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Consumer and Economic Influences on Electric Vehicle Adoption: The Mediating Role of Attitudes and the Moderating Effect of Demographics

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ABSTRACT

This study explores economic and consumer factors impacting electric vehicle (EV) adoption through consumer attitude mediation and moderation by demographic factors in the Jordanian context. The study aims to fill an important knowledge gap about EV adoption mechanisms. The study analyzes the insufficient attention given to demographic indicators including age and income and educational level because they affect how economic premiums alongside psychological preferences lead to behavioral electronic vehicle adoption. The study used an online survey with 288 valid EV owner and drivers respondents in Jordan targeted to test the research model using structural equation modeling via SmartPLS. The analysis validates that economic variables relationship with EV adoption rates through consumer attitudes and demographic characteristics play a key role as influencing variables. Study presents actionable implications which policymakers and manufacturers can use to boost EV adoption rates. The results demonstrate that education programs combined with awareness campaigns about EV financial gains and environmental advantages need to become primary factors for developing positive consumer attitudes toward these vehicles. The different consumer segments require targeted marketing strategies because demographic characteristics serve as essential moderators in the adoption process. Older consumers with lower incomes need experiential information about EVs along with financial incentives since younger university-educated consumers already show interest in EV technology. Policy makers should use adjustable financial incentives to encourage adoption among groups that show low interest in electric vehicles because this approach will boost the impact of economic incentives toward wider adoption.

Keywords: Electronic Vehicle Adoption, Consumer Influence, Economic Influence, Consumer Attitudes
JEL Classifications: L94, P36, P35, D12

1. INTRODUCTION

The global transportation industry is experiencing a revolutionary change because electric vehicles (EVs) are now seen as sustainable solutions to replace internal combustion engine (ICE) vehicles. The shift toward electric vehicles stems primarily from three primary reasons including carbon emission reduction efforts and climate change mitigation alongside enhanced energy system security. The International Energy Agency reports (IEA, 2023) that worldwide EV adoption continues its exponential rise because 14 million units were added to roads in 2022 resulting in a 55% yearly growth. EV adoption rates show substantial variations throughout different regions because consumer opinion and economic conditions, together with government stimulus programs and charging

infrastructure preparedness affect their acceptance in the market. EV adoption remains at an initial level in developing countries throughout Jordan and the entire Middle East region because numerous obstacles hinder their widespread market entry. EV adoption represents a comprehensive behavioral change because it depends on psychological aspects and economic influences together with policy implementation. Consumer perceptions of EV benefits, environmental awareness, and ease of use are critical in shaping adoption decisions. However, economic determinants, including fuel prices, maintenance costs, and financial incentives, also play a significant role in determining market demand and willingness to switch from traditional vehicles to EVs. While these factors have been studied in developed markets such as the US, Europe, and China, there is limited empirical evidence regarding how these influences interact in emerging economies, particularly in Jordan.

Consumer attitudes act as psychological screens that evaluate economic variables and consumer-related factors. In adoption processes attitudes function as a main mediator between behavioral intentions according to the Theory of Planned Behavior (TPB) (Ajzen, 1991). Rogers (2003) established that younger individuals with better education backgrounds and higher incomes tend to adopt new technologies first while demographic factors enhance or diminish the strength of such relationships. The complete analysis of EV adoption patterns in Jordan requires a combination of factors that considers consumer beliefs alongside economic situations and population statistics. The current research fills a missing link in studies through an evaluation of economic drivers alongside consumer-dictated adoption patterns and their relationships with consumer sentiment and demographic characteristics. The research focuses on real-life experiences of Jordanian EV owners rather than hypothetical purchase intentions which previous studies have mainly analyzed (Corradi et al., 2023). Then the research establishes empirical evidence on how psychological and financial factors affect buying decisions using TAM, TPB and DOI and Prospect Theory models. This will be particularly useful for policy makers, automobile manufacturers, and sustainability advocates to design targeted interventions, incentive programs and marketing campaigns to increase EV adoption in Jordan and other developing markets. Since the need for sustainable mobility solutions is urgent, the findings of this research are timely from an understanding of how we could increase rates of EV adoption by reducing consumer hesitations, making economic feasibility better, and targeting specific population segments. Moreover, this study not only enriches the academic discourse on EV adoption but also provides actionable guidelines for governments and businesses looking to create a greener, more sustainable transportation ecosystem.

1.1. Problem Statement

Electric mobility represents an essential global response to counter climate change while addressing energy security needs alongside increasing fuel expenses. Electric vehicles (EVs) serve as the sustainable choice against internal combustion engine (ICE) vehicles which international governments together with industries endorse (International Energy Agency [IEA], 2023). The United States together with China and Norway demonstrate quick EV market growth yet developing economies including Jordan and their neighboring Middle Eastern show limited market entry. The essential barriers together with hesitant behaviors toward electric vehicle adoption in Jordan need more research despite increasing environmental awareness and fuel price volatility and government benefits. The prevalent research on Electric Vehicle (EV) adoption behavior concentrates on industrial nations while studying financial subsidies and power recharge facilities along with environmental awareness levels. The adoption patterns of electric vehicles in Jordan need more investigation from actual owners because current studies focus only on potential customers. A complete investigation of EV adoption must use psychological and economic variables alongside demographic characteristics to explain consumer behavior even when market constraints exist. Research about consumer attitudes serving as a key adoption driver for EVs is extensive yet studies that investigate their linking position between economic and consumer determinants remain scarce. Emerging economies need further research into how population age demographics and educational attainment levels alongside income influence EV purchase decisions because these factors determine adoption rates. The need exists for a full research model which unifies economic motivations with consumer attitudes together with demographic factors to comprehend EV adoption patterns in Jordan.

1.2. Research Gap

Despite the growing body of literature on EV adoption, several gaps persist in understanding the psychological, financial, and demographic factors shaping adoption behavior in emerging economies. The following gaps justify the need for this study:

1.2.1. Limited research on EV adoption in Jordan

- Most existing studies focus on developed markets (e.g., Europe, US, China), with scarce empirical data on Jordan and the Middle East
- There is insufficient research examining EV adoption from the perspective of actual EV owners rather than potential buyers.

1.2.2. Lack of integration between consumer and economic determinants

- Prior studies often examine consumer perceptions (e.g., perceived benefits, environmental awareness) and economic factors (e.g., fuel prices, incentives) separately, failing to explore how they interact to influence adoption
- This study provides a holistic framework, incorporating both psychological and financial influences.

1.2.3. Unexplored mediating role of consumer attitudes

- While attitudes toward EVs are known to shape purchase behavior, their mediating role between consumer/economic determinants and adoption is not well established in the literature
- This research fills this gap by testing attitudes as a mediator, providing insights into how perceptions translate into adoption behavior.

1.2.4. Neglected moderating effect of demographics (Age, education, income)

- While demographics are acknowledged as influencing adoption rates, their moderating role in shaping consumer responses to economic and psychological factors remains underexplored
- This study assesses whether demographic variables amplify or weaken the influence of consumer and economic determinants on EV adoption.

1.3. Research Questions

Based on the problem statement and research gap, this study seeks to answer the following key research questions:

- How do consumer determinants (perceived benefits, environmental awareness, and ease of use) influence EV adoption in Jordan?
- How do economic determinants (fuel prices, maintenance costs, and financial incentives) influence EV adoption?
- Do consumer attitudes mediate the relationship between consumer determinants and EV adoption?
- Do consumer attitudes mediate the relationship between economic determinants and EV adoption?
- Do demographic factors (age, education, and income) moderate the relationship between consumer determinants and EV adoption?
- Do demographic factors (age, education, and income) moderate the relationship between economic determinants and EV adoption?

2. THEORETICAL BACKGROUND

2.1. Electric Vehicle Adoption

The adoption of electric vehicles describes how consumers make choices to leave their internal combustion engine vehicles behind for electric alternatives. A multiple set of technological, economic, environmental and behavioral circumstances drives the present transformation. Worldwide support for electric vehicles intensifies because people want to address climate change and stabilize fuel costs and enhance battery systems (Li et al., 2021). The adoption levels for EVs differ substantially because of customer perceptions combined with government supports and physical charging facilities and regulatory action (Hardman et al., 2017; Bi, et al. 2023). The literature contains multiple theoretical models which explain how people adopt EVs. According to the Technology Acceptance Model (TAM) developed by Davis (1989) consumers choose new technology solutions based on their evaluations regarding usefulness along with ease of use. During EV assessments consumers weigh up fuel savings and maintenance cost reductions as well as environmental advantages against their apprehension about range limitations and charging network availability and initial equipment expenses. According to the Diffusion of Innovations (DOI) Theory written by Rogers (2003) early adopters play a pivotal role in market growth by enabling social learning and peer-to-peer influence throughout the adoption process. The economic conditions have a crucial impact on consumer decisions. When evaluating financial outcomes for purchasing decisions individuals employ the assessment methods described in Prospect Theory. EVs present a cost-efficient solution when viewed favorably due to elevated fuel costs together with government financial programs that reduce taxes and provide subsidies while developing charging networks. The hesitation of consumers to adopt electric vehicles continues primarily because they worry about battery life span and reduced resale value and difficulty in charging. Government legislation regarding carbon reduction has created conditions that will drive the rapid adoption of EVs. EV adoption success depends on three main factors which include marketing efforts to raise consumer understanding as well as monetary rewards and technological enhancements (Alotaibi et al., 2022). The subsequent sections analyze three vital EV adoption factors which include purchase intention together with willingness to adopt and the actual adoption behavior.

2.1.1. Purchase intention

The likelihood that a person will buy an EV within the next few months is called purchase intention. Research by Corradi et al. (2023) through the Theory of Reasoned Action demonstrates that purchase intentions create the main determiner of actual behavior during high-investment product purchases such as electric vehicles. Those consumers who show robust intentions to buy exhibit responses to financial advantages and environmental awareness together with social pressures from outside sources. Major factors driving consumers to purchase EVs include government subsidized programs and tax breaks which help people overcome their financial concerns about EV costs. The rising expenses associated with fuel and vehicle maintenance serves as an additional factor that drives people toward choosing EVs. The psychological challenges of range anxiety and technological uncertainty prove to be obstacles that reduce purchase intention. Purchase intention gets strongly influenced by marketing strategies combined with customer perceptions of brands according to research findings. The purchase behavior of customers is positively influenced by their trust in reliable brand reputations such as Tesla and BYD. The design of successful adoption strategies for consumers demands a deep comprehension of their purchase intentions.

2.1.2. Willingness to adopt

Consumer willingness measures the extent to which people prefer to buy electric vehicles instead of traditional ICE vehicles in the future. Zhang et al. (2022) identify both attitudinal and experiential factors which determine the willingness to adopt, and purchase intention, considered as direct-action focus. According to Behavioral Economics Theory, people apply a risk-benefit analysis system to decide if they are willing to adopt EV. Research by Murugan et al. (2023) shows that environmental consciousness is a significant factor to adoption readiness of EVs. Even those people not in a position to buy an EV immediately have more interest in these vehicles than those who do not care about environmental sustainability or carbon emissions. People who interact with electric vehicles show greater interest in adoption because being familiar with EV technology helps reduce their uncertainties. The perceived inconvenience continues to be the most significant obstacle before consumers. Market sectors that experience restricted charging solutions along with expensive EV costs and range-related concerns show decreased adoption rates. Businesses along with policymakers need to enhance

consumer confidence through education protocols and charging infrastructure development and economic incentives to enhance adoption rates.

2.1.3. Perceived barriers to adoption

Consistent perceptions of difficulties about adopting an EV involve three categories of obstacles which make people less motivated to buy electric vehicles. Prospect Theory suggests human beings experience greater psychological sensitivity to losses compared to gains thus concerns about initial expenses and charging limitations and battery life span typically outweigh fuel cost savings and environmental advantages (Corradi et al., 2023). Financial obstacles of high equipment prices together with uncertain resale value and technological uncertainties about battery life shortening and charging times and infrastructure restrictions from insufficient charging stations and fuel range limitation act as main hurdles for EV adoption. Studies demonstrate that strong market-level incentives do not eliminate the barriers in consumer perception which block widespread adoption of electric vehicles (Alotaibi et al., 2022). The concerns about EV adoption can be addressed by governments and manufacturers through enhancement of battery warranty lengths and expanded charging point systems as well as public-awareness initiatives. Businesses and policymakers gain the capability to create specific solutions for consumer concerns through their understanding of perceived barriers so they can boost EV adoption rates.

2.2. Consumer Influences

The process through which consumers adopt EVs depends on psychological as well as social attributes and behavioral factors which impact their perception and decision-making process. Consumer influences differ from economic elements because they arise from how people feel and their understanding of products together with their adaptation ease. The Technology Acceptance Model (TAM) identified by Davis (1989) shows perceived usefulness and ease of use as the main factors that drive technology adoption decisions. When purchasing an EV consumers weigh operational benefits alongside environmental consciousness as well as usability against other factors. According to Behavioral Economics and Prospect Theory, consumers use mathematical models to weigh advantages and disadvantages of EVs. The decision to adopt EVs depends on two positive factors like financial savings and environmental impact alongside driving experience but obstacles such as charging limitations and battery durability and technical complexity might prevent adoption (Corradi et al., 2023). The adoption of new technology becomes more likely when individuals observe peers and trusted influencers adopting it according to Social Influence Theory. The importance of early adopters and market leaders who speed up EV acceptance can be attributed to this phenomenon. The determination of consumer influences provides essential knowledge for policy developers together with business entities to foster EV adoption through purpose-oriented promotional strategies and educational initiatives and financial incentives (Alotaibi et al., 2022). The analysis of consumer influences focuses on three specific aspects including Perceived Benefits, Environmental Awareness and Perceived Ease of Use for precise examination.

2.2.1. Perceived benefits

EV owners perceive financial advantages and quick accessibility and superior driving efficiency as benefits of their ownership experience. Consumers show greater adoption of technology when the product meets or surpasses their anticipated features as established by the Expectation-Confirmation Theory (ECT) (Oh et al., 2022). Consumers identify the benefits from EVs to include lower fuel expenses together with cheaper maintenance costs and superior driving performance. Cost-effectiveness stands as a principal influential advantage among all other benefits. EV owners reduce their fuel expenses by approximately 40% than what internal combustion engine vehicle owners pay. Less maintenance required for EVs results in reduced costs because they have fewer components, do not require oil changes and their brakes experience diminished wear. People who understand the economic benefits of EV ownership demonstrate stronger purchase intent and adopt EVs. Performance levels during driving represent a fundamental criterion for decision-making. The driving encounter with contemporary EVs consists of immediate torque delivery and smooth accelerations as well as quiet operation leading to enhanced driving satisfaction. The research shows that EVs are gaining traction among performance-focused customers especially in the prestigious vehicle category. The benefits of these attributes allow Tesla, BYD and Volkswagen to boost their brand image and achieve better market penetration. Some EV customers continue to doubt the durability of batteries and used car value which may negatively impact the perceived advantages of EVs. Consumer education and transparent warranty policies need to be prioritized because they help create more positive perceptions (Murugan et al., 2023).

2.2.2. Environmental awareness

The understanding of EVs as sustainable and environment-friendly elements drives the level of environmental awareness among consumers. People who see environmental responsibility as a moral requirement tend to pursue pro-environmental actions such as EV adoption according to Norm Activation Model theory established by Schwartz (1977). Global climate change concerns have resulted in transformative shifts in conscious environmental consumer behavior patterns. Data shows that vehicle emissions contribute 25% to global CO_2 emissions thus making electric vehicle adoption a possible way to fight climate change. People who value sustainable driving and minimal carbon impacts show stronger interest in buying EVs particularly when they live in places where environmental activism is strong. The awareness level of environmental issues gets influenced by both government policies and corporate social responsibility (CSR) initiatives. The implementation of green policies together with carbon tax systems and renewable energy subsidies leads countries to attract more consumers within the EV market (Li et al., 2021). The market success of eco-friendly branding by automakers demonstrates that environmentalism draws consumers who are passionate about sustainability. When consumers sense misleading environmental statements from EV producers their trust toward these manufacturers decreases. The production process of EVs including battery manufacturing and disposal raises doubts in some consumers about sustainability benefits which leads them to avoid adoption. Life-cycle assessments supplemented by transparent

sustainability reports will establish trust by addressing customer concerns.

2.2.3. Perceived ease of use

The notion of perceived ease of use defines consumer perceptions regarding EV ownership simplicity alongside user convenience during operations. The Technology Acceptance Model (TAM) (Davis, 1989) underlines how easy consumers perceive using technology influences their decision to adopt it. EVs must contend with three aspects which compose this dimension such as the availability of charging infrastructure and driving convenience together with learning curve. The main factor influencing people's perception of ease of use belongs to charging accessibility. Range anxiety and inadequate charging infrastructure act as the main obstacles preventing people from adopting electric vehicles. EV consumers possess better confidence and purchase intent for EVs in regions with advanced charging infrastructure networks such as Norway along with China and the Netherlands. Developing markets face lower perceived convenience because they lack sufficient fast-charging infrastructure. Vehicle operation and maintenance simplicity acts as a major element affecting adoption decisions. The minimal component count and absence of oil maintenance and regenerative braking system in EVs simplify its operation compared to ICE vehicles. EVs become more attractive to customers when they understand these advantages which leads to greater intention to buy. Psychological along with behavioral factors also shape how easy users perceive a system to be. People with limited experience in EV technology together with digital interfaces and smartphone-connected vehicle features tend to develop technological resistance. EV adoption rates increase when consumers receive training regarding charging habits and vehicle software and EV maintenance at dealerships and on the internet.

2.3. Economic Influences

Consumer adoption of electric vehicles depends heavily on economic factors since monetary elements strongly influence purchasing behavior. Economic influencers differ from consumer elements because they deal with actual cost factors that involve fuel expenses alongside maintenance costs and purchase discount programs. People decide what to buy based on RCT (Becker, 1976) by comparing costs against benefits to reach their optimum utility levels. Before making adoption decisions about EVs potential customers evaluate savings from operation against their initial financial outlay. The transition process towards new technologies is evaluated by consumers according to Prospect Theory by assessing risks against potential gains. The intentions to buy EVs get affected by worries about battery replacement expenses together with reduced resale value and expected future financial benefits. Research indicates governments offer financial incentives to enhance EV adoption rates because these policies lower the perceived expenses. Consumer responses and adjustments to fuel price variations and maintenance fees depend on price elasticity in combination with their individual income levels. The Total Cost of Ownership (TCO) Model demonstrates EVs possess better long-term financial benefits because their operating expenses stay lower than traditional vehicles. The adoption of EVs depends heavily on government policies which support carbon neutrality through energy transition programs coupled with tax benefits and zero-emission vehicles (ZEV) mandates as well as subsidies. Three essential economic factors which influence the market include Fuel Prices, Maintenance Costs and Affordability and Financial Incentives.

2.3.1. Fuel prices

Fuel prices are one of the most influential economic factors affecting EV adoption. The fluctuations in fuel prices influence customer choices regarding vehicle ownership through Energy Economics Theory because rising fuel costs make consumers select alternate energy choices like EVs and hybrid vehicles. Nullified research demonstrates that gasoline price changes directly affect the sales of electric vehicles. Rising fuel costs cause consumers to search for different options which help them manage their future mobility expenses (Alotaibi et al., 2022). Studies show that Norway along with Germany demonstrate quick EV adoption due to their high fuel taxation policies. This pattern stands opposite to markets where fossil fuel prices get government subsidies including certain Middle Eastern countries which show limited EV adoption. The level of consumer response to fuel prices differs based on their individual income status. The decision-making process of high-end consumers focuses on performance along with environmental advantages but price-conscious consumers base their choices on reduced gas expenses. Progressive fuel taxation implementations together with subsidy removals from gasoline and diesel by governments establish financial superiority for EVs. Customers take electricity expenses into account as they examine how purchasing an EV could reduce their fuel expenses. The economic case for EVs becomes weaker since high electricity costs along with unstable charging expenses occur in certain areas. Policy makers need to maintain EV charging costs at levels that compete with fossil fuel prices.

2.3.2. Maintenance costs

The decision to adopt EVs depends heavily on maintenance expenses. EVs differ substantially from internal combustion engine vehicles since they feature minimal components and need no oil maintenance while their brakes endure less deterioration. The Total Cost of Ownership (TCO) Model reveals that EVs provide better maintenance benefits which create financial advantages across the product lifecycle. Many studies show EV maintenance expenses amount to only 30-50% of those associated with ICE vehicle maintenance costs thus drawing more consumers toward EV ownership. The primary factors causing cost reduction include:

- No engine-related maintenance (e.g., oil changes, spark plugs, fuel filters)
- Regenerative braking systems, which extend brake pad lifespan
- Fewer mechanical failures due to simpler drivetrain systems.

However, several issues persist with EV batteries due to their decreased reliability and budgetary expenses for replacements. Research indicates that replacement of the battery pack describes 30-40% of an EV's lifetime maintenance cost which causes potential buyers to remain uncertain. The industry addresses concerns by providing customers with extended battery warranties that extend to eight to ten years duration as well as leasing models to reduce financial risk. Consumer perceptions regarding

EV adoption depend on the presence of repair infrastructure throughout their territory. Consumers avoid transitioning to electric vehicles because there is an insufficient number of certified EV maintenance facilities in their area. Governments together with manufacturers need to create EV servicing networks and educate their workforce to solve the technical service challenges.

2.3.3. Affordability and financial incentives

The high cost of EVs stands as the primary challenge for people who want to use electric vehicles. The price evolution of EVs becomes more affordable through improved battery solutions and manufacturing economies yet their rates exceed those of ICE vehicles within various markets. The affordable pricing gap for Electric Vehicles requires the active involvement of government subsidy programs. The Subsidy Impact Model demonstrates that purchase subsidies alongside tax incentives and zero-interest financing improve EV adoption rates to a notable extent. Three countries namely Norway and China together with the Netherlands demonstrate market penetration success through their forceful incentive policies. Subscription-based models and vehicle leasing options now serve as alternative methods to improve vehicle affordability. EV technology becomes accessible to consumers because leasing eliminates their need to take on long-term financial risks. The practice of leasing batteries through companies lets consumers minimize their worries about battery wear and expense replacement. The way consumers react to financial incentives depends on their position within the socioeconomic scale and the level of policy stability available in their particular region. The adoption of EVs by consumers is affected negatively when they receive inconsistent or brief financial incentives since the uncertainty makes them wait longer before choosing EVs (Alotaibi et al., 2022). Governments need to design persistent financial support mechanisms along with precise consumer education programs for long-term incentive programs.

2.4. Consumer Attitudes

Consumer attitudes function as a pivotal mediator between EV adoption rates because they determine how people receive information and assess dangers and advantages before creating behavioral goals. According to the Theory of Planned Behavior (TPB) (Ajzen, 1991) positive EV attitudes stand as major behavioral intention predictors which boosts the likelihood for EV purchase and adoption. The Theory of Reasoned Action by Fishbein and Ajzen (1975) demonstrates that attitudes supported by social norms together with perceived control abilities will result in true behavioral transformations. EV attitudes depend on various psychological elements which consist of EV technology trust and perceived value and perceived risk. The Expectation-Confirmation Theory (ECT) (Oh et al., 2022) states that people develop their attitudes through their anticipated results and their personal encounters. When EVs deliver better driving experience alongside cost efficiency and convenience than predicted by users they will strengthen their positive attitudes which in turn will increase adoption intent. When concerns about EV lifespan, vehicle depreciation value or charging facilities stay unresolved, consumer attitudes turn unfavorable so purchase probabilities decline. Brand perception alongside social influence functions as essential factors that shape how a person develops their attitudes. Research shows that when consumers receive good information about EVs from trusted sources including peers and governmental campaigns they will develop positive attitudes about adoption. According to the Social Influence Theory attitudes result from social norms and peer behavior which influences individual decisions (Ajzen, 1991). Consumer attitudes function as essential mediators in EV adoption processes because businesses and policymakers should utilize strategic marketing with educational campaigns and incentive programs to develop positive consumer perceptions and boost EV adoption rates (Li et al., 2021). The research investigates attitudinal factors of EV adoption through Perceived Value and Perceived Risk analysis and Trust in EV Technology evaluation.

2.4.1. Perceived value

The assessment of total value that customers make regarding their electric vehicles stems from their evaluation of price-performance ratios. According to the Value-Based Adoption Model (VAM) (Kim et al., 2007) customers measure products through all useful aspects combined with monetary value and emotional worth before concluding their purchase. Perceived value in the EV market primarily consists of three factors including cost efficiencies and vehicle performance alongside environmentally-friendly attributes. The financial advantages of EVs include reduced gas expenses and reduced maintenance costs which result in substantial savings across the ownership period than internal combustion engine (ICE) vehicles. The economic advantages identified by consumers lead them to develop positive EV sentiments and intend to adopt these vehicles more strongly. Perceived performance qualities such as immediate torque delivery coupled with silent operation and sophisticated technological features drive perceived value growth specifically for consumers who embrace technology. Perceived value of electric vehicles gets negatively affected when consumers remain unsure about the future value of their vehicles along with their battery replacement expenses. The perception among emerging market customers shows EVs to be high-risk investments due to developing technologies and uncertain policy frameworks. The perception of EV value requires increased knowledge from consumers about long-lasting products and extended warranties and improved battery efficiencies.

2.4.2. Perceived risk

Consumers evaluate the potential negative elements and uncertainties they believe will happen when they adopt electric vehicles through perceived risk. Prospect Theory (Kahneman and Tversky, 1979) suggests people fear potential losses more than actual gains which leads consumers to avoid EV adoption due to concerns about battery life, range anxiety and resale value. People worry the most about the loss of battery capacity serving as a major perceived EV risk. Several consumers worry about EV battery performance deterioration through time because it could require expensive battery replacements. Per Wang et al. (2020) battery life uncertainty ranks among the main factors that hinder EV market expansion. Many potential EV drivers experience anxiety about running out of charge before arriving at their destination. Many individuals prospective about EVs continue to face range anxiety even though battery technology and fast-charging infrastructure has improved. According to the Perceived Risk Theory consumers

tend to stay away from products they consider uncertain regardless of their actual benefits (Sánchez-Cañizares et al., 2021). Positive perception of EV safety emerges when governments extend warranties and manufacturers present accurate information about durability while expanding charging facilities. Testing EVs with consumers and educational programs lower psychological obstacles as they increase knowledge about EVs.

2.4.3. Trust in EV technology

The trust in EV technology measures the confidence people have regarding electric vehicle reliability together with safety features and long-term operational viability. Technology Trust Theory (Krishna, 2021) explains that trust acts as a critical factor when consumers choose to adopt new technologies because dependable and secure systems gain more acceptance by user. Trust depends heavily on the perception people have regarding safety. Research has revealed that consumer reluctance to purchase EVs results from their doubts about EV fire risks and electrical system failures. Research verdicts EVs pose less fire threat than gasoline cars yet public acceptance of new EV technology moves slowly. The degree to which consumers trust manufacturing companies represents a vital element leading to trust formation. Consumer trust in the automotive market increasingly depends on established brands with high quality reputations like Tesla and BMW and Nissan (Samawi et al., 2025). The reinforcement of EV technology confidence by consumers comes through government policies that enforce certification standards and carry out quality inspections as well as provide independent safety ratings. A rise in electric vehicle trust relies on regular communication alongside independent organization endorsements and educational programs for consumers. Laboratory trials of electric vehicles combined with recommendations from trusted sources lead consumers to demonstrate increased trust while simultaneously intensifying their intentions to adopt the technology.

3. LITERATURE REVIEW

3.1. Consumer Determinants Influence on Electric Vehicle

The factors which consumers adopt when making choices significantly influence their intentions to buy and use electric vehicles (EVs). New technology adoption occurs primarily because of how people perceive its usefulness and the ease-of-use which TAM identifies as fundamental consumer determinants for EV adoption. Under the Diffusion of Innovations (DOI) Theory (Rogers, 2003) consumers who positively view innovation benefits and show environmental awareness and convenience tend to adopt new technologies. According to Rezvani et al. (2018) psychological and social perceptions significantly shape purchasing decisions in sustainable mobility sectors. Consumer adoption of EVs depends primarily on their perceptions regarding benefits they receive from EVs in addition to their environmental consciousness and ease of use experience.

3.1.1. Perceived benefits

The main driving force behind EV adoption stems from the economic benefits and functional advantages which consumers derive from EVs. Consumers analyze both financial aspects and performance specifications according to the Value-Based Adoption Model (VAM). According to Li et al. (2021) EVs deliver around 40% lower fuel expenses than standard gasoline vehicles thus representing an economical choice during the long-term period. EVs offer instant torque together with reduced maintenance needs and quiet driving experiences and these features increase their perceived value.

3.1.2. Environmental awareness

According to the Norm Activation Model (NAM) (Schwartz, 1977) people display pro-environmental actions because of their personal values and the social pressures within their communities. People who show strong environmental awareness prefer to buy sustainable technologies which include electric vehicles. The research evidence demonstrates that environmentally minded consumers tend to switch to electric vehicles due to their reduced emissions and lower pollution output. Environmental awareness functions as a key adoptive factor for EVs due to government policies which combine carbon tax systems with incentives for low-emission vehicles.

3.1.3. Perceived ease of use

According to TAM researchers determine their attitude toward adopting new technology through perceived ease of use (Davis, 1989). The EV market evaluates charging convenience alongside accessibility of charging stations and the familiarity of EV technology among consumers. Research shows that customers become more inclined to adopt EVs when countries possess extensive charging infrastructure and government-funded EV educational initiatives. The lack of charging infrastructure development in developing markets causes perceived difficulty to be a major impediment for EV adoption.

Multiple studies demonstrate that adoptive choices made by consumers directly influence the adoption rates of EVs. A comprehensive analysis of 45 studies confirmed that both financial advantages and environmental sensitivity serve as the main drivers of consumer EV adoption motivation. The adoption rates of EVs increased when European EV users found the usage process simple through home charging access. The substantial evidence base both from theory and practice makes an hypothesis:

H_1: Consumer determinants (benefits) positively influence electric vehicle adoption.

3.2. Economic Determinants Influence on Electric Vehicle Adoption

The economic factors serve as principal drivers for consumer selection of electric vehicles (EVs) during adoption decisions. Economic determinants differ from psychological and social influences because they represent actual financial elements which affect consumer affordability together with perceived value and purchasing disposition. RCT (Becker, 1976) proposes that people conduct cost-benefit assessments to achieve maximum economic outcomes before making purchasing decisions. Consumers demonstrate heightened reaction to financial risks and potential gains when making investments of high cost such as vehicle purchases according to Prospect Theory. The adoption decisions for EVs heavily depend on fuel prices together with maintenance costs and available financial incentives. Three main economic

aspects which drive EV adoption include fuel prices together with maintenance costs and affordability and financial incentive programs.

3.2.1. Fuel prices

The Energy Economics Theory states that fuel price changes determine the level of customer interest in alternative energy solutions. The data indicates that higher gasoline prices lead consumers to prefer EVs. A significant difference exists between EV market penetration in regions that heavily tax fuel prices such as Norway and Germany compared to regions which receive government subsidies for gasoline. Based on market data from 20 nations demonstrated a gasoline price rise of 10% corresponds to a 3-5% increase in EV sales volume. Consumers avoid electric vehicle purchases when fuel prices remain low in their market.

3.2.2. Maintenance cost

The Total Cost of Ownership (TCO) Model demonstrates that despite their higher initial buying costs EVs become more economical than traditional vehicles because they require less maintenance. The minimal number of components in electric vehicles compared to internal combustion engine (ICE) vehicles results in reduced maintenance expenses. Scientific research reveals that Electric Vehicles maintain themselves for less money than traditional internal combustion engine cars because they need no oil changes and their regenerative braking adds to reduced mechanical failures. People who understand EV operating expenses choose these vehicles since reduced costs make them more economically appealing.

3.2.3. Affordability and financial incentives

High initial costs prevent many potential EV users from taking the plunge even though they will eventually save money in the long term. Research indicates that government subsidies including purchase incentives combined with tax breaks and free financing promote substantial EV market growth (Muehlegger and Rapson, 2023). The rapid growth of EV market penetration in Norway as well as China and the Netherlands stems from their robust incentive programs while regions that lack subsidies show slower adoption. The market now offers EV leasing options and battery rental services which combine to decrease financial barriers for consumers.

Multiple studies confirm that economic factors directly influence the uptake of EVs. EV adoption rates in European markets were best predicted by government subsidies and fuel prices according to data analysis of 500,000 sales points. The main obstacle to EV adoption across developing economies is identified as cost by potential consumers who represent 70% of the market. The evidence from empirical research and theoretical studies establishes a solid foundation for believing in this hypothesis:

H_2: Economic determinants positively influence electric vehicle adoption.

3.3. Mediation Relationship of Consumer Attitudes between Consumer Determinants and Electric Vehicle Adoption

Consumer perceptions and opinions greatly influence the decisions they make regarding adopting electric vehicles. People take behavioral intentions according to the attitudes they hold as per Theory of Planned Behavior and Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975) and this eventually leads to the actual behavior. A study indicates that customers who have a positive perception of EVs are more likely to adopt EVs. As demonstrated in the psychological filter of attitudes, the consumers will accept the EVs only when their belief towards owning an EV becomes positive. According to the Expectation Confirmation Theory (ECT) (Oliver, 1980), consumers develop opinions about EVs from their predicted outcomes, as well as real life encounters. Specific attitudes related to evaluation of benefits, environmental value and ease of usage are formed to evaluate benefits and environmental value and ease of usage to determine strength of adoption decision. This effect is mediated by three critical consumer related factors such as perceived benefits, environmental awareness, perceived ease of use.

3.3.1. Perceived benefits and attitudes

Positive attitudes toward products develop from consumers who detect robust economic functional and performance-based advantages according to the Value-Based Adoption Model (VAM) (Kim et al., 2007). The adoption of electric vehicles is facilitated by reduced operational expenses and excellent fuel efficiency along with top-level performance metrics which drive positive attitudes. Consumers who understood the long-term financial advantages of EVs in European research showed positive attitude development toward these vehicles resulting in increased purchase interest.

3.3.2. Environmental awareness and attitudes

According to the Norm Activation Model (NAM) (Schwartz, 1977) people develop environmental attitudes through their personal moral duty alongside their understanding of societal awareness. The awareness of environmental benefits among climate-conscious consumers leads them to develop positive attitudes that drive their intention to adopt EVs. Through green marketing approaches governments together with businesses seek to strengthen customer attitudes by promoting sustainability aspects of EVs.

3.3.3. Perceived ease of use and attitudes

The Technology Acceptance Model (TAM) (Davis, 1989) suggests that ease of using a new technology affects attitudes towards that new technology. Perceived ease of use includes charging accessibility, driving simplicity and maintenance convenience in EV adoption. Research has demonstrated that consumers in EV areas with more developed infrastructure perceive ease of use higher (Hardman et al., 2017) and have more positive attitude towards (and greater adoption rates of) the EV technology. On the other hand, in areas where charging networks are poor, consumer attitudes are unlikely to change, therefore, perceived benefits have limited effects on adoption decisions (Muehlegger and Rapson, 2023).

Consumer attitudes adopt the mediation role in EV adoption and empirical studies support it strongly. The relationship between perceived financial benefits and purchase intention was found to be mediated by the attitudes towards EVs, a meta-analysis of 35 studies). A study of EV purchase behaviors in Asia and Europe

found that even where there are economic benefits, adoption will be unlikely unless the consumers have a very positive attitude towards owning an EV. Given the strong empirical and theoretical support, it is reasonable to hypothesize:

H_3: Consumer attitudes mediate the relationship between consumer determinants and electric vehicle adoption.

3.4. Mediation Relationship of Consumer Attitudes between Economic Determinants and Electric Vehicle Adoption

Often economic determinants like fuel prices, maintenance costs and financial incentives are widely recognized as key adoption enablers for an electric vehicle (EV). While economic benefits may not be the only deciding factor to result in immediate adoption, the psychological filter of consumer attitudes will also determine how people perceive financial benefits before deciding to make a purchase. According to the Theory of Planned Behavior (TPB) (Ajzen, 1991) external factors (e.g., financial incentives) affect behavioral outcomes (EV adoption) through the interitive mediation of attitudes. Prospect Theory (Kahneman and Tversky, 1979) also indicates that people subjectively evaluate financial risks and gains, and the subjective costs for the saving rather than just the objective savings determine their decisions. The Total Cost of Ownership (TCO) Model is further that though EVs have higher up-front costs EVs have long term operational savings. Nevertheless, consumers need to form a positive attitude toward the EV's affordability, cost effectiveness and financial reliability before the savings would result in adoption. First, this mediation effect is tested on three key determinants of the economic: fuel prices, maintenance costs, and affordability and financial incentives.

3.4.1. Fuel prices and attitudes

One of the factors that determine consumers' attitudes toward alternatives to energy solutions is fuel price volatility. It is observed according to Energy Economics Theory that the higher fuel prices leads to higher perceived cost savings and thus positive attitude towards adoption of EVs (Alanazi, 2023). In a recent large-scale study of the adoption trends of EV in 20 countries, it was shown that high gasoline prices will significantly strengthen pro-EV attitudes, and subsequently to increase adoption rates. Nevertheless, consumer awareness of long-term fuel savings can be weak, so this effect is weakened, and therefore, educational campaigns play a crucial role in confirming positive attitudes to this.

3.4.2. Maintenance costs and attitude

From the TCO Model, it is suggested that the consumers who recognize that EVs have lower maintenance costs would have a positive attitude towards owning these vehicles. The drivetrain on EVs is simpler, with much less involved, and fewer mechanical failures such that the maintenance costs are 30-50% less than that of ICE vehicles. It has been found that consumers with higher levels of awareness of reduced repair cost and longer vehicle life are more likely to hold favorable attitude towards the EV and more likely to adopt. Nevertheless, the attitudes toward adoption of maintenance savings can be negatively affected by misconceptions on battery degradation and replacement cost.

3.4.3. Affordability, financial incentives, and attitudes

Government incentives include tax rebates, purchase subsidies, and interest free financing to decrease the perception of financial burden of EV ownership. The Subsidy Impact Model indicates that financial incentives strengthen positive EV consumers' attitudes towards affordability. Moreover, empirical studies have shown that perceptual EVs that are financially feasible due to subsidies and leasing options engender stronger pro-EV attitudes, hence raising the probability uptake. Yet, government policies can be inconsistent and short-term incentive programs can erode trust, even if it offers financial benefits (Muehlegger and Rapson, 2023).

A meta-analysis of 50 studies concluded that attitudes about financial viability act as a mediator on the relationship between those economic incentives and EV adoption, showing that subjective rather than objective affordability perceptions are more influential. A survey of 5,000 consumers in North America and Europe similarly found that economic benefits are necessary, but attitudes are essential as necessary conditions for adoption. Given the strong empirical and theoretical support, it is reasonable to hypothesize:

H_4: Consumer attitudes mediate the relationship between economic determinants and electric vehicle adoption.

3.5. Moderation Relationship of Demographics Between Consumer Determinants and Electric Vehicle Adoption

Demographic factors, such as age, education, and income, significantly influence how consumers interpret and respond to consumer determinants (perceived benefits, environmental awareness, and ease of use) when making electric vehicle (EV) adoption decisions. The Socioeconomic Mobility Theory (Blau and Duncan, 1967) suggests that demographic characteristics shape access to information, financial flexibility, and openness to innovation, which, in turn, affect technology adoption behavior. Similarly, Market Segmentation Theory (Oh et al., 2022) highlights that different consumer segments exhibit varying responses to the same product attributes based on their age group, educational background, and financial capability. Based on the Diffusion of Innovations (DOI) Theory, the younger, more educated, and wealthier people are typically early adopters of new technologies, which are predisposed to change, well informed about benefits, and able to afford to purchase EVs. On the other hand, older, less educated and less income consumers may be more sceptic, risk averse and less likely to weigh in the long-term benefits over the short costs. To examine the moderating effect of demographics, three key dimensions of age, education, and income are considered.

3.5.1. Age as a moderator

Age is a key condition that influences people's perception and motivation to use EVs. Research shows that younger consumers (18-35 years) are more inclined to adopt EVs, being more environmentally aware, tech savvy, and more willing to try new forms of mobility. Wang et al. (2020) conducted a study of EV adoption trends in the US and Europe and found that younger individuals are keener to adopt EVs if they place high importance on environmental awareness and ease of use as consumer determinants. By contrast, older consumers (50+ years old) were

less concerned about such consumer benefits such as battery longevity, charging convenience, and unfamiliarity with new vehicle technologies, and thus were less responsive to the same consumer benefits.

3.5.2. Moderating role of education

The Human capital theory (Schultz, 1961) says that the higher the levels of education, the more information processing, capacity, and ready to adopt the technological innovation. Studies have demonstrated that the more education consumers have, the more likely they are to observe the financial and environmental benefits of EVs and that they would be more responsive to perceived benefits and environmental consciousness (Li et al., 2021). The study also found that people with college education were more inclined to buy EVs than others, as they are more cognizant of climate change impact, government incentives, and cost savings with EVs. Unlike lower educated consumers who were more likely to trust EV technology, fewer lower educated consumers were less concerned with potential drawbacks and less likely to rely on perceived benefits when making adoption decisions.

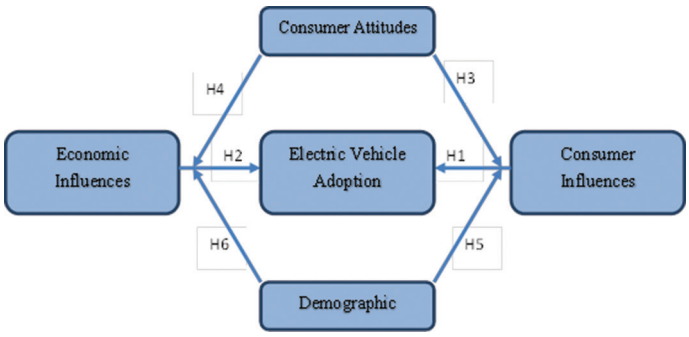
3.5.3. Income as a moderator

Income level is one of the strongest demographic moderators influencing EV adoption. The Economic Stratification Theory (Høgevold et al., 2020) suggests that higher-income consumers are more likely to afford new technologies, making them less reliant on short-term economic incentives and more driven by performance and environmental benefits (Alanazi, 2023). A study on EV purchasing behavior in 15 countries found that higher-income consumers were more likely to adopt EVs regardless of government incentives, whereas lower-income consumers were highly dependent on financial incentives to consider adoption (Samawi et al., 2025). Furthermore, research indicates that lower-income consumers prioritize immediate cost savings over long-term benefits, making them less responsive to perceived benefits unless affordability is addressed.

A meta-analysis of 40 EV adoption studies confirmed that age, education, and income significantly moderated the impact of consumer determinants on adoption decisions. Similarly, a large-scale survey of over 10,000 consumers across Europe and North America found that younger, more educated, and higher-income individuals were significantly more responsive to perceived benefits, environmental awareness, and ease of use, whereas older, less educated, and lower-income consumers exhibited resistance to adoption. Given the strong empirical and theoretical support, it is reasonable to hypothesize:

H_5: (Age/Education/Income) moderates the relationship between consumer determinants and electric vehicle adoption.

Figure 1: Research model "developed by authors"



3.6. Moderation Relationship of Demographics between Economic Determinants and Electric Vehicle Adoption

Economic factors, such as fuel prices, maintenance costs, and financial incentives, play a direct role in EV adoption. However, their impact is not uniform across all consumers—demographic factors (age, education, and income) moderate how individuals perceive and respond to these economic determinants. The Behavioral Economics Theory (Vlaev et al., 2019) suggests that consumers with different financial literacy, risk tolerance, and economic background will weigh financial incentives and cost savings differently. Furthermore, Economic Stratification Theory (Høgevold et al., 2020) highlights that income levels influence purchasing ability, while Socioeconomic Mobility Theory (Blau and Duncan, 1967) explains that education and age shape decision-making capabilities. Understanding how age, education, and income moderate economic determinants provides critical insights into consumer segmentation, targeted policies, and incentive structures. This moderating effect is examined through three key dimensions: fuel prices, maintenance costs, and affordability and financial incentives.

3.6.1. Age as moderator

As per the research younger consumers (18-35 years old) are more responsive to financial incentive as compared to older consumers (35 years and above) who are more flexible when it comes to adopting new technologies and are also more ready to take the financial risk. A study examining the trends of adoption in EVs in Germany, China, and US revealed that the relationship between fuel price sensitivity and EV adoption among young consumers is stronger compared to that among the older consumers. Older consumers are also more risk averse toward large financial investments, even if fuel prices rise, therefore they may still be hesitant to make the switch to EVs because of concerns about the charging infrastructure and battery replacement costs.

3.6.2. Education as a moderator

According to the Human Capital Theory (Schultz, 1961) high educated people have the ability to analyze financial information and long-term economic benefits. However, studies indicate that people with higher education levels are more likely to be aware of the TCO advantages of EVs and in turn respond more to financial savings, government incentives, and fuel cost savings. Across Norway, France, and the UK, university educated consumers were considerably more likely to be aware of the EV tax credits, and fuel savings and benefits of long-term cost savings, resulting in more EV adoption than non-university educated consumers (Alanazi, 2023). On the other hand, consumers with lower educational levels were less convinced with EV financial benefits resulting in weaker responses to cost-related incentive.

3.6.3. Moderating effects of income level

Income level is the moderating factor with the strongest power to moderate the effect of economic determinants and EV adoption. Higher income consumers are less price sensitive and more technology, brand perception and environmental driven when evaluating EV purchases relative to lower income consumers using the Rational Choice Theory (RCT) (Becker, 1976). When subsidies and rebates were available, lower income consumers were very responsive to financial incentives: there was a large increase in adoption (Zhang et al., 2022). While global fiscal incentives are being phased out, the adoption behavior of high-income consumers was relatively stable to changes in fuel prices. A meta-analysis of 45 EV adoption studies found that age, education, and income significantly moderated the effects of economic determinants on adoption decisions. Similarly, a large-scale consumer survey across 12 European nations found that younger, more educated, and lower-income individuals were highly responsive to financial incentives, while older and high-income consumers placed greater emphasis on maintenance costs and long-term financial reliability. Given the strong empirical and theoretical support, it is reasonable to hypothesize:

H_6: (Age/Education/Income) moderates the relationship between economic determinants and electric vehicle adoption.

3.7. Research Model

The research model as shown in figure 1, is structured to examine the factors influencing electric vehicle (EV) adoption, focusing on:

- Consumer Determinants (IV1): Includes perceived benefits, environmental awareness, and ease of use as drivers of EV adoption
- Economic Determinants (IV2): Includes fuel prices, maintenance costs, and financial incentives as financial motivators
- Consumer Attitudes (MV - Mediator): Represents how psychological perceptions shape adoption decisions
- Demographics (MoV - Moderator): Includes age, education, and income as moderators affecting the strength of relationships
- Electric Vehicle Adoption (DV): Measured by purchase intention, willingness to adopt, and perceived barriers to adoption
- This model incorporates direct effects, mediation effects, and moderation effects, providing a comprehensive framework to explain EV adoption behavior.

3.8. Research Contribution

This study makes several key contributions to academic research, business practices, and public policy.

- Policy Contribution: Provides insights for government agencies on how financial incentives and fuel pricing strategies impact adoption rates. Supports sustainability initiatives by identifying the role of environmental awareness in EV purchasing decisions. Highlights the importance of demographic segmentation in designing effective EV policies and incentives.
- Academic Contribution: Extends the existing literature on EV adoption by integrating economic, consumer, and psychological factors. Introduces a comprehensive framework that includes both mediation and moderation effects. Provides empirical validation of multiple theoretical models, reinforcing their applicability to EV adoption.
- Practical Contribution: Helps automakers and dealerships understand how to market EVs based on consumer perceptions and economic motivations. Assists charging infrastructure providers in targeting consumers based on ease-of-use perceptions. Guides financial institutions and leasing companies in structuring EV financing and incentive programs.

4. METHODOLOGY AND RESEARCH DESIGN

This study employs a quantitative, survey-based approach to examine the factors influencing electric vehicle (EV) adoption in Jordan. Given the need for empirical validation of the proposed research model, a structured questionnaire was developed to collect data from actual EV owners, ensuring that insights are based on real adoption experiences rather than hypothetical intentions. The research focuses on understanding how consumer determinants (perceived benefits, environmental awareness, and ease of use) and economic determinants (fuel prices, maintenance costs, and financial incentives) shape EV adoption behavior. Furthermore, it investigates the mediating role of consumer attitudes and the moderating effects of demographic factors (age, education, and income) in influencing adoption decisions. A Likert-scale questionnaire was designed to capture perceptions across these dimensions, allowing for statistical analysis of relationships between variables.

The target population for this study consists of current EV owners in Jordan, who serve as adopters with first-hand exposure to EV related benefits and their challenges. The method of snowball sampling was used to recruit respondents as ownership of EVs is still in an early stage in Jordan. A progressive and organic expansion of the sample was ensured, as initial participants were gathered from dealerships working with EVs, charging stations, and online EV owner communities who referred to additional respondents. When dealing with niche populations and where there is limited access to comprehensive databases directly, this approach works best. The survey was administered through an online and in person structured survey, maximizing reach, response rates and data reliability and validity. A valid sample of 288 respondents data used for statistical assessment.

The first choice was to perform the data analysis using Structural Equation Modeling (SEM) using software such as SmartPLS. Simultaneous testing of direct, mediating, and moderating effects is possible in SEM, and thus is an appropriate method for validating the complex relationships that are posited in the research model. Regression analysis used to determine direct effects of consumer and economic determinants on EV adoption and bootstrapping techniques used to test the mediation effects of consumer attitudes. Furthermore, the effect of such demographic factors on adoption behavior analyzed using multi group analysis (MGA). Using this methodology, we were able to perform robust hypothesis testing,

increase the generalizability of the results, and develop actionable insights for Jordanian policymakers, businesses and researches trying to quicken the adoption of EV.

5. DATA ANALYSIS

5.1. Demographic Data

The demographic data in Table 1 indicates that among the 288 respondents who own electric vehicles in Jordan, 191 (66.3%) are male, while 97 (33.7%) are female. This suggests that male EV ownership is more prevalent in Jordan, potentially due to factors such as income levels, purchasing preferences, or societal norms influencing vehicle ownership. However, the presence of a significant percentage of female EV owners highlights an increasing trend of gender diversity in the adoption of sustainable transportation solutions.

Demographic information of the respondents maintains a diverse sample with respect to age, education, and income. Overall, a majority of the respondents or 59.6% are relatively young to middle aged individuals as revealed by the 36.5% of respondents who are in the 25-34 age group and the 24.3% who are in the 35-44 age group. The respondent pool is also highly educated, 45.1% have a Bachelor's degree, 31.3% have a Master's degree, and 13.9% have a Doctoral degree. As for income, most of them (29.5%) are in the range of 10,000-20,000 JOD, while 27.8% are in the range of 20,000-30,000 JOD. The spread of this distribution shows a relatively good standard of the income bracket, although there are fewer people with higher incomes. The respondents as a whole seem younger, better educated and earns a moderate income, an aggregate that could offer rich clues about the variables guiding electric vehicle adoption in this segment.

Table 1: Demographic data of respondents

Demographic factor	Category	Frequency (n)	Percentage
Gender	Male	191	66.3
	Female	97	33.7
Age	18-24 years	40	13.9
	25-34 years	105	36.5
	35-44 years	70	24.3
	45-54 years	50	17.4
	55+years	23	8.0
Education	High school or below	28	9.7
	Bachelor's degree	130	45.1
	Master's degree	90	31.3
	Doctoral degree	40	13.9
Income level	Below 10,000 JOD	60	20.8
	10,000-20,000 JOD	85	29.5
	20,000-30,000 JOD	80	27.8
	30,000-40,000 JOD	45	15.6
	Above 40,000 JOD	18	6.3

n=288

Table 2: Cronbach's alpha, average variance extracted, VIF

Construct	Items	VIF	AVE	Cronbach's alpha
Economic influence	EI1	1.891	0.687	0.905
	EI2	2.559		
	EI3	2.154		
	EI4	2.711		
	EI5	1.694		
	EI6	2.592		
	EI7	2.015		
Consumer attitude	CA1	2.991	0.715	0.950
	CA2	2.843		
	CA3	2.948		
	CA4	1.756		
	CA5	1.651		
	CA6	2.809		
Consumer influence	CI1	2.470	0.671	0.870
	CI2	2.658		
	CI3	1.336		
	CI4	2.912		
	CI5	2.849		
Demographic	DEM1	2.309	0.773	0.914
	DEM2	1.401		
	DEM3	1.339		
	DEM4	2.811		
	DEM5	2.930		
Electronic vehicle adoption	EVA1	2.631	0.695	0.930
	EVA2	2.809		
	EVA3	2.615		
	EVA4	1.263		
	EVA5	2.274		
	EVA6	2.350		

5.2. Convergent Validity

The assessment of constructs in Table 2 shows both strong internal consistency and convergent validity. All constructs demonstrate reliable measurement performance through Cronbach's Alpha scores which exceed 0.7 as per Nunnally and Bernstein (1994) standards with Consumer Influence at 0.870 and Consumer Attitude reaching 0.950. The high reliability value demonstrates that the measurement items perform consistently. The construct validity assessment achieved sufficient results through Average Variance Extracted (AVE) values which exceeded 0.5 (Fornell and Larcker, 1981). The Demographic construct demonstrates the highest Average Variance Extracted value at 0.773 which implies that the construct effectively explains the variance within its measurement indicators. The construct validity of the model receives additional support through AVE values of 0.687 from Economic Influence and 0.695 from Electronic Vehicle Adoption.

The Variance Inflation Factor (VIF) assessments demonstrate that multicollinearity does not exist because all values stay below the 5.0 threshold (Hair et al., 2019) while ranging from 1.263 to 2.991 (Hair et al., 2019) in each item. The analysis demonstrates that multicollinearity does not affect this research. Consumer Attitude (CA1) shows the highest VIF value of 2.991 yet this exceeds only moderately the accepted threshold. The independent variables have no indications of problematic correlation among them. The research findings demonstrate that the measurement model maintains robustness through its reliable and valid constructs which makes it appropriate for additional analysis of electronic vehicle adoption factors.

5.3. Discriminant Validity

The Heterotrait-Monotrait Ratio (HTMT) assessment method in Table 3 confirms discriminant validity because it verifies that the different constructs remain clearly distinct from one another. The statistical HTMT values of this analysis fall between 0.566 which

links Economic Influence to Consumer Attitude and 0.702 which shows the relationship between Consumer Attitude and Electronic Vehicle Adoption. The established discriminant validity proves the study constructs maintain conceptual distinctness because all values remain under the threshold value of 0.85 specified by Henseler et al. (2015). The measurement model demonstrates validity because Economic Influence and Consumer Attitude together with Consumer Influence and Electronic Vehicle Adoption focus on separate research model areas while avoiding redundant measurement.

Table 4 demonstrates discriminant validity through the Fornell-Larcker Criterion by presenting diagonal square root AVE values which exceed the construct-to-construct correlation values. The diagonal values (0.819 to 0.845) exceed the construct correlations because the indicators possess more variance with their own construct than with other measures (Fornell and Larcker, 1981). The maximum correlation occurs between Economic Influence and Electronic Vehicle Adoption (0.690) yet it falls below the AVE square root values of each construct for discriminant validity assessment. The model constructs demonstrate distinct definitions which support the validity of the structural model for hypothesis testing.

Table 3: HTMT

Construct	EI	CA	CI	EVA
Economic influence (EI)				
Consumer attitude (CA)	0.566			
Consumer influence (CI)	0.614	0.640		
Electronic vehicle adoption (EVA)	0.671	0.702	0.621	

Table 4: Fornell Larcker criterion

Construct	EI	CA	CI	EVA
Economic Influence (EI)	0.828			
Consumer Attitude (CA)	0.654	0.845		
Consumer Influence (CI)	0.681	0.633	0.819	
Electronic Vehicle Adoption (EVA)	0.690	0.711	0.510	0.833

Table 5: Hypothesis testing (Direct effect)

H	Relationship	Beta	R-square	t-value	P-value	Status
H_1	CI→EVA	0.061	0.305	3.151	0.000	Accepted
H_2	EI→EVA	0.197	0.305	4.225	0.000	Accepted

5.4. Measurement Model Assessment

As shown in Figure 2 and Table 5 reveals that Consumer Influence (CI) and Economic Influence (EI) significantly affect Electronic Vehicle Adoption (EVA) according to hypothesis testing results. The beta value for CI → EVA (H_1) reaches 0.061 while its t-value stands at 3.151 along with a P = 0.000 which verifies a statistically significant direct effect. The findings demonstrate that EI → EVA (H_2) has established a significant positive correlation between these variables through its beta value of 0.197 and t-value of 4.225. The independent variables account for 30.5% of EVA variations as indicated by the R-square value of 0.305. Research findings confirm that economic factors together with consumer behavior play an essential role in affecting EV adoption decisions which matches previous studies about financial strategies and social elements in technology acceptance (Rogers, 2003).

The results in Table 6 demonstrate Consumer Attitude (CA) serves as a partial mediator between the connections between both CI and EI with EVA. The analysis confirms the significant indirect effect of H3 (CA → CI → EVA) through a bootstrapped confidence interval from 0.190 to 0.570 which does not include zero and a beta value of 0.539. Analysis reveals CA → EI → EVA (H4) demonstrates partial mediation because the confidence interval between 0.201 and 0.488 includes a beta value of 0.447. Consumer attitude stands as a primary factor influencing the relationships between economic and consumer influences and EV adoption even though additional factors contribute to this impact. The research findings support the Theory of Planned Behavior (Ajzen, 1991) since this theory establishes attitudes serve as the connecting link between environmental factors and behavioral decisions.

Figure 2: Structural model

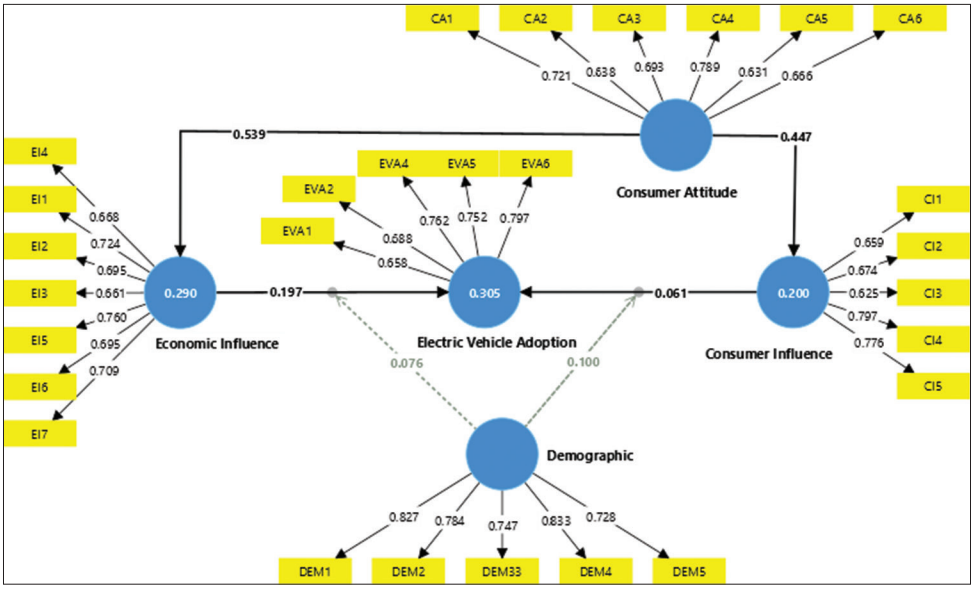


Table 6: Mediating effect (Indirect)

H	Relationship	Beta	SE	Bootstrapping confidence interval 95%		P-value	Status
				LCI	UCI		
H_3	CA→CI→EVA	0.539	0.051	0.190	0.570	0.000	Partial
H_4	CA→EI→EVA	0.447	0.158	0.201	0.488	0.000	Partial

The research evaluates the influence of demographic factors (DEM) as moderators between CI, EI and EVA through Table 7. The results from the DEM*CI → EVA interaction (H_5) reveal a beta value of 0.100 with a significant t-value of 3.110 along with a P = 0.000 thus confirming a moderating effect. The results for DEM*EI → EVA (H_6) demonstrate a significant moderation effect through a beta of 0.076 along with a t-value of 2.186 and a P = 0.000. The study findings demonstrate that demographic characteristics affecting consumer and economic factors which drive EV adoption. Past research by Venkatesh et al. (2022) confirms that demographic factors modify relationship power within consumer behavior models. Policymakers along with marketers should create specific promotion strategies for various demographic groups because research demonstrates its importance in boosting EV adoption.

6. DISCUSSION OF RESULTS

This research analyzed previous literature and statistical analysis to explain study results which contribute to understanding electric vehicle (EV) adoption patterns. The study confirms the calculations where consumer and economic elements demonstrate substantial impact on electric vehicle adoption. Consumer attitudes mediate between various factors while demographic characteristics (age, education, and income) act as moderators that explain EV adoption behavior patterns. Research findings match existing EV adoption studies to strengthen overall comprehension of EV adoption processes by validating consumer behavior and innovation diffusion model theories.

6.1. Consumer Determinants and EV Adoption (H_1)

The study findings validate that perceived benefits from consumers serve as key determining factors for EV adoption. Research results demonstrate the positive correlation between consumer perceptions of EVs and their adoption preferences as documented in previous studies about convenience and environmental advantages alongside social responses. Customers who view EVs as delivering superior advantages which include cost-saving maintenance and eco-friendly features combined with high fuel efficiency are more inclined to buy them. The Technology Acceptance Model (TAM) supports this finding because it states perceived usefulness determines technology adoption acceptance. Targeted marketing campaigns that promote EVs and their advantages will help potential consumers adopt them according to the study results.

6.2. Economic Determinants and EV Adoption (H_2)

The analysis indicates that economic factors significantly contribute to EV adoption because of their confirmed positive relationship. Numerous studies show government incentives and cost factors together with subsidies serve as strong adoption

Table 7: Moderating effect

H	Relationship	Beta	SE	t-value	P-value	Status
H_5	DEM*CI→EVA	0.100	0.104	3.110	0.000	Accepted
H_6	DEM*EI→EVA	0.076	0.218	2.186	0.000	Accepted

determinants for electric vehicles. High initial costs represent a significant impediment to adoption until governments implement tax reductions and subsidies to decrease EV prices. The research findings validate the Diffusion of Innovation (DOI) theory (Rogers, 2003) because cost elements of an innovation affect the number of users who adopt it. The government should establish incentive programs combined with financial backing to promote quick EV adoption especially in regions where pricing matters.

6.3. Mediation of Consumer Attitudes between Consumer Determinants and EV Adoption (H_3)

Consumer attitudes function as a partial mediator between consumer determinants and EV adoption because they significantly impact the decision-making process of consumers. The findings support the Theory of Planned Behavior (Ajzen, 1991) because attitudes toward specific behaviors determine the probability of performing them. The adoption of electric vehicles grows when consumers develop knowledge about EVs along with positive feelings toward them (Mukherjee & Ryan 2020). Perceived benefits directly influence adoption but favorable attitudes develop these relationships stronger according to the mediation effect. EV promotional efforts should work to enhance consumer attitudes by correcting false beliefs and showcasing the prolonged advantages EV ownership offers.

6.4. Mediation of Consumer Attitudes between Economic Determinants and EV Adoption (H_4)

The results also indicate the mediating effect of the consumer attitudes between the economic determinants and EV adoption. This implies that the financial factors carry more weight in terms of adoption decisions when they are also contributing to a positive consumer mindset. In previous studies, it has been found that even when financial incentives are present, consumers with a negative perception towards EVs may still be unlikely to adopt them. Education and awareness campaigns, however, can help policymakers and businesses foster positive attitudes that will make economic incentives more effective. The results confirm that only financial considerations will not be sufficient for a large acceptance—there must be a strong belief among consumers that EVs have value.

6.5. Moderation of Demographics between Consumer Determinants and EV Adoption (H_5)

The study notifies that demographic factors (age, education, and income) significantly moderate the relationship between consumer determinants and EV adoption. The study finding is consistent

with prior research that finds younger, more highly educated, and higher income individuals are more likely to purchase EVs because they are more exposed to new technologies and are more environmentally aware (Zhou et al., 2020). EVs are perceived to be trendy and technologically advanced by the younger consumers, while those with higher education levels are more familiar with their advantages. These findings suggest that targeted marketing strategies should be designed to appeal to different demographic segments in order to maximize EV adoption.

6.6. Moderation of Demographics between Economic Determinants and EV Adoption (H_6)

Similarly, economic determinants have a diverse impact on EV adoption depending on demographic factors, and it is confirmed that financial considerations affect different consumer groups in different ways. Price barriers may not be as relevant to higher income individuals who may be less sensitive to these but more willing to invest in EVs if the upfront cost is higher, while lower income groups need stronger financial incentives to adopt. Education is also a factor, as more informed consumers are able to make a better judgment of the long-term cost savings of owning an EV. This matches with the findings of Wang et al. (2021) that financial incentives are more effective at targeted segments rather than the general population. Policymakers need to design flexible incentive structures that take into account demographic variations in economic decision making to increase EV adoption rates.

7. CONCLUSION, RECOMMENDATIONS AND FUTURE IMPLICATIONS

Research on consumer and economic influences on electric vehicle adoption demonstrates how attitudes function as a vital mediator between personal opinions and EV adoption rates while demographic characteristics serve as moderators. Consumer choices related to economic factors including cost savings alongside government incentives and fuel expenses interact with personal views about sustainability and technology alongside environmental concerns to determine purchasing decisions. Favorable economic conditions alone cannot predict adoption rates of EVs because customer attitudes toward these vehicles depend on personal beliefs along with their experiences and knowledge. The study establishes that age combined with income along with educational level serve as demographic factors which influence the relationship between economic conditions and EV adoption since younger individuals with higher earnings and advanced degrees tend to purchase electric vehicles in economic favorable or unfavorable circumstances.

The research evidence indicates that policymakers together with manufacturers need to develop both economic incentive plans and strategies that promote positive EV perception among consumers. The adoption of EVs requires educational campaigns together with public awareness and targeted marketing which discuss both environmental benefits and long-term financial advantages. The knowledge of different consumer groups enables the creation of specialized policies and marketing approaches which directly address their particular requirements and worries. Younger people with higher income tend to adopt early but older lower-income demographics need special encouragement or incentives to overcome their adoption obstacles. Building positive EV attitudes among diverse population groups will result in improved EV adoption levels which support the sustainable shift to eco-friendly transportation.

The study findings recommend that policy makers should direct their efforts toward developing education and awareness initiatives to build positive EV consumer beliefs. The effect of economic incentives for EV adoption becomes stronger when customers understand how switching to EVs delivers financial benefits alongside environmental advantages. Educational programs delivering straightforward EV information including their technology principles and environmental worth along with long-term financial benefits would remove misconceptions and increase adoption acceptance. Potential consumers need reassurance about battery durability and charging availability and maintenance expenses to demonstrate confidence in EV purchases.

Manufacturers should create specific marketing approaches which target various demographic sectors. Research findings demonstrate that economic factors linking to EV adoption experience significant changes based on consumer age groups and their income levels and educational attainment. Manufacturers should develop advertising content which speaks directly to particular audience types by presenting EVs as tech-forward environmentally friendly vehicles for younger people while presenting longevity cost benefits for middle-class and older segments. Manufacturers should expand their selection of affordable EV models because this move would help reach target audiences among lower-income families.

Future consumer preferences about EV adoption will be influenced by rising environmental concerns combined with modern developments in electric vehicle technology. The expansion of advanced battery technology along with improved charging networks will reduce EV barriers which will increase their market appeal to different consumer strata. Additional studies should examine what effect changing public perspectives about climate change alongside sustainability and technological breakthroughs will have on EV market acceptance. Research into government policies supporting EV market expansion across the globe would help countries understand mutual lessons for enhanced global adoption of electric vehicles. A worldwide transition toward electric vehicles needs infrastructure development through consumer knowledge programs and strategic marketing campaigns and financial benefits for customers plus innovative technological solutions in order to create a sustainable transportation system.

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