Drivers of Interstate Differences in Electric-Vehicle Adoption

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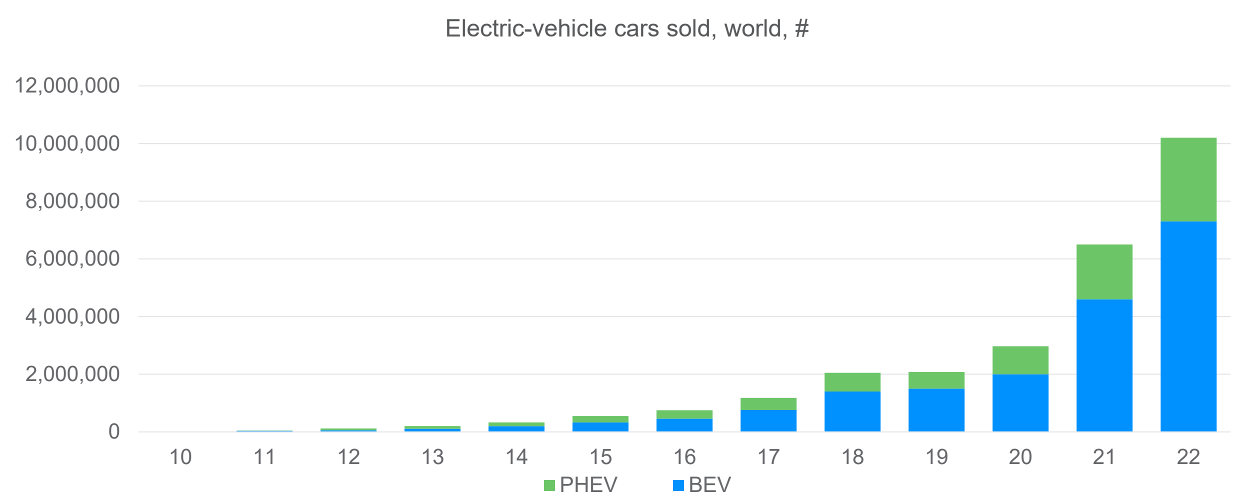
In the past decade, there has been an exponential surge in the sales of electric vehicles, with 2022 marking a new record. Since 2019, the total number of EVs sold globally has more than quadrupled (see Chart 1), with the latest figures showing that over 10 million EVs (battery electric vehicles + plug-in hybrid electric vehicles) have sold worldwide.

The reasons behind the jump in EV sales are two-fold. First off, governments are increasingly involved in curbing greenhouse gas emissions to combat climate change. A primary strategy for curbing emissions is the electrification of the transportation sector. Second, recent technological advancements have improved EV performance and battery life. As a result, EV sales accounted for 14% of all new-vehicle sales worldwide in 2022; a substantial increase compared with 2020, when EV sales made up less than 5%.

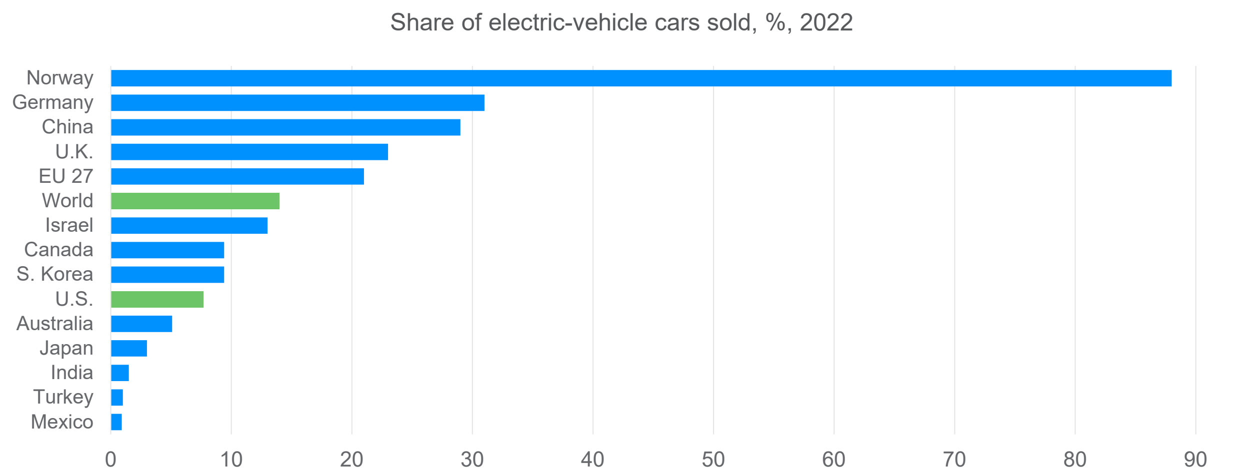
In the U.S., 7% of all vehicles sold in 2022 were EVs—half the global average (see Chart 2). However, U.S. adoption of EVs has steadily increased over time. According to the Alternative Fuels Data Center, total EV and PHEV registrations in the U.S. increased at an average rate of 33% between 2017 to 2021 (most recent available

Chart 1: Global EV Sales Surge



Sources: IEA, Moody's Analytics

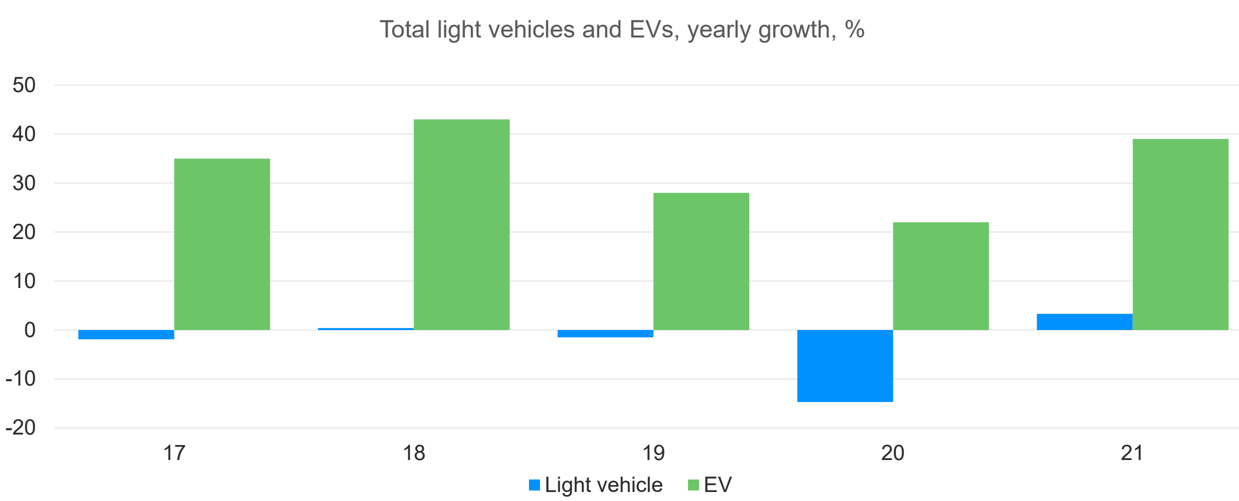
Chart 2: Share of EVs Still Lagging in the U.S.



Sources: IEA, Moody's Analytics

data). Even in 2020 and 2021, when the global economic downturn and supply-chain issues caused by COVID-19 dented vehicle sales, EV registrations in the U.S. grew by 22% and 39%, respectively. In all, EV registrations in the U.S. totaled 2.2 million in 2021—a 319% increase from 2016 (see Chart 3).

Chart 3: Growth in Light Vehicles Pales in Comparison to EVs



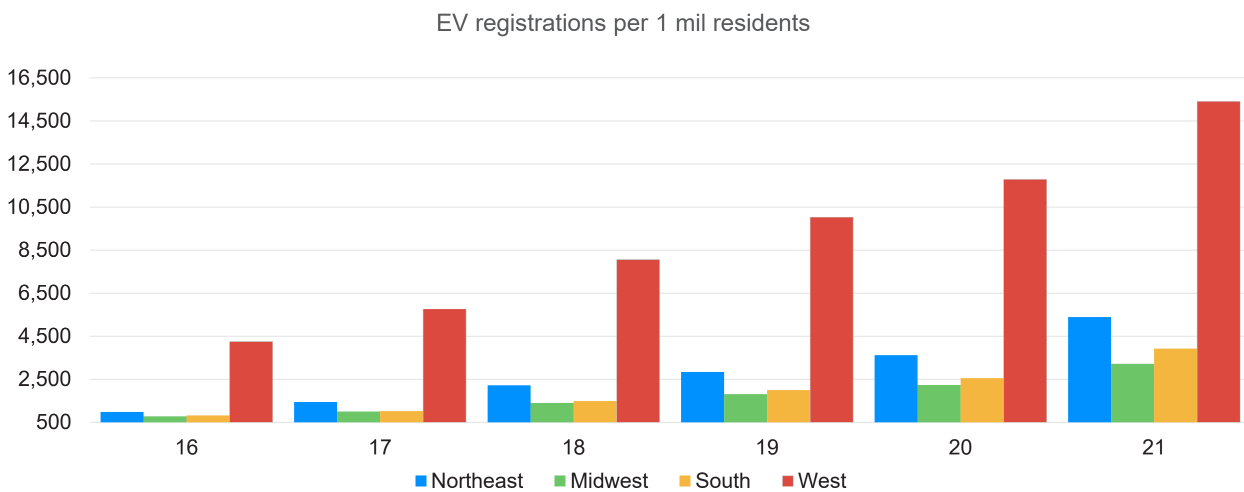
Sources: U.S. Department of Energy, BEA, Moody's Analytics

EV growth at the national level masks significant differences in EV adoption between states. From 2016 to 2021, more than two-thirds of EV registrations in the U.S. were concentrated in less than 15 states. The West accounts for more than half of all EV registrations in the U.S., followed by the South, the Northeast and the

Midwest. However, the West's share has been trending lower since 2017 as other regions, particularly the South and the Northeast, catch up.

Accounting for differences in population, we observe similar patterns. The West is considerably ahead in EV adoption compared with the rest of the country with 15,407 EVs on the road per 1 million residents in 2021 (see Chart 4). Still, average per capita growth in EV registrations in the other three regions was ahead of the West between 2017 and 2021. The Northeast ranked first in this category, followed by the South and the Midwest. Of note is the relative strength in the South given the region's population growth was the strongest between 2016 and 2021.

Chart 4: The West Dominates the U.S. EV Market



Sources: U.S. Department of Energy, BOC, Moody's Analytics

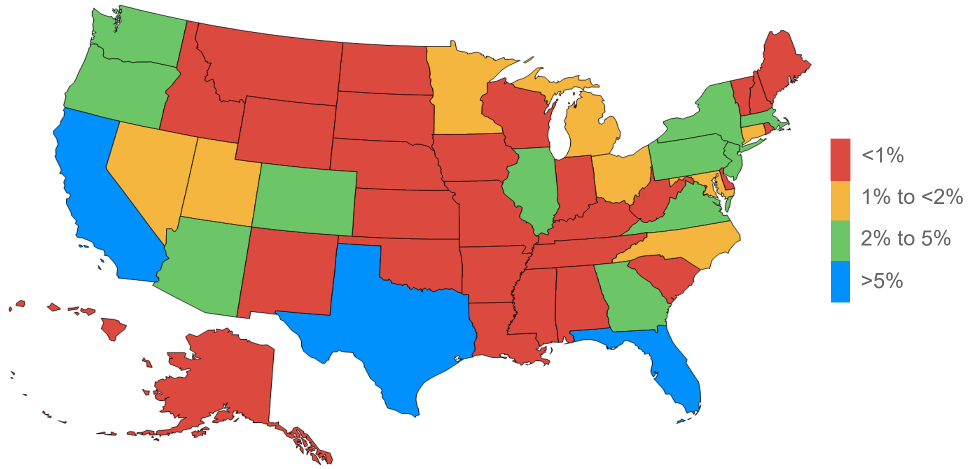
At the state level, California is significantly ahead in EV adoption. In 2021, California EV registrations represented nearly 40% of the U.S. total (see Chart 5). Moreover, California has the highest number of EV registrations per 1 million state residents—almost twice as high as the next two states, Hawaii and Washington. On the opposite side of the ledger, Mississippi has the lowest per capita EV registrations.

Not all states that hold a significant share in total registrations rank highly in per capita terms. For example, Florida and Texas, the second and third largest markets in total EV registrations, ranked 15th and 25th, respectively, in per capita EV registrations nationally in 2021 (see Chart 6). Additionally, some smaller states like Vermont and Hawaii that seem to be performing poorly on a level basis show they are doing just fine when looked at through a per capita prism.

Similar to registrations, state-to-state divergence exists for EV-charging infrastructure. On the national level between 2016 and 2021, public charging stations grew at a rate of 25% per year. Still, this number is a bit skewed by the large increase in 2021. From 2016 through 2020 charging-station growth averaged 18% (see Chart 7).

Chart 5: EV Registrations in California Are Six Times Higher Than Florida & Texas

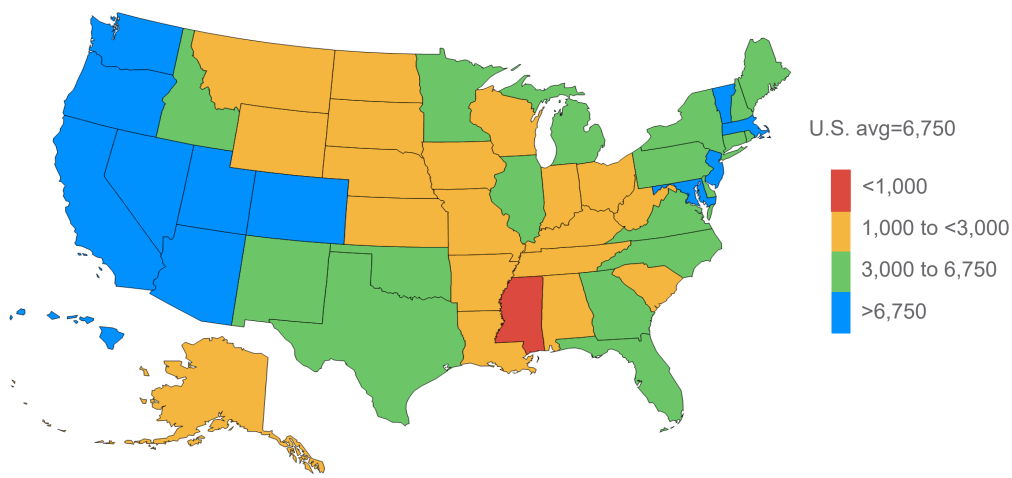
EV registrations, 2021, % of U.S. total



Sources: U.S. Department of Energy, Moody's Analytics

Chart 6: Florida and Texas Below U.S. Per Capita Average

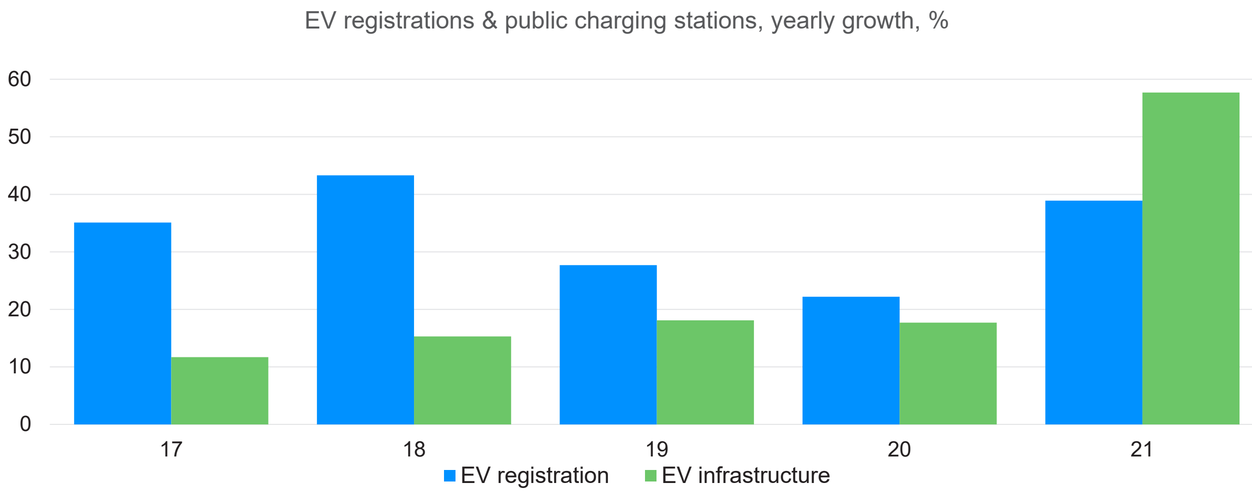
EV registrations in 2021 per 1 mil state residents



Sources: U.S. Department of Energy, BOC, Moody's Analytics

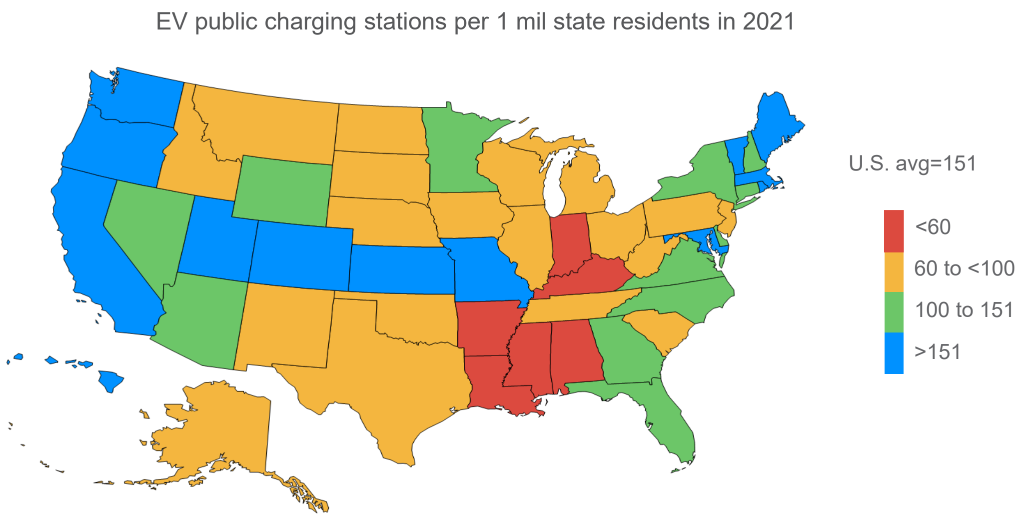
At the state level, Vermont held the top spot for having the highest number of EV public charging stations per capita with 507 charging stations per 1 million state residents in 2021. California, the largest EV market, ranked second with 373 public charging stations per 1 million state residents in 2021. At the bottom of the table ranked Louisiana and Mississippi with 34 and 38 public charging stations per 1 million state residents, respectively, in 2021 (see Chart 8).

Chart 7: Growth in Charging Infrastructure Catching Up to EV Registrations



Sources: U.S. Department of Energy, Moody's Analytics

Chart 8: Midwest Has Lowest Number of Public Charging Stations Per Capita

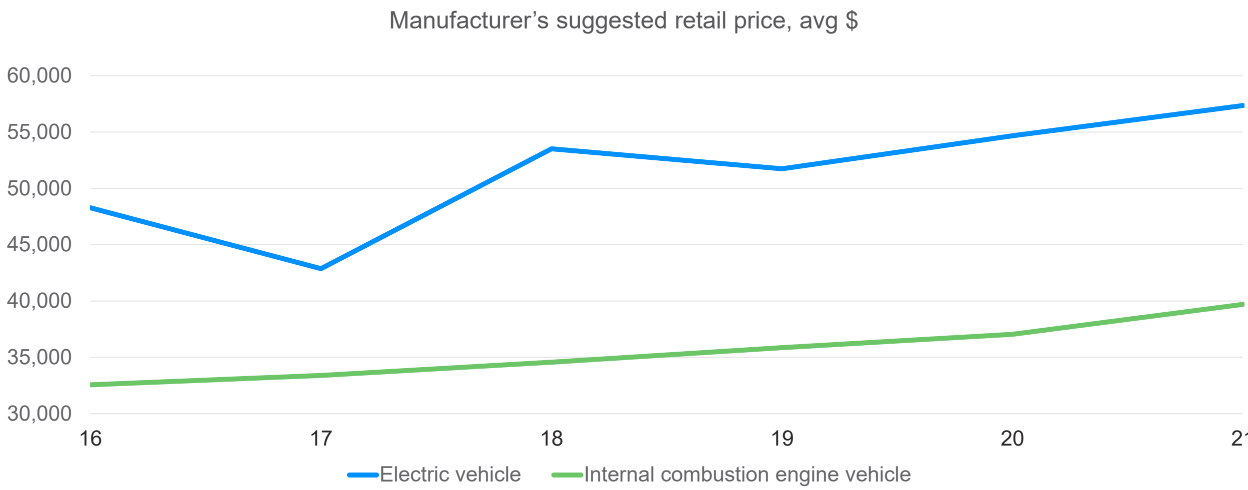


Sources: U.S. Department of Energy, BOC, Moody's Analytics

EV incentives

State-level differences extend beyond registrations and infrastructure. States are providing a cornucopia of financial incentives in a bid to speed up EV adoption, far surpassing federal subsidies in complexity. Incentives are thought to be needed to speed up adoption given the cost of an EV remains considerably higher than internal combustion engine vehicles. Between 2016 and 2021, the average MSRP of an EV was nearly 45% above ICE vehicles (see Chart 9). This difference in initial cost keeps potential buyers away from the EV market, and in looking to green their transportation fleet faster than market conditions would dictate, some states offer subsidies to increase EV adoption.

Chart 9: EVs Are Pricier Than Their ICE Counterparts



Sources: National Automotive Auction Assn., Moody's Analytics

A common type of incentive is a tax credit. This incentive is available when a taxpayer purchases or leases an EV from a qualified seller. Once the taxpayer applies the credit amount to their income tax return, they receive the amount of the credit minus any other taxes that may be due as a refund. For instance, one of the most generous states in terms of its EV incentive program, California offers up a $7,500 tax credit on qualifying purchases.

Between 2016 and 2021, 19 states offered tax credits or rebates to buyers of an EV. Out of this group, nearly half are in the Northeast, with the other half spread between the West and South. Except for Illinois, which ended its EV incentive program after 2016, not a single midwestern state offered state-level income tax credits or rebates between 2016 and 2021.

Another type of incentive is a sales and use tax exclusion. This incentive allows a tax credit for the sales and use taxes paid on an EV purchase. In the State of Washington, for example, electric and fuel cell motor vehicles are eligible for an exclusion from sales and usage tax.[1]

Finally, some states offer programs that go beyond direct financial incentives for EVs. These benefits can include utility rate discounts, at-home charger rebates, and high-occupancy vehicle traffic lane access. For instance, as of 2022, 20 states give some form of access or special privileges to HOV lanes for EVs, a bonus to time-conscious consumers living in areas prone to high levels of traffic congestion.

EV adoption drivers

Research related to drivers of EV adoption at the national level has increased substantially during the last decade, but analyses of state-level differences remain elusive. In a meta-analysis around the adoption of EVs, Kumar and Alok (2020) summarize studies between 2010 and 2018. They find that vehicle price, cost of ownership (Levay et al., 2017; Palmer et al., 2018), past driving experience (Skippon et al., 2016; Berkeley et al.,

1 https://www.dol.wa.gov/vehicles-and-boats/taxes-fuel-tax-and-other-fees/tax-exemptions-alternative-fuel-vehicles-and-plug-hybrids

2018), charging infrastructure (Sierzchula et al., 2014; Berkeley et al., 2018), policies and incentives (Sierzchula et al., 2014; Bjerkan et al., 2016; Melton et al., 2017), social influence (Schuitema et al., 2013; White and Sintov, 2017), and environmental awareness (Smith et al., 2017) are all critical factors that influence EV adoption.

Still, Kumar and Alok did not include studies exploring differences in EV adoption between U.S. states. Kumar and Alok (2020) did include a study that used state-level information by Onat et al. (2015), but this explores differences in carbon footprints across states, not EV adoption.

State-level EV adoption is investigated in Soltani-Sobh, et al. (2017). Here the authors look at the transportation modal choice between EV and conventional vehicles. The authors found that electricity prices, urban roads and incentives are decisive factors in the type of vehicle fuel decision. In terms of sensitivity, they find electricity price was the most influential.

Another study that explored intrastate differences in EV adoption was conducted by Javid, R. J., & Nejat, A. (2017). The authors studied the factors that influenced EV penetration in California at a county level and concluded that social-demographic factors such as annual income, educational level, car sharing status, charging stations per capita, and gas prices were significant for estimating EV penetration.

A large portion of EV-related studies in the U.S. explores the effectiveness of government incentives. Beresteanu and Li (2011) find that incentives had a significant impact, explaining 20% of hybrid electric-vehicle sales in 2006. In 2011, Gallagher and Muehlegger conducted a study that estimated for every thousand dollars of incentive, there was a 6% increase in per capita HEV registrations.

Data and model setup

We build on this existing literature by creating a unique dataset to understand the extent to which state- level subsidies and relevant macro- and socioeconomic variables play a role in driving EV adoption within each state. Included are drivers that have traditionally been considered such as financial incentives, charging infrastructure, and demographic characteristics. Additionally, macroeconomic factors such as gasoline prices, electricity prices and income measures have all been considered. Finally, a new variable that captures political differences between states is looked at to see if this may be a missed driver of EV adoption at the state level.

The data are comprised on an annual time series for each state from 2016 to 2021. Our variable of interest, per capita EV registrations, incorporates the total state-level EV and PHEV registrations data made public by the AFDC. Registrations are then divided by the 18+ population to create new EV registrations per capita using data from the Census Bureau and Moody's Analytics.

State-level EV-charging station data were also obtained from the AFDC. Data for public charging stations are sourced from multiple entities such as Blink, ChargePoint and Electrify America and are uploaded frequently onto the ADFC website. We include all public EV-charging stations, for example multiple EVSE ports, Level 1, Level 2 and DC Fast charging outlets.

Apart from registrations and charging stations, we utilize numerous time-variant, state-level socioeconomic indicators. These include nominal median and disposable incomes, the percentage of a state's population with a bachelor's degree or higher, and a state's population density. Data on nominal median income are retrieved from the U.S. Census Bureau and estimated by Moody's Analytics, while information on states' disposable income per capita is from the U.S. Bureau of Economic Analysis. Population density per square mile is from the U.S. Census Bureau and calculated by Moody's Analytics using 2010 land area, and data on states' educational attainment are from the American Community Survey and calculated by Moody's Analytics. State-level fuel prices for our analysis are provided by the U.S. Energy Information Administration in the form of nominal motor gasoline average price in dollars per million BTUs.[2]

Information on state laws and regulations from AFDC is used to generate an indicator variable for state-level financial incentives. A value of 1 represents all those states that had an income tax credit and/or tax rebate available for the purchase of an EV between 2016 and 2021; a value of 0 is given for those that did not have such incentives for their residents. Other indirect and nonfinancial incentives were not included.

In addition, an electoral variable representing the state-level Democratic Party's vote share in the 2016 and 2020 U.S. presidential elections is used to understand the relationship between a state's political leaning and the growth in its EV market. The data on the Democratic Party's vote share were compiled from the Federal Election Commission. A linear interpolation was created using the two values at the state level to fill in non-presidential election year observations.

Finally, to eliminate the presence of unit roots, we detrended all the variables discussed above by regressing them against time to generate predicted values. We then took the difference between the original and the predicted values to arrive at the detrended series for each variable.

For our analysis, we utilized a fixed-effects model specification described below to test the relationship between a state's per capita EV registrations and previously mentioned drivers. Alternative specifications beyond the primary model below have also been tried and are discussed in the next section of the paper.

$$Y_{s,t} = \alpha_s + \beta_1 Incentives_{s,t} + \beta_2 Charging\ Stations_{s,t} + \theta X_{s,t} + \varepsilon_{s,t}$$

Where,

- t denotes a data observation at time t,
- s denotes a data observation for state s,
- $Y_{s,t}$ represents the detrended number of charging stations in state s at time t,
- $Incentives_{s,t}$ represents an indicator variable for state s at time t with a value of 1 for states with income tax credit and/or rebate and 0 otherwise,
- $Charging\ Stations_{s,t}$ represents the detrended level of charging stations in state s at time t
- $X_{s,t}$ represents a scalar of time and state variant industry and macroeconomic variables such as gasoline prices, and nominal median incomes.
- and $\varepsilon_{s,t}$ is the assumed Gaussian error term.

2 Fuel prices measured in $/MMBtu. 1-gallon gasoline = 0.12 MMBtu.

Regression results

Table 1 shows a stepwise series of regressions that all maintain strong statistical significance and pass the test for economic intuition. We find that financial incentives, detrended change in charging infrastructure, detrended change in gasoline prices, and detrended median income are highly predictive of the detrended number of EV registrations per capita.[3] This specification remains highly significant even with the exclusion of the 2021 and 2020 years of data, showing the robustness of the findings.

Along with significance for all the variables, the model fit for this specification shows that 67% of the variation in the number of EV registrations per capita is explained by the variation of independent variables in the fixed-effects model. Additionally, 71% of the variation between states can be explained by the model specification. Given that a fixed-effects methodology allows us to track both within sample and overall sample fit, the model presented maximized both (see Table 1).

Table 1: Panel Regression U.S. States Electric-Vehicle Adoption

Regression models

Variable (b/p)	Model 1	Model 2	Model 3	Model 4
Incentives	1.571	1.658	1.608	1.471
	0.002	0.000	0.000	0.000
Fuel prices		0.1478	0.1010	0.1315
		0.002	0.000	0.000
Charging stations			0.001460	0.0014
			0.000	0.000
Median income				0.0002
				0.029
Constant	-0.411	-0.407	-0.388	-0.347
	0.002	0.001	0.001	0.000
Within R-squared	0.051	0.1153	0.4471	0.4916
Between R-squared	0.141	0.3608	0.6272	0.7061
Overall R-squared	0.123	0.3009	0.5961	0.6697
Observations	306	306	306	306

Notes: All models include state-level fixed effects

Sources: DOE, BEA, BLS, BOC, Moody's Analytics

Additionally, the preferred model specification showed robustness through strong performance in out-of-sample testing. That is, holding out one and two years of data for each state and running the same model specification. In this test, we see that all variables remain statistically significant and the model fit as demonstrated by the between and the within R-squared remain above 60% (see Table 2).

We also tested the model for robustness using non-detrended variables. In this specification, with results shown in Appendix Table 1, there was surprisingly little change in the coefficient point estimates or the model's R-squared percentages. This suggests a high level of stability in the results. Still, the detrended variables were used in the primary model to account for the presence of a unit root in the non-transformed variables.

3 State-level population >18 in year of observation, according to BOC and Moody's Analytics estimates.

Table 2: Regression Out-of-Sample Testing
Regression models

Variable (b/p)	1 yr	2 yrs
Incentives	0.978	0.732
	0.000	0.001
Fuel prices	0.0794	0.0239
	0.000	0.484
Charging stations	0.0030	0.0038
	0.000	0.000
Median income	0.0002	0.0001
	0.000	0.000
Constant	-0.223	-0.108
	0.000	0.051
Within R-squared	0.6114	0.6187
Between R-squared	0.7219	0.7209
Overall R-squared	0.6953	0.6965
Observations	255	204

Notes: All models include state-level fixed effects

Sources: DOE, BEA, BLS, BOC, Moody's Analytics

Alternative specifications

Several other model specifications were also tested that each had issues ranging from loss of economic intuition in the coefficients to significantly worse model fit. These specifications were not used as our primary model but still were able to help us glean additional insights (see Table 3).

From the alternate specifications, we see that financial incentives, infrastructure, and fuel price variables all remained significant despite the addition or subtraction of other variables. This was also true of population density; however, this variable was extremely harmful to the between-state model fit. Also, population density remained negative, counter to a priori expectations. Additionally, electricity prices remained insignificant despite transformations or inclusion of other variables.

Another interesting revelation is that whenever median income, disposable income, democratic lean, and percentage of college education are in the same specification, one or more of those variables becomes insignificant. This demonstrates strong collinearity between these input variables. This was also confirmed using univariate correlation testing between these input variables (see Appendix Table 2). Median income was used as it maximized model fit, but given these findings, these other independent variables also proxy for similar drivers of EV adoption.

Due to the high degree of collinearity between education, income, and democratic electoral lean, it is not possible to establish causality. However, it is important to note that there is a strong correlation between this group of variables and EV registrations. Therefore, it is crucial to control for them to test the significance of other variables.

Interestingly, when income (or education) and Democratic electoral lean were included in the same specification, the Democratic lean variable turned negative and significant. This suggests that the relationship between a

Table 3: Panel Regression U.S. States Electric-Vehicle Adoption

Alternative regression model specifications

Variable (b/p)	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Incentives	1.280134	1.420945	1.332593	1.184311	1.777969	1.441942
	0.002	0.002	0.001	0.001	0.000	0.000
Fuel prices	0.0816	0.095286	0.084834	0.135084	0.114549	0.156773
	0.005	0.001	0.004	0.000	0.000	0.000
Charging stations	0.0013	0.001156	0.001331	0.001310	0.001390	0.001426
	0.000	0.000	0.000	0.000	0.000	0.000
Disposable income	0.0003	0.000416	0.000283	0.000253		
	0.027	0.002	0.039	0.032		
Electoral lean		-33.40982			-21.53985	
		0.006			0.091	
Population density			-0.004435			
			0.000			
Education percentage				0.505869		0.560665
				0.000		0.000
Constant	-0.260	16.10895	-0.273041	-0.220108	10.13464	-0.320214
	0.020	0.007	0.016	0.024	0.103	0.002
Within R-squared	0.4892	0.544	0.5045	0.5417	0.4723	0.513
Between R-squared	0.4771	0.0018	0.0381	0.3976	0.0023	0.4905
Overall R-squared	0.4702	0.0019	0.0466	0.3831	0.0021	0.4712
Observations	306	306	306	306	306	306

Notes: All models include state-level fixed effects

Sources: DOE, BEA, BLS, BOC, FEC, CPS, Moody's Analytics

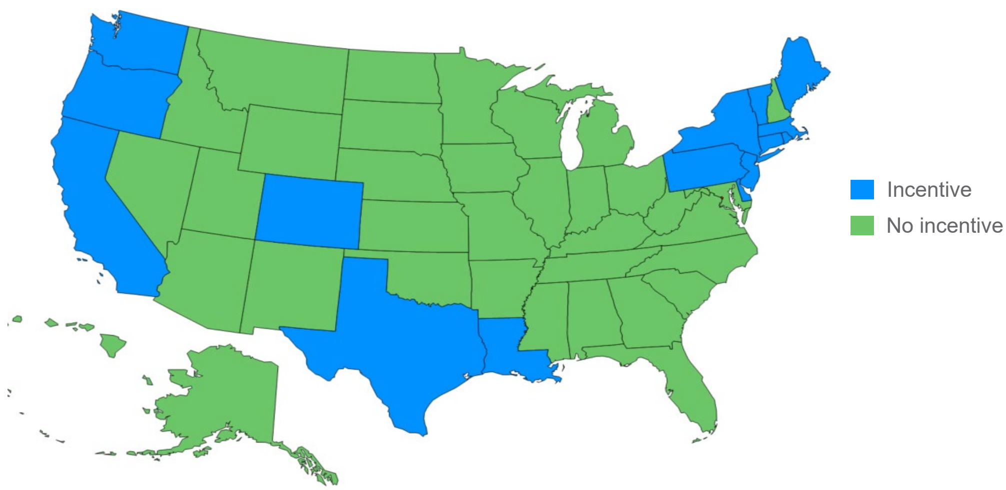
state voting more Republican is associated with more EV registrations when these other demographic indicators, such as income and education, have been controlled. It is important to note that this is not causal and suffers from the aforementioned issue of multicollinearity. However, this finding contradicts current national party platforms.

Interpretation of final model

Although the insights gained from exploring alternative specifications are valuable, they were not included in the final model due to the previously mentioned issues. Therefore, it is best to focus on the selected model and what the results can tell us at a more basic level. The financial incentive variable, with a coefficient of 1.47, indicates a statistically significant positive relationship between the presence of state incentives for purchasing an EV and the number of EV registrations per capita. Chart 10 displays a map of all states that had an EV incentive in blue in 2021 and those that did not in green.

Under the generous assumptions of linearity and causality this point estimate translates to an average 13% increase in EV registrations from the implementation of an average state financial incentive compared with the five-year cumulative level of EV registrations. The distribution of impact ranges, with states that currently have a high number of EV registrations per capita gaining less as a percentage. At the high end of the distribution, this point estimate suggests all else equal the state with the lowest cumulative EV registrations from 2016 through 2021, Mississippi, would see a 50% increase in EV registrations from a financial incentive; whereas the state with the highest number of EVs per capita, California, would only see a 1.4% increase in registrations from an additional incentive.

Chart 10: States With EV Purchase Incentives in 2021



Sources: U.S. Department of Energy, Moody's Analytics

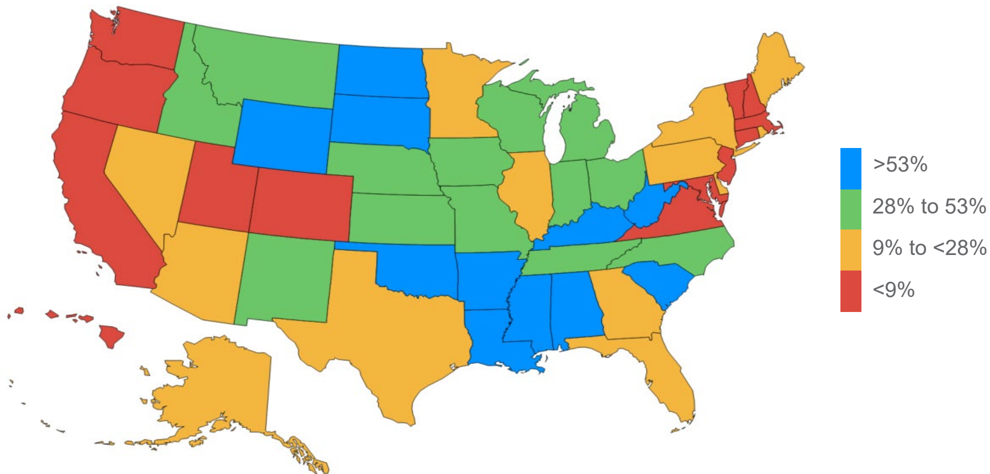
The results suggest that financial incentives are an important factor in promoting EV adoption, as they directly influence the cost of purchasing and owning an EV. Additionally, this point estimate may be a bit conservative as well. First adopters of EVs tend to be higher-income groups, which means that any incentive will be a lower percentage of the consumer's income compared with the average consumer. In this case a consumer with less income will derive a higher benefit from the same incentive than the first adopters, making it more impactful.

This theory syncs nicely to the results that suggest a resident's income is important to driving EV registrations. Or as we saw in the discussion on collinearity, the demographic factors that income is representing in the specification. This relationship comes through in our chosen specification quite cleanly where the point estimate suggests a 5% increase in median income to an average state ($3,400) represents on average a 5% increase in the per capita EV registrations. Compare this with a financial incentive a state would need to increase its median income on average by 12% ($8,750). In Chart 11 we see what our model suggests the increase in percentage of total EV registrations would look like if every state had the same level of median income as the highest state, New Hampshire, holding all else equal.

Our model specification also points to one intriguing but less-discussed policy tool for increasing EV adoption. This is the ability to tax gasoline sales, leading to higher fuel prices. Our final model shows this relationship holds. In the model, a $1 (real) increase in fuel prices leads to a 0.148-unit increase in EV registrations per 1,000 residents over age 18. To put this into context, if the median state by our population measure, Kentucky, with a population over 18 of 3.5 million in 2021, increased its gas tax by 25 cents (almost double the current level), forecasted EV registrations would increase by 4.4% compared with their cumulative registrations since 2016. For Kentucky, increasing the gas tax by a couple of quarters would represent the same percentage increase as a financial incentive. Still, there is a considerable variability between states, with the average state needing to increase fuel costs by more than a dollar to get the same impact as a financial incentive.

Chart 11: If Every State Had New Hampshire's Median Income

Estimated % change in EV registrations if median income were equal across states



Sources: BOC, Moody's Analytics

It is important to note that this type of analysis is fraught with caveats. The direction of causality is impossible to determine without a good instrument variable, and linearity is a heroic assumption in and of itself. However, these assumptions are necessary in order to add some sense of the magnitude to the policy choices available. In the case of fuel prices, increasing the gas tax in most states is politically perverse, making this policy option for increasing EV ownership usually off the table.

The final independent variable in our model is the number of public charging stations. This variable, like the others in the final model specification, increases the predictive power, has a sign that is intuitive with economic theory, and is statistically significant. It makes sense that more charging stations lead to more EVs, but there is a strong case for reverse causality here. Despite the lack of an instrument variable, and not letting the perfect get in the way of the good, the model provides a point estimate of a 0.0014-unit increase for every additional charging station.

To put this in context, the median state in 2021, Nevada, added 447 new charging stations. In a state the size of Nevada, investment in 447 charging stations reaps an estimated benefit of 1,536 new EV registrations. At the national level, the Inflation Reduction Act set aside $7.5 billion with the stated goal of 500,000 new charging stations. This would equate to $15,000 per charging station. Using the point estimate derived in this exercise and the Nevada example, the investment of $15,000 per charging station would equate to 3.44 EV registrations per charger at a cost of $4,360. Compared to the federal $7,500 tax credit for new EV purchases, this suggests that charging stations are a better investment all else equal.

Conclusion

In this paper, we aim to understand the drivers behind EV adoption at the state level and the role of financial incentives in driving differences between states. Our study has used a range of socioeconomic drivers such as disposable and nominal incomes, states' political leaning, charging infrastructure, electricity and fuel costs, population density, educational attainment, and financial incentives to investigate the role they play in driving EV adoption between states.

The findings suggest that charging infrastructure, gasoline prices, median incomes and financial incentives are important factors that explain the differences in EV adoption between states. Similar to studies on the national level, state-level financial incentives play a critical role in propelling EV adoption. In addition to incentives, we show that higher median incomes can also boost EV adoption in several states by as much as 50%. Further, model results also suggest that, compared with financial incentives, investment in public charging infrastructure can pay larger dividends in driving EV adoption in some states.

Whereas our study has provided valuable insights about the role of financial incentives and other socioeconomic drivers in explaining differences in EV adoption between states, there is scope for more research. This includes research into whether financial incentives become more or less impactful over time, whether state mandates push toward sooner adoption, and whether introduction of larger electric models lead to more EVs in the South and Midwest where trucks/SUVs usually dominate and many others. Still, our findings help to give magnitudes to current policies and drivers, along with providing a starting point to forecast EV registrations at the state level. The transition to EVs in the U.S. is in full swing, and despite current differences in adoption rates, there will not be any state that does not feel the switch over the next decade.

Appendix

Table 1: Non-Detrended Panel Regression U.S. States Electric-Vehicle Adoption

Regression models

Variable (b/p)	Model 1	Model 2	Model 3	Model 4
Incentives	2.51	2.51	2.29	1.52
	0.00	0.00	0.00	0.00
Fuel prices		0.44	0.32	0.18
		0.00	0.00	0.00
Charging stations			0.00	0.00
			0.00	0.00
Median income				0.00
				0.03
Constant	2.69	-6.55	-5.01	-19.76
	0.00	0.00	0.00	0.00
Within R-squared	0.05	0.35	0.58	0.80
Between R-squared	0.14	0.46	0.69	0.64
Overall R-squared	0.11	0.42	0.66	0.65
Observations	306	306	306	306

Note: All models include state-level fixed effects.

Sources: DOE, BEA, BLS, BOC, Moody's Analytics

Table 2: Correlation Table

Highly correlated input variables

	Disposable income	Median income	Education percentage	Electoral percentage
Disposable income	1			
Median income	0.85	1		
Education percentage	0.80	0.83	1	
Electoral percentage	0.59	0.68	0.81	1

Sources: BEA, BLS, FEC, CPS, Moody's Analytics

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