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The Political Economy of Electric Vehicle Adoption: Policy Stability, Pricing Dynamics, and Infrastructure Variables

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ABSTRACT

This paper examines the interplay between government interventions—primarily fiscal policies such as tax incentives and purchase subsidies—and how the Total Cost of Ownership (TCO) and strategic pricing policies are utilized to accelerate consumer uptake of electric vehicles (EVs). Adopting a global perspective on the automotive manufacturing industry, this study addresses the primary challenges facing mass-level EV adoption, focusing on the substantial upfront retail pricing premium compared to conventional Internal Combustion Engine Vehicles (ICEVs). By synthesizing international empirical data and TCO frameworks, the paper analyses the structural efficacy of financial interventions in closing this price gap, alongside their direct effects on manufacturer pricing behaviours and consumer purchasing decisions. The literature review confirms that while EVs offer lower lifetime operating and maintenance costs, the high upfront manufacturing cost of batteries remains a primary economic hurdle. Furthermore, the analysis reveals that the market efficacy of these fiscal measures is frequently compromised by economic "pass-through" effects, where automotive vendors absorb public subsidies rather than transferring full savings to consumers. The study also demonstrates that long-term policy stability and duration predictability outweigh the absolute monetary volume of short-term incentives, as abrupt policy reversals can severely stall market growth. Additionally, the findings suggest that consumer confidence in EV technology and awareness of long-term cost savings play an important role in shaping purchasing decisions. Crucially, the long-term effectiveness of these pricing architectures relies heavily on critical complementary assets, namely public charging infrastructure availability, and regional energy variables such as domestic fuel subsidies and electricity tariffs.

Keywords: Electric Vehicle (EV) Adoption, Total Cost of Ownership (TCO), Fiscal Policy and Subsidies

INTRODUCTION

The automotive industry is a major contributor to global environmental problems, with more than a quarter of the world's energy consumption and greenhouse gas emissions. As a result, the shift towards sustainable transportation has become less dependent on fossil fuels. Electric vehicles (EVs) are becoming increasingly accepted as one of the main solutions to these problems, as they do not depend on oil and do not produce direct greenhouse gases. ICVs help to decrease air pollution and noise in the cities (Alanazi, 2023; Abas et al., 2019). In addition the conflict between the United States and Iran led to disruptions in crude oil supply, resulting in higher oil prices. Consequently, many consumers shifted towards electric vehicles (EVs) as a more cost-effective alternative to conventional fuel-powered vehicles.

While these developments have a positive environmental and operational impact, there are several major obstacles that hinder the mass adoption of electric vehicles. High initial purchase prices, limited driving ranges, and battery performance remain major concerns for consumers, contributing to their reluctance to adopt EV technology. Also amplifying these problems is the slow growth of the necessary charging infrastructure; a vicious circle of dependency is generated when there are not enough EVs on the networks to justify station expansion, which in turn slows down road and infrastructure investment. Consequently, the price of EVs continues to be high for consumers while widespread access to charging remains limited (Kim et al., 2017; Ramachandaran et al., 2023).

Effective government policy coordination and infrastructure development are vital to accelerate market penetration and overcome these consumer barriers. To reduce the total cost of ownership (TCO) for buyers, policymakers are increasingly giving direct fiscal attention to incentivizing the products they purchase. Purchase subsidies and tax exemptions are excellent examples of such financial mechanisms. Aside from this temporary financial assistance, it is critical to keep in mind that a significant investment in a robust charging infrastructure is required over a long period. The most critical enabler for long-term EV adoption remains a reliable, comprehensive charging network (Santos & Davies, 2020; Broadbent et al., 2022).

LITERATURE REVIEW

This section critically examines how these political changes and government interventions impact the pricing and adoption of electric vehicles (EVs). It explores the transition of internal combustion engine vehicles (ICEVs) to sustainable transportation through the prism of market dynamics driven by policies.

Political Interventions and the Pricing Gap

The greatest economic determinant highlighted throughout the literature is the high initial purchase price of EVs relative to conventional vehicles. A shift in political priority usually leads to the adoption of market-pull policies aimed at bridging this initial price gap (Broadbent et al., 2022; BloombergNEF, 2026). First, evidence indicates that fiscal stimulus including tax credits, purchase rebates, and exemptions has a strong positive relationship with EV market share (Xue et al., 2021). However, the success of these policies is highly contingent on the stability of the specific political environment, as sudden rollbacks or policy shifts can instantly disrupt market momentum (International Energy Agency [IEA], 2026). For instance, in European markets, purchase subsidies are structurally recognized as the second most effective tool to rapidly accelerate market penetration (Santos & Davies, 2020).

Next, in emerging political environments such as Malaysia, Life Cycle Costing (LCC) frameworks demonstrate that while political inaction may result in upfront retail prices remaining prohibitively high, the long-term cost-effectiveness of an EV makes it highly competitive against ICEVs, provided it is underpinned by a favourable, stable national energy and tax policy framework (Ayodele & Mustapa, 2020; Ramachandaran et al., 2023). Finally, a critical political-economic debate within the literature focuses on the true destination of public funds. Economic incidence studies indicate that dealers and vehicle manufacturers frequently absorb a significant portion of government subsidies by adjusting vehicle base prices upward, creating an artificial price premium that partially cancels out the financial discount intended for the end consumer (Whitehead et al., 2019; Xing et al., 2021).

Effect of World Political Changes and Political Stability in Policies

Pricing strategies are highly sensitive to the stability of the political environment, where sudden shifts can either hasten or cripplingly slow down EV market maturity. Broadbent et al. (2022) observe that abrupt disruptions to policy—such as a change in government that results in the premature removal of financial incentives—can retard the growth of EV sales by up to a decade. This emphasizes that the long-term consistency and *longevity* of a pricing policy are far more critical to stabilizing vehicle price points than the sheer cash value of the initial incentive (BloombergNEF, 2023).

In addition to financial incentives, political shifts frequently introduce direct supply-side regulations, such as Zero Emissions Vehicle (ZEV) mandates. Rather than letting the open market set values, these aggressive legal quotas compel automotive manufacturers to alter their baseline pricing architectures. Automakers are forced to strategically lower EV showroom prices to meet compliance targets, effectively cross-subsidizing these lower margins by inflating the retail prices and profit margins of higher-polluting ICE models (Environmental Science & Technology, 2024).

Finally, in emerging macro-environments such as Brunei and Malaysia, political decisions regarding national electricity tariffs and fuel subsidies remain the most powerful determinants of EV economic feasibility. Fluctuations in these specific political variables dictate the daily operational costs within a consumer's Life Cycle

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Cost framework. Sudden changes in state-controlled energy policies directly shift the "Total Cost of Ownership" (TCO), determining whether an electric vehicle remains a luxury item or functions as a practical, cost-effective alternative for the mainstream public (International Energy Agency [IEA], 2025; Ramachandaran et al., 2023).

Infrastructure as a Politically-Influenced Price Variable

Although public charging infrastructure presents as a tangible, physical asset, its systemic development is a direct consequence of non-monetary price variables governed heavily by public land-use zoning laws, grid capacity allocations, and state-backed capital funding. In the economics of innovation, charging networks function as vital complementary assets; a lack of political commitment to their deployment creates severe structural market friction. Kim et al. (2017) discover that inadequate state investment in public charging hubs induces widespread consumer range anxiety. This anxiety inflicts a severe non-monetary utility penalty on potential buyers, which psychologically inflates the perceived cost of the vehicle and renders its high initial showroom MSRP even less justifiable (van Dijk et al., 2022). This dynamic creates a classic "chicken-and-egg" market failure where private investors refuse to build charging infrastructure due to low EV volume, while consumers refuse to buy expensive EVs due to a lack of charging availability (Luo, 2022).

To break this cycle of dependency, recent econometric modelling suggests that the political development of an optimized, reliable public charging network is far more cost-effective at driving long-term market penetration than continuous, direct cash purchase subsidies (Santos & Davies, 2020). While cash rebates temporarily manipulate the retail price, they suffer from diminishing returns; conversely, a dense, state-supported public charging network permanently reduces the functional barriers to ownership and actively multiplies the long-term additionality of remaining fiscal tools (Liao et al., 2025).

Finally, according to Alanazi (2023), political frameworks focused heavily on decarbonization and reducing national petroleum reliance act as the structural catalysts driving the establishment of urban "green zones," zero-emission corridors, and low-cost municipal charging hubs. These targeted political and spatial interventions alter the consumer's long-term financial modelling. By granting EVs preferential parking, lower charging tariffs, and toll exemptions while simultaneously introducing strict driving restrictions or congestion fees on internal combustion engine vehicles (ICEVs), policymakers indirectly reduce the total operational price of owning an EV relative to conventional transport, establishing clear economic parity across the vehicle's life cycle (Bernal et al., 2024; Mansor & Anuar, 2025).

METHODOLOGY

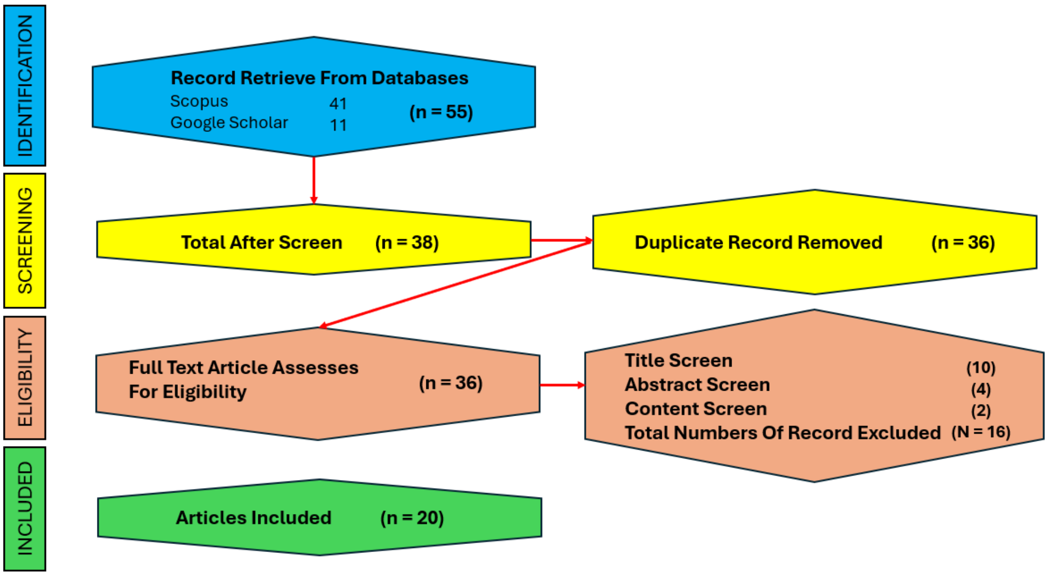

Figure 1: Flow Diagram of Searching Process

To map the complex political economy landscape of Electric Vehicle (EV) adoption, this study employs a Systematic Literature Review (SLR). Rather than utilizing standard biomedical protocols like PRISMA, this review explicitly adopts the ROSES (Reporting standards for Systematic Evidence Syntheses) guidelines proposed by Haddaway et al. (2018). The ROSES framework is specifically engineered to improve the transparency, clarity, and environmental policy relevance of evidence syntheses, making it an ideal methodological fit for analyzing macro-level socio-economic and policy frameworks. Following the initial phase of the ROSES protocol, the foundational research question was formulated based on gaps identified in preceding literature. Specifically, this review addresses the following core inquiry:

RQ: *Do government-provided financial and non-financial incentives enhance the adoption rates of Electric Vehicles (EVs)?*

The article selection pipeline progressed through a systematic three-phase workflow derived from the ROSES protocol: identification, screening, and eligibility evaluation. A comprehensive database search using Scopus and Google Scholars was executed utilizing targeted, boolean-linked keywords designed to capture the cross-disciplinary nature of the topic. The core search string combined keywords representing the three pillars of the study. The string used in the study included political or economy and electrical vehicle adoption. The initial pool of identified literature was subjected to rigorous screening based on explicit inclusion and exclusion criteria in Table 1. Aligning with the methodology of Kraus et al. (2020), the chronological boundary of this study was limited to publications released between 2015 and 2026. This timeframe ensures that the data reflects a period of "research field maturity," capturing the exponential growth, policy pivots, and modern market realities of global EV adoption. Furthermore, linguistic constraints were applied, limiting the sample to peer-reviewed articles published exclusively in English to ensure precision during data synthesis.

Table 1: Criteria for Inclusion and Exclusion

Criterion	Inclusion	Exclusion
Timeline	2015-2026	2014 and earlier
Language	English	Non-English
Document Type	Article	Chapter in a book, book, conference proceeding, etc

Following the initial keyword matching and abstract screening, the broader pool of literature was narrowed down to 55 highly relevant articles. These 55 papers underwent deep material evaluation, resulting in a final subset of 20 articles that completely fulfilled the conceptual scope of the research question. Figure 1 exhibited the process to arrive at final article included in the study.

To safeguard the internal validity and reliability of the synthesized findings, the 20 shortlisted papers were subjected to a formal quality appraisal using the framework established by Abouzahra et al. (2020). The appraisal process was meticulously executed by a pair of independent researchers to eliminate individual bias. The investigators thoroughly audited each publication against six distinct Quality Assessment (QA) criteria Table 2, checking for analytical rigor, methodological transparency, and contextual relevance.

With 6 criteria, the maximum possible quality score for any single paper was 6.0. To ensure that only high-quality, methodologically sound literature contributed to the final narrative synthesis, a strict benchmark was enforced: an article was required to achieve a minimum cumulative score of 3.0 to be included in the final review. All 20 articles successfully cleared this threshold, ensuring a robust data foundation for the subsequent discussion.

Table 2: Quality Assessment Criteria

Item	Quality Assessment Criterion
QA1	Is the research objective/question clearly stated?

QA2	Is the political economy/policy context adequately described?
QA3	Is the data collection method transparent and justified?
QA4	Are the data analysis techniques robust and clearly explained?
QA5	Are the conclusions directly supported by the presented data?
QA6	Does the study explicitly discuss policy implications for EV adoption?

FINDINGS

According to emerging research, the transition to electric vehicles (EVs) relies heavily on technological evolution alongside political and economic restructuring. Although governments globally deploy tax incentives and subsidies to alleviate upfront purchase premiums, these fiscal measures are frequently compromised by economic "pass-through" effects, wherein vendors pocket a significant portion of the subsidy instead of transferring the complete cost-saving to the end consumer. Furthermore, empirical evidence demonstrates that long-term policy stability outweighs the absolute monetary value of a short-term incentive; abrupt reversals in state support can completely stall market maturity. Finally, constructing a dependable, widespread charging network presents a more successful long-term strategy for decreasing an EV's "perceived cost" and mitigating range anxiety than providing transient, one-time cash payments.

Cost Increase, Price Adjustment, and Pass-Through Effects

A recurring finding in macroeconomic literature identifies the high initial purchase price as the primary economic barrier to mass EV adoption. To counter this, market-pull policies—such as tax credits and rebates—are universally deployed to bridge the initial retail price gap (Broadbent et al., 2022). However, a crucial economic impediment to these policies is the "pass-through" effect (Xue et al., 2021). Evidence suggests that automotive dealers and manufacturers often dynamically absorb a portion of government subsidies by inflating vehicle baseline MSRPs, creating an artificial price premium that partially negates the financial relief intended for the consumer (Whitehead et al., 2019).

When analysing long-term price adjustments, Life Cycle Costing (LCC) models demonstrate that while high upfront costs are commonplace in politically passive environments, vehicles like the Nissan Leaf can achieve complete cost-competitiveness if supported by a favourable, stable energy policy framework (Mustapa et al., 2020).

Supply Chain, Market Stability, and Policy Retraction Risks

Market maturity and vehicle retail stability remain directly sensitive to unexpected political shifts. Rapid changes in governing regimes and the sudden withdrawal of financial support can trigger severe market disruptions. Researchers observe that such abrupt policy retractions can cripple near-term sales velocity and stall EV market recovery timelines by up to a decade, underlining that the duration predictability and longevity of a pricing policy are far more critical than the absolute monetary volume of the initial incentive (Broadbent et al., 2022).

Simultaneously, supply-side political mandates such as aggressive Zero Emissions Vehicle (ZEV) quotas disrupt conventional pricing structures across the supply chain. These regulations legally compel manufacturers to alter internal financial arrangements, forcing them to cross-subsidize low-margin EV production using the profits generated from higher-polluting internal combustion engine models (Kim et al., 2017).

Regional Price Feasibility and Consumer Purchasing Power

The localized political-economic context serves as a significant determinant of EV feasibility and adoption velocity. Strategic decisions regarding state-controlled fuel subsidies and domestic electricity tariffs particularly in developing regions like Malaysia and Brunei directly alter a consumer's Total Cost of Ownership (TCO) calculation (Pg Abas et al., 2019). Artificially low, state-backed fuel subsidies in these countries often render EVs an expensive luxury rather than a practical financial alternative to conventional vehicles (Levay et al., 2017).

Consequently, literature highlights a systemic disparity in consumer purchasing power: many mainstream consumers cannot afford the transition to sustainable transport because retail pricing remains prohibitively high despite active incentives. Accordingly, recent research trends are shifting from purely technological innovations toward identifying the "Price Parity Tipping Point" as an aggressive, policy-driven target achieved through precision subsidy and tax modelling (Broadbent et al., 2022).

Non-Monetary Pricing and Government Policy Impact

Emerging research strongly challenges the priority historically placed on direct cash purchase incentives. While upfront subsidies remain highly effective at driving short-term market penetration—particularly across European nations—broader structural studies suggest that long-term political commitment to public charging infrastructure development is substantially more influential in optimizing long-term pricing and consumer adoption rates (Santos & Davies, 2020).

A lack of state-backed commitment to infrastructure development imposes an invisible, non-monetary price penalty on potential buyers in the form of acute range anxiety, which functions as a functional utility penalty that makes a high vehicle retail price even less justifiable to the public (Kim et al., 2017). Conversely, decisive political shifts toward decarbonization produce positive economic externalities, such as municipal "green zones" and zero-emission corridors, which indirectly lower daily EV operating costs relative to internal combustion engines (Alanazi, 2023).

DISCUSSION

The present study sheds light on some of the critical implications that could impact the EV market. Specifically, issues such as price, policy, affordability, and infrastructure will be addressed in relation to their significance for the market. The results demonstrate that subsidies, fluctuating government policies, economic constraints, and inadequate infrastructure might have a direct effect on consumers' perceptions and their adoption of EVs.

Implications of Subsidy Distortion on Ev Pricing

From the results, there needs to be some kind of subsidy that helps to offset the costly initial investment associated with EVs, since the initial cost of an EV is the major challenge hindering consumer uptake of EVs. Rebates and reduced taxes were offered by governments to help bring down the cost of EVs so that it could be on par with ICEVs. The pass-through phenomenon is detrimental to the success of the incentives program due to the absorption of part of the subsidy in terms of increased vehicle premium prices (Whitehead et al., 2019)

Furthermore, the literature reviews shows that EV pricing should not concentrate solely on the acquisition cost but should also include ownership costs. According to the results of LCC analysis, EVs can be considered cost-effective in the future because of the reduction in maintenance and fuelling costs (Mustapa et al., 2020; Pg Abas et al., 2019). That is why governments still invest in EVs by providing fiscal incentives, although the pricing for purchasing an electric car is currently relatively high.

Policy Stability and Long-Term EV Market Growth

The discussion also makes it clear that political stability plays a crucial role in determining the EV price strategy and its implementation. Given that the EV industry is currently dependent on government intervention, the sudden elimination or change o policies might lead to uncertainty within the market, thereby delaying the adoption of electric vehicles (Broadbent et al., 2022).

Moreover, government policies, such as those that require the manufacture of zero-emission vehicles, makes it mandatory for companies to increase their production of electric cars and transfer the cost from conventional cars to electric car production (Kim et al., 2017). All these together create instability in pricing within the automobile industry. Temporary incentive measures like tax exemptions, rebates, and grants could aid in boosting sales during the initial period by easing the cost for the buyers. Nevertheless, this incentive scheme does not stay permanent and hence could ease uncertainty due to changes in this regard. Long-term policy measures like infrastructure development, consistent EV policies, and long-term environmental goals give a boost to market confidence among customers and producers alike. Hence, it is better to have long-term government policies rather than short-term monetary incentives.

Economic Barriers to EV Affordability

The results show that EV affordability varies depending on the region due to varying economic environments, fuel subsidies, and consumer financial strength. In developing nations like Malaysia and Brunei, the fuel subsidy policies provided by the government for conventional vehicles affect the financial benefit of EVs, making them luxurious items rather than affordable vehicles (Pg Abas et al., 2019). Despite the presence of tax breaks and subsidies, many middle-class customers consider EVs too costly even in those countries (Mustapa et al., 2020). In Malaysia, the government has introduced several financial incentives to improve EV affordability, such as income tax relief of up to RM2,500 for EV charging equipment installation and the MARiiCas cash rebate scheme for electric motorcycle purchases. These initiatives help reduce the financial burden on consumers and encourage wider EV adoption.

On the other hand, developed nations with strong purchasing power capabilities and robust policy support have shown success in terms of price competitiveness compared to developing countries (Lévay et al., 2017). Many recent studies have shifted their focus on achieving the “price parity tipping point” when the price of electric cars becomes equivalent to or cheaper than regular cars without substantial subsidies (Broadbent et al., 2022). It indicates that government tax, rebate, and fuel cost-related decisions are instrumental in influencing whether EVs will be affordable in various parts of the world.

Infrastructure Development and Consumer Perception

In addition, results suggest that EV price is not solely affected by cost but is also affected by non-financial attributes such as lack of charging facilities and concerns about driving range. Although governments can provide subsidies, people may find it difficult to switch to an electric vehicle if the availability of charging facilities is inadequate (Kim et al., 2017). For example, in Malaysia the charging facilities is not well establish and need to be improve. So that, people are not afraid to buy EV cars because the facilities provided are sufficient. The “perceived cost” refers to the difficulty that consumers face while owning an electric car due to limited facilities available for charging.

For that reason, several research studies suggest that investing in the development of the charging network may be more beneficial for promoting the adoption of electric vehicles compared to one-time purchase incentives (Santos & Davies, 2020). On the other hand, environmental policies like the setting of objectives for lowering CO2 emissions and mobility sustainability projects will positively impact the competitive advantage of electric cars because of their impacts on the operating costs of electric cars and green transport advocacy amongst the masses (Alanazi, 2023).

CONCLUSION

EVs currently struggle to compete with conventional cars in terms of total cost of ownership (TCO) without outside assistance, which suggests that the value proposition for marketing professionals and students needs to change. In order to effectively promote EVs, we must acknowledge that the eco-friendly message is insufficient to address significant customer concerns like high initial prices and extreme range anxiety. Instead of relying entirely on the environmental advantages, marketing efforts should emphasize long-term usability, charging ease, and total life cycle savings. Nowadays, EVs often struggle to compete with traditional cars in terms of total cost of ownership (TCO) without outside help. This suggests that the value proposition for students and marketing professionals has to be adjusted. Instead of relying solely on the environmental benefits, marketing initiatives must directly address these functional and economical limits by highlighting long-term use, charging simplicity, and total life cycle savings.

Since natural consumer demand is still unable to drive broad acceptance, the external environment, especially government laws and financial incentives, is crucial. According to studies, direct purchase subsidies, tax cuts, and major public investment in charging networks are the most important variables in bringing EVs to a competitive pricing level. Marketers must closely monitor these macroenvironmental developments since various incentive structures have a direct impact on the TCO and determine which automobile segments will be most visible to certain target groups.

Marketing professionals can successfully alter public perception by actively incorporating government subsidies into promotional pricing and highlighting the rapid expansion of charging networks, which will make electric mobility an accessible, affordable, and highly valued lifestyle option for the general public. In the end, an automotive brand's marketing strategy must be in line with these evolving regulations and infrastructure advancements in order to succeed. EVs should be presented as fully supported mobility solutions rather than just as alternative vehicles. Instead of only presenting EVs as alternative vehicles, marketers should show them as fully supported mobility solutions. By aggressively incorporating government subsidies into promotional pricing and highlighting the rapid expansion of charging networks, marketing professionals may effectively alter public opinion. As a result, the general public will find electric mobility to be a highly valued, accessible, and reasonably priced lifestyle choice.

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