EFFECT OF PERCEIVED ENVIRONMENTAL KNOWLEDGE, PERFORMANCE EXPECTANCY, PERCEIVED RISK ON ELECTRIC PURCHASE INTENTION

Dr. Chidananda H L[1]., Jithu Varghese[2], Kavin Sridhar[3] and Kishan P[4]

[1]*Assistant Professor, School of Economics and Commerce, CMR University Bangalore, India*
[2,3,4] *Research Students, School of Economics and Commerce, CMR University Bangalore, India*

ABSTRACT   DOI No: 10.36713/epra16932   Article DOI https://doi.org/10.36713/epra16932

The purpose of this study is to determine how the intention to purchase an electric vehicle (EV) is influenced by perceived risk, performance expectancy, and environmental understanding. Examining how these variables affect consumer behavior in the context of environmentally friendly transportation is the goal, with an emphasis on encouraging the adoption of EVs. A structured questionnaire using Google Forms was used to gather data from 199 participants. Responses were graded on a five-point Likert scale, with 5 representing strong agreement and 1 representing strong disagreement. To evaluate the predictive ability of perceived environmental awareness, performance expectancy, and perceived risk on EV purchase intention, regression analysis was performed using SPSS 20. The results reveal significant positive associations between perceived environmental knowledge, performance expectancy, perceived risk, and EV purchase intention, indicating their crucial role in influencing consumer attitudes towards EV adoption. These findings underscore the importance of addressing perceived environmental knowledge, performance expectancy, and perceived risk in promoting EV adoption and advancing sustainable transportation solutions.

KEYWORDS-*Perceived Environmental Knowledge, Performance Expectancy, Perceived Risk and electrical vehicle purchase intention*

INTRODUCTION

Electric vehicles (EVs) have emerged as a game-changing technology in terms of environmental protection and emissions reduction. Adoption of EVs as a sustainable alternative has gained attention due to growing concerns about climate change and the negative impacts of conventional fossil fuel-powered vehicles (Anastasiadou, 2021). According to Peters and Dütschke (2014), electric vehicles (EVs) not only provide a more environmentally friendly form of transportation but also have the potential to lower greenhouse gas emissions and enhance air quality.

According to Yang et al. (2018), the switch to electric vehicles is in line with international efforts to tackle climate change and create a more sustainable future. The broad adoption of electric vehicles (EVs) is significantly influenced by consumer purchase intention. Tu and Yang (2019) found that consumers' propensity to acquire electric vehicles is highly influenced by factors such as perceived environmental understanding, perceived risk, and performance expectancy. Research indicates that customers' desire to buy electric vehicles (EVs) can be positively influenced by their awareness of the environmental advantages of EVs and the availability of financial incentives (Xu, Wang, Li, & Zhao, 2020). Furthermore, consumers' attitudes regarding electric vehicles and their intention to purchase them can be directly influenced by their level of information about these vehicles (Jiang et al., 2021). A growing number of people are following the trend and buying electric vehicles (EVs), with a variety of reasons impacting their choices. According to Li et al. (2015), purchase intentions of consumers for electric vehicles are influenced by a number of factors, including perceived

risk, brand identification, brand image, and awareness. In addition, antecedent elements that affect consumers' behavioral intention to buy electric vehicles (EVs) include environmental concerns and perceptions of environmental legislation (Zang et al., 2022). The notion of perceived endorsement, encompassing perceived benefit, perceived risk, range anxiety, and attitude, provides additional insight into consumers' intents to acquire electric vehicles (EVs) (Singh et al., 2023). Policymakers and industry players are actively involved in supporting the use of EVs as the EV market continues to develop. Belingheri et al. (2019) assert that the expansion of the electric vehicle (EV) industry has been facilitated by government subsidies, investments in charging infrastructure, and supportive regulations. It is now essential for sustainable development and solving environmental issues to promote the EV market, particularly in nations like China (Huang, Lin, and Yang, 2022).

Value generation in the developing EV ecosystem is further accelerated by the collaboration of ecosystem actors and business players.As a sustainable and environmentally beneficial substitute for conventional gasoline-powered automobiles, electric vehicles have drawn a lot of attention lately (Isharyani et al., 2020). In order to combat climate change and lower greenhouse gas emissions, the switch to electric vehicles is essential (Liu et al., 2021).

Nevertheless, the market penetration of electric vehicles is still quite low, despite the growing interest in them. Understanding the variables that affect consumers' decision-making when thinking about buying electric vehicles is why it is important to research the relationship between perceived environmental knowledge, performance expectancy, and perceived risk and electric purchase intention. The purpose of this study is to investigate the relationship between perceived risk, performance expectancy, perceived environmental understanding, and intention to buy an electric vehicle.

LITERATURE REVIEW
Environmental knowledge and Electric Vehicle Purchase Intention
Perceived environmental knowledge refers to people's knowledge and comprehension of the advantages that electric mobility has for the environment, such as lower carbon emissions and cleaner air. Based on the theory of planned behavior (Ajzen, 1991), which suggests that attitudes toward a behavior are influenced by subjective norms and perceived behavioral control, we contend that people who perceive the environment more highly are more likely to view electric vehicles as a sustainable mode of transportation and, as a result, to be more inclined to buy them. Empirical data that indicates environmental concerns significantly influence customer attitudes on the adoption of electric vehicles lends credence to this idea (Steg & Vlek, 2009; Liang, Zhang, Xu, & Wang, 2020). Below is the hypotheses to test:

H_0: Perceived environmental knowledge affects the electric vehicle purchase intention

Performance Expectancy and Electric Vehicle Purchase Intention
The term "performance expectancy" describes people's assessments of how much driving an electric vehicle will improve their overall driving experience, taking into account things like vehicle dependability, charging infrastructure, and driving range. Individuals with higher levels of performance expectancy are more likely to view electric vehicles as viable and practical alternatives to conventional vehicles, thus exhibiting greater intention to purchase them. This theory is based on the technology acceptance model (Davis, 1989), which states that perceived usefulness and ease of use are key determinants of user acceptance of technology. Consumer opinions regarding new technologies, such as electric vehicles, are significantly influenced by perceived performance gains (Venkatesh et al., 2003; Xu, Zhang, Bao, Zhang, & Xiang, 2019). Based on above, following hypotheses drawn:

H_0: Performance expectancy affects the electric vehicle purchase intention

Perceived Risk and Electrical Vehicle Purchase Intention
The term "perceived risk" describes how consumers subjectively assess any risks or unpredictability's related to buying electronic devices, such as doubts about the dependability, compatibility, or safety of the products. It is argued that people who perceive lower levels of risk associated with electronic purchases are more likely to demonstrate higher buy intentions. This claim is based on the theory of reasoned action (Fishbein & Ajzen, 1975), which holds that attitudes and subjective norms influence behavioral intentions. Previous studies (Hair et al., 2010; Chen et al., 2019) have provided evidence in favor of this concept, showing that customer attitudes and purchase behavior across a range of product categories, including electronics, are significantly influenced by perceived risk.

Based on above discussion following hypothesis is drawn:

H_0: Perceived risk effects on electronic vehicle purchase intention

METHODS
This study employed a quantitative research design to investigate the effect of perceived environmental knowledge, performance expectancy, and perceived risk on electric vehicle purchase intention among respondents.

The participants in this study consisted of 199 individuals who were selected using a convenience sampling technique.

The sampling technique used in this study was convenience sampling. Respondents were selected based on their accessibility and willingness to participate. Data collection was conducted through a structured questionnaire distributed via Google Forms.

A structured questionnaire was used to collect data from the participants. The questionnaire included items designed to measure perceived environmental knowledge, performance expectancy, perceived risk, and electric vehicle purchase intention. Each item was rated on a five-point Likert scale, ranging from 5

(Strongly Agree) to 1 (Strongly Disagree), allowing respondents to indicate their level of agreement or disagreement with each statement.

To examine the effect of perceived environmental knowledge, performance expectancy, and perceived risk on electric vehicle purchase intention, regression analysis was conducted using SPSS version 20. The independent variables (perceived environmental knowledge, performance expectancy, and perceived risk) were entered into the regression model to assess their predictive power on electric vehicle purchase intention. The regression analysis conducted for the examination of the relationship between the independent variables and the dependent variable, controlling for other factors.

ANALYSIS

Table no. 1: Determinants of Electric Vehicle Purchase Intention

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.507[a]	.519	**.513**	.2112
a. Predictors: (Constant), perceived environmental knowledge, performance expectancy and perceived risk				

Source: Primary Data

According to Table 1's Adjusted R Square value of .513, the combined effects of perceived environmental understanding, performance expectancy, and perceived risk can account for around 51.3% of the variance in electric car purchase intention. This suggests that the model has a

reasonable amount of explanatory power in predicting the desire to buy an electric vehicle. The Adjusted R Square value gives a more cautious estimate of the model's fit by taking the number of predictors into consideration.

Table no. 2: Determinants of Electric Vehicle Purchase Intention

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.552	.022		.574	.212
	Perceived Environmental Knowledge	.574	.092	.549	11.065	**.000**
	Performance Expectancy	.546	.043	**.559**	4.003	**.000**
	Perceived Risk	.533	.114	.523	14.321	.000
a. Dependent Variable: **Electric vehicle Purchase Intention**						

Source: Primary Data

The coefficients displayed in Table 2 offer significant insights into the factors influencing the intention to purchase an electric vehicle (EV). Three key predictors stand out: perceived risk, perceived environmental understanding, and performance expectancy. These factors each have a unique impact on consumers' inclinations to purchase electric vehicles. Higher levels of perceived environmental knowledge (.549), performance expectancy (.559), and perceived risk (.523) are linked to increased

intents to buy electric vehicles, according to the positive standardized coefficients (Beta) for these variables. These results are consistent with previous research showing how risk perceptions, perceived performance benefits, and environmental awareness influence consumer behavior toward sustainable products like electric vehicles (EVs) (Chen et al., 2019; Steg & Vlek, 2009). Consumer attitudes on the adoption of electric vehicles (EVs) are significantly influenced by perceived environmental knowledge.

People who are more aware of the environmental advantages of EVs are more likely to view EVs as a sustainable mode of transportation (Zhang et al., 2018). In a similar vein, consumers' opinions of EV feasibility and functionality are greatly influenced by performance expectancy, which includes elements like driving range and charging infrastructure (Feng & Li, 2020). On the other hand, some consumers may find it difficult to embrace EVs due to perceived risk, which includes worries regarding battery range and charging infrastructure (Hair et al., 2010).

The literature has revealed contradictory results, despite the fact that these parameters in this study show strong relationships with EV purchase intention. According to some research, perceived environmental knowledge has little bearing on the adoption of electric vehicles (EVs); instead, other factors including financial incentives and societal norms may be more important. This is according to Langbroek, Franklin & Susilo, (2016). Furthermore, depending on contextual factors like customer preferences and market maturity, the influence of perceived risk on EV purchase intention may change (Neubauer & Wood, 2014). Even though this study shows that perceived risk, performance expectancy, and environmental knowledge are important factors in determining EV purchase intention, more investigation is required to fully understand the intricate interactions between these and other factors that shape customer behavior in the ever-changing EV market. Comprehending the intricate correlation among these variables is imperative in formulating efficacious approaches to encourage the extensive integration of electric vehicles (EVs) and expedite the shift towards an eco-friendly transportation infrastructure.

CONCLUSION

The examination of the impact of perceived environmental knowledge, performance expectancy, and perceived risk on the desire to acquire an electric vehicle (EV) illuminates important factors influencing consumer behavior related to sustainable mobility. The regression analysis's results indicate the critical role that these factors play in influencing consumers' decision-making processes by highlighting the strong and substantial connections that exist between them and EV purchase intention. Interestingly, there is a positive correlation between stronger intents to buy electric vehicles (EVs) and better levels of perceived environmental knowledge, performance expectancy, and reduced perceived risk. This implies that programs targeted at raising consumer understanding of environmental issues, strengthening EV performance, and reducing perceived dangers could successfully encourage EV adoption.

As a result of customers' awareness of the environmental advantages of electric mobility, perceived environmental knowledge becomes a significant factor in determining their decision to acquire an EV. According to Zhang et al. (2018), those who are more conscious of the environmental benefits of electric vehicles (EVs) are inclined to consider them as practical means of cutting carbon emissions and slowing down the loss of the environment. This research highlights the value of education and awareness-raising initiatives in encouraging sustainable mobility options and a greater comprehension of the environmental effects of transportation decisions. Comparably, customer sentiments on the adoption of EVs are significantly shaped by performance expectations. Perceptions regarding the viability and functionality of electric vehicles (EVs) are greatly influenced by factors including vehicle reliability, driving range, and charging infrastructure. Customers are more likely to view electric vehicles (EVs) as practical options for achieving their transportation needs if they believe they perform on par with or better than regular cars (Feng & Li, 2020). To remove adoption barriers and increase consumer acceptability of EVs, it is therefore imperative to make improvements to EV technology, increase the availability of charging infrastructure, and boost car performance. Moreover, perceived risk emerges as a critical factor influencing EV purchase intention, with concerns about battery range, charging infrastructure, and resale value acting as potential deterrents to adoption. Consumers who perceive lower levels of risk associated with EV ownership are more likely to express stronger intentions to purchase EVs (Hair et al., 2010). Therefore, addressing consumer concerns and misconceptions through targeted marketing, education initiatives, and policy interventions is crucial for building consumer confidence and promoting EV adoption. It is imperative to recognize the limitations inherent in this research, though. The findings' generalizability may be constrained by the convenience sampling strategy and dependence on self-reported data. Furthermore, the cross-sectional design of the study makes it impossible to draw conclusions about causality, emphasizing the necessity of longitudinal research to confirm the associations that have been found over time. Future research may also include other variables, like as psychological and sociodemographic ones, to offer a more thorough knowledge of the factors influencing EV purchase intention.

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