Driving Labor Apart:
Climate Policy Backlash in the American Auto Corridor*

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Abstract

What are the electoral effects of green industrial policy? We argue that uncertainty about the distribution of benefits can give rise to voter backlash. We examine automobile manufacturing, where politicians and unions have promised that communities vulnerable to the electric vehicle (EV) transition will gain from new investments. Leveraging a matched difference-in-differences design, we find that growing EV transition salience caused Republican presidential vote share to increase by three percentage points in counties that produce gasoline vehicle components as compared to those that manufacture other auto parts. There is no backlash in counties that have received EV investments. Interviews with autoworkers and union leadership show how uncertainty about the EV transition affected political information provided by local unions. This bottom-up information provision helps to explain the diverging political reactions of organized labor to structural economic transformations and sheds light on electoral responses to climate policy.

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Climate change's effects are already being felt with extreme heat, destructive wildfires, and catastrophic floods, which will only intensify if governments do not act (IPCC 2022). Solutions to global warming require international cooperation that depends on domestic support for emission-cutting policies (Aklin and Mildenberger 2020; Bechtel and Scheve 2013). However, climate policies have distributional consequences that could give rise to resistance from voters in places with industries reliant on fossil fuels (Bechtel, Genovese, and Scheve 2019; Gaikwad, Genovese, and Tingley 2022). Yet, support could also emerge from voters with ties to businesses that benefit from the energy transition, which is part of the political logic behind the turn to "green" industrial policy (Bergquist, Mildenberger, and Stokes 2020; Meckling et al. 2015).

Past research on the electoral effects of climate policy has focused on industries like coal, oil, and gas that are unequivocally threatened (Bolet, Green, and Gonzalez-Eguino 2023; Martinez-Alvarez and Ross 2023) or policies affecting energy consumers (Colantone et al. 2023; Voeten 2022). However, these findings do not speak to businesses that could receive investments from green industrial policies, which should be more likely to support the clean energy transition (Aklin and Urpelainen 2013; Colgan, Green, and Hale 2021). What are the electoral effects of climate policy for voters with ties to industries that have been promised to benefit from green investments?

We examine this question in the context of the American auto industry, which employs over 1.1 million manufacturing workers, mostly located in swing states (BLS 2023). Democratic presidents have enacted industrial policies opposed by Republicans that led to the growth of electric vehicles (EV) between 2013 and 2016 (Foster et al. 2022; Lane et al. 2013). In the future, communities manufacturing internal combustion engines (ICE) could face employment losses, but they can also pivot to build EVs. As early as 2016, Democratic presidential candidates and unions have promised that autoworkers will benefit from the EV transition.

However, we build on political economy theories of reform to argue that when economic

transitions have uncertain distributional consequences, even potential beneficiaries could prefer the status quo (Fernandez and Rodrik 1991). Counter-intuitively, voters in places with industries promised to benefit from the green transition could have incentives to oppose climate policy because of these uncertainties. Workers and their communities may not want to risk being left behind.

We hypothesize that as the salience of EVs increases, communities producing gasoline vehicle parts should be more likely to vote for politicians opposed to climate policy, despite promised benefits from EV investments. This means support for the Republican presidential candidate should increase due to a partisan divide on climate policies that encourage the EV transition (Egan 2013; Egan and Mullin 2023; Karol 2019). Since whole communities will be affected through social and economic ties, we expect a county-wide electoral response (Bisbee 2019; Gaikwad, Genovese, and Tingley 2022; Guisinger 2017).

We depart from the conventional wisdom that positive messages from the national union would moderate this uncertainty by shaping the preferences of their members (Ahlquist, Clayton, and Levi 2014; Kim and Margalit 2017). Instead, we develop a bottom-up argument about the role of unions as information brokers. Large unions, such as the UAW, are not monoliths. The messages provided by their locals also matter and can vary.

We argue that one factor that affects the content of information supplied by union locals is how government policies affect a local's workers. In unions with members across an extensive supply chain, this can give rise to a heterogeneity of preferences. Local leaders understand their particular situation and could lose re-election if they are out-of-step with members, whereas national leaders focus on the union as a whole and cater to the preferences of the median worker. Thus, UAW locals representing members in manufacturing more prone to job loss from the EV transition should pass along more negative information about EVs and Democrats. By contrast, local union leadership at facilities more likely to benefit from the transition should spread more positive messaging.

It is challenging to investigate the electoral effects of the EV transition because at the

same time as EVs grew in market share, Donald Trump, the Republican presidential nominee, also made appeals to voters on issues like trade, immigration, and racial identity (Autor et al. 2020; Mutz 2018; Sides, Tesler, and Vavreck 2018). These factors that were major issues in the 2016 and 2020 elections could confound inferences about increased GOP vote share.

We approached this challenge with a difference-in-differences (DiD) research design that examines counties with unionized auto manufacturing. Within these counties, we leveraged highly disaggregated data on auto industry employment to identify those that are vulnerable to the EV transition. We further matched these counties along socio-demographic characteristics thought to influence receptivity to racial appeals and trade exposure that could create economic grievances (Ho et al. 2007). The key difference is whether workers in a county produce parts not used in EVs, so any electoral change is theoretically attributable to growing EV salience.

Analyzing presidential elections from 1976–2020 with the fixed effects counterfactual estimator (Liu, Wang, and Xu 2022), we find that the growing salience of EVs caused a three percentage point increase in Republican presidential vote share in counties vulnerable to the EV transition compared to otherwise similar unionized auto manufacturing areas. Despite the promise of benefits, voters in counties producing gasoline vehicle parts become more supportive of presidential candidates opposed to climate policy. This is a meaningful effect, considering that elections in swing states like Michigan have been decided by margins of less than 0.2 percentage points.

We tested our uncertainty mechanism using interviews and quantitative analyses. We conducted 29 interviews with union members and leaders across Michigan, a major auto manufacturing state. The subjects came from UAW locals that varied in their vulnerability to the EV transition. Building on previous studies (Foster et al. 2022; Silva, Carley, and Konisky 2023), our interviews revealed that uncertainty from the EV transition is driving support for Republican presidential candidates.

To systematically investigate the effect of uncertainty, we collected proprietary data on

the location of new EV and battery manufacturing plants. Counties that received new EV investments should be more certain about the benefits of the transition. Indeed, we find that these benefits moderated the electoral backlash. The distribution of investments is not random, so we refrain from making strong causal claims. Still, the evidence is descriptively consistent with uncertainty affecting voting.

We also investigated the informational role of unions using mixed methods. Our argument implies that electoral backlash should be stronger in unionized areas because these residents have more information about the anticipated effects of the EV transition and are cross-pressured on labor and environmental issues. Consistent with this hypothesis, we find that the increase in Republican support occurs only in counties with union employment.

A barrier to testing our argument about heterogeneous information provision is that there are a variety of factors that could affect messages. To approach this challenge, we leveraged local union exposure to the EV transition within the same county, effectively holding the broader political and economic context constant. We find that leadership from UAW Local 160, a local more susceptible to job loss, has provided much more negative information about the EV transition and President Biden's policies than UAW Local 2280, which has a firmly situated future in EV production. Union information provision is not top-down but varies with how policies affect locals.

Our paper identifies a novel reason for the working-class electoral shift to right-wing parties. Climate policy is creating a new cleavage between the working class and the left, which is likely to intensify as the energy transition unfolds. Further, we provide the first empirical test of the electoral effects of green industrial policy, which aims to avoid political opposition through promises of new economic benefits. Voters in communities promised to benefit from climate policy have been ignored in the literature, and perhaps by policy-makers, who assume that because EV transitions might help their industry, their support will automatically follow. It may not, and governments that ignore this do so at their peril.

Politics of the Clean Energy Transition

Climate change is difficult for governments to solve because it is a global problem that requires sacrifice today for uncertain future benefits. Much of the early scholarship on political responses to global warming focused on the international challenge of overcoming incentives to free ride on other nations' emission mitigation (Keohane and Victor 2016). Yet, countries have enacted climate laws despite the prospect of free-riding, which has led researchers to focus on domestic politics (Aklin and Mildenberger 2020). This view examines the interests, institutions, and ideas that shape climate policy outcomes (Harrison and Sundstrom 2007), often with an emphasis on business influence in politics (Genovese 2019; Kennard 2020; Meckling 2011; Mildenberger 2020; Stokes 2020).

A stream of this research explores public support for climate policy, finding that there is little appetite to incur costs (Ansolabehere and Konisky 2014; Bechtel and Scheve 2013; Egan and Mullin 2023). These costs matter for electoral outcomes, evidenced by backlash to restrictions on cars (Colantone et al. 2023), higher utility bills (Voeten 2022), and wind turbine development (Stokes 2016).[1] Politicians are also more willing to support climate policy when institutions insulate leaders from electoral risks (Finnegan 2022) or there are strong welfare states to shield consumers from higher prices (Kono 2020). This cost aversion has led scholars to study how policies could be designed to engender public support, such as by emphasizing economic benefits (Bergquist, Mildenberger, and Stokes 2020; Gazmararian and Tingley 2023; Stokes and Warshaw 2017).

There has been less research on the behavior of individuals with ties to carbon-intensive industries. Bechtel, Genovese, and Scheve (2019) show that workers in occupations with higher emissions intensity are less likely to support international cooperation on climate change. Studies comparing the preferences of fossil fuel communities and the national public

[1]Urpelainen and Zhang (2022) find electoral rewards for pro-renewable politicians when facilities create local economic benefits.

regarding just transition policies also uncover systematic differences (Gaikwad, Genovese, and Tingley 2022; Gazmararian 2024). There is also documented uncertainty about the benefits of new green industries both in energy communities and the general population (Gazmararian and Tingley 2023).

In terms of electoral behavior, the focus has been on industries that are clear losers from climate policy, like coal, oil, and gas. Egli, Schmid, and Schmidt (2022) show that the decline of coal increased Republican vote share, while Bolet, Green, and Gonzalez-Eguino (2023) find just transition assistance moderates the effect in Spain. Martinez-Alvarez and Ross (2023) find that supply-side oil declines in Mexico affected electoral behavior.

Yet, some of the largest industries, like auto manufacturing, can adapt their business models to climate policy and may even benefit. Kelsey (2018) refers to these industries as "convertible," meaning they can convert their assets to maintain profitability in the energy transition. These businesses should have different preferences over climate policy (Colgan, Green, and Hale 2021). Indeed, varying costs and benefits from climate policy influence firm lobbying (Genovese 2019; Kennard 2020; Meckling 2011). But no study to date has explored how voters in areas with convertible industries respond to the clean energy transition despite their economic clout and theoretical relevance.

Study Context: American Auto Corridor

We study the electoral effects of green industrial policy in the context of the American auto industry, which is directly responsible for about 3% of America's GDP (BEA 2023). Auto manufacturing is geographically concentrated in a corridor that extends south from Ontario through Michigan, Ohio, Kentucky, and Alabama, with parts reaching Mexico. Primarily represented by the UAW, auto manufacturing has a high level of unionization. Partly due to these union ties, autoworkers across Midwestern states have historically supported the Democratic Party, which has long aligned itself with organized labor and received the

endorsement of UAW leadership (Dark 1999).

Promised Benefits, Uncertain Distributive Effects

As a result of industrial policies put in place by Democratic presidents, and generally opposed by Republicans, the EV market has grown in size and salience (Foster et al. 2022; Lane et al. 2013). We consider salience to be the level of awareness and importance residents of auto manufacturing communities assign to the EV transition, and that salience is a function of both the timing of policies and the visibility of policy effects manifested in growing EV market share (Arnold 1990).

Democratic presidential candidates have pledged that autoworkers will benefit from their policies accelerating the EV transition. Hillary Clinton, when accepting the UAW endorsement in 2016, said that her administration would ensure that auto jobs created by the clean energy transition would be unionized (Clinton 2016). Likewise, Joe Biden's 2020 campaign platform promised to accelerate the deployment of EVs "powered by high-wage and union jobs."[2] Most recently, the IRA, the basis of which emerged from grassroots organizing and policies proposed during the 2020 Democratic primary, included incentives to manufacture EV components using union labor. In theory, these messages of new union jobs and a just transition for workers who may be threatened should moderate opposition to green industrial policies responsible for the EV transition.

While union leaders have concerns, the national UAW leadership also views the EV transition as "an opportunity to re-invest in American manufacturing, with union workers making the vehicles of the future" (UAW 2019, 1). To this end, the national UAW is lobbying their Democratic allies in government to enact policies to encourage the creation of unionized EV jobs in the places that will lose ICE manufacturing. The union is also negotiating with the major auto manufacturers to achieve these goals.

However, we build on existing political economy theory to argue that the uncertainty

[2] "2020 Democratic Party Platform," July 27, 2020, https://bit.ly/3s3aiqo.

of these promised benefits can give rise to status quo bias (Fernandez and Rodrik 1991). The EV transition represents a structural transformation for the auto industry. Jobs at plants and suppliers for powertrain components, including engines and transmissions, will be replaced with simpler batteries and electric motors (Foster et al. 2022). Whereas jobs manufacturing components such as automobile bodies, motor vehicle steering mechanisms and suspension components, and car interiors will be less affected because EVs also require these parts.

Communities with ICE-related jobs are uncertain about their economic future (Silva, Carley, and Konisky 2023). Some estimates indicate that the EV transition will require more jobs than what is needed to manufacture conventional gasoline-powered vehicles (Cotterman, Fuchs, and Whitefoot 2022), whereas others are more pessimistic (Reuters 2017). Studies also indicate that the skills utilized for ICE-related tasks would transfer to the new types of jobs created by EVs (Cotterman et al. 2022). So there is considerable uncertainty about the overall costs and benefits of the transition.

Still, even if more jobs are required and there is skills transferability, communities and workers wonder whether new jobs tied to EV production will offset the jobs lost. The answer will depend on the location of new jobs, how numerous they are, and their pay and benefits. Much will also depend on how many EV manufacturing processes are on-shored. While workers can move, counties cannot, so there will also be a local interest in the location of new EV investments.

In response to this uncertainty, auto communities manufacturing gasoline vehicle parts should be more likely to vote for candidates who oppose climate policy as the salience of the EV transition grows. This means support for Republican presidential candidates should increase in these vulnerable counties. The GOP opposes EV transition, which is largely the result of Democratic policies, and takes place against a historical partisan cleavage on environmental issues of which voters are generally aware (Egan 2013; Karol 2019). This electoral backlash should occur in presidential elections because that is where the climate

policy divide is starkest. It is the president who takes on the mantle of the party, while other lawmakers strategically diverge to stay in step with their constituents (Canes-Wrone, Brady, and Cogan 2002).

We expect to detect these electoral effects at the county level for two reasons. First, the auto industry has social and cultural importance for communities beyond those directly employed because of its history. The sociological literature has documented how auto communities view making cars as a way of life (e.g., Dudley 1994). Individuals in these communities are also embedded in networks where their friends or family members are employed in the industry, which should encourage them to prioritize their welfare when voting.[3]

Second, the decline of the auto industry has community-wide economic effects, including reduced tax revenue that provides for public goods and the displacement of service industry jobs that rely on employed autoworkers. Thus, it is the self-interest of individuals, even those without direct employment, to support the industry. Consistent with this claim, studies of local socio-tropic behavior show evidence of community-wide effects for trade shocks and coal's decline (Bisbee 2019; Guisinger 2017).

Unions as Ground-Up Information Brokers

Our hypotheses contrast with existing theories, which imply that the national UAW's favorable stance on EVs would sustain its members' support for Democratic presidential candidates. Unions help workers to overcome collective action problems in part by shaping their members' political beliefs and behavior through information provision and socialization (Ahlquist 2017; Schlozman, Verba, and Brady 2012).

Most previous work has advanced a top-down view, where unions provide consistent information that has a common effect on their members' policy preferences. For example, Kim and Margalit (2017) show how information from the UAW affected auto workers' prefer-

[3]Workers and community members may differ in perceptions of the EV transition, but there is a general sense of uncertainty (Silva, Carley, and Konisky 2023).

ences regarding the Korea-US free trade deal. Evidencing the effect of unions on members, studies link union membership to greater political knowledge and more tolerant racial attitudes (Frymer and Grumbach 2021; Iversen and Soskice 2015; Macdonald 2021). While some acknowledge the horizontal transmission of information across locals, their focus is not variation in the content of information (e.g., Frymer and Grumbach 2021).

Existing studies also suggest that information provision and socialization may be more powerful determinants of union member preferences than their economic self-interest. Ahlquist and Levi (2013) show how union leaders who have demonstrated their ability to deliver goods and services can lead members to support projects without obvious material benefits. Demonstrating this argument, Ahlquist, Clayton, and Levi (2014) conducted a landmark study showing how longshore union members, despite benefiting from globalization, did not support trade liberalization.

We propose that to generalize this argument, scholars must consider the variation of economic interests within unions. There is tremendous heterogeneity in the interests and organizational structure of unions (Ahlquist 2017). For example, Ahlquist, Clayton, and Levi (2014) examine the International Longshore & Warehouse Union (ILWU), which plays a crucial role in the global economy. Compared to other industrial unions like the UAW, where members are involved in a wide variety of roles across the auto supply chain, the ILWU has a more similar set of tasks it performs and fewer locals. In the presence of heterogeneous preferences and larger groups, collective action becomes harder to sustain (Olson 1965), so political responses to structural economic transformations should differ.

We advance a bottom-up view of unions as information brokers that emphasizes the role of local unions and how they are differentially affected by policies. Crucially, this information does not always accord with messages from the national leadership. National and local union leaders have different incentives. The national must consider how policies affect the entire organization, whereas locals respond to their specific situations often at the plant and community levels. Local leaders have a narrower electoral constituency and are more

embedded in their communities, which can give rise to different concerns from the national.

We hypothesize that the content of the information provided by local unions depends on how they are affected by the EV transition. UAW locals with members in facilities that face job losses should be more uncertain about the promised new EV jobs, so their local leaders should pass along more negative information about EVs and Democrats. By contrast, local union leadership at plants that will likely benefit from the transition should spread more optimistic messages. Indeed, our interviews suggest that the national UAW leadership recognizes that their top-down messaging is ineffective if it conflicts with the information provided by locals. Dick Long, who held a senior leadership role with the National UAW, said:

> You always needed the local leadership to get on board and communicate with their members. I can walk in there from the international union and you're the local union president and they voted for you, who are they going to believe? If the local leadership isn't behind you, it's hard to do much.

We hypothesize that an implication of this differential information provision is that within unionized auto manufacturing counties, there should be variation in voting patterns as the salience of the EV transition grows. Rather than continuing to support Democratic presidential candidates, counties with unionized auto employment tied to gasoline vehicles should become more supportive of Republican candidates compared to otherwise similar unionized counties manufacturing auto parts not affected by the EV transition.

Our argument also implies that there should be a larger electoral backlash in union auto counties for two reasons. First, unions provide crucial information, which is costly to gather, about the anticipated effects of the EV transition, whereas such information may be less available in counties without unions (Ahlquist 2017). Many theoretical accounts envision voters as focusing on the past or lacking policy knowledge (Achen and Bartels 2016). Of course, citizens have other sources of information (Guisinger 2017), but union leaders are especially trustworthy and accessible. So, without information from unions, citizens might struggle to understand how they will be affected by the EV transition because its labor

market effects are yet to be felt.

Second, residents of areas with union presence are more likely to be cross-pressured on labor and environmental issues. Labor and its ties to the Democrats push voters to the left, while environmental politics are now pushing the same voters to the right (Mildenberger 2020). Thus, there is greater potential for voters to move to the right in union auto counties, whereas non-union counties may already be more inclined to vote Republican.

Research Design

We employed a differences-in-differences (DiD) design that leverages geographic variation in the automotive supply chain's exposure to the EV transition. As the salience of the EV transition increases, we should expect counties manufacturing gasoline-powered vehicles to be more likely to vote for Republican presidential candidates than counties producing parts that will not be displaced by EVs.

EV Salience Timing

Our treatment is the increased salience of EVs, which we identify as occurring in 2013–2016, based on an analysis of previous studies, government policies, statements by politicians, labor negotiations, automaker plans, EV sales data, and interviews with UAW leadership. This corresponds most closely with the 2016 election, which serves as the beginning of the treatment period in the analysis.[4]

Following the global financial crisis, the Obama administration adopted an "industrial policy" approach to EVs, establishing consumer tax credits, a loan guarantee program, and grants to fund charging infrastructure. These policies invested over $9 billion and helped then-nascent companies like Tesla grow (Lane et al. 2013). In 2011, the White House set a

[4]Results hold in a robustness test that uses a continuous timing measure proxied through the annual market share of EVs (Table C5).

goal of 1 million EVs on the road by 2015. Globally, ten jurisdictions between 2016 and 2017 announced goals to phase out the sale of ICE vehicles (Meckling and Nahm 2019). Following government signals, between 2011 and 2017, most major automakers adopted EV targets (Meckling and Nahm 2019). In 2022, the Democratic presidential administration further expanded EV subsidies via the Inflation Reduction Act (IRA).

As a consequence of these green industrial policies, the EV market went from niche to mainstream. Between 2012 and 2016, the market share of EVs in the United States increased by over 500% (Figure B1). Up until 2010, the number of EVs sold was too small to be reported. In 2016, over 87 thousand EVs were sold. By 2020, that number more than doubled to 239 thousand EVs sold (Figure B2).

The EV transition began to grow in salience for the UAW in the early 2010s, evidenced by the union's negotiations with GM over production of the Chevrolet Volt (Foster et al. 2022, 22). Our interviews corroborate this timing. Darryl Nolen, who served in UAW leadership, when asked when the EV transition first became salient in the eyes of the membership, said:

> We had a department [in the UAW] called Product Intelligence. And that department's sole responsibility was to take a look and peek behind the curtain of the future of manufacturing. Those topics were something that we had been on top of in the Ford Department. So, yeah, I can speak intelligently and say 2015-2016.

EV Transition Exposure

The treatment group consists of counties with unionized ICE-related manufacturing employment which are more vulnerable to the EV transition. The control group includes counties with unionized non-ICE manufacturing which are less vulnerable. We focus on the level of jobs, as opposed to layoffs, because our argument is about the anticipated effects of the EV transition. To date, there has not been EV-induced labor market dislocation.

The level of jobs is continuous, but taking advantage of the DiD approach requires discrete

treatment and control groups, which we determine using theory and data.[5] Our argument implies that the EV transition should have community-wide effects, so there should be electoral backlash even in counties with lower levels of employment. The data also indicate that there is a meaningful difference between counties with 1% or more employment in the auto industry. This threshold also has a strong positive correlation with GDP from manufacturing, which suggests it captures the economic relevance of the industry for the county. So, we defined treated counties as those with more than 1% local employment in ICE-related industries after 2008, and the control group includes counties with more than 1% local employment in non-ICE industries. We focus on the post-2008 period to capture contemporary employment and avoid fluctuations due to cyclical trends[6]

As an alternative treatment definition, we employed a continuous measure of ICE employment. We examined models that leverage within-county and within-state deviations in local reliance on gasoline engine-related manufacturing. The results hold and strengthen (Appendix C.2).

Crucially, the control counties are not necessarily those that received EV investments. Rather, they are ones whose manufacturing output could still be used in EVs. Employment in these non-ICE jobs benefits from the sales of autos regardless of whether the vehicles sold are electric or not, so they should not anticipate benefits from the transition. This means the treatment contrast is between counties with workers who are exposed to the EV transition and those with more insulated autoworkers.

One possible concern is that the types of workers across these industries differ in a way correlated with voting behavior. However, our interviews indicate that there is a mix of both high- and low-skilled labor to manufacture ICE and non-ICE vehicles. So the workforce across the treatment and control counties should have similar levels of age and education.

[5]Appendix C.2 explains treatment definition approach.

[6]Some counties have ICE and non-ICE employment, which should introduce bias against our hypothesis by increasing their economic resilience to the EV transition.

Further, we match counties along these socio-demographic characteristics to ensure covariate balance.

We measured county vulnerability to the EV transition using employment data at the 6-digit NAICS level spanning 1975–2020 (Eckert et al. 2020). These are the most fine-grained and comprehensive data available to researchers on employment across the automotive supply chain. We used the industry descriptions to classify them as ICE or non-ICE. Figure 1 provides an example showing how these data are able to differentiate employment for building gasoline engines and powertrain parts, which are vulnerable to the EV transition, from employment manufacturing auto bodies and suspension, which are less vulnerable.

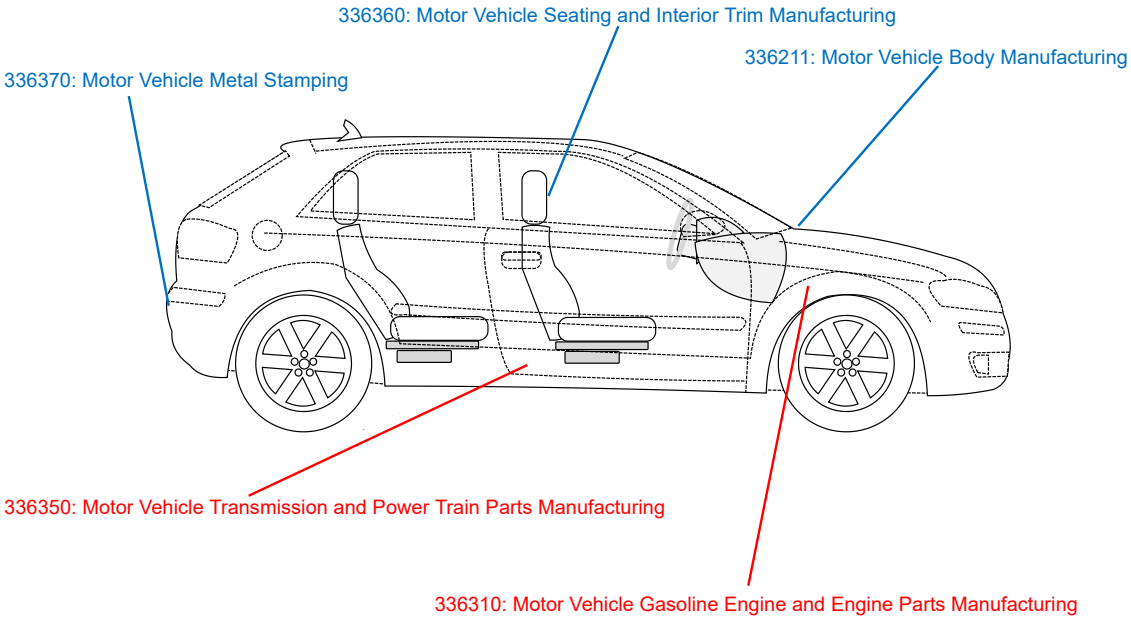

Figure 1: Example of 6-digit NAICS disaggregating auto manufacturing employment according to EV transition exposure. Red labels indicate parts used only in ICE vehicles (treatment), and blue labels denote parts that could be used in non-ICE vehicles (control). Appendix B.2 contains the full list of industry codes.

Our main analysis examines only counties with union auto employment because these voters should have more information about EV policies and they are cross-pressured on labor and environmental issues. To identify counties with union employment, we compiled all union

financial disclosure reports from the Department of Labor from 2000–2021 (N = 468,151), which are required by law, within which we identified the addresses of UAW locals.[7] We used the ZIP code to identify the corresponding county. Our focus is on union employment prior to increased EV salience, so we created a binary indicator for whether counties had union members in any year after 2008. This allows us to subset the data to union counties for the main analysis and to examine heterogeneity by unionization in subsequent tests.

Outcome: Presidential Vote Share

The outcome is two-party Republican presidential vote share, with county-level data spanning 1976–2020 (Leip 2020). Counties represent the lowest unit of analysis that matches the employment data. Our theory also predicts county-wide voting effects due to the social and economic centrality of the auto industry for communities.

We focus on presidential races because, at the national level, there is a clear partisan divide on climate policy, and presidential candidates take the mantle of the party platform in the eyes of voters. By contrast, other lawmakers may strategically diverge from the party line to stay in step with their constituents, so there would not necessarily be a partisan change in non-presidential elections (Canes-Wrone, Brady, and Cogan 2002).

Causal Identification

The primary challenge for causal inference would be if there were unobserved differences between the union counties with ICE (treatment) and non-ICE (control) employment that explain voting for reasons spurious with the rise of EVs. First, the counties in the sample could differ in how they were affected by international trade agreements like NAFTA, which Donald Trump emphasized in his campaign. Second, the counties could differ in their racial and socio-economic composition, which may have influenced the appeal of Trump's messaging (Mutz 2018; Sides, Tesler, and Vavreck 2018).

[7]These include LM-2, LM-3, and LM-4 reports.

We take three steps to account for the role of trade, race, and immigration. First, we compare American counties with union auto employment, so the primary difference is whether they manufacture parts that could be displaced in the EV transition. These counties have similar histories of trade exposure and socio-demographic characteristics that could be activated by racial messaging. Such a narrow comparison may make it harder to detect an effect because both treatment and control counties are likely shifting to the right during this period.

Second, to further improve the comparability of ICE and non-ICE counties, we employed matching. We first estimated the propensity score for being in the treatment group, using the universe of counties with unionized ICE and non-ICE employment. Then we used nearest neighbor matching to select counties with similar propensities of being treated (Ho et al. 2007). We matched counties using covariates for race, foreign-born population, college education, poverty, total population, population age structure, mobility, exposure to NAFTA, and their 2012 GOP vote share. These factors are relevant because they could make voters more or less susceptible to Trump's messages. So, ensuring that they are evenly distributed in the treatment and control groups means that they should not confound our inferences.

Figure 2 plots the counties in the treatment (ICE) and control groups (non-ICE). There were not considerable covariate imbalances to begin within, a consequence of our narrow contrast (Appendix C.3). Still, the matching procedure further improved balance, so county ICE employment is more likely to be statistically independent of covariates, such as race or NAFTA exposure, that could otherwise introduce confounding.

Third, we collected time-varying data on county exposure to economic disruption from trade and NAFTA. Our first measure is the annual count of Trade Adjustment Assistance (TAA) petitions filed in a county. Groups of workers dislocated by trade file these petitions, so they represent a direct measure of perceived economic distress due to globalization (Kim and Pelc 2021). We retrieved data from the Department of Labor on the universe of TAA

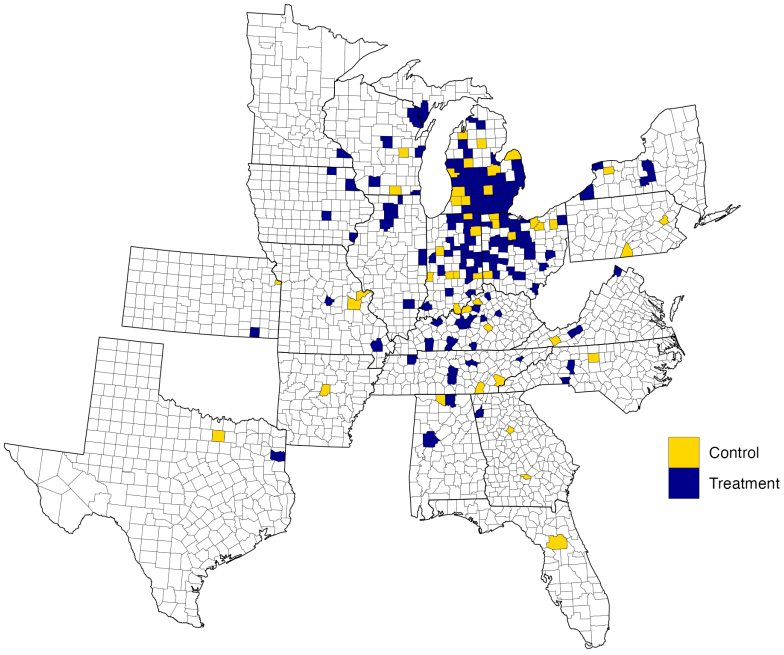

Figure 2: Matched treatment ($N = 135$) and control counties ($N = 46$).

petitions from 1975–2022 ($N = 86{,}306$), from which we identified petitions filed by workers in the auto industry using the 6-digit NAICS codes and SIC equivalents.

Our next measure captures labor exposure to NAFTA. We used comprehensive data from Hakobyan and McLaren (2016) on the change in Mexican tariffs after NAFTA for 12,056 products listed on the Harmonized Tariff Schedule (HTS) Chapter 8 code. We mapped these products to NAICS and paired them with employment data to construct a variable for the annual level of county jobs in an industry exposed to NAFTA. We used this measure in two ways. First, we included the 1994 share of jobs exposed to NAFTA as a covariate when matching. Second, we included a time-varying measure of county jobs in NAFTA-exposed industries in our regression models.

Difference-in-Differences Estimation

Our aim is to estimate the average treatment effect of increased EV salience on Republican vote share in union counties with ICE employment: the average treatment effect on the

treated units (ATT). The empirical challenge is that the counterfactual vote share had these counties not experienced increased EV salience, denoted $Y_{it}(0)$, is unobserved. The DiD design approaches this challenge by making the parallel trends assumption: had the treatment group not been treated, they would have had the same average Republican presidential vote share as the control counties.

To estimate the counterfactual Republican presidential vote share, we used the FEct, which provides more reliable estimates than the standard two-way fixed effects model (Liu, Wang, and Xu 2022). This approach takes treated observations as missing and imputes their potential outcomes.

$$Y_{it}(0) = \mathbf{X}_{it}^{\intercal}\beta + \alpha_i + \eta_t + \epsilon_{it} \tag{1}$$

$\mathbf{X}_{it}$ is a matrix of time-varying covariates, including county employment, jobs exposed to NAFTA, and TAA petitions filed. α_i is a county fixed effect, which removes bias from time-invariant factors such as resource endowments that could affect vulnerability to the EV transition.

To account for national trends, such as new policy developments, price changes, candidate characteristics, or national economic conditions, we include η_t, an election fixed effect. This statistically removes bias unique to an election year that has a common effect across counties.

An assumption behind our county-level analysis is that compositional shifts, such as migration, are not responsible for the change in vote share. Since the EV transition has yet to cause major disruption, there is less likely to be compositional change driven by the treatment. We also match the counties according to 2015 mobility levels to help ensure that compositional shifts are not driving the results in the 2016 election.

Effect of Growing EV Salience on Republican Vote Share

Figure 3 plots the effect of increased EV salience beginning around 2016 on two-party Presidential vote share in counties with union labor vulnerable to the EV transition compared to matched counties that are less vulnerable. Increased EV salience caused Republican vote share to rise by three percentage points in exposed counties, despite promised benefits. This effect also appears in the 2020 election as the EV market continues to grow. Since this partisan change occurs prior to labor market disruption, we interpret these votes as reflecting anticipation of the effects of the EV transition.

The effect is modest but substantive given the context: recent presidential elections in swing states like Michigan were decided by margins of 0.2 percentage points. Given how narrow our comparison is between union ICE and non-ICE counties and the array of factors accounted for, a three percentage point increase is notable.

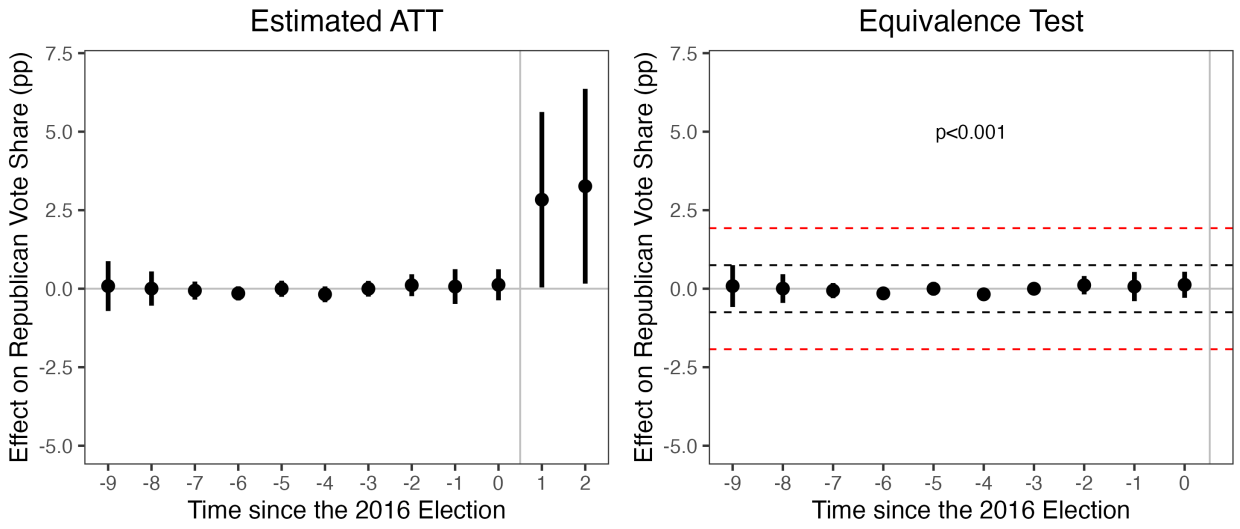

Figure 3: Effect of increased EV salience on Republican presidential vote share in unionized auto manufacturing counties vulnerable to EVs compared to matched counties that are less vulnerable, 1976–2020. Left plot shows the dynamic treatment effects estimates for elections before and after 2016. Bars denote 95% confidence intervals from 5,000 block bootstrap replications clustered by county. Right plot shows the pre-treatment average prediction errors and their 90% confidence intervals. Red dashed lines denote the equivalence range and black dashed lines mark the minimum range. $N = 2{,}172$ (181 counties $\times$ 12 elections).

These results are most consistent with EV salience driving the electoral backlash. There

would have to be an unobserved, time-varying factor unrelated to EVs present only in counties with ICE employment that caused an increase in Republican vote share to contradict our interpretation. We are unaware of any spurious processes in counties that manufacture gasoline vehicle parts, compared to counties manufacturing parts that could be used in EVs (e.g., auto bodies, vehicle steering, and brake systems) that would explain their greater shift to Republican presidential candidates. Given this precise comparison, the growing salience of the EV transition is the most consistent explanation for the partisan change observed in 2016 and sustained into 2020.

A visual inspection of the dynamic treatment effects in the left panel of Figure 3 indicates there is no apparent violation of the parallel trends assumption. Still, we used two systematic statistical tests to investigate this assumption. First, the right panel of Figure 3 presents the results from an equivalence test of the null hypothesis that there is no pretrends violation of a certain magnitude. The p-value for the equivalence test is less than 0.001, which indicates high confidence that equivalence holds (Hartman and Hidalgo 2018). Second, placebo tests using the three periods before the increased EV salience indicate no statistically detectable violation of the parallel trends assumption (Table C2).

To see how these results generalize beyond the matched sample, we also estimated the same models using the full universe of union counties with auto employment. The results are equivalent, which suggests that the findings should extend to other counties affected by the EV supply chain. This finding is an additional indication of the robustness of our empirical strategy (Appendix C.5.2).

The results are robust to alternative estimation strategies. They become even more precise when using a matrix completion estimator (Appendix C.5.1), which provides greater leverage in addressing omitted time-varying confounding (Liu, Wang, and Xu 2022).

The results also hold when including a control for the number of UAW members in a county. This accounts for the alternative explanation that it is the decline of organized labor that explains the increase of Republican presidential vote share in ICE counties. On

the contrary, we find no consistent correlation between changes in union membership and electoral behavior (Appendix C.5.4).

Lastly, the results are consistent when using alternative operationalizations of the treatment. In one case, we defined the treatment using a continuous measure of the county share of ICE employment interacted with the annual EV market share (Appendix D.2). In another specification, we employed a continuous measure of the share of ICE employment, exploiting variation within counties over time and within states (Appendix C.5.3). The results hold, lending further support to the mechanism, where greater ICE dependence intensifies the electoral effect of EV salience.

Mechanism Tests

EV Transition Salience

Our theory implies that increasing EV salience drives the electoral backlash. To test this mechanism, we constructed a time-varying measure of EV salience using data on the national market share of EVs. The logic is that as more EVs are built and sold, the transition should increase in salience, so there should be larger shifts to Republican presidential candidates in counties with gasoline-vehicle manufacturing.

Since the number of EVs sold in a county is endogenous to political factors, such as partisanship, we used the national EV market share measure to capture increasing EV salience. In our interviews, union leaders would discuss their awareness of national trends in the auto industry. This suggests that these market shifts are relevant inputs into their assessments of the EV transition, which in turn affects their messages to members.

We estimated a linear regression of Republican vote share on the interaction of national EV market share and the county-level proportion of ICE employment.

$$Y_{it} = \beta_1 EVShare_t + \beta_2 ICE_{it} + \beta_3 (EVShare_t * ICE_{it}) + \mathbf{X}_i^{\intercal}\beta + State_i + \epsilon_{it} \qquad (2)$$

$EVShare_t$ is the national percentage of new cars sold in a year that are EVs; ICE_{it} is the county-level share of ICE employment; and $\mathbf{X}_i$ is a matrix of county-level demographic covariates, the same as used in matching previously. The model also includes state fixed effects to account for time-invariant factors across states like their history with the auto industry.[8] Our main expectation is that β_3 should be positive, which represents the effect of an increase in national EV market share for counties with a standard deviation greater share of ICE employment relative to the state average.

Table 1: Linear regression of two-party Republican presidential vote share on county vulnerability to the EV transition interacted with the annual EV market share, 1976–2020

	(1)	(2)	(3)	(4)
EV Market Share	8.00***	8.95***	7.76***	9.24***
	(0.68)	(1.14)	(0.66)	(1.13)
ICE Employment Share	−0.12	−0.07	−0.07	0.00
	(0.27)	(0.28)	(0.26)	(0.27)
EV Market Share × ICE Employment Share	3.65***	4.47***	3.77***	4.25***
	(0.92)	(1.16)	(0.91)	(1.09)
N	2172	2172	2472	2472
Adjusted R^2	0.38	0.42	0.39	0.43
Covariates	Yes	Yes	Yes	Yes
Covariates × Moderator	No	Yes	No	Yes
State Fixed Effects	Yes	Yes	Yes	Yes
Matched	Yes	Yes	No	No

Notes: Standard errors clustered by county. Table D2 contains all covariate estimates.
$^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table 1 presents the estimated effect of an increase in national EV market share on Republican presidential vote share in counties with a standard deviation greater share of ICE employment relative to the state average. As expected, there is a strong positive effect that holds across the specifications. The constituent term for ICE employment by itself

[8]County fixed effects would capture within-county *change* in ICE employment, but the variation of interest is the *level* of jobs relative to the state average. Election fixed effects would be colinear with the annual share of EVs.

does not have a discernible effect, which is unsurprising because we only expect employment in gasoline vehicle manufacturing to affect voting once EVs become salient. These results suggest that growing EV salience is the mechanism behind the increased Republican vote share in vulnerable counties.

Uncertainty of Benefits

We hypothesize that the uncertainty about the benefits of EVs contributes to the increase in Republican vote share, despite assurance from union leaders and Democratic leaders that autoworkers will not be left behind. The uncertainty mechanism implies that in places where there is construction of EV-related plants, there should be less electoral backlash because there is greater certainty about the benefits of the transition.

This claim is challenging to assess given the lack of public data on the location of EV manufacturing. To overcome this barrier, we acquired private data from MarkLines, which collects this information for industry clients. We used this data to identify the original equipment manufacturer locations for EVs and batteries. We constructed a binary indicator for whether a county has an EV plant or not. The modal auto manufacturing county has no EV plants, yet there is still some variation we can leverage.

The location of new EV investments is related to factors that could predict vote share, such as local support for the energy transition and partisanship. So, we interpret the moderating effect of new EVs through a descriptive rather than causal lens.

We estimated the following DiD model:

$$Y_{it} = \delta(D_{it} * EV_i) + \mathbf{X}_{it}^{\intercal}\beta + EV_i * \mathbf{X}_{it}^{\intercal}\theta + County_i + Election_t + \epsilon_{it} \tag{3}$$

EV_i is an indicator for if a county had an EV plant that we interacted with D_{it}, the treatment indicator for whether the county had ICE employment. The model included the same time-varying covariates as before, as well as county and election fixed effects.

The first column of Table D1 presents the results from a model that simply includes the count of new EV plants in a county. We had no strong prior expectations about this coefficient, and it does not have a discernible effect. The second two columns interact the binary indicator for whether a county has an EV plant, which has a moderating effect on ICE employment after the increased EV salience. Crucially, in counties with ICE employment that also have an EV plant, there is no shift to Republican presidential candidates.

Table 2: Linear regression of two-party Republican presidential vote share on county vulnerability to the EV transition moderated by new EV plant construction, 1976–2020

	(1)	(2)	(3)
ICE Employment × Post Period	2.79*	3.28**	3.40***
	(1.48)	(1.48)	(1.26)
ICE Employment × Post Period × EV Plant		−5.51**	−4.81**
		(2.37)	(2.24)
New EV Plants	−1.66		
	(4.09)		
N	2172	2172	2472
Adjusted R^2	0.72	0.72	0.72
County Fixed Effects	Yes	Yes	Yes
Election Fixed Effects	Yes	Yes	Yes
Time-Varying Covariates	Yes	Yes	Yes
Matched	Yes	Yes	No

Notes: Heterogeneity robust standard errors clustered by county. Table D1 contains covariate estimates. $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

These descriptive results lend support to our interpretation that uncertainty about the EV transition leads unionized manufacturing workers to support Republican presidential candidates despite the promised benefits. The finding also has some suggestive support from our interviews. Jim Pedersen, a UAW leader, emphasized that the opening of new EV plants, such as the announced battery plant in Marshall, Michigan, which will reportedly employ 2,500 people, will demonstrate to autoworkers that there are opportunities available within the future direction of the auto industry.

Interview Evidence of Climate Policy Backlash

We conducted semi-structured interviews with UAW members and leaders across Michigan to trace the mechanisms causing county-level electoral change. Interviews provide a valuable opportunity to understand the perceptions of central political actors, which can help interpret the reason for the electoral shifts. The interview topics were wide-reaching but focused in part on the attitudes of UAW members and leaders about the EV transition, including what type of information they received from their union leadership and their opinions on government policies.

Autoworkers and union leaders are a hard-to-reach population. We reached interviewees by leveraging initial connections, cold-calling UAW locals, and snowball sampling. We successfully conducted 29 interviews with union leaders and members, most of whom resided in the Metro Detroit area. The interviews ranged in length from one to three hours and were held virtually over video calls, by telephone, or in person at bars, cafes, and union halls. The interviews took place between spring 2022 and fall 2023, so they provide stronger evidence of EV salience in recent elections between Biden and Trump.

Critically, the subjects varied in their exposure to the EV transition, which allows us to investigate the relationship between uncertainty, candidate preferences, and information provision by local unions. The subjects included UAW members who were well-positioned to maintain their jobs in the EV transition (e.g., those employed in non-ICE manufacturing) and members whose future job prospects were more precarious (e.g., those employed in ICE-related production). We also interviewed active and retired UAW leadership, who spoke to the role of union leadership and the mood of members around the EV transition.

The interviews speak most directly to worker and union leader perceptions. These individuals are likely better informed than members of their community by virtue of their employment. Still, the perceptions conveyed by workers and union leaders should also affect beliefs, attitudes, and preferences of community members through socialization and information diffusion, as has been demonstrated in other research (e.g., Ternullo 2023).

High Vulnerability: EV Pessimism, Democratic Opposition

In places vulnerable to the EV transition, much of what we heard in interviews with autoworkers and UAW leaders was distinctly negative. Some of the people we spoke to expressed that the transition to EVs is the most pressing issue for autoworkers, with the potential to upend the auto industry. The main concern pertained to the long-term level of employment in the auto sector. Yet, we also heard worries about whether new EV-related facilities were going to be unionized, and how current workers at production sites for ICE vehicles would transition to new work.

For example, Scott Birdsall, a retired UAW leader who started working in the auto industry in 1978, emphasized that there is considerable uncertainty among the membership about the transition to EVs:

> With electrification, the question is the level of employment within these facilities. It takes fewer people to assemble an electric vehicle; there are fewer parts than there are in an internal combustion engine. So, the concern is where the membership is going to go, what the training opportunities are going to be to get these people ready for the transition.

Others within the UAW echoed this concern. We spoke to some of the current leadership of UAW Local 160, which represents workers at the GM Tech Center in Warren, Michigan, which is more at risk of job displacement. Earl Fuller Jr., the Chairman of Local 160, when asked what was the most pressing concern for his membership, said—without hesitation—the EV transition.

> My membership can't help but notice that electrification will eventually eliminate 95% of our work... You lose a transmission. No less than 200 machine processes with a transmission. That all goes away [with EVs]. The most sophisticated part of an automobile is the internal combustion engine and that will be replaced by an electric motor. They get to shave their engineering staff probably by half and get to cut their hourly workforce probably by 40%. Because the cars lose their sophistication, they don't require the same testing and validation, *which is what this campus was built for*, so it's taking away my members' work long-term. The *promise that electrification will bring more work* is simply a fantasy, it's a

> complete lie [that] *everybody including the leadership in the union believes*... So, my membership's outlook is concern and uncertainty for the future.

Notably, his reaction acknowledged how the national leadership thought the EV transition with the right policies could create more jobs—promised benefits that lack credibility from the perspective of this local union.

Union members and leaders connected these concerns to politics, being quick to voice their pointed opposition to the current policy direction of President Biden. Some of the interviewees highlighted how subsidies for EVs and tax incentives for auto companies transitioning to electrification are accelerating the loss of jobs in ICE facilities. For example, Jessie Kelly, a member of UAW Local 160 and the local's head of communications, said that there is a disconnect between what the local union believes should be done and what they hear from their national leadership: "Union leadership works with the Biden administration on EVs. You get tax incentives to buy EVs in this country, and then your plant closes...that's the disconnect."

We heard similar sentiments from Jim Pedersen, a retired UAW leader, whom we interviewed twice. Pedersen is more balanced in his beliefs, thinking that while there will be disruption to employment, the EV transition will not be the end of the auto industry nor the UAW. Yet, he said many members are not as positive and may support Trump:

> This is the feds saying: 'Here are some tax incentives to build facilities in the United States of America and the result is fewer jobs'. So, I don't speak for [UAW President] Shawn Fain, but the members that I talk to are saying: 'Why are we helping them get rid of jobs?'... To the extent that Trump gets 30% of anybody to believe him... there is a significant number of people saying: 'This is a horrible idea, Biden's got to go, Trump 2024'... A significant number.

Low Vulnerability: EV Optimism, Democratic Support

Our interviews revealed that not everyone is pessimistic about EVs, but this varied with subjects' vulnerability to the transition. The majority of positive sentiments came from people whose current employment is more certain in the transition to EVs. One prime

example is Steve Lyons, a long-time UAW member, who grew up in Southeast Michigan. Lyons works in machine repair at the Ford plant in Sterling Heights, Michigan, represented by UAW Local 2280. When asked about the general mood at his plant, he said:

> I personally feel optimistic because I'm in an area that I think everyone is going: the electrification field. We make the standard rotor for the electric motors of the Ford Lightning and the Maverick. But we're in the field that everyone seems to be going. So, in our plant, it seems that everyone is a bit more optimistic. Because of what we're doing, it looks good for us. This is the direction of the company

Lyons also stated that he is an avid supporter of Joe Biden.

Interviews with UAW leaders also demonstrated this positive sentiment about the transition among the workers who stand to benefit. Both Nolen and Pedersen, who spent their entire careers in the auto industry and served in senior UAW leadership roles, agreed that the type of work a person does will significantly impact their stance on EVs. Pedersen said,

> Yes, it matters a whole lot... my perception of what people think is that it's: 'What do I do?' Well, if you work in a final assembly plant, we're going to assemble the EVs here, so you're good. If you work in an engine plant, well, a full EV has a much different engine/motor than what we make right now. How many of us will still be making something, what will they be going into, and so forth. For the guys that make transmissions, there are none in an EV. So, what's going to happen to them?

Information Mechanism: Local Union Heterogeneity

Heterogeneous Effects by Unionization

Our argument implies that communities with *unionized* autoworkers should be more likely to vote for Republican presidential candidates than non-unionized areas for two reasons: they have more information about the effects of the EV transition and they are cross-pressured on labor and environmental issues. While there does not exist sufficient individual-level data

to disaggregate these two mechanisms, we test observable implications consistent with this claim.

We estimated the effect of growing EV salience in *non-union* auto manufacturing counties. As before, we defined the treatment group as counties with ICE-related employment while the control consists of counties with non-ICE auto manufacturing employment. Unlike before, where we found a positive effect of increased EV salience on Republican presidential vote share, we expected to find a more limited—and possibly null—treatment effect among these non-union counties. We also applied the same matching technique to ensure that within the non-union counties, the contrast is between comparable units in terms of their socio-demographic characteristics (Appendix C.3).

We find that there is no effect of increased EV salience on Republican vote share in the matched non-union sample (Figure D1). This is consistent with our contention that union areas are more responsive to growing EV salience because of their greater access to information and voters who are cross-pressured.

Interview Evidence of Information Provision

Our hypothesized mechanism explaining variation within union auto counties, despite positive messages from the national UAW, is that local unions transmit diverging information about EVs. Our ground-up argument contends that the information members receive is far from uniform and depends in large part on the structural economic position of their local union.

To test this argument, we examined the extent of consensus or disagreement in the messages provided by local UAW leaders and the national UAW, and how this varied with the local's vulnerability to the EV transition. An inferential challenge is that differences in the information provided by local unions could vary for reasons other than their vulnerability to EVs, such as their counties' pre-existing level of partisanship.

We approached this challenge by examining two local unions *within the same county*,

Macomb, Michigan, that are separated by only a short drive: Local 160 and Local 2280. Of course, elite-level interviews cannot systematically control for the same factors that our quantitative analysis can. Still, by focusing on the same county, the local political and economic context is held constant, but what differs is the vulnerability of their plants to the EV transition.

We found wide variation in the information locals provided. Local 160 represents the employees at the GM Tech Center in Warren, which is vulnerable to the EV transition because it tests transmission parts and other ICE components. In contrast, Local 2280 represents the employees at the Ford Plant in Sterling Heights that produces electric rotors for the Lightning and Maverick, the company's flagship EVs.

In the local vulnerable to the EV transition, Fuller Jr., the chairman of UAW Local 160, said that the messages he passes along to his members about EVs are much more negative than what members in other locals hear from more supportive labor leadership. He did not mind expressing a different opinion than national UAW leadership: "The incumbent [UAW] president apparently wrote an article that said we have to get behind EVs...I'm not going to support a political party when their desire is to exodus manufacturing. That's what I see and that's what my members see."

In contrast, the local less vulnerable to the EV transition passed along more positive messages about EVs. Nicole Didia is the Vice President of UAW Local 2280, and a third-generation UAW member. Didia was far more positive in her comments on the EV transition and what it would mean for her local: "Our facility is electric, we're booming." Unlike Fuller, Didia is a Democrat and a supporter of President Biden. Local 2280 represents UAW members such as Lyons, who, as mentioned previously, expressed optimism about the EV transition.

Our interviews illustrate different views between UAW locals on the EV transition, how this emanates from the relative risk of job displacement from the move to EVs, and, correspondingly, how this impacts what types of messages are passed down to UAW members.

Conclusion

The climate crisis is one of the most pressing global challenges of the 21st century. The distributive effects of climate policies have hampered government efforts to mitigate emissions. Reformers hope that green industrial policies that create economic benefits will foster durable political support for the energy transition (Bergquist, Mildenberger, and Stokes 2020; Meckling et al. 2015). However, our results indicate that uncertainty about the EV transition is driving vulnerable communities to support presidential candidates who oppose climate policy. This partisan change is of large enough magnitude to potentially influence the outcome of elections in swing states like Michigan. Yet, we do not observe this electoral backlash in counties that received EV investments, which suggests how crucial the certainty of benefits is for maintaining electoral support.

Our findings are relevant for countries with large auto manufacturing sectors. We already observe growing backlash to the EV transition in nations like Germany (Politico 2023), and we anticipate the mechanisms identified in our paper should translate to these related national contexts. Our argument could also apply to other industries where older methods of manufacturing are being disrupted by government policies encouraging more sustainable technologies and production processes, such as aviation, shipping, and steel.

One limitation of our study is the dearth of individual-level panel data of unionized autoworkers with granularity sufficient to examine different modes of work. Such information would be helpful to identify the extent to which growing EV salience increased Republican vote share through the mobilization of new voters or the conversion of existing voters. Still, we attempted to overcome this limitation with interviews that probed the top-of-mind considerations of autoworkers and union leaders.

Our study also took place just as EVs began to grow in salience. For this reason, we adopted an empirical strategy to hold major issues like trade and race constant. In future elections, EVs may play an even more central role as their salience has grown due to the expansion of Democratic policies. There will also be implications of the transition on the

massive car dealership and repair network tied to gasoline-powered vehicles, which represents an avenue of future analysis.

Our paper makes three contributions. First, departing from the view of unions as top-down information brokers providing homogeneous information, we advance a ground-up perspective illustrating how variation in the effects of policies alters the messages local union leaders provide members. Our argument builds on Ahlquist, Clayton, and Levi (2014) and Ahlquist and Levi (2013) by showing how self-interest affects the information unions provide.

Second, we offer a new argument explaining the partisan reversal in working-class areas. Scholars have long debated the cause of this phenomenon, identifying factors such as trade, deindustrialization, and racial backlash (Autor et al. 2020; Baccini and Weymouth 2021; Mutz 2018; Sides, Tesler, and Vavreck 2018). Our results indicate that above and beyond these factors, backlash to climate policy exerts an independent effect on increased support for Republican presidential candidates. This suggests that climate change has created a cleavage between left-wing parties and organized labor, which may continue to intensify as the energy transition unfolds (Mildenberger 2020).

Lastly, for the study of climate politics, we provide the first estimates of the electoral effects of green industrial policy. We show how uncertainty about the economic effects of the energy transition leads communities tied to industries promised to benefit to act similarly to those with assets that are clearly threatened by climate policy, such as coal, oil, and gas. These findings underscore the importance of creating credible local economic benefits that could reduce this uncertainty (Gazmararian and Tingley 2023). Otherwise, political backlash to the energy transition could unwind or block the policies needed to combat the climate crisis.

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Online Appendix:
Driving Labor Apart

A Research Ethics

The study conforms to the APSA Principles and Guidance for Human Subjects Research.

Power We conducted human subjects research exclusively with labor leaders and union members. We did not engage with vulnerable populations (e.g., children, prisoners). The questions were not sensitive; the semi-structured interview focused on the subject's views of the auto industry, which is a daily topic of conversation for this population.

Consent We obtained voluntary informed consent from all subjects orally before commencing with the interview. We transparently communicated our names and affiliations, the general purpose of the research, an explanation of what participation entailed, the potential risks and benefits to participants, how identities and data would be protected, and any other information relevant to the study.

Compensation There was no compensation paid to participants.

Deception No deception was used.

Harm and trauma No harm or trauma was anticipated or identified.

Confidentiality We provided all participants with the option of confidentiality. For those who consented to their names being referenced, we made clear that they would be included in potential published research. As mentioned above, we did not anticipate any harm or trauma from this identification. For those who chose not to be identified, we ensured confidentiality by de-identifying responses so that there is no traceable record of who they are.

Impact No impact on political processes was anticipated or identified.

Laws, regulations, and prospective review The study complied with all relevant laws and regulations. Prospective review by IRB at [[redacted institution]] was obtained.

B Data and Measurement

B.1 EV Market Share

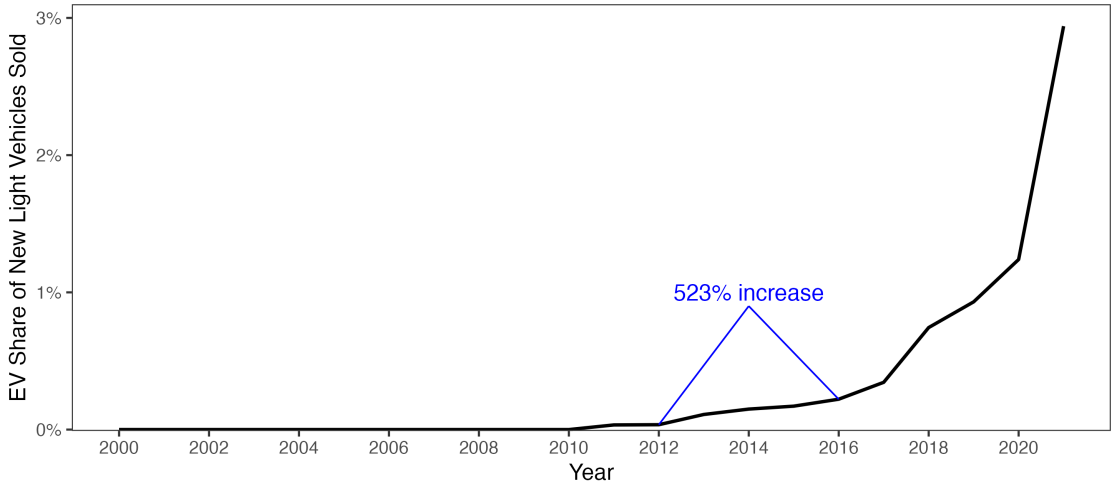

Figure B1: EV market share for new light vehicles sold in the United States, 2000–2021. Data from the National Transportation Statistics report. Between 2000 and 2010, the number of EVs sold in the US was "too small to report," so we code those years as 0.

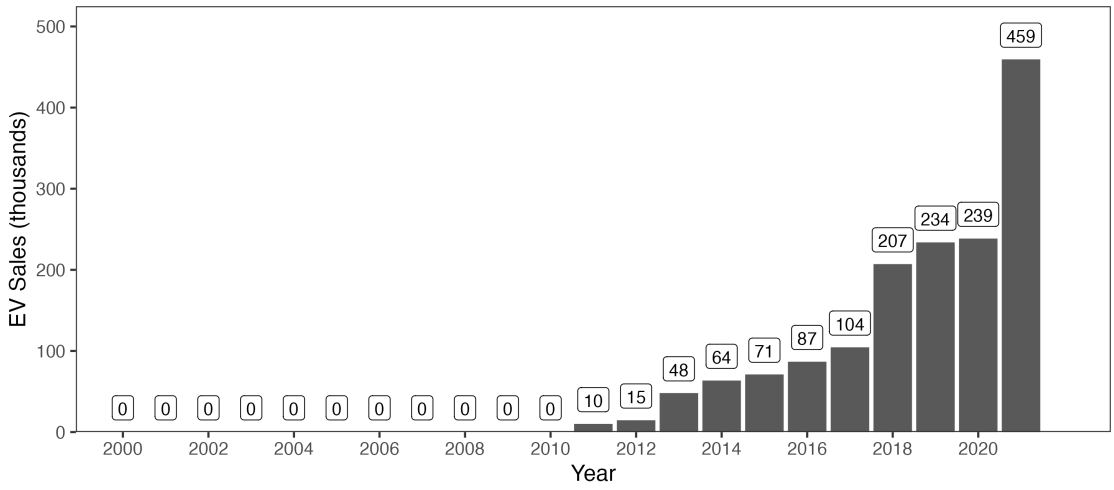

Figure B2: New EV sold in the United States, 2000–2021. Data from the National Transportation Statistics report. Between 2000 and 2010, the number of EVs sold in the US was "too small to report," so we code those years as 0.

B.2 Auto Supply Chain Measurement

ICE 6-digit NAICS include:

- **336310: Motor Vehicle Gasoline Engine and Engine Parts Manufacturing**

"This industry comprises establishments primarily engaged in (1) manufacturing and/or rebuilding motor vehicle gasoline engines and engine parts and/or (2) manufacturing and/or rebuilding carburetors, pistons, piston rings, and engine valves, whether or not for vehicular use."

- **336350: Motor Vehicle Transmission and Power Train Parts Manufacturing**

  "This industry comprises establishments primarily engaged in manufacturing and/or rebuilding motor vehicle transmissions and power train parts."

- **336320: Motor Vehicle Electrical and Electronic Equipment Manufacturing**

  "This industry comprises establishments primarily engaged in manufacturing and/or rebuilding electrical and electronic equipment for motor vehicles and internal combustion engines. The products made can be used for all types of transportation equipment (i.e., aircraft, automobiles, trucks, trains, ships) or stationary internal combustion engine applications."

- **336390: Other Motor Vehicle Parts Manufacturing**[9]

  "This industry comprises establishments primarily engaged in manufacturing and/or rebuilding motor vehicle parts and accessories (except motor vehicle gasoline engines and engine parts, motor vehicle electrical and electronic equipment, motor vehicle steering and suspension components, motor vehicle brake systems, motor vehicle transmissions and power train parts, motor vehicle seating and interior trim, and motor vehicle stampings)."

  Illustrative examples:

  Catalytic converters, engine exhaust, automotive, truck, and bus, manufacturing

  Compressors, motor vehicle air-conditioning, manufacturing

  Mufflers and resonators, motor vehicle, manufacturing

  Radiators and cores manufacturing

Non-ICE 6-digit NAICS include:

- **336111: Automobile Manufacturing**

  "This U.S. industry comprises establishments primarily engaged in (1) manufacturing complete automobiles (i.e., body and chassis or unibody) or (2) manufacturing automobile chassis only."

- **336112: Light Truck and Utility Vehicle Manufacturing**

  "This U.S. industry comprises establishments primarily engaged in (1) manufacturing complete light trucks and utility vehicles (i.e., body and chassis) or (2) manufacturing light truck and utility vehicle chassis only. Vehicles made include light duty vans, pick-up trucks, minivans, and sport utility vehicles."

[9]This category includes some parts used in EVs, but the majority of parts appear relevant for ICEs.

- **336120: Heavy Duty Truck Manufacturing**

  "This industry comprises establishments primarily engaged in (1) manufacturing heavy duty truck chassis and assembling complete heavy duty trucks, buses, heavy duty motor homes, and other special purpose heavy duty motor vehicles for highway use or (2) manufacturing heavy duty truck chassis only."

- **336211: Motor Vehicle Body Manufacturing**

  "This U.S. industry comprises establishments primarily engaged in manufacturing truck and bus bodies and cabs and automobile bodies. The products made may be sold separately or may be assembled on purchased chassis and sold as complete vehicles."

- **336212: Truck Trailer Manufacturing**

  "This U.S. industry comprises establishments primarily engaged in manufacturing truck trailers, truck trailer chassis, cargo container chassis, detachable trailer bodies, and detachable trailer chassis for sale separately."

- **336213: Motor Home Manufacturing**

  "This U.S. industry comprises establishments primarily engaged in (1) manufacturing motor homes on purchased chassis and/or (2) manufacturing conversion vans on an assembly line basis. Motor homes are units where the motor and the living quarters are integrated in the same unit."

- **336214: Travel Trailer and Camper Manufacturing**

  "This U.S. industry comprises establishments primarily engaged in one or more of the following: (1) manufacturing travel trailers and campers designed to attach to motor vehicles; (2) manufacturing pick-up coaches (i.e., campers) and caps (i.e., covers) for mounting on pick-up trucks; and (3) manufacturing automobile, utility and light-truck trailers. Travel trailers do not have their own motor but are designed to be towed by a motor unit, such as an automobile or a light truck."

- **336110: Automobile and Light Duty Motor Vehicle Manufacturing**

  No examples given.

- **336330: Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing**

  "This industry comprises establishments primarily engaged in manufacturing and/or rebuilding motor vehicle steering mechanisms and suspension components (except springs)."

- **336340: Motor Vehicle Brake System Manufacturing**

  "This industry comprises establishments primarily engaged in manufacturing and/or rebuilding motor vehicle brake systems and related components."

- **336360: Motor Vehicle Seating and Interior Trim Manufacturing**

  "This industry comprises establishments primarily engaged in manufacturing motor vehicle seating, seats, seat frames, seat belts, and interior trimmings."

- **336370: Motor Vehicle Metal Stamping**

  "This industry comprises establishments primarily engaged in manufacturing motor vehicle stampings, such as fenders, tops, body parts, trim, and molding."

B.3 Summary Statistics

Table B1: Summary statistics for matched sample prior to standardization

	Mean	SD	Min	Max	NA	N
Treatment	0.75	0.44	0.00	1.00	0	2172
ICE (% of County Employment)	2.98	4.59	0.00	42.65	0	2172
Two-Way Republican Vote Share (%)	57.94	10.60	24.81	86.92	0	2172
Employment	44 805.89	86 165.65	969.00	830 168.00	0	2172
NAFTA Exposure	590.36	1178.47	0.00	13 336.91	0	2172
TAA Petitions	0.51	4.39	0.00	172.00	0	2172
EV Plants	0.00	0.06	0.00	2.00	0	2172

Notes: In the analysis, we standardize the measures of employment, NAFTA exposure, and TAA petitions by subtracting the county mean and dividing by the county standard deviation, which captures the within-county variation over time. Table B2 contains summary statistics for the unmatched sample.

Table B2: Summary statistics for time-varying covariates, unmatched sample

	Mean	SD	Min	Max	NA	N
Treatment	0.66	0.48	0.00	1.00	0	2472
ICE (% of County Employment)	2.76	4.47	0.00	42.65	0	2472
Two-Way Republican Vote Share (%)	57.74	10.61	15.71	86.92	0	2472
Employment	46 272.38	89 571.48	969.00	830 168.00	0	2472
NAFTA Exposure	608.12	1215.42	0.00	13 336.91	0	2472
TAA Petitions	0.47	4.14	0.00	172.00	0	2472
EV Plants	0.00	0.06	0.00	2.00	0	2472

Notes: In the analysis, we standardize the measures of employment, NAFTA exposure, and TAA petitions by subtracting the county mean and dividing by the county standard deviation, which captures the within-county variation over time

Table B3: Summary statistics for time-invariant covariates, unmatched sample

	Mean	SD	Min	Max	NA	N
White	0.84	0.16	0.10	1.00	2	3110
Foreign Born	0.03	0.03	0.00	0.57	9	3103
College	0.14	0.06	0.02	0.55	2	3110
Poverty	0.03	0.01	0.00	0.15	9	3103
Population (log)	10.28	1.47	4.76	16.12	2	3110
Under 40	0.49	0.06	0.21	0.83	2	3110
Mobility	0.84	0.06	0.39	0.99	3	3109

Notes: Data from the 2015 5-Year ACS. In the analysis with state fixed effects, we standardize the measures by subtracting the state mean and dividing by the state standard deviation, which captures within-state variation.

C Identification of Main Results

C.1 Descriptive Pre-Trends

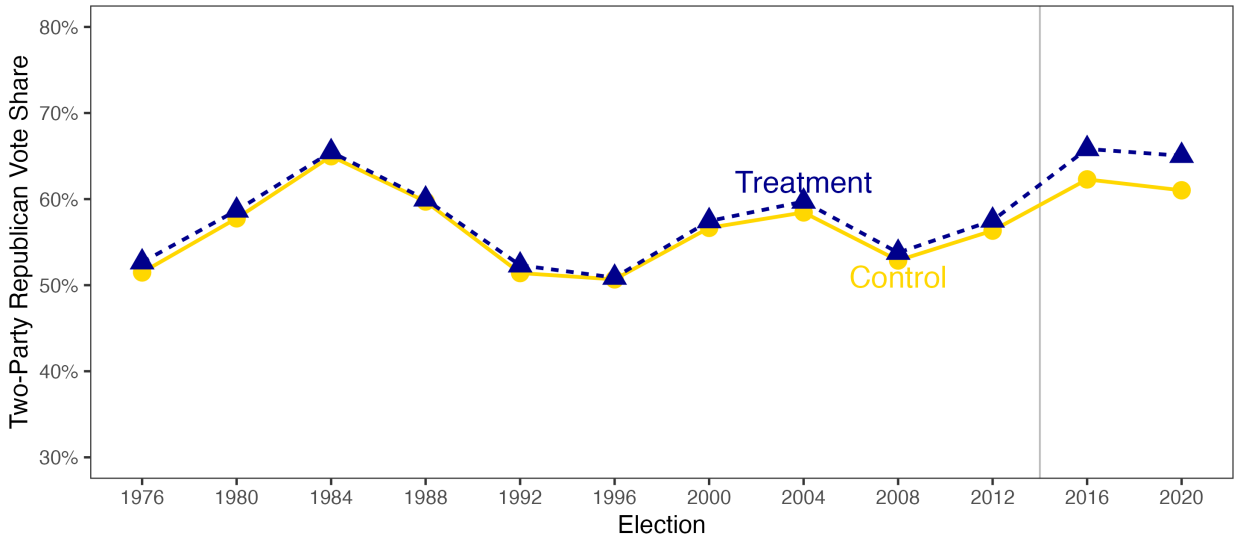

Figure C1: County-level average two-party Republican vote share in the matched sample, 1976–2020. $N = 2{,}184$. There is no adjustment in this plot for time-varying covariates—simply the descriptive pre-trends. Visually, the trends appear parallel until the 2016 election, when the treated counties become more Republican on average than the control counties.

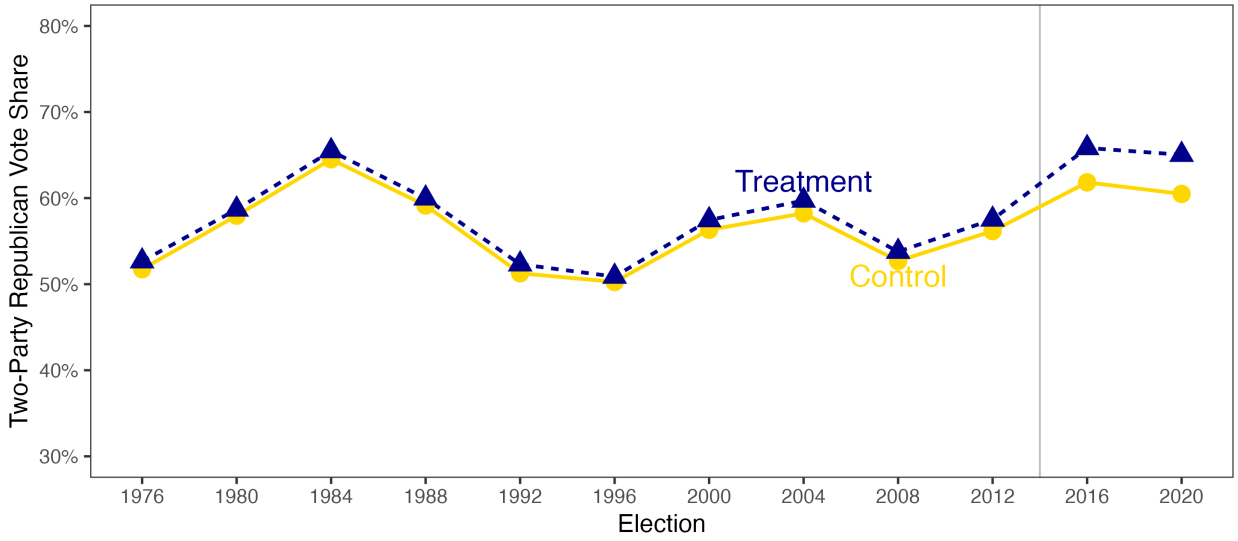

Figure C2: County-level average two-party Republican vote share in the unmatched sample, 1976–2020. $N = 2{,}472$. As an indication that our design to examine only unionized counties with auto employment enhanced comparability—before even the matching procedure—the pre-trends appear parallel until the 2016 election.

C.2 Treatment Definition

The canonical DiD model is a powerful approach to causal inference that requires a binary treatment.[10] We use theory and data to guide the choice of treatment and control groups. Our theory suggests that the local importance of the industry through economic and social ties matters more than direct employment, so even in counties with relatively low levels of employment in ICE there should be an electoral effect in response to growing EV salience.

Yet, this theoretical intuition cannot determine the precise threshold that we should use to distinguish treatment and control counties. We approach this challenge by examining the data to determine where a meaningful break in the distribution of employment occurs. The aim is to find a point that filters out the counties with employment marginal enough that ICE is not relevant economically or socially. Figure C3 plots the distribution of the county-level share of ICE and non-ICE employment. We examine non-ICE employment because these counties will serve as our control group, so there too, we must pick a threshold. At about 1% employment, there is a noticeable break in the distribution that separates counties with close to 0 percent employment in the two industries from those with more appreciable shares of ICE or non-ICE employment. For this reason, we employ the 1% threshold.

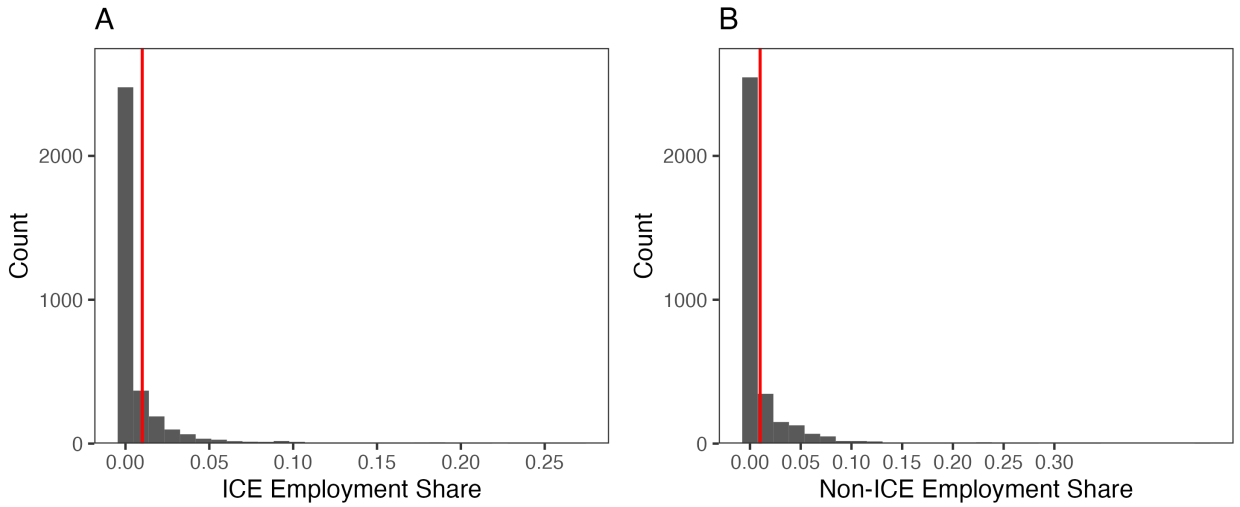

Figure C3: Histogram of ICE and non-ICE employment with the 1% treatment definition cutoff depicted in red. Employment data include only counties with UAW presence and in the post-2008 period.

As a test of the validity of this threshold, we examine the correlation of the treatment indicator with a measure of the share of county GDP from the manufacturing industry. The expectation is that there should be a strong, positive correlation between the treatment and local GDP from manufacturing. GDP data come from the Bureau of Economic Analysis in the Department of Commerce. Unfortunately, there is not a GDP measure at the auto

[10] Some work has begun to consider DiD with a continuous treatment, but this requires *much* stronger assumptions (e.g., Callaway, Goodman-Bacon, and Sant'Anna 2021; D'Haultfœuille, Hoderlein, and Sasaki 2023).

industry level, so this measurement error should make this a more conservative test. We averaged the GDP data to match the same years as the employment data.

Table C1 presents the results from regressing the share of county GDP from manufacturing on indicator variables with progressively stricter employment thresholds used for dichotomization. Model 1 shows that having more than 1% local employment in the auto industry has a positive correlation with county GDP from manufacturing. There is about a 9% increase in county GDP from manufacturing associated with the binary indicator at the threshold our treatment uses. Model 2 shows that even increasing our threshold by tenfold does not do much to improve the magnitude of the correlation between the indicator and local GDP from manufacturing—13% increase versus 9%. Model 3 shows that using the continuous share of auto employment (standardized for interpretation) does not have as large of a correlation with county GDP compared to the threshold used for our treatment in Model 1. In all, this analysis indicates the 1% threshold for treatment assignment captures our concept of interest: the local economic importance of the auto industry.

Table C1: Linear regression of county GDP from manufacturing on the indicator for 1% automotive employment and alternative employment thresholds

	(1)	(2)	(3)
Intercept	0.05***	0.06***	0.06***
	(0.00)	(0.00)	(0.00)
Above 1% Auto Employment (=1)	0.09***		
	(0.01)		
Above 10% Auto Employment (=1)		0.13***	
		(0.02)	
Auto Employment			0.03***
			(0.00)
N	3059	3058	3058
Adjusted R^2	0.100	0.063	0.201

Notes: HC2 standard errors clustered by county. $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$

Lastly, we also estimated a model that uses a continuous measure of ICE employment. One might expect the effects of increasing EV salience to be greater in counties where its importance to the local industry is higher. Indeed, our results are also consistent when using this continuous treatment measure in a shift-share design (Table 1) and a DiD setup (Table C5).

C.3 Matching Diagnostics

C.3.1 Unionized Counties

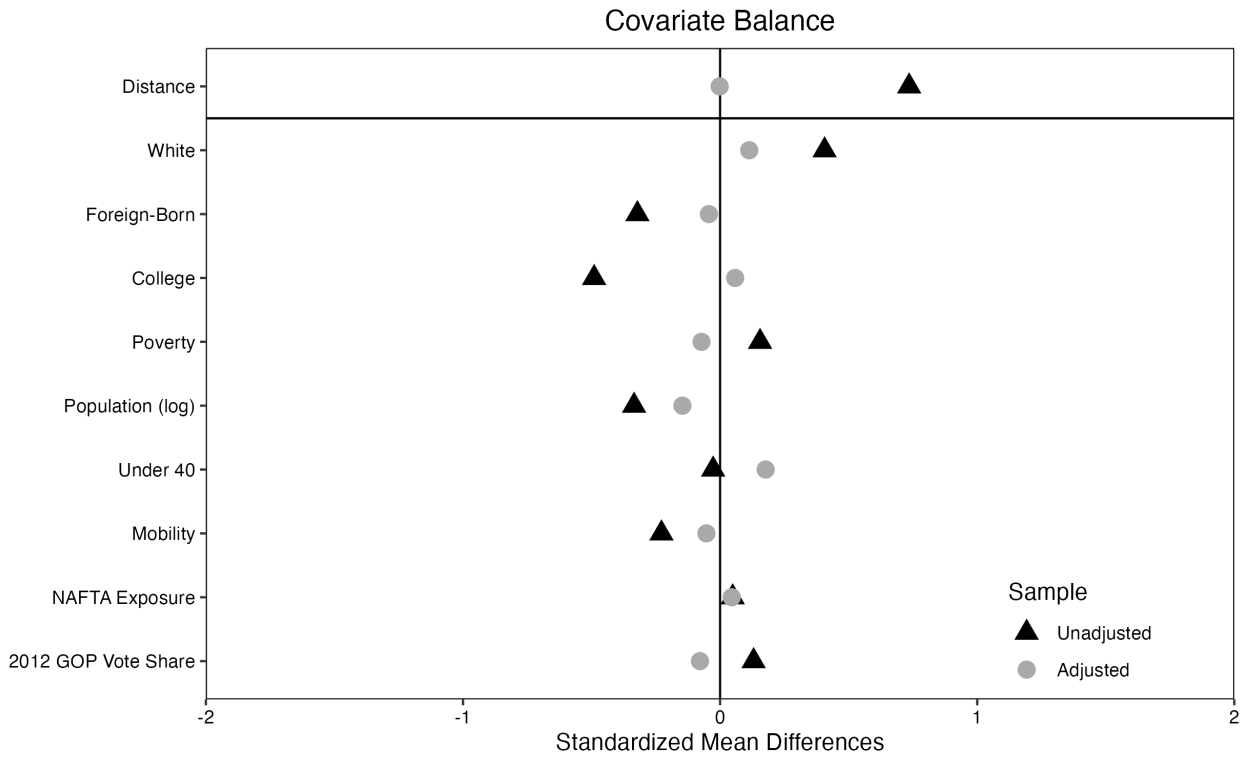

Figure C4: Covariate balance before and after matching. Treated counties are those with union employment in manufacturing for parts related to ICEs, whereas control counties are those with union employment in manufacturing for non-ICE parts. Nearest neighbor matching with replacement employed (Ho et al. 2007). Covariate data from the 2015 5-Year ACS. The plot shows low imbalance before matching, with less than a standard deviation of imbalance across all covariates. After matching, balance improves to within less than about a 0.25 standardized mean difference, with there being no overall imbalance represented by *distance*.

C.3.2 Non-Unionized Counties

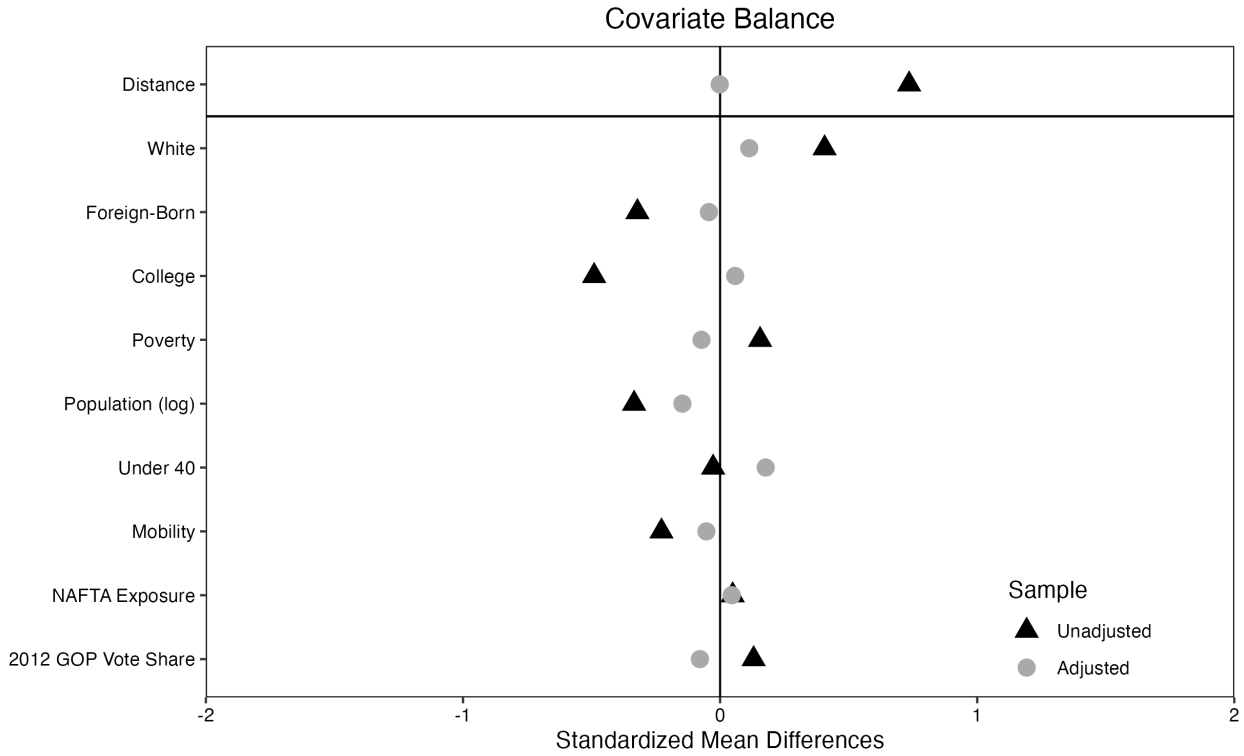

Figure C5: Covariate balance before and after matching non-union counties. Treated counties are those with employment in manufacturing for parts related to ICEs, whereas control counties are those with employment in manufacturing for non-ICE parts. Nearest neighbor matching with replacement employed (Ho et al. 2007). Covariate data from the 2015 5-Year ACS. After matching, balance improves to within less than about a 0.25 standardized mean difference, with there being no overall imbalance represented by *distance*.

C.4 Regression Estimates

Table C2: Effect of increased EV salience on Republican presidential vote share in unionized auto manufacturing counties vulnerable to EVs versus those less vulnerable, 1976–2020.

	Estimate	S.E.	$CI_{2.5\%}$	$CI_{97.5\%}$	p-value
ATT:					
Observations equally weighted	3.05	1.49	0.12	5.98	0.04
Units equally weighted	3.05	1.49	0.12	5.98	0.04
Covariates:					
Employment	0.27	0.29	-0.29	0.84	0.34
NAFTA Exposure	0.52	0.28	-0.02	1.06	0.06
TAA Petitions	0.61	0.21	0.20	1.02	0.00
Placebo Tests:					
-2 to 0 election interval	0.35	1.29	-2.17	2.87	0.79

Notes: Standard errors and confidence intervals constructed using 5,000 block bootstrap replications clustered at the unit level. Covariates standardized to capture within-county variation. $N = 2{,}172$.

C.5 Robustness

C.5.1 Matrix Completion Estimator

This appendix reports the results of using the MC estimator (Athey et al. 2021; Liu, Wang, and Xu 2022). This estimator constructs a lower-rank approximation of the outcome data matrix using information from untreated observations to address potential time-varying confounders. The advantage of this estimator is that it accounts for potential time-varying confounders, more efficiently uses the available data, and avoids the two-way fixed effects model's negative weights problem. We used cross-validation to determine whether to use the interactive fixed effects or MC counterfactual estimator. We also used cross-validation to select the parameters for the model.

Figure C6 shows the dynamic treatment effect estimates from the MC estimator, which are equivalent to the main results. As before, the equivalence test indicates that equivalence in the pretrends holds with high confidence.

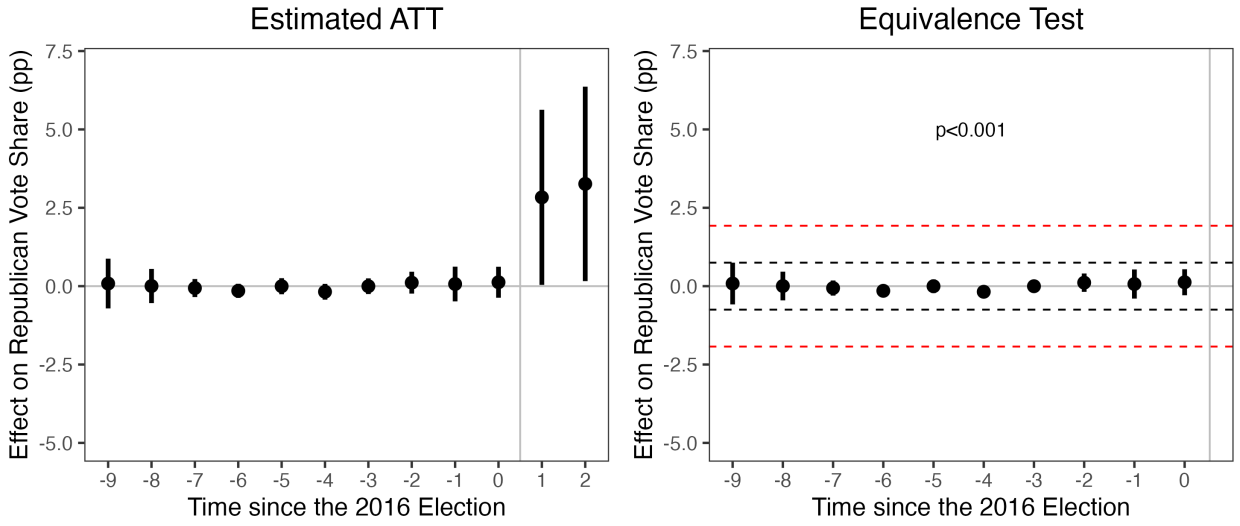

Figure C6: Matrix completion estimator for the effect of increased EV salience on Republican presidential vote share in matched unionized auto manufacturing counties vulnerable to EVs versus those less vulnerable, 1976–2020. The left plot shows the dynamic treatment effects estimates for elections before and after the 2016 election. Bars denote 95% confidence intervals from 5,000 block bootstrap replications clustered by county. Table C3 contains the regression estimates. The right plot shows the pre-treatment average prediction errors and their 90% confidence intervals. The red dashed lines denote the equivalence range and the black dashed lines mark the minimum range. $N = 2{,}172$.

Table C3: Matrix completion estimator of the effect of increased EV salience on Republican presidential vote share in matched unionized auto manufacturing counties vulnerable to EVs versus those less vulnerable, 1976–2020.

	Estimate	S.E.	$CI_{2.5\%}$	$CI_{97.5\%}$	p-value
ATT:					
Observations equally weighted	2.80	1.33	0.19	5.41	0.04
Units equally weighted	2.80	1.33	0.19	5.41	0.04
Covariates:					
Employment	0.17	0.22	-0.26	0.61	0.43
NAFTA Exposure	0.37	0.15	0.08	0.66	0.01
TAA Petitions	0.06	0.12	-0.17	0.29	0.60
Placebo Tests:					
-2 to 0 election interval	0.35	1.29	-2.18	2.88	0.79

Notes: Standard errors and confidence intervals constructed using 5,000 block bootstrap replications clustered at the unit level. Covariates standardized to capture within-county variation. $N = 2{,}172$.

C.5.2 Unmatched Estimates

For robustness, we also use FEct to estimate the ATT of increased EV salience across the unmatched sample. There are two reasons for examining this unmatched sample. First, if the results are consistent, that instills confidence that the findings are not reliant on the matching procedure. Second, consistent results would also signal that the findings in the matched counties generalize to other places with auto manufacturing employment.

Recall that the unmatched sample includes only unionized auto manufacturing employment, where counties with ICE employment are in the treatment group while the rest are in the control group. Even in this unmatched sample, the covariate balance tests (Figure C4) and the pre-trend Republican presidential vote share (Figure C2) suggest that these counties are quite comparable in terms of their socio-demographics and their electoral behavior over time.

Figure C7 presents the estimates of the effect of increasing EV salience for counties with union ICE employment, compared to those with union non-ICE employment, on two-party Republican presidential vote share. Consistent with the main results, there is a strong positive effect of increased EV salience on Republican vote share in counties vulnerable to the EV transition. There also appears to be parallel pre-trends by a visual inspection of the dynamic treatment effect plot on the left and the equivalence test on the right, the p-value of which indicates equivalence holds with high confidence. The ATT estimate in Table C4 is 3.3, which is slightly higher than the estimate in the matched sample, but absent a hypothesis test we refrain from stating that this effect is distinguishably larger.

Table C4: Effect of increased EV salience on Republican presidential vote share in unionized auto manufacturing counties vulnerable to EVs compared to all less vulnerable union auto manufacturing counties, 1976–2020.

	Estimate	S.E.	$CI_{2.5\%}$	$CI_{97.5\%}$	p-value
ATT:					
Observations equally weighted	3.25	1.28	0.75	5.75	0.01
Units equally weighted	3.25	1.28	0.75	5.75	0.01
Covariates:					
Employment	0.04	0.31	-0.57	0.64	0.91
NAFTA Exposure	0.52	0.25	0.03	1.00	0.04
TAA Petitions	0.45	0.20	0.06	0.84	0.03
Placebo Tests:					
-2 to 0 election interval	0.27	1.09	-1.86	2.41	0.80

Notes: Standard errors and confidence intervals constructed using 5,000 block bootstrap replications clustered at the unit level. Covariates standardized to capture within-county variation. $N = 2{,}472$.

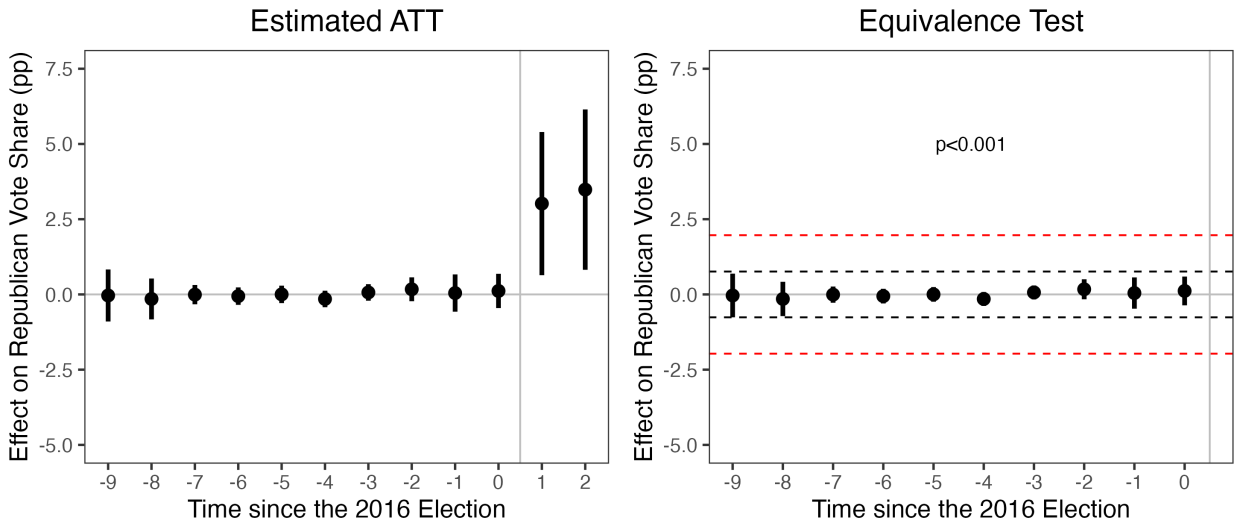

Figure C7: Effect of increased EV salience on Republican presidential vote share in the unionized auto manufacturing counties vulnerable to EVs compared to all less vulnerable union auto manufacturing counties, 1976–2020. The left plot shows the dynamic treatment effects estimates for elections before and after 2016. Bars denote 95% confidence intervals from 5,000 block bootstrap replications clustered by county. Table C4 contains the regression estimates. The right plot shows the pre-treatment average prediction errors and their 90% confidence intervals. The red dashed lines denote the equivalence range and the black dashed lines mark the minimum range. $N = 2{,}472$.

C.5.3 Continuous Treatment

We estimate a series of models that use a continuous measure of the county share of ICE employment. Two reasons motivate this analysis. First, it tests the robustness of our findings when using a treatment different from our 1% threshold. Second, these models allow for the effect of increased EV salience to vary with the local reliance of a county on ICE employment, which helps to test one causal mechanism behind the electoral backlash.

We estimate two sets of models that capture different dimensions of ICE employment. The first set of models examines the effect of within-county variation in ICE employment by employing election and county fixed effects. We examine these models for robustness despite them not being an ideal match for our theory; our theory is about the *presence* of ICE employment, whereas these models capture the *change* in ICE employment, which may be positively correlated with Republican presidential vote share but could also represent a distinct underlying process.

The second set of models examines within-state variation in ICE employment by employing election and state fixed effects. This better matches our theorized process, which implies that the level of ICE employment is what matters, while still also taking advantage of the state fixed effects for differencing time-invariant characteristics like a state's history with the auto industry that might bias the results.

In both of these model specifications, we employ the same set of covariates as before for the level of employment, jobs exposed to NAFTA, and number of TAA petitions filed. For the analysis with county and state fixed effects, respectively, we standardize these covariates at the county and state levels to match the variation used in estimation. Heterogeneity-robust standard errors are clustered at the county level in all analyses.

Table C5 presents the results when using a continuous measure of ICE employment as the treatment interacted with an indicator for post-2016 elections. Models 1 and 2 examine the effect of within-county changes in ICE employment in the post-2016 period. In Model 1, which uses the matched sample, there is a positive effect of an increase in county ICE employment on two-party Republican presidential vote share in the post-2016 period. A standard deviation increase in post-2016 ICE employment (1.3 percentage points) corresponds with 0.37 percentage points more Republican presidential vote share. The effect is also similar in Model 2, which uses the unmatched sample, suggesting that the result generalizes to other auto manufacturing counties. Substantively, we interpret these results as saying that as counties increase their exposure to the EV transition over time, their political behavior shifts to voting for candidates opposed to climate policy. However, we caution against reading too much into these results because the primary variation in EV exposure is *across* counties as opposed to changes over time within them.[11] Still, it is encouraging that we detect the effect given the variation that does exist.

Models 3 and 4 in Table C5 examine the effect of within-state variation in ICE employment in the post-2016 period on Republican presidential vote share. We find that there is a positive effect of increasing ICE employment, relative to employment shares in the rest of the state, on Republican presidential vote share after increased EV salience beginning around

[11] Indeed, when residualizing the variation in the share of ICE employment using the county and election fixed effects, the probability mass of the residuals concentrates over 0, but there is still some variation evidenced by the standard deviation of 1.3.

2016. A one standard deviation increase in the local ICE employment share relative to other auto manufacturing counties in a state (1.4 percentage points) causes a 2.3 percentage point increase in Republican presidential vote share in the post-2016 period. Overall, the results are consistent when using a dichotomous treatment and a continuous treatment across a variety of specifications.

Table C5: Linear regression of two-party Republican presidential vote share on the county-level ICE employment share, 1976–2020

	(1)	(2)	(3)	(4)
ICE Employment × Post	0.29**	0.35***	1.66***	1.80***
	(0.12)	(0.12)	(0.44)	(0.44)
ICE Employment	0.05	0.02	−0.14	−0.08
	(0.08)	(0.08)	(0.28)	(0.27)
Employment	−0.35	−0.46	−0.51	−0.60*
	(0.32)	(0.31)	(0.31)	(0.33)
NAFTA Exposure	0.71***	0.66***	1.26***	1.25***
	(0.27)	(0.24)	(0.35)	(0.35)
TAA Petitions	0.60***	0.45**	−0.10	−0.06
	(0.19)	(0.19)	(0.12)	(0.12)
N	2172	2472	2172	2472
Adjusted R^2	0.72	0.71	0.55	0.55
County Fixed Effects	Yes	Yes	No	No
Election Fixed Effects	Yes	Yes	Yes	Yes
State Fixed Effects	No	No	Yes	Yes
Census Covariates	No	No	Yes	Yes
Matched	Yes	Yes	Yes	No

Notes: Heterogeneity robust standard errors clustered by county. Analyzed counties include those with a union presence. Covariates in the models with county and state fixed effects, respectively, standardized to capture within county and state variances. $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

C.5.4 Time-Varying Union Control

Since the union data begin in 2000, in the main models, we only use the information to identify unionized and non-unionized counties at the time of increased EV salience. Yet, one might also want to control for the level of unionization to account for the alternative explanation that increased Republican vote share stems from the decline of organized labor's strength as opposed to exposure to EVs. To do so, we subset the data to the post-2000 period when there is temporal coverage for the unionization data.

Re-estimating the models shows that the positive treatment effect remains when controlling for the number of UAW union members in a county each year (Figure C6). The union membership covariate in Table C6 also shows that there is no statistically distinguishable effect of changing levels of unionization on Republican vote share, which suggests there is little evidence for the union decline alternative explanation.

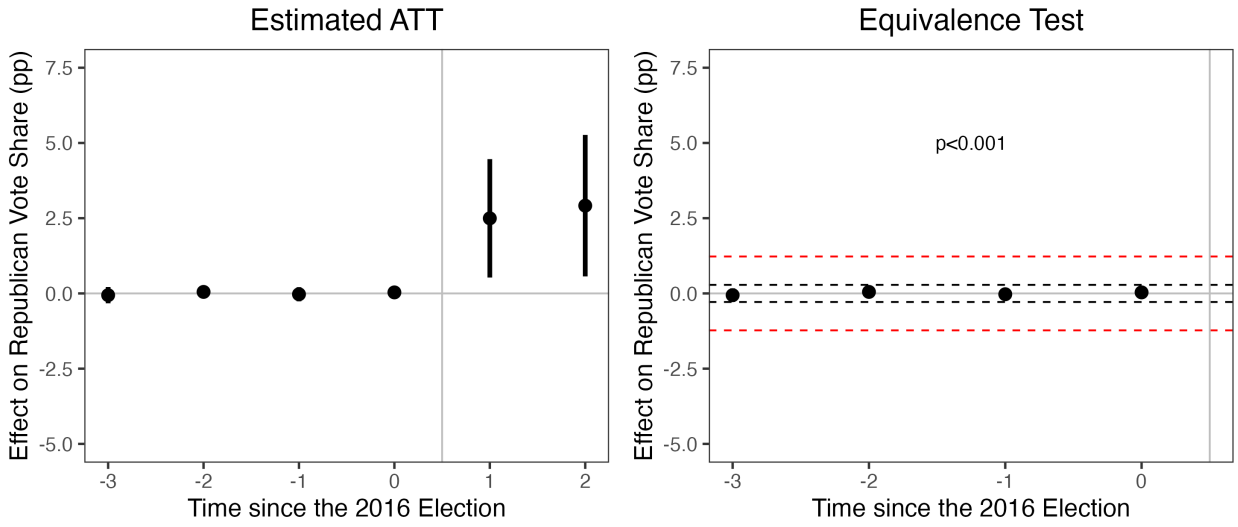

Figure C8: Effect of increased EV salience on Republican presidential vote share in the unionized auto manufacturing counties vulnerable to EVs compared to all less vulnerable union auto manufacturing counties when controlling for unionization, 2000–2020. The left plot shows the dynamic treatment effects estimates for elections before and after 2016. Bars denote 95% confidence intervals from 5,000 block bootstrap replications clustered by county. Table C6 contains the regression estimates. The right plot shows the pre-treatment average prediction errors and their 90% confidence intervals. The red dashed lines denote the equivalence range and the black dashed lines mark the minimum range. $N = 1{,}086$.

Table C6: Effect of increased EV salience on Republican presidential vote share in unionized auto manufacturing counties vulnerable to EVs compared to all less vulnerable union auto manufacturing counties when controlling for unionization, 2000–2020.

	Estimate	S.E.	$CI_{2.5\%}$	$CI_{97.5\%}$	p-value
ATT:					
Observations equally weighted	2.71	1.09	0.57	4.84	0.01
Units equally weighted	2.71	1.09	0.57	4.84	0.01
Covariates:					
Employment	-0.12	0.34	-0.78	0.54	0.72
NAFTA Exposure	0.16	0.31	-0.44	0.76	0.61
TAA Petitions	0.15	0.16	-0.16	0.47	0.35
Union Membership	0.00	0.00	0.00	0.00	0.86
Placebo Tests:					
-2 to 0 election interval	0.07	0.81	-1.51	1.66	0.93

Notes: Standard errors and confidence intervals constructed using 5,000 block bootstrap replications clustered at the unit level. Covariates standardized to capture within-county variation. $N = 1{,}086$.

D Empirical Extensions

D.1 Uncertainty of Benefits

Table D1: Linear regression of two-party Republican presidential vote share on county-level exposure to the EV transition moderated by the construction of new EV plants, 1976–2020

	(1)	(2)	(3)
ICE Employment × Post Period	2.79*	3.28**	3.40***
	(1.48)	(1.48)	(1.26)
ICE Employment × Post Period × EV Plant		−5.51**	−4.81**
		(2.37)	(2.24)
New EV Plants	−1.66		
	(4.09)		
Employment	−0.30	−0.23	−0.27
	(0.32)	(0.33)	(0.32)
NAFTA Exposure	0.66**	0.65**	0.56**
	(0.27)	(0.28)	(0.25)
TAA Petitions	0.60***	0.54***	0.38**
	(0.20)	(0.20)	(0.19)
New EV Plant × Employment		−0.95	−1.63
		(1.07)	(1.02)
New EV Plant × NAFTA Exposure		0.02	0.53
		(1.08)	(0.94)
New EV Plant × TAA Petitions		0.81*	0.79*
		(0.42)	(0.47)
N	2172	2172	2472
Adjusted R^2	0.72	0.72	0.72
County Fixed Effects	Yes	Yes	Yes
Election Fixed Effects	Yes	Yes	Yes
Matched	Yes	Yes	No

Notes: Heterogeneity robust standard errors clustered by county. Analyzed counties include those with a union presence. Covariates standardized to capture within-county variance. $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

D.2 EV Salience

Table D2: Linear regression of two-party Republican presidential vote share on county-level exposure to the EV transition interacted with the annual EV market share, 1976–2020

	(1)	(2)	(3)	(4)
EV Market Share	8.00***	8.95***	7.76***	9.24***
	(0.68)	(1.14)	(0.66)	(1.13)
ICE Employment Share	−0.12	−0.07	−0.07	0.00
	(0.27)	(0.28)	(0.26)	(0.27)
EV Market Share × ICE Employment Share	3.65***	4.47***	3.77***	4.25***
	(0.92)	(1.16)	(0.91)	(1.09)
Employment	−0.48	−0.22	−0.56*	−0.26
	(0.31)	(0.35)	(0.32)	(0.36)
NAFTA Exposure	1.18***	0.81**	1.17***	0.80**
	(0.35)	(0.32)	(0.35)	(0.32)
TAA Petitions	−0.04	−0.08	−0.02	−0.06
	(0.11)	(0.11)	(0.11)	(0.10)
White Share	10.03***	10.03***	9.72***	9.70***
	(1.45)	(1.50)	(1.42)	(1.46)
Foreign-Born Share	1.11	1.60	1.27	1.49
	(1.64)	(1.69)	(1.52)	(1.56)
College Share	0.31	0.85	0.36	0.95
	(0.85)	(0.87)	(0.64)	(0.66)
Poverty Share	−2.15***	−2.19***	−2.11***	−2.11***
	(0.64)	(0.68)	(0.61)	(0.65)
Population (log)	−1.79	−1.50	−1.87	−1.65
	(1.41)	(1.47)	(1.30)	(1.34)
Under 40 Share	1.80**	1.93**	2.09***	2.29***
	(0.74)	(0.78)	(0.69)	(0.73)
EV Market Share × Employment		1.00*		0.72
		(0.60)		(0.45)
EV Market Share × NAFTA Exposure		2.27		1.62
		(2.52)		(2.37)
EV Market Share × TAA Petitions		0.31		0.30
		(0.26)		(0.24)
EV Market Share × White Share		1.67		1.74*
		(1.14)		(0.92)
EV Market Share × Foreign-Born Share		−3.36**		−1.04
		(1.55)		(1.46)
EV Market Share × College Share		−4.67***		−4.86***
		(0.65)		(0.50)
EV Market Share × Poverty Share		0.18		−0.25
		(0.72)		(0.68)
EV Market Share × Population (log)		−2.62***		−2.29***
		(0.86)		(0.68)
EV Market Share × Under 40 Share		−0.62		−1.16
		(0.82)		(0.74)
N	2172	2172	2472	2472
Adjusted R^2	0.38	0.42	0.39	0.43
State Fixed Effects	Yes	Yes	Yes	Yes
Matched	Yes	Yes	No	No

Notes: Heterogeneity robust standard errors clustered by county. Analyzed counties include those with a union presence. Covariates standardized to capture within-state variance. $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

D.3 Effect in Non-Union Counties

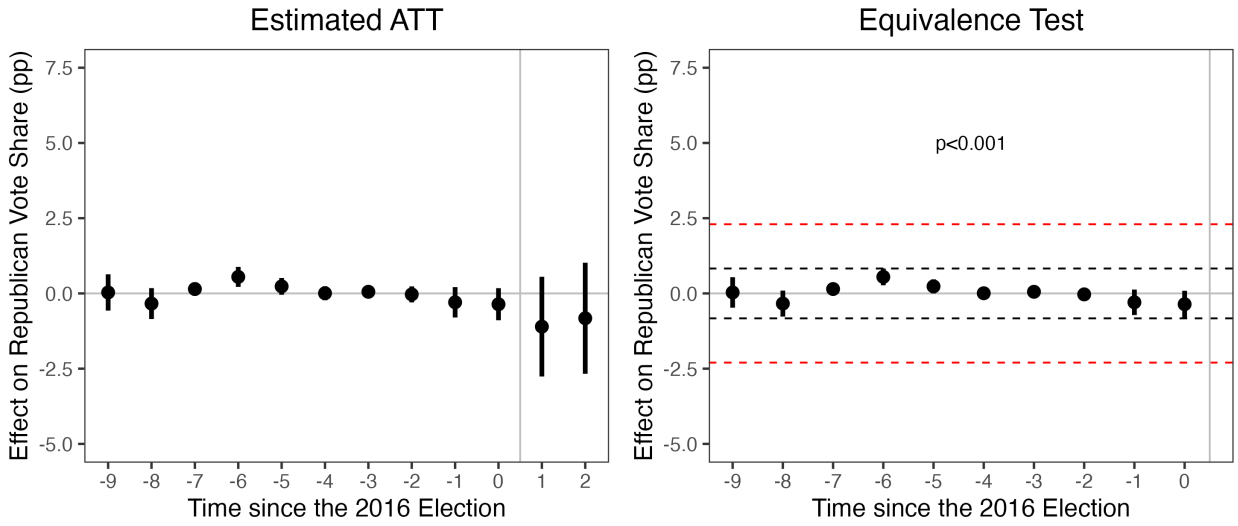

Figure D1: Effect of increased EV salience on Republican presidential vote share in non-union auto manufacturing counties vulnerable to EVs compared to matched counties that are less vulnerable, 1976–2020. The left plot shows the dynamic treatment effects estimates for elections before and after 2016. Bars denote 95% confidence intervals from 5,000 block bootstrap replications clustered by county. The right plot shows the pre-treatment average prediction errors and their 90% confidence intervals. The red dashed lines denote the equivalence range and the black dashed lines mark the minimum range. $N = 5{,}436$.

Table D3: FEct estimates of the effect of increased EV salience on Republican presidential vote share in matched non-union auto manufacturing counties vulnerable to EVs versus those less vulnerable, 1976–2020.

	Estimate	S.E.	$CI_{2.5\%}$	$CI_{97.5\%}$	p-value
ATT:					
Observations equally weighted	-0.96	0.89	-2.71	0.78	0.28
Units equally weighted	-0.96	0.89	-2.71	0.78	0.28
Covariates:					
Employment	-0.06	0.24	-0.53	0.40	0.79
NAFTA Exposure	-0.24	0.15	-0.53	0.04	0.10
TAA Petitions	-0.08	0.18	-0.44	0.28	0.66
Placebo Tests:					
-2 to 0 election interval	-0.90	0.82	-2.52	0.71	0.27

Notes: Standard errors and confidence intervals constructed using 5,000 block bootstrap replications clustered at the unit level. Covariates standardized to capture within-county variation. $N = 5{,}436$.

E Field Work

E.1 Semi-Structured Interview Questions

Selected interview questions, altered for specific position of the interviewee:

- How would you say the average UAW member evaluates the state of the auto industry? Are they optimistic or pessimistic about it going forward?
- What political issues/concerns do members care about the most right now?
- When would you say the transition to electric vehicles first emerged? When did UAW members start seeing this as an issue?
- How do you think opinions among the membership towards the EV transition has evolved over time?
- What do you think the general reaction of UAW membership is to Biden's pro-EV policies?
- Do you think that the perception of UAW membership towards the EV transition is shaped by what type of work they do
- Do you think membership is getting the same direction about EV's from their local union leadership as their national leadership?

E.2 Interview List

1. Jim Pedersen, Retired UAW Leader, Zoom, October 4, 2023
2. Darryl Nolen, Retired UAW Leader, Zoom, October 4, 2023
3. Darryl Nolen, Retired UAW Leader, Zoom, June 28, 2023
4. Paul Massaron, Retired UAW Leader, Phone, June 25, 2023
5. Rick Isaacson, Retired UAW Leader, Zoom, June 19, 2023
6. Nicole Didia, VP of UAW Local 2280, Phone, May 17, 2023
7. Scott Birdsall, Retired UAW Leader, Phone, May 12, 2023
8. Steve Lyons, Member UAW Local 2280, Phone, May 11, 2023
9. Dottie Lenard, UAW Local 900 Member, Zoom, April 27, 2023
10. Anonymous UAW Member, Phone, April 24, 2023
11. Dick Long, Retired UAW Leader, Personal Address, April 24, 2023
12. Samuel Cohen, Member Michigan Carpenters Union, Zoom, April 23, 2023

13. Jim Pedersen, Retired UAW Leader, Zoom, April 21, 2023
14. Dan Nixon, President Plumber's Local 98, Nemo's bar in Detroit, April 20, 2023
15. Rick Nelson, Retired Michigan union member, Nemo's bar in Detroit, April 20, 2023
16. Bob Morris, Son of UAW Leader, Fishbones in Detroit, April 19, 2023
17. Brian Pannebecker, Retired UAW Member, EOS Café in Macomb County, April 17, 2023
18. Rick Nelson, Retired Michigan union member, Kurley's Bar, Windsor ON, April 15, 2023
19. Sean Crawford, Member UAW Local 160, Local 160 Hall, April 13, 2023
20. Jessie Kelly, Member UAW Local 160, Local 160 Hall, April 13, 2023
21. Jaren Garza, Member UAW Local 160, Local 160 Hall, April 13, 2023
22. Earl Fuller Jr., Chairman UAW Local 160, Local 160 Hall, April 13, 2023
23. D. Robinson, VP UAW Local 140, Local 140 Hall, April 12, 2023
24. Lisa Canada, Michigan Carpenters' Union, Zoom, July 21, 2022
25. Mark Gaffney, Former President of Michigan AFL-CIO, Zoom, July 7, 2022
26. Jamiel Martin, Former political director of the Metro Detroit AFL-CIO, The Congregation Bar/Restaurant in Detroit, June 9, 2022
27. Ron Bieber, President of Michigan AFL-CIO, Head Office Michigan AFL-CIO, June 7, 2022
28. Pat Devlin, President of the Michigan Building Trades Association, Nemo's Bar, June 6, 2022
29. Rick Nelson, Retired Michigan union member, Nemo's Bar, June 6, 2022