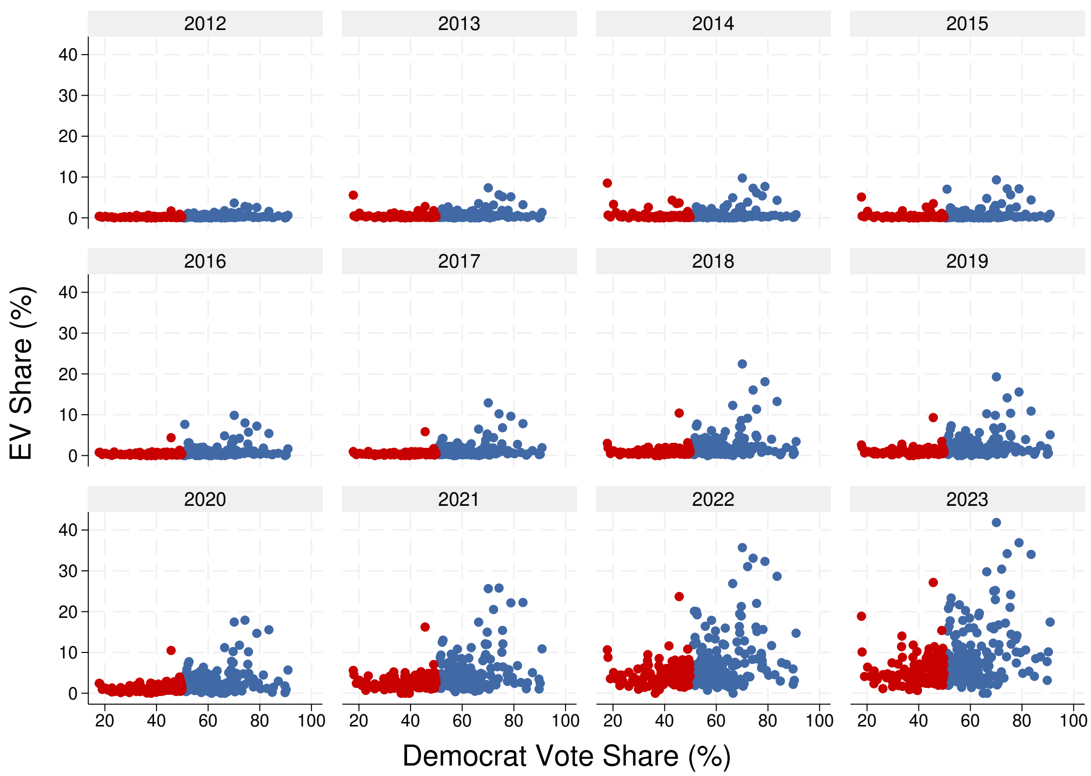
Notes: This binscatter plot shows the relationship between county-level residualized EV shares and residualized Democrat vote shares. The x-axis is the share of voters in the 2012 presidential election who voted for Barack Obama. The y-axis is EVs as a share of all new vehicles registered during the period 2012 to 2023. Both variables were residualized with respect to county-level median household income in 2012, and then the sample mean was added back.

Appendix Figure 7: EV Adoption in High Population Density Counties



Notes: This figure is a county-level scatterplot, restricted to high population density counties (above 90th percentile). The x-axis is the share of voters in the 2012 presidential election who voted for Barack Obama. The y-axis is EVs as a share of all new vehicles registered during the period 2012 to 2023. Population density is defined at the county level as population divided by land area. Counties with majority vote Democrat are in blue and counties with majority vote Republican are in red.

Appendix Figure 8: EV Adoption in High Population Density Counties, by Year



Notes: This figure is identical to Appendix Figure 7, except we include a separate scatterplot for each year.

Appendix Table 1: Descriptive Statistics

	Obs	Mean	Std dev.	Min	Max
EV Share	37,344	0.81	1.85	0	41.8
Democrat Vote Share	37,344	38.5	14.8	3.45	93.4
County Median Household Income ($1,000)	37,344	44.7	11.3	22.1	121
County Population (10,000 persons)	37,344	10.1	32.1	0.009	993
County Population Density (100 persons per square mile)	37,344	2.67	17.7	0.001	711
State-Level Gasoline Prices ($/gallon)	37,344	2.85	0.60	1.85	5.55
State-Level Electricity Prices (cents/kWh)	37,344	12.4	2.61	8.37	43.0
County Tesla Station Count	37,344	2.21	14.6	0	1,212
State-Level BEV Subsidy (0/1)	37,344	0.22	0.41	0	1
State-Level PHEV Subsidy (0/1)	37,344	0.21	0.40	0	1
County 12-month Heating Degree Days (1,000°Df)	37,284	4.76	2.26	0.08	11.6

Notes: This table provides descriptive statistics for our county-level dataset. The unit of observation is county-by-year and the sample period covers 2012 to 2023. See Section 2 in the paper for a detailed description of data sources. EV share is the share of all new vehicles registered in a given county and year that are EVs. Democrat vote share is the share of voters in the 2012 presidential election who voted for Barack Obama. In 2012, Barack Obama received 51% of all votes (i.e. the popular vote), but the mean is lower here because these statistics are not weighted by population. County-level voting records are not available for Alaska for 2012, so Alaska is dropped in all county-level analyses. We also drop Kalawao county, Hawaii, in all county-level analyses as it is a very small county that only has non-zero new vehicle registrations in about half of the years in our sample. County median annual household income is from 2012 and measured in thousands of dollars. County population is from 2012 and measured in ten thousands of people. Population density is measured at the county-level and measured in hundred persons per square mile. Gasoline prices are measured at the state-by-year level, in dollars per gallon. Electricity prices are measured at the state-by-year level, in cents per kilowatthour. County Tesla station counts are measured as the total number of Level 3 Tesla charging outlets. BEV and PHEV subsidies are dummy variables that take on the value of one if a BEV or PHEV subsidy was available at any point during that year in the state. County-level 12-month heating degree days are the sum of negative differences between the mean daily temperature and the 65°F base, measured in Fahreinheit degree-days. Heating degree days are not available for Hawaii and Lexington County, VA.

Appendix Table 2: Top and Bottom 20 U.S. Counties for EV Adoption

Panel A: Highest EV Adoption		**Panel B: Lowest EV Adoption**	
County	**EV Share (%)**	**County**	**EV Share (%)**
Santa Clara, CA	17.9	Hidalgo, TX	0.5
Alameda, CA	14.9	Macomb, MI	0.7
San Francisco, CA	12.1	El Paso, TX	0.8
Contra Costa, CA	11.0	St. Louis County, MO	1.0
Orange, CA	9.8	Cuyahoga, OH	1.0
King, WA	7.7	Jefferson, KY	1.1
San Diego, CA	7.7	Wayne, MI	1.1
Ventura, CA	7.3	Milwaukee, WI	1.1
Los Angeles, CA	7.2	Shelby, TN	1.2
Sacramento, CA	6.7	Erie, NY	1.2
Multnomah, OR	6.1	Marion, IN	1.3
Riverside, CA	5.2	Bexar, TX	1.4
San Bernardino, CA	4.9	Baltimore, MD	1.4
Fresno, CA	4.5	Harris, TX	1.4
Montgomery, MD	4.4	Tarrant, TX	1.4
Middlesex, MA	4.3	Bronx, NY	1.4
Honolulu, HI	4.3	Franklin, OH	1.5
Fairfax, VA	4.0	Allegheny, PA	1.5
New York, NY	3.8	Duval, FL	1.5
Middlesex, NJ	3.7	Hamilton, OH	1.5

Notes: This table reports the top 20 counties with the highest EV adoption (Panel A) and the bottom 20 counties with the lowest EV adoption (Panel B) during the period 2012 to 2023. Both lists are restricted to counties with population greater than 750,000. Cities represented in Panel (A) include San Jose (Santa Clara County), Oakland (Alameda County), Seattle (King County), Portland (Multnomah County), and Cambridge (Middlesex County). Taken together, the 20 counties with the lowest EV adoption account for 8.8% of all new vehicle registrations in the U.S. but only 4.4% of all new EV registrations.

Appendix Table 3: Correlation Between County-level EV Shares and Democrat Vote Shares, by Year

Panel A: Correlation by Year		
Year	Correlation	P-value
2012	0.253	0.000
2013	0.289	0.000
2014	0.239	0.000
2015	0.253	0.000
2016	0.313	0.000
2017	0.340	0.000
2018	0.334	0.000
2019	0.344	0.000
2020	0.360	0.000
2021	0.379	0.000
2022	0.386	0.000
2023	0.394	0.000
Panel B: Hypothesis Test		
Slope	0.014	0.000

Notes: Panel (A) reports correlations by year between county-level EV shares and Democrat vote shares in the 2012 presidential election. Panel (B) assesses whether this correlation is going up or down. We run a regression using 12 observations, one for each year. We regress the correlation on a linear time trend, and report in Panel (B) the slope from this regression as well as a p-value from a test where the null hypothesis is that the slope is zero.

Appendix Table 4: Correlation Between State-level EV Shares and Democrat Vote Shares

Panel A: Correlation by Year		
Year	Correlation	P-value
2012	0.601	0.000
2013	0.579	0.000
2014	0.373	0.007
2015	0.440	0.001
2016	0.552	0.000
2017	0.589	0.000
2018	0.528	0.000
2019	0.629	0.000
2020	0.654	0.000
2021	0.698	0.000
2022	0.635	0.000
2023	0.629	0.000
Panel B: Hypothesis Test		
Slope	0.015	0.043

Notes: Panel (A) of this table presents correlations by year between state-level EV shares and Democrat vote shares from the 2012 Presidential Elections. Panel (B) assesses whether this correlation is going up or down. We run a regression using 12 observations, one for each year. We regress the correlation on a linear time trend, and report in Panel (B) the slope from this regression as well as a p-value from a test where the null hypothesis is that the slope is zero.

Appendix Table 5: Alternative Measures of Political Ideology

Year	2012 vote	2016 vote	2020 vote
2012	0.253	0.302	0.344
2013	0.289	0.355	0.399
2014	0.239	0.315	0.352
2015	0.253	0.320	0.354
2016	0.313	0.389	0.430
2017	0.340	0.414	0.459
2018	0.334	0.416	0.460
2019	0.344	0.431	0.480
2020	0.360	0.458	0.509
2021	0.379	0.480	0.539
2022	0.386	0.496	0.558
2023	0.394	0.508	0.569

Notes: This table is identical to Appendix Table 3, but uses alternative measures of political ideology. Column (1) shows our baseline results using the share of voters in the 2012 Presidential Election who voted for Barack Obama. Columns (2) and (3) repeat the exercise, but using Democrat vote share from the 2016 and 2020 Presidential Elections, respectively.

Appendix Table 6: EV Adoption and Political Ideology, Regression Estimates With Population Weights

	(1)	(2)	(3)	(4)
Democrat Vote Share	0.074*	0.065**	0.071*	0.052**
	(0.030)	(0.024)	(0.028)	(0.014)
County Median Household Income	No	Yes	Yes	Yes
County Population Density	No	No	Yes	Yes
State-Level Gasoline Prices	No	No	No	Yes
Observations	37,344	37,344	37,344	37,344
R-squared	0.074	0.151	0.154	0.372

Notes: This table is exactly the same as Table 2 in the paper except we use population weights in all regressions. In contrast, Table 2 in the paper uses no weights, so implicitly puts equal weight on all counties. ** Significant at the 1% level, *Significant at the 5% level.

Appendix Table 7: EV Adoption and Political Ideology, Regression Estimates with Additional Controls

	(1)	(2)	(3)	(4)
Democrat Vote Share	0.013**	0.011**	0.012**	0.013**
	(0.004)	(0.004)	(0.004)	(0.004)
County Median Household Income	0.036**	0.031**	0.030**	0.034**
	(0.005)	(0.005)	(0.005)	(0.005)
County Population Density	0.004	0.002	0.002	0.001
	(0.004)	(0.003)	(0.003)	(0.002)
State-Level Gasoline Prices	0.761**	0.671**	0.660**	0.704**
	(0.153)	(0.126)	(0.115)	(0.119)
State-Level Electricity Prices	0.221**	0.162**	0.148**	0.169**
	(0.075)	(0.052)	(0.050)	(0.054)
County Tesla Station Counts		0.048**	0.047**	0.045**
		(0.008)	(0.008)	(0.008)
State-level BEV Subsidies			0.532*	0.476
			(0.225)	(0.253)
State-level PHEV Subsidies			-0.080	-0.129
			(0.305)	(0.335)
County Heating Degree Days				-0.069
				(0.035)
Observations	37,344	37,344	37,344	37,284
R-squared	0.330	0.463	0.473	0.481

Notes: This table is exactly the same as Table 2 in the paper except we include additional control variables. Tesla charging station counts are defined as the number of Level 3 charging outlets at stations with Tesla connectors on the last day of each year from 2012 to 2023. For this purpose, we use daily snapshots from 2014 to 2023 obtained from the U.S. Department of Energy, Alternative Fuels Data Center (AFDC). For the period 2014 to 2023, we use the daily snapshot from January 1st of the following year to represent the total number of installed chargers on the last day of a given year. Since daily snapshots are not available for 2012 and 2013, we use opening dates indicated for those specific years from the January 2014 snapshot of the AFDC U.S. charging stations database. In most cases, these stations only have Tesla Level 3 connectors. However, in a small number of cases, other Level 3 connector types are also present. Since the data do not contain connector counts by type, we use the total number of Level 3 charging outlets as a proxy for Tesla Level 3 outlet counts in such cases. Heating degree days are not available for Hawaii and Lexington County, VA.** Significant at the 1% level, *Significant at the 5% level.

Appendix Table 8: States with the Zero-Emission Vehicle Mandate

State	First Year Mandate Was Adopted
California	1990
New York	1993
Massachusetts	1995
Vermont	2000
Connecticut	2008
Rhode Island	2008
Maine	2009
New Jersey	2009
Oregon	2009
Maryland	2011
Colorado	2023
Minnesota	2025
Nevada	2025
Virginia	2025
Washington	2025
New Mexico	2026

Notes: This table lists the states that have adopted California's Zero-Emission Vehicle mandate for light-duty vehicles. This information comes from the California Air Resources Board. For each state, the table reports the first year the mandate was adopted, i.e. the first model year which was subject to the mandate. See `https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/states-have-adopted-californias-vehicle-regulations` for details.

Appendix Table 9: EV Adoption and Political Ideology, Regression Estimates in States with the Zero-Emission Vehicle Mandate by 2023

	(1)	(2)	(3)	(4)
Democrat Vote Share	0.094*	0.079**	0.082**	0.082**
	(0.032)	(0.020)	(0.021)	(0.021)
County Median Household Income	No	Yes	Yes	Yes
County Population Density	No	No	Yes	Yes
State-Level Gasoline Prices	No	No	No	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes
Observations	3,864	3,864	3,864	3,864
R-squared	0.599	0.663	0.664	0.695

Notes: This table is exactly the same as Table 2 in the paper except we restrict all regressions to only include states that have the zero-emission vehicle mandate during our sample time period. ** Significant at the 1% level, *Significant at the 5% level.

Appendix Table 10: EV Adoption and Political Ideology, Regression Estimates in States without the Zero-Emission Vehicle Mandate by 2023

	(1)	(2)	(3)	(4)
Democrat Vote Share	0.012**	0.016**	0.012**	0.012**
	(0.003)	(0.002)	(0.002)	(0.002)
County Median Household Income	No	Yes	Yes	Yes
County Population Density	No	No	Yes	Yes
State-Level Gasoline Prices	No	No	No	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes
Observations	33,480	33,480	33,480	33,480
R-squared	0.393	0.473	0.482	0.500

Notes: This table is exactly the same as Table 2 in the paper except we restrict all regressions to only include states that do *not* have the zero-emission vehicle mandate during our sample time period. ** Significant at the 1% level, *Significant at the 5% level.

Appendix Table 11: Descriptive Statistics for Survey

	(1) Democrats n=499	(2) Republicans n=498	(3) p-value (1) vs (2)
Basic Demographics			
Age	42	42	.80
Male	39%	46%	.02
Household Size	2.7	3.3	.00
Annual Household Income $1000s	71	74	.24
Student	12%	11%	.63
Employment Status			
Employed Full-Time	56%	52%	.22
Employed Part-Time	13%	14%	.77
Not in Paid Work (e.g. retired)	11%	16%	.01
Unemployed or Other	12%	10%	.27
Employment Status Not Available	8%	7%	.82
Education			
High School Graduate	100%	100%	.56
College Graduate	62%	55%	.02
Race			
Asian	7%	2%	.00
Black	12%	5%	.00
Mixed	4%	2%	.08
White	74%	88%	.00
Other	2%	2%	.82
U.S. Census Region			
Northeast	16%	15%	.87
Midwest	22%	21%	.60
South	42%	47%	.09
West	20%	16%	.14
Survey Details			
Survey Completion Time (Minutes)	4.1	4.9	.02
Previously Completed Surveys	2,392	1,499	.00

Note: This table reports descriptive statistics the individuals we surveyed January 2025 on Prolific. We restricted the survey to respondents living in the United States, fluent in english, with a drivers license, and with either an owned or leased car. Prolific asks participants, "In general, what is your political affiliation?" and we surveyed 500 Democrats and 500 Republicans. Participants identifying as "Independent," "Other," or "None" were not surveyed. Three participants failed to correctly submit their survey responses resulting in a sample with 499 Democrats and 498 Republicans. Household income is elicited by Prolific using 13 categories. For the purposes of the table we calculated mean income based on the bottom of each range, e.g. "$60000–$69999" is treated as $60,000 and "More than $150,000" is treated as $150,000.

Appendix Table 12: Survey Results By Political Party and State of Residence

(1) Democrats in Blue States n=309	(2) Republicans in Blue States n=272	(3) Democrats in Red States n=190	(4) Republicans in Red States n=226	(5) *p*-value (1) vs (2)	(6) *p*-value (3) vs (4)
A. Distinguishing EVs from non-EVs, Overall Percentage Correct					
79%	79%	78%	78%	.91	.88
B. Knowledge About EVs, Overall Percentage Correct					
67%	62%	66%	63%	.02	.25
C. General Automotive Knowledge, Overall Percentage Correct					
69%	71%	68%	72%	.37	.17

Note: This table is similar to Table 3, but reports statistics separately by both political party and state of residence. Blue and red states are defined based on the 2012 presidential election.