Political Ideology and U.S. Electric Vehicle Adoption

Lucas W. Davis Jing Li Katalin Springel*

March 2025

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 no difference in the ability of Democrats and Republicans to identify EVs. Overall, our results suggest that barriers to widespread U.S. EV adoption may be greater than anticipated.

JEL: D12, H23, Q48, Q50

*(Davis) University of California, Berkeley; *lwdavis@berkeley.edu* (Li) Tufts University; *j.li@tufts.edu* (Springel) HEC Montréal; *katalin.springel@hec.ca*. We have not received any financial compensation for this project nor do we have any financial relationships that relate to this research. Jing Li gratefully acknowledges support from the MIT Energy Initiative Mobility Systems Center for purchasing some data for an unrelated project which are also used in this paper. We thank Michael Anderson, Arthur van Benthem, Mark Jacobsen, David Rapson, Daniel Sperling, and Matthew Tarduno as well as seminar and conference participants at UC Berkeley and the Quebec Political Economy Conference for helpful comments. Upon completion of the project all the code used for the analysis will be posted on our websites. The survey conducted for this paper was reviewed and approved by the Research Ethics Board of HEC Montréal (Project No.: 2025-6083) and was deemed exempt from review by the IRB at Tufts University (IRB ID: STUDY00005289).

1 Introduction

The prospect for electric vehicles (EVs) as a climate change solution hinges on their widespread adoption by households across the political spectrum. Some policymakers envision EVs reaching 50% or more of U.S. new vehicle sales by 2032, so even ubiquitous adoption in left-leaning areas like Cambridge, Massachusetts will simply not be enough.[1]

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, and gasoline prices, 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

[1] "Biden Plans an Electric Vehicle Revolution. Now the Hard Part." *New York Times*, Coral Davenport and Neal E. Boudette, April 13, 2023.

other observable factors.

Surprisingly, we find little evidence that the correlation between political ideology and EV adoption has decreased over time. The overall scale of the EV market expands dramatically over our sample period, but new registrations continue to be overwhelmingly concentrated in the most left-leaning counties. 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 strong 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. Updated U.S. fuel economy standards, for example, are designed to ensure that EVs reach more than 50% of new vehicle sales by 2032.[2] But, with EVs representing only 8% of new vehicle sales

[2]"E.P.A. Is Said to Propose Rules Meant to Drive Up Electric Car Sales Tenfold" *New York Times*, Coral Davenport, April 8, 2023. "Biden Administration Announces Rule Aimed at Expanding Electric Vehicles" *New York Times*, Coral Davenport, March 20, 2024.

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. 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".[3]

Thus far there has been little research on political ideology and electric vehicles. Probably most closely related to our paper, 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. They also show that EV purchases as a share of sedan sales are higher in states where a high fraction of individuals believe climate change is happening. 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

[3]Further afield, Costa and Kahn (2013) finds that Democrats are more responsive than Republicans to energy-related peer comparisons.

alternatives to conventional light trucks".

The paper is also related to a broader 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., 2022), 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 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",

[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).

[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.

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.

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. The results are similar when we instead use 2016 or 2020 election outcomes (see Section 3.4 for details). 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. 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 vehicle sales in about half of the years in

[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.

our sample.

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 more likely to adopt EVs. See, e.g. Borenstein and Davis (2016); Gillingham et al. (2023); Borenstein and Davis (forthcoming). We use county-level median household income estimates for 2012 from the U.S. Census Bureau Small Area Income and Poverty Estimates (SAIPE) Program.[7]

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 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.[8]

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

[7] `https://www.census.gov/programs-surveys/saipe/data/datasets.html`

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

households choosing between gasoline-powered vehicles and EVs (Bushnell et al., 2022). We use state-by-year average gasoline prices from 2012 to 2022 from the U.S. Department of Energy, Energy Information Administration, *State Energy Data System* (SEDS).[9]

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.[10]

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 define Tesla charging station counts as the number of Level 3 charging outlets at stations with Tesla connectors on the last day of each year from 2012 to 2023.[11] For this purpose, we use daily snapshots from 2014 to 2023 obtained from the U.S. Department of Energy, Alternative Fuels Data Center (AFDC).[12] 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

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

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

[11] 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.

[12] `https://afdc.energy.gov/data_download`

indicated for those specific years from the January 2014 snapshot of the AFDC U.S. charging stations database.

Finally, 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]

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.

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

[13]https://afdc.energy.gov/laws

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 to facilitate 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 sample 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 relationship between EV adoption and political ideology is still present when examining the data by vehicle class, i.e., for EV trucks and 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. However, we find that adoption of each vehicle class is positively associated with higher Democrat vote shares. The correlation is lower for EV trucks compared to EV cars but still positive. Appendix Figure 1 is a state-level scatterplot showing the relationship between political ideology and EV adoption for EV trucks and cars separately.

These state-level scatterplots show a strong and enduring relationship between EV adoption and political ideology. It is hard to say from looking at these figures whether political ideology matters more or less in 2023 than it did in 2012, but it clearly does matter throughout the sample period. The positive correlation between Democrat vote share and EV adoption is present when analyzing the data by vehicle classes separately, and even for EV trucks. In the next section we dig deeper by turning from state-level data 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

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. Panel (A) of Appendix Table 2 lists these twenty counties and their state, along with the EV market share of new vehicles. For examining the counties with highest and lowest EV shares and results reported in Appendix Table 2, we restrict the analysis to counties with population greater than 750,000.

Most of these counties are urban, high-income, and in Democratic states. California features prominently in the list with nine of the top ten counties. Strikingly, the top four counties are all in California's Bay Area, 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. 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).

In contrast, the 20 U.S. counties with the *lowest* EV shares (among counties with population greater than 750,000) look quite different from the top 20, with multiple counties from Texas, Michigan, New York, and Ohio. Together, these 20 counties account for 8.8% of all new vehicle sales in the U.S. but only 4.4% of all new EV sales. Panel (B) of Appendix Table 2 reports these bottom 20 U.S. counties for EV adoption. Interestingly, of the 79 U.S. counties with population higher than 750,000, 66 are Democrat and only 13 are Republican. So this list by construction includes many Democratic counties. The EV share in these counties is quite low compared to Panel (A) – in all cases below 1.5%.

In the following section, we continue to examine the concentration of EVs, but with a more explicit focus on political ideology.

3.3 Quantifying the Concentration of EVs

We next examine the concentration of EVs in the most left-leaning counties. Panel (A) of Table 1 presents 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, from 2012 to 2023. In addition to reporting EV shares for each year, Panel (A) also reports the slope for each statistic across years, to show whether the statistic is going up or down.

The table reveals a high degree of concentration in the most Democratic counties. For example, in 2023, 45.6% of new EV registrations occurred in the top 10% most Democratic counties, and 32.5% occurred in the top 5%. Overall, there is little change in the concentration of EV shares across years. The slopes are negative, indicating lower concentration, but small in magnitude. Moreover, the pattern fluctuates across years, tending to increase during the first half of the sample and then decrease during the second half.

In Panel (B) of Table 1, we report the share of all registered EVs in the U.S. that occur in the most left-leaning counties by vehicle class during the period from 2021 to 2023. Non-car EVs are uncommon early in our sample period, so for this panel we restrict registrations to 2021-2023. Panel (B) shows that EV adoption is concentrated in the most Democratic counties across all vehicle classes, though less so for trucks. 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.

Another approach for understanding this concentration is to examine the cumulative distribution function (CDF) of EV adoption with respect to political ideology. That approach again shows that EV adoption is highly concentrated in the counties with the highest Democrat vote share. About 50% of all new EVs went to the 10% most-Democratic counties, about 70% to the top 20%, and about 90% in the top 50%. Appendix Figure 2 presents the concentration of EV adoption across counties with regard to political ideology, and how this has changed over time. The x-axis is the percentile of counties based on Democrat vote shares, from highest to lowest. The y-axis is the share of all new U.S. EV registrations. The figure plots the CDF for EV adoption by 3-year periods from 2012 to 2023. There is no clear pattern across years. The CDFs show a modest broadening, particularly in the most recent period (2021-2023), though even in that latest period, over 40% of EVs are still going to the top 10th percentile.

The most Democratic counties are also some of the most populous counties, so higher EV adoption in the most Democratic counties may be due to a higher propensity to purchase new cars. We therefore examine the proportion of all new vehicle registrations going to the most left-leaning counties. Appendix Figure 3 presents similar CDFs as Appendix Figure 2, but with all new vehicle registrations rather than only EVs. The most left-leaning counties also account for a high share of all new vehicles in the U.S.; in all 3-year periods, about 80% of new vehicles are registered in the top 50% most-Democratic counties. 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 indicate 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.

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.

When we calculate the correlation between county-level EV market share and Democrat vote share by year we see an enduring positive correlation. Appendix Table 3 reports the results. For these correlations we no longer use the bins, we simply calculate the correlation using all 3,100+ counties. Correlations range from 0.25 to 0.39, with p-values equal to 0.00 in all cases. The slope of the correlation coefficients across years is positive and statistically significant (0.014, p-value = 0.000), implying an *increasing* correlation between EV adoption and political ideology over time.[14]

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 in the U.S. 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

[14] Appendix Table 4 shows similar results when correlations are examined at the state-level. In that case, the slope across years is slightly larger (0.15), but only statistically significant at the 5% level (p-value 0.043). Appendix Table 5 is identical to Appendix Table 4, but uses alternative measures of political ideology. In particular, Columns (2) and (3) use Democrat vote share from the 2016 and 2020 presidential elections, respectively. Across all specifications, the results remain similar, implying that the correlation between EV adoption and political ideology is positive and enduring.

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, with no visually discernible evidence of weakening correlation in later 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 the sample is restricted to only 10% of all counties. For these figures, we also return to using red and blue for indicating counties with majority vote Republican and Democrat, respectively.

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 regressive evidence. Table 2 reports estimates from four 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) – but remains large in magnitude and strongly statistically significant. The estimate in Column (4) with all controls implies that a one percentage point increase in Democrat vote share is associated with a 0.02 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 provides the full set of regression estimates, including coefficients corresponding to control variables. Appendix Table 7 reports results from an alternative specification which weights observations using the population of the county. Appendix Table 8 reports results from an alternative specification which includes additional control variables including average retail electricity prices, Tesla station counts, and state-level EV subsidies. 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.[15]

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

[15]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.

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 9 lists the ZEV states and the year they initially adopted the mandate. Appendix Tables 10 and 11 report regression estimates restricting the sample to include only ZEV states and only non-ZEV states, respectively. Appendix Table 12 reports regression estimates from specifications with state-by-year fixed effects. 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.

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 want to 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 label them EVs or non-EVs. 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 general multiple-choice questions about EV knowledge (e.g., What is level-2 charging?) as well as three general multiple-choice questions about automotive knowledge (e.g., What is an alternator?). We conducted the survey with about 1,000 participants in January 2025 on *Prolific*. See Appendix Table 13 for descriptive statistics and Appendix Table 14 for survey results reported separately for red and blue states.[16]

Table 3 shows the survey results. Democrats and Republicans were equally able to distinguish EVs from non-EVs. Republicans were a bit more likely to be able to identify the Ford Mach-E and Democrats were a bit more likely to be 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.

[16]The entire the survey instrument can be downloaded from `https://faculty.haas.berkeley.edu/ldavis/DLS%20Survey%20Details.pdf`.

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%. In particular, Democrats do better answering questions about EV charging. This does not seem to reflect stronger overall automotive knowledge, with Democrats doing 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. Appendix Table 14 also shows that the survey results remain similar when comparing responses of Republicans (or Democrats) in Democrat- vs. Republican-leaning states, defined based on the 2012 presidential election results.

6 Conclusion

Many new technologies start off as niche products, appealing 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 about one-third go to the 5% most-Democratic counties. We also find that the association between EV adoption and political ideology remains even after controlling for income, population density, and gasoline prices. Finally, we conducted a survey with 1,000 vehicle owners in the U.S. from across the political spectrum and find that Democrats and Republicans are approximately equally accurate at answering questions about EVs.

Recent news coverage from 2025 further suggests that political ideology is an important factor in consumers' vehicle ownership choices. For example, some left-leaning consumers in the U.S. have felt alienated by the political activities of Elon Musk and are seeking to sell their Teslas.[17] Tesla sales in Europe in January 2025 plummeted even while EV sales overall have soared.[18] 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.

[17] `https://www.nytimes.com/2025/03/03/business/tesla-boycott-elon-musk.html`

[18] `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*, forthcoming.

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," *National Bureau of Economic Research Working Paper*, 2022.

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.

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.

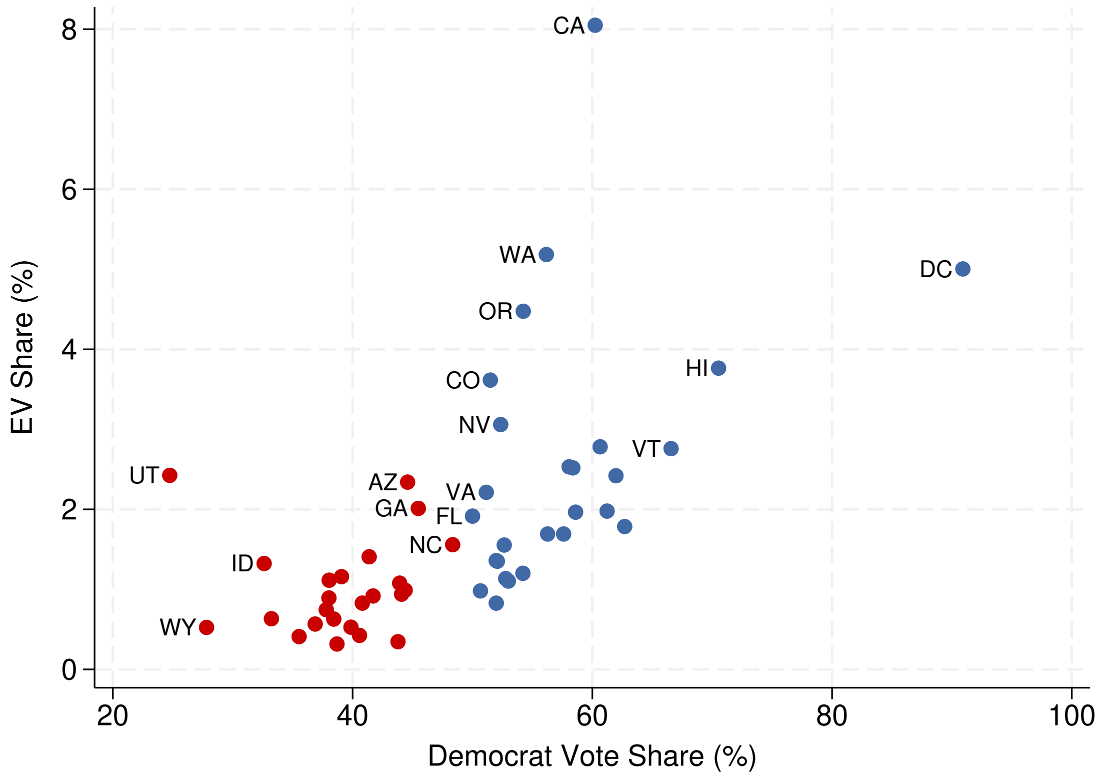
Sexton, Steven E and Alison L Sexton, "Conspicuous Conservation: The Prius Halo and Willingness to Pay for Environmental Bona Fides," *Journal of Environmental Economics and Management*, 2014, *67* (3), 303–317.

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.

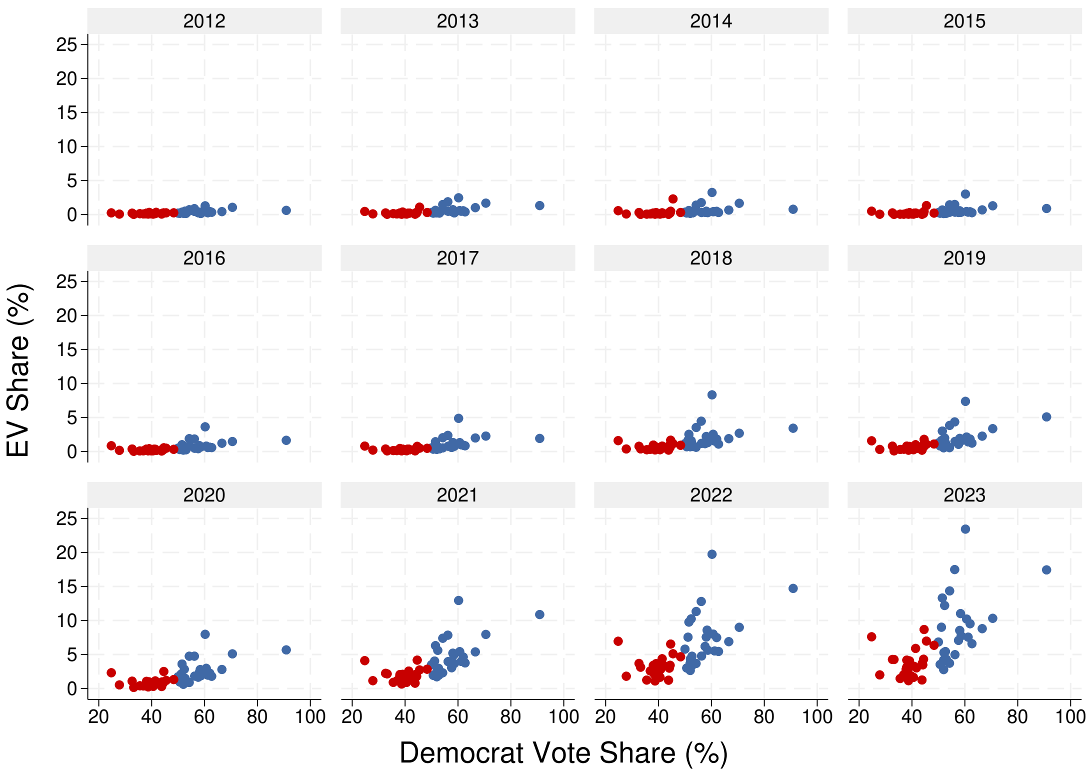
Xing, Jianwei, Benjamin Leard, and Shanjun Li, "What Does an Electric Vehicle Replace?," *Journal of Environmental Economics and Management*, 2021, *107*, 102432.

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)
Democrat Vote Share	0.031**	0.028**	0.027**	0.020**
	(0.009)	(0.007)	(0.007)	(0.005)
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	34,232
R-squared	0.060	0.158	0.160	0.229

Notes: This table reports coefficient estimates and standard errors from four 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. The number of observations is smaller in Column (4) because gasoline prices are not yet available for 2023. Standard errors are clustered by state. ** Significant at the 1% level, *Significant at the 5% level.

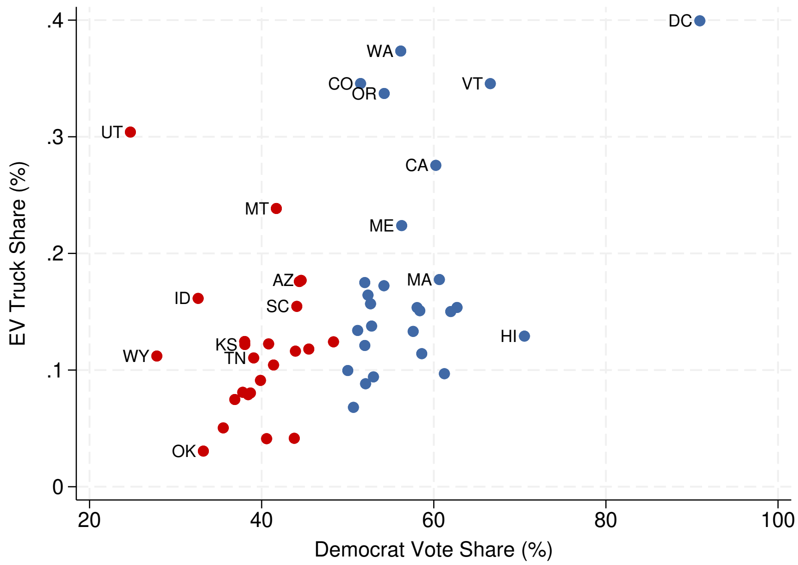
Table 3: Do Democrats Know More Than Republicans About EVs?

	(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

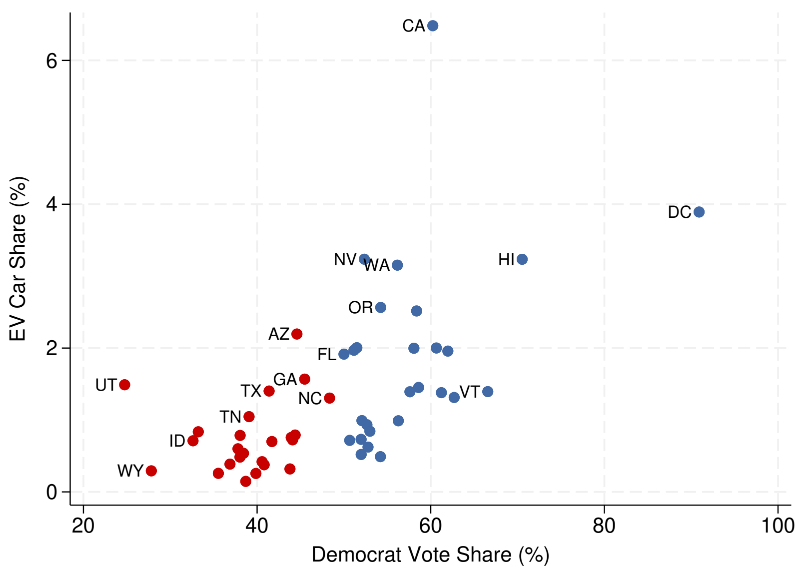
Note: This table reports results from the survey we conducted January 2025 on Prolific. See Appendix Table 13 descriptive statistics and additional details.

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

(a) Trucks

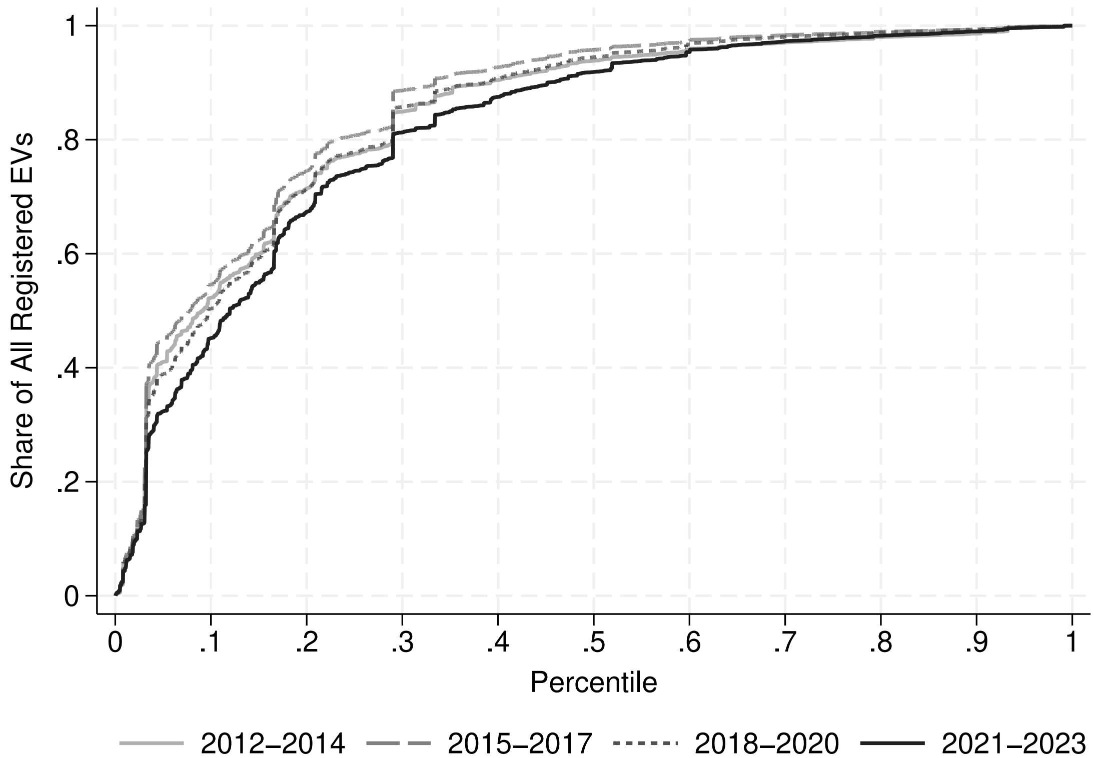


(b) Cars



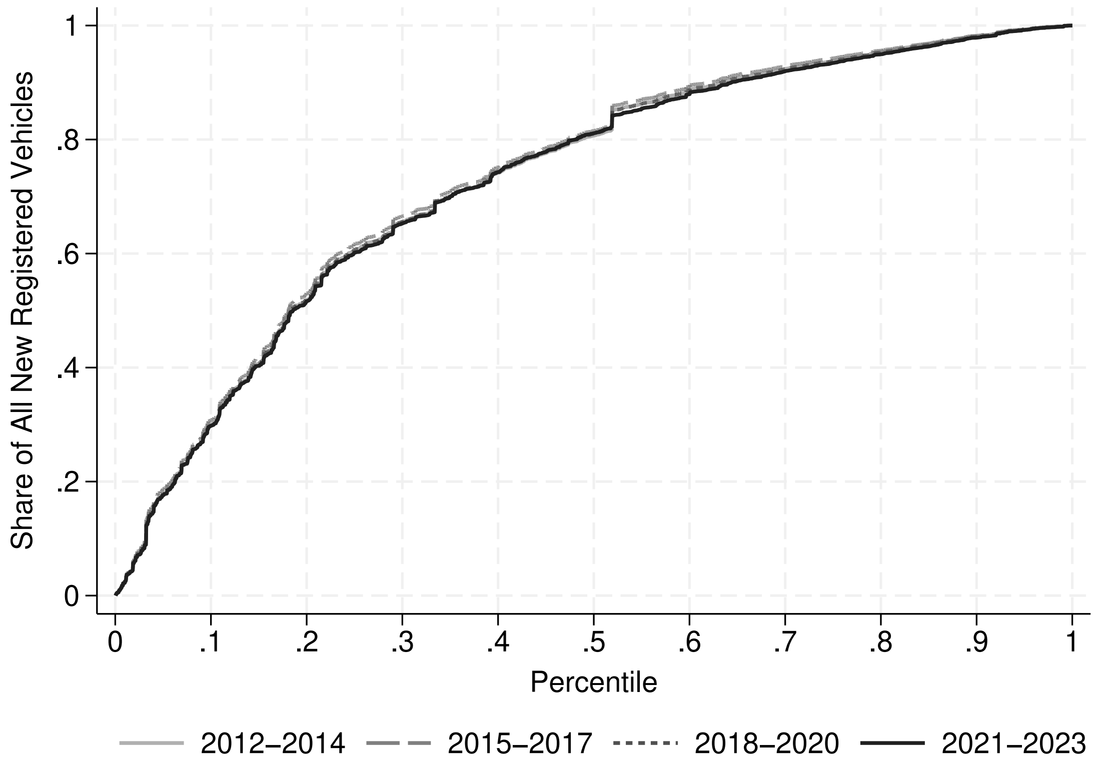
Notes: Each scatterplot has 51 observations, one for each state and one for Washington, DC. The x-axis is the share of voters in the 2012 U.S. presidential election who voted for Barack Obama. The y-axis is EV trucks or cars as a share of all new vehicles registered from 2021 to 2023, ranging from 0%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



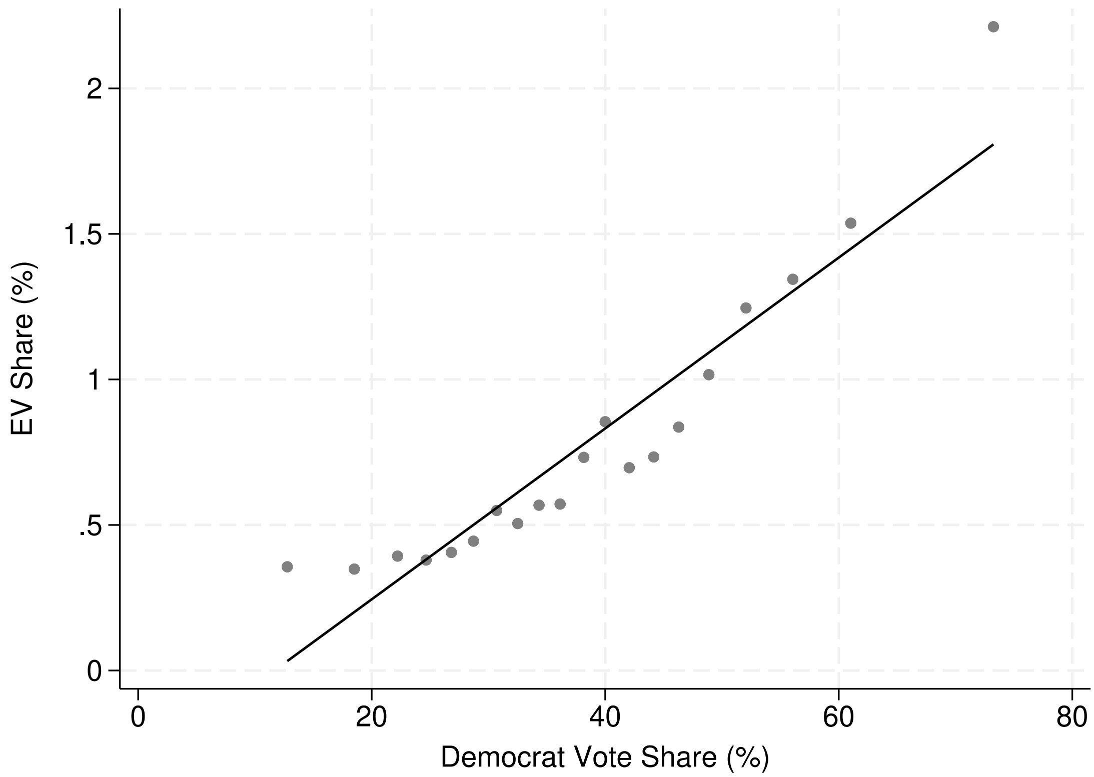
Notes: This figure plots the distribution of EV adoption across counties based on Democrat vote share and how this has changed over time. For example, in all 3-year time periods about 80% of EV adoption occurred in the 30% most Democratic counties. The x-axis is the percentile of counties based on Democrat 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



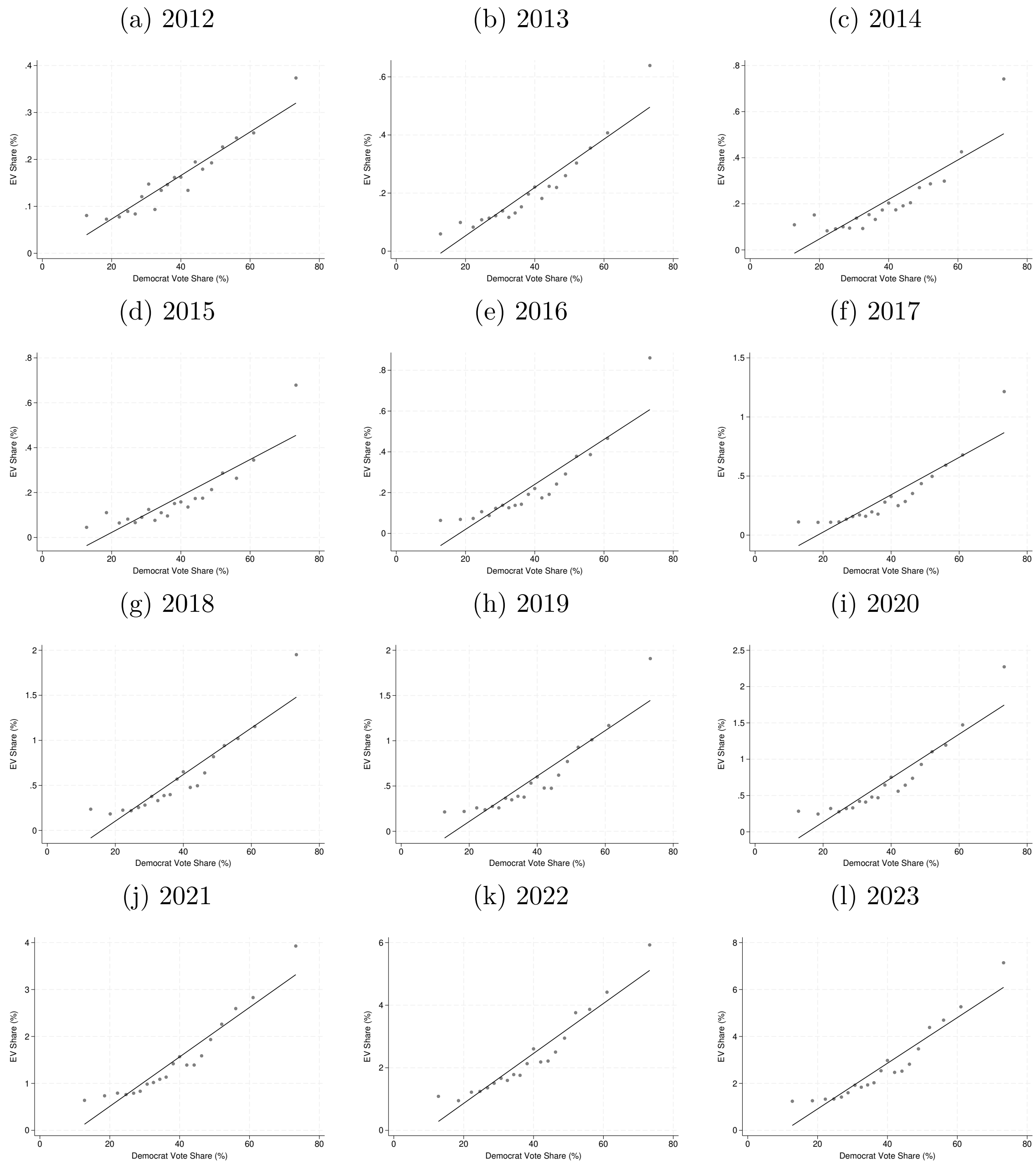
Notes: This figure is similar to Appendix Figure 2 in the paper, except it is constructed using *all* new vehicle registrations, not just EVs. This figure shows, for example, that in all 3-year time periods about 80% of new vehicles are registered in the 50% most Democratic counties. The x-axis is, as 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.

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



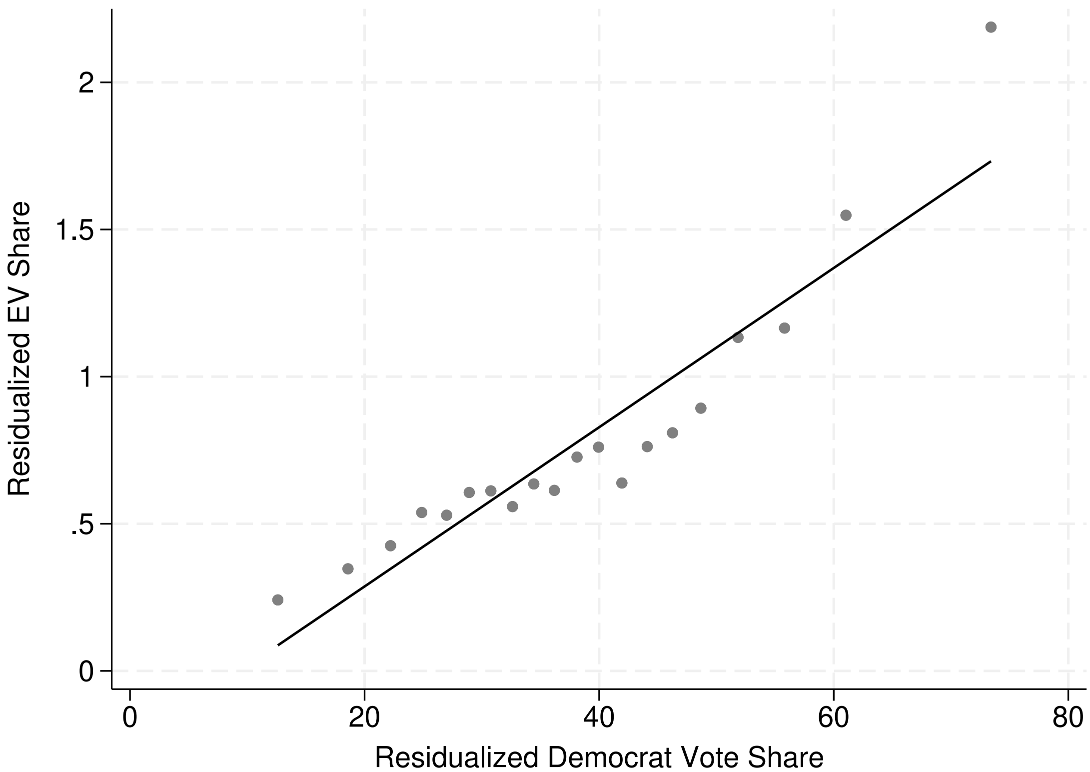
Notes: For this figure we group counties into twenty equal-sized "bins" on the basis of Democrat vote share, and then plot the mean EV share and Democrat vote share for each bin. We also plot a least squares linear regression line (in black). The x-axis is the share of voters in the 2012 presidential 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



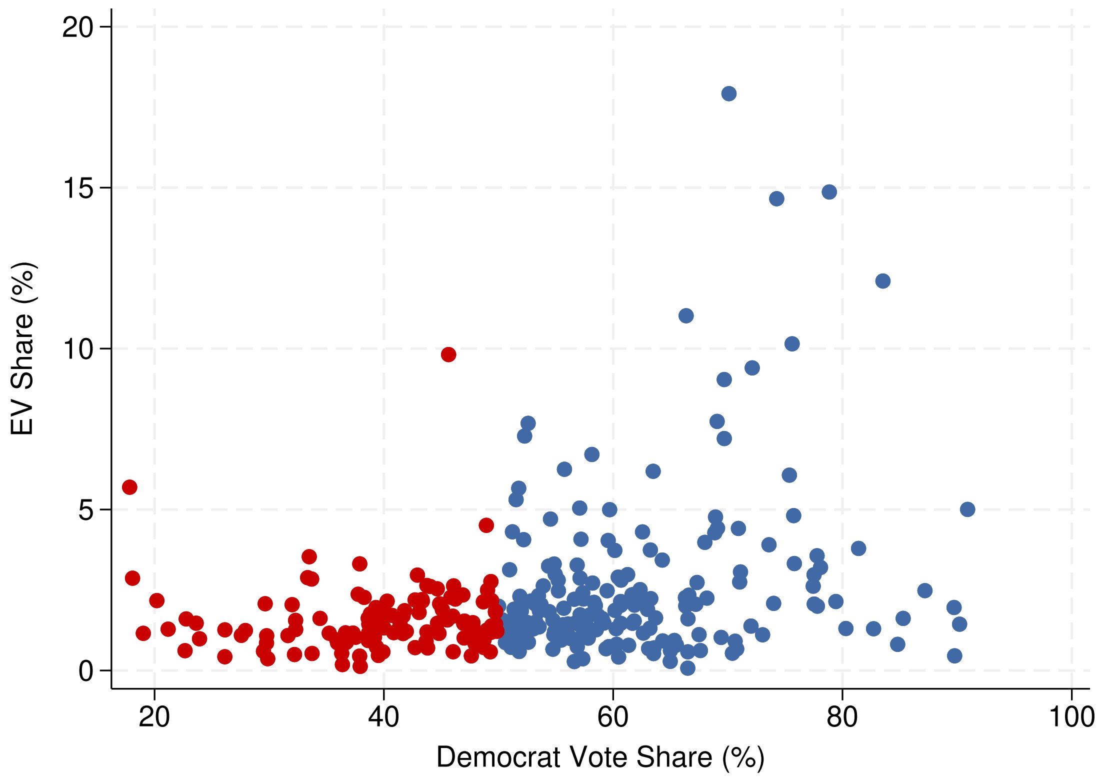
Notes: These binscatter plots are identical to Appendix Figure 4, except we include a separate scatterplot for each year.

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



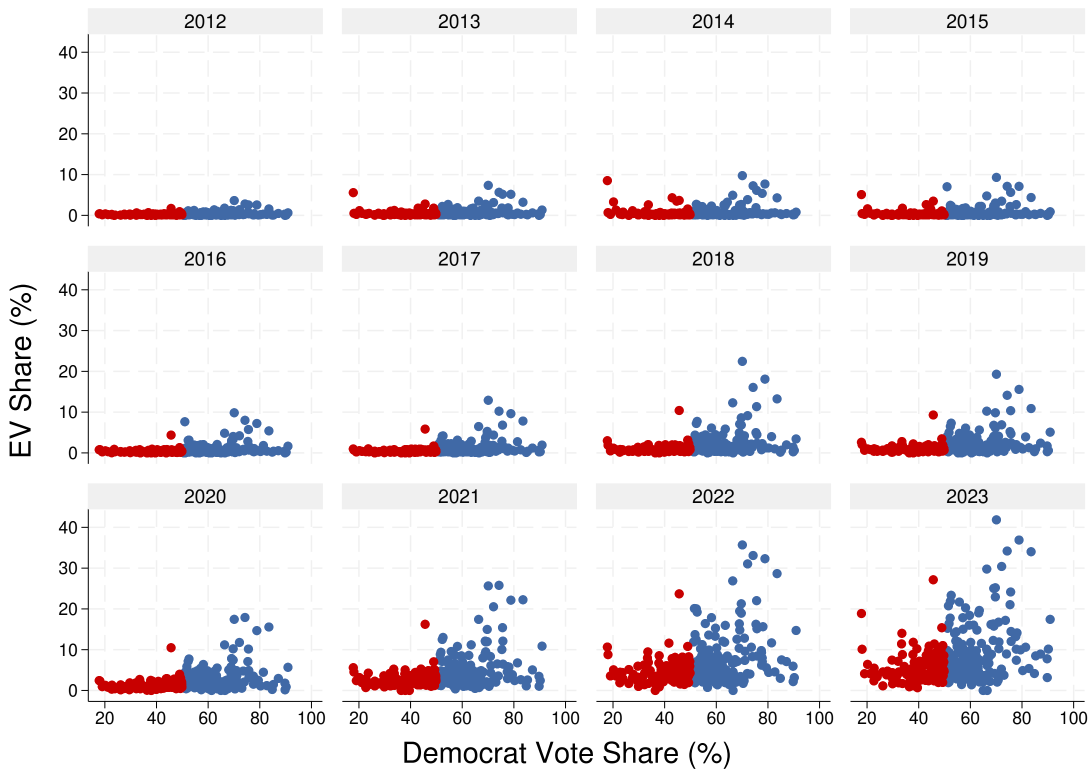
Notes: This binscatter plot shows the relationship between county-level residualized EV shares and residualized Democrat vote shares. The x-axis is the share of voters in the 2012 presidential election who voted for Barack Obama. The y-axis is EVs as a share of all new vehicles registered during the 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)	34,232	2.80	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

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, obtained from the Experian North American Vehicle Database, 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 median annual household income is from 2012 and measured in thousands of dollars, using data from the U.S. Census Bureau Small Area Income and Poverty Estimates (SAIPE) Program. 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. County-level population estimates are obtained from the U.S. Census Bureau Population Estimates Program and information on land area comes from the U.S. Census Bureau TIGER/Line Shapefiles. Gasoline prices are measured at the state-by-year level from 2012 to 2022 and measured in dollars per gallon, using data from the U.S. Department of Energy, Energy Information Administration. Electricity prices are measured at the state-by-year level, in cents per kilowatthour and come from the U.S. Department of Energy, Energy Information Administration. County Tesla station counts, obtained from the U.S. Department of Energy, Alternative Fuels Data Center, are measured as the total number of Level 3 Tesla charging outlets on the last day of that year. 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. Data on state-level government incentives were collected manually, using the U.S. Department of Energy, Alternative Fuels Data Center website as a guide.

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 higher 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).

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	0.601	0.611	0.620
2013	0.579	0.623	0.634
2014	0.373	0.446	0.448
2015	0.440	0.509	0.517
2016	0.552	0.610	0.628
2017	0.589	0.636	0.655
2018	0.528	0.610	0.622
2019	0.629	0.700	0.713
2020	0.654	0.721	0.735
2021	0.698	0.766	0.780
2022	0.635	0.728	0.741
2023	0.629	0.726	0.741

Notes: This table is identical to Appendix Table 4, 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, Full Regression Results

	(1)	(2)	(3)	(4)
Democrat Vote Share	0.031**	0.028**	0.027**	0.020**
	(0.009)	(0.007)	(0.007)	(0.005)
County Median Household Income		0.051**	0.050**	0.038**
		(0.010)	(0.010)	(0.007)
County Population Density			0.005	0.004
			(0.004)	(0.003)
State-Level Gasoline Prices				0.635**
				(0.172)
Observations	37,344	37,344	37,344	34,232
R-squared	0.060	0.158	0.160	0.229

Notes: This table is exactly the same as Table 2 in the paper except we report coefficients for all variables. ** Significant at the 1% level, *Significant at the 5% level.

Appendix Table 7: EV Adoption and Political Ideology, Regression Estimates With Population Weights

	(1)	(2)	(3)	(4)
Democrat Vote Share	0.074*	0.065**	0.071*	0.045**
	(0.030)	(0.024)	(0.028)	(0.015)
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	34,232
R-squared	0.074	0.151	0.154	0.329

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 8: EV Adoption and Political Ideology, Regression Estimates with Additional Controls

	(1)	(2)	(3)
Democrat Vote Share	0.012**	0.010**	0.010**
	(0.003)	(0.003)	(0.003)
County Median Household Income	0.030**	0.025**	0.025**
	(0.005)	(0.004)	(0.004)
County Population Density	0.003	0.002	0.001
	(0.003)	(0.002)	(0.002)
State-Level Gasoline Prices	0.560**	0.492**	0.482**
	(0.122)	(0.091)	(0.082)
State-Level Electricity Prices	0.171*	0.121**	0.110**
	(0.068)	(0.044)	(0.041)
County Tesla Station Counts		0.054**	0.052**
		(0.007)	(0.006)
State-level BEV Subsidies			0.370*
			(0.152)
State-level PHEV Subsidies			0.029
			(0.213)
Observations	34,232	34,232	34,232
R-squared	0.293	0.443	0.455

Notes: This table is exactly the same as Table 2 in the paper except we report coefficients for all variables. ** Significant at the 1% level, *Significant at the 5% level.

Appendix Table 9: 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 10: 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**	0.068**
	(0.032)	(0.020)	(0.021)	(0.020)
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	3,542
R-squared	0.599	0.663	0.664	0.678

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 11: 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**	0.009**
	(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	30,690
R-squared	0.393	0.473	0.482	0.491

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 12: EV Adoption and Political Ideology, Regression Estimates With State-by-Year Fixed Effects

	(1)	(2)	(3)	(4)
Democrat Vote Share	0.021**	0.024**	0.023**	0.018**
	(0.007)	(0.006)	(0.005)	(0.005)
County Median Household Income	No	Yes	Yes	Yes
County Population Density	No	No	Yes	Yes
State-Level Gasoline Prices	No	No	No	Yes
State-by-Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	37,332	37,332	37,332	34,221
R-squared	0.605	0.671	0.672	0.659

Notes: This table is exactly the same as Table 2 in the paper except we add state-by-year fixed effects in all regressions. With 50 states and 12 years in our sample period, this is over 600 total fixed effects. The number of observations in this table is slightly smaller than other tables 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.

Appendix Table 13: 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 14: 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.