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Key Factors Influencing Sri Lankan Conventional Fuel Vehicle Owners Towards Switching to Electric Vehicles: A Study Based on Consumer Purchase Intention

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Abstract: In light of Sri Lanka's attempts to promote sustainable transport, the movement towards electric vehicles (EVs) appears promising. Despite the global trend towards EV adoption, their reception in Sri Lanka has been poor. This study employs a quantitative approach to identify the factors that influence conventional fuel vehicle owners in the Western Province of Sri Lanka to switch to EVs and analyse the effect of perceived risk on EV purchase intention using the Theory of Planned Behaviour (TPB). In this research, data from a survey carried out among a representative sample of the population was analysed by employing SmartPLS4. The outcomes bring to attention some important factors about consumer purchase intentions relating to switching to EVs, such as relationships with vehicle characteristics, economic benefits, social influence, environmental concerns, infrastructure availability, and perceived risk. These results have implications for policymakers in Sri Lanka, industry players, and researchers interested in sustainable transportation options. The targeted interventions will help address these challenges, thus leading to faster adoption of EVs in Sri Lanka and enabling its society to realize the benefits associated with sustainable mobility.

Keywords: Electric vehicle (EV), Purchase intention, Theory of planned behaviour (TPB), Perceived risk, PLS

1. Introduction

When it comes to climate change and sustainability, discussions regularly focus on electric vehicles (EVs). Adoption of EVs for public or personal transportation is rare in Sri Lanka, as none have been recorded in the public transport sector. The largest consumer of energy is the transportation sector, which accounts for around 70% of imported oil [1]. Despite government and manufacturer efforts, consumer interest in EVs remains low [2]. Import taxes for EVs were significantly reduced by the government to about 50% of their cost as against 200-300% for conventional cars following the 2015 Paris Climate Conference recommendations [3]. Nevertheless, from 2017 to 2019, registrations of EVs grew from only 0.17% to a mere 2.07%, which is quite insignificant compared with total vehicle registration rates [4].

EV markets have experienced an explosive rise worldwide, with the sale of more than ten million vehicles in 2022 alone. From the year 2020 to 2022, EVs sold are estimated to have increased over threefold from about four percent in 2020 to fourteen percent in 2022. By making projection on current trends, it can be estimated that EVs would entirely displace approximately five million barrels of fuel oil consumption per day by the year 2030 [5].

There are few research studies conducted with regard to the adoption of hybrids and EVs in Sri Lanka, but this study only considers how current conventional fuel vehicle owners switch to EVs. This specific focus has not been previously researched in Sri Lanka. A Sri Lankan study examined factors influencing the purchase of hybrid vehicles but did not include EVs [6]. Another study suggested future studies on perceived risk affecting purchase intentions in Sri Lanka, using a literature-based approach [7].

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A study conducted by Shetty et al. [8] identified the obstacles to the adoption of plug-in EVs in Asian emerging markets, but its study's urban technological focus limits its applicability to Sri Lanka [8]. A separate study investigated the impact of perceived risk on buying alternative fuel vehicles in Sri Lanka, including hybrids and EVs [9]. Comprehensive literature reviews reveal that the purchase intention of EVs in this context has not been thoroughly explored, highlighting the need to identify key factors influencing conventional fuel vehicle owners' perceptions and their transition to EVs.

The present study aims to identify the key factors influencing the purchase intention of EVs among current conventional fuel vehicle owners and understand the effect of perceived risk on this intention, particularly in Sri Lanka's Western Province. The results will help various stakeholders to understand the reasons behind the low adoption and sales of EVs. Ultimately, this study will contribute to reducing transportation-related emissions and pollutants in Sri Lanka, promoting sustainable development and mitigating climate change.

2. Literature Review

2.1 Electric Vehicles (EVs)

EVs are operated by an electric motor instead of a conventional diesel or petrol internal combustion engine. EVs use a battery set to power the electric motor. To charge the battery, EV must be plugged into a normal household electricity socket outlet or a dedicated charging system. [10]. As an EV runs on electricity, it does not emit any exhaust smoke and does not contain the typical fuel components. Therefore, they are considered as environmentally friendly.

When considering the existing literature, a study discusses how switching to EVs instead of conventional vehicles could reduce emissions that cause air pollution and greenhouse gases produced from the transportation sector [11]. Here, the authors argue that an EV owner pays a substantial amount of money for the advantages concerning cost, availability, speed, and acceleration of EVs. In another study, researchers aimed to identify customer perceptions of EVs concerning the environment, vehicle cost, comfort, trustworthiness, technology, infrastructure, and social acceptance [12]. They found out that consumers are well aware of the advantages to the environment by switching to EVs. However, those consumers believe that more infrastructure facilities are needed to be provided by the government.

2.2 Purchase Intention

Purchase intention refers to a consumer's prospective intention or likelihood of acquiring a specific product or service in the future [13]. It is a crucial concept in marketing research and consumer behaviour analysis, influenced by factors such as personal preferences, past experiences, marketing efforts, social influence, and perceived value. While high purchase intention usually indicates a strong likelihood of actual purchase, it is not a guarantee, as external factors or changes in circumstances can impact the final decision.

Within the realm of existing scholarly works, a study has interpreted that purchase intention, often synonymous with the willingness to buy, encapsulates the tendency of consumers to acquire a particular product or service [14]. Central to the understanding of consumer behaviour, purchase intention signifies a pivotal concept. Another study presents purchase intention as the cognitive inclination of a consumer toward engaging in transactions with a manufacturer or seller [15].

2.3 Perceived Risk

Perceived risk is the subjective perception of potential negative consequences that may result from a decision or action. This includes things like the uncertainty of future events, possible negative outcomes, and how likely they might be. It is an essential factor in consumer decisions, financial decision-making and health choices. Perception of risk is important to know for businesses, public policy makers and also researchers because it guides how people respond on levels from attitudes and behaviours right up to decision-making.

Obe research explained five dimensions of perceived risk, encompassing financial, functional, physical, social, and psychological aspects [16]. Financial risk pertains to potential monetary loss, while functional risk relates to doubts regarding a product's performance or reliability [17]. Physical risk involves the expenditure of time and effort linked with the purchase [18]. Social risk entails the potential loss of social standing or relationships [19], whereas psychological risk involves the potential threats to self-image [18].

2.4 Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) suggests that behaviours are shaped by intentions, which are persuaded by three key

factors, namely, attitudes, subjective norms, and perceived behavioural control [20]. Attitudes are positive or negative assessments of consumers performing an act. Subjective norm is the force that people receive from other people who are significantly important in society to perform or do not perform a kind of behaviour. Perceived behavioural control is defined as the difficulties that deal with various social and health behaviours. Perceived behavioural control explains the amount of control consumers believe that they have to perform a particular behaviour [20].

2.5 Hypothesis Formulation for the Study

2.5.1 Vehicle Characteristics (VC)

The characteristics of vehicles are a crucial factor in influencing consumers to purchase or transition to a new vehicle. According to a report by JD Power and Associates [21], eight potential barriers impede the adoption of EVs: (1) high purchase price; (2) limited range; (3) uncertainty regarding maintenance costs and battery lifespan; (4) ambiguity surrounding fuel cost savings; (5) uncertainty about power and performance; (6) uncertain total cost of ownership over the vehicle's lifespan; (7) lengthy recharging times; and (8) uncertainty about infrastructure for vehicle support and recharging [21].

Numerous research conducted in the past have identified the high purchase price of EVs as the primary and most significant barrier to their adoption [22]. Another study revealed that potential EV purchasers repeatedly expressed concerns about charging infrastructure availability, inadequate battery capacity, and higher buying costs [23]. Concerns among potential EV buyers were highlighted in another study concerning vehicle model obsolescence, driving range on a single charge, price, charging time, battery capacity, and societal perceptions of EV drivers and owners [24].

Therefore, consumers will be more likely to purchase and switch to EVs if these vehicles have the characteristics that the customer is expecting. Hence, the following hypothesis is derived.

H1: Vehicle characteristics of an EV vehicle has a positive impact on the purchase intention of EVs.

2.5.2 Economic Benefit (EB)

The perceptions of customers regarding the economic aspects of EVs significantly influence their purchase intentions. According to a study, individuals' perceptions of economic benefits generally impact their acceptance of products or services [25]. EV sales tend to increase in response to high gasoline prices when compared to traditional gasoline vehicles [26]. Moreover, this study found that the maintenance and operational costs of full EVs are lower than those of conventional fuel vehicles.

Energy costs associated with conventional fuels such as gasoline and diesel vehicles are nearly eight times higher than the costs associated with EVs [27]. Additionally, the availability of relatively inexpensive electricity and the high cost of gasoline have been identified as factors motivating consumers to opt for EVs instead of conventional fuel vehicles [28]. Another study suggests that consumers may consider energy-related benefits when making decisions about purchasing a new vehicle [29].

Therefore, consumers will be more likely to purchase and switch to EVs if significant economic benefits are involved with it. Hence, the following hypothesis is derived.

H2: Economic concern towards an EV has a positive impact on the purchase intention of an EV.

2.5.3 Social Influence (SI)

Social influence refers to the phenomenon where individuals adhere to the expectations or information communicated by others, interpreting it as an indicator of reality [30]. Social influence occurs when individuals adapt their thoughts, beliefs, and behaviours to synchronize with their societal and environmental contexts [31]. A study highlighted that social influence stems from various sources, including friends, family, and the media [32]. Given its importance, social influence assumes a pivotal role in studies related to behaviour, as individuals frequently look for social validation before embracing new products or services [33].

One research underscored the peer impact as a pivotal factor influencing green purchasing behaviour, a concept closely linked to EVs [34]. Another researcher identified the 'neighbour effect' as a significant determinant in consumers' decision-making processes regarding EV purchases [35]. Considering Sri Lanka's collectivist culture, wherein social norms hold sway, and individual actions are influenced by various communities, social influence is poised to play a substantial role in the purchasing journey [36].

Therefore, consumers will be more likely to purchase and switch to EVs with social influence from individuals and society towards EVs. Hence, the following hypothesis is derived.

H3: Social influence towards an EV has a positive impact on the purchase intention of an EV.

2.5.4 Environment Concern (EC)

Environmental concern signifies individuals' awareness of environmental concerns and their commitment to participate in the solution to those concerns [37]. Another study defines environmental concern as the willingness to alter actions, supported by emotional investment and knowledge of the environment [38]. This study proposed that an individual exhibits environmental concern when possessing environmental knowledge, impact, purpose, and dedication toward the issues related to the environment.

Another research suggested that purchasers extremely worried about environmental well-being are more inclined to buy green products, including EVs [39]. Another study found a significant association between environmental factors and consumer behaviours, such as purchasing eco-friendly products and engaging in recycling [40]. Conversely, non-environmentalists are less likely to purchase EVs compared to environmentalists [41]. Environmental factors positively influence consumers' preference for EVs even before they have experienced using one [42]. Environmental concern emerges as a primary determinant in consumers' decisions to purchase EVs [43]. Environmental benefits serve as motivators in the decision-making process for purchasing EVs [44].

Therefore, consumers will be more likely to purchase and switch to EVs with regard to environmental concerns associated with EVs. Hence, the following hypothesis is derived.

H4: Environmental concern towards an EV has a positive impact on the purchase intention of an EV.

2.5.5 Infrastructure Availability (IA)

The criticality of the availability of charging infrastructure is visible with the uptake of EVs and the intentions to purchase EVs. The need for the availability and affordability of charging infrastructure plays significant roles in purchasing EVs. Insufficient dedication for infrastructure development by governments result in reduced EV purchases as well as a discouragement in the private sector investment in electric charging infrastructures. Therefore, government investments and a policy in place remain critical to the realization of EV charging infrastructure.

A study reported that public charging infrastructure was an essential element of US consumers' decisions to purchase EVs [45]. In addition, another study indicates that the main factor for EV purchasing decision process was the access to public and quick charging stations [46]. Lack of charging infrastructure in the consumer's area and limited access to quick chargers were further reasons for its purchase rejection [47].

Therefore, since easy access and availability of EV charging infrastructure will result in more purchases of EVs, all the stakeholders will benefit from ending the challenge of access and affordability. These include the consumers who will have easy access to the charging infrastructure, the companies that roll out the charging infrastructure and the suppliers of electricity.

Therefore, consumers will be more likely to purchase and switch to EVs with better availability of infrastructure associated with EVs. Hence, the following hypothesis is derived.

H5: Infrastructure availability towards an EV has a positive impact on the purchase intention of an EV.

2.5.6 Perceived Risk (PR)

A moderating effect occurs when a variable changes the connection or nature of the relationship between predictor and criterion variables. Perceived risk factors significantly impact the purchase intention of automobiles, establishing a connection between perceived risk and purchase intention. Given that automobiles are substantial investments, consumers typically expect them to endure over time. Consequently, making a wrong decision can lead to uncertainty, resulting in performance dissatisfaction, compromised self-image, and insecurity, thereby exposing consumers to financial, physical, social, and performance risks [48].

A study discovered a negative correlation between risk perceptions and the components of the Theory of Planned Behaviour, which include behavioural intentions, attitudes, and self-efficacy [49]. Another study found that higher risk perceptions do not necessarily lead to reduced behavioural intentions [50].

Empirical evidence in the literature has demonstrated that psychological, physical, functional, financial, time, and social risks are determinants of perceived risk in automobile purchases. But there is a lack of clarity regarding the impact of perceived risk on EV purchase intention, particularly among current conventional fuel vehicle owners considering a switch to EVs.
Therefore, following hypotheses were derived.

H6: Perceived risk moderates the effect of vehicle characteristics on the purchase intention of an EV.

H7: Perceived risk moderates the effect of economic benefit on the purchase intention of an EV.

H8: Perceived risk moderates the effect of social influence on the purchase intention of an EV.

H9: Perceived risk moderates the effect of environmental concern on the purchase intention of an EV.

H10: Perceived risk moderates the effect of infrastructure availability on the purchase intention of an EV.

2.6 Conceptual Framework

As per the above hypotheses, this study has proposed the model shown in Figure 1 for measuring the factors that influence the purchase intention of EVs.

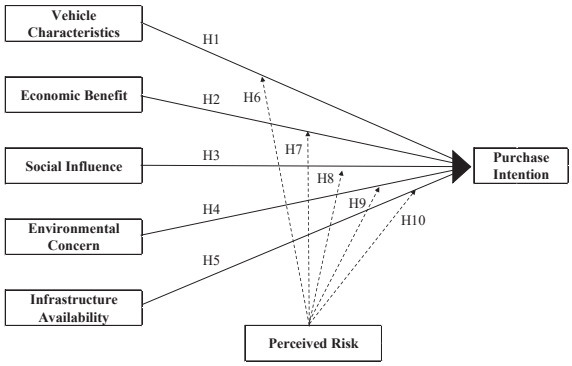

Figure 1 - Conceptual Framework

3. Methodology

3.1 Research Design

This study includes a deductive approach and involves testing the effectiveness of a model. Therefore, it is best suited to conduct this research as a quantitative analysis. Here, testing is done to understand the correlation between five different EV-related factors including vehicle characteristics, economic benefit, social influence, environmental concern and infrastructure availability and the EV purchase intention. The primary objective of the quantitative research design is to quantify data on participants' perceptions, attitudes and intentions towards EV adoption, in addition to their perception of perceived risk concerning EV adoption. The research, thus, seeks to establish patterns, trends and relationships between these variables on standardized measurement scales to provide practical insights into the factors influencing consumer behaviours within EV purchase intention.

3.2 Sampling

A purposive sampling approach is utilized in this study. This approach ensures that individuals, with traits or experiences relevant to the research goals are included. Since the focus is on comprehending the views, attitudes and plans of owners of vehicles regarding adopting EVs, it is crucial to choose participants who have firsthand experience with traditional vehicles and are potential EV adopters. In this study, the term population refers to the group of interest from which a sample is chosen and to which the study's findings are intended to be applied or generalized.
The main tool for collecting data in this study was a questionnaire created using a 5-point Likert scale. The questionnaire comprised questions aimed at assessing respondents' viewpoints, attitudes and intentions concerning EV adoption as their perceptions of perceived risks associated with adoption. To ensure validity and reliability, the questionnaire underwent a test with a pilot group to assess clarity, comprehensibility and relevance. 158 responses were selected and analysed after the process of data cleaning.

3.3 Operationalization

Operationalization refers to the process of converting theoretical concepts like purchase intention and perceived risk into tangible, measurable variables that can be observed and analysed. Vehicle characteristics (VC) evaluate specific attributes of EVs. Perception of fuel efficiency (distance: energy), consideration of battery capacity and driving range, perception of saving time for maintenance and perception of smart features were the indicators used to measure the effect of VC. Economic benefit (EB) is the perceived financial advantage associated with owning and using an EV. Perception of potential savings on fuel costs, awareness of government incentives or tax benefits,

perception of the maintenance-related cost-effectiveness and perception of the reasonable value were the indicators used to measure the effect of EC. Social influence (SI) refers to the impact of social factors on the decision to purchase an EV. Opinions of friends and family on switching to EVs, the influence of friends and family who own EVs, perception of societal norms and expectations regarding EV ownership, the influence of influential people on the decision to purchase an EV and influence of social media on the decision to purchase an EV were the indicators used to measure the effect of SI. Environmental concern (EC) refers to the participants' level of concern regarding environmental issues related to conventional fuel vehicles and the benefits resulted from EVs. Level of concern about air pollution caused by traditional cars, level of concern about the lower effect of EVs on climate change, recognition of the impact of traditional cars on wildlife and ecosystems and attitude toward personal responsibility for environmental conservation were the indicators used to measure the effect of EC. Infrastructure availability (IA) indicates the perceived accessibility and convenience of charging infrastructure and service organizations. Perception of the accessibility of EV charging stations in the local area, ease of finding EV charging stations, the reliability of EV charging stations and the competency of EV service organizations were the indicators used to measure the effect of IA. Perceived risk (PR) indicates the perception of risk associated with EV adoption. Concern of malfunctioning in critical EV equipment and concern about low reliability of EV batteries (PRVC), concern of low resale value of EVs and concern of doubtful government incentives towards EVs (PREB), concern about favourability towards EVs from close circle and concern about comments for EVs from friends (PRSI), concern about EV battery recyclability and concern on EV battery manufacturing process (PREC), concern of reliability of EV charging stations and concern of competency of EV service organizations (PRIA) were the indicators used to measure the effect of PR. Purchase intention (PI) refers to intentions and likelihood of purchasing an EV as a replacement for a conventional vehicle. Perception of driving an EV over a conventional fuel vehicle, likelihood of purchasing an EV in the near future, recommendation to others about purchasing an EV and probability of purchasing an EV as the next vehicle were the indicators used to measure the effect of PI.

4. Data Analysis

The data analysis utilized SmartPLS4, a widely recognized software tool for conducting structural equation modelling (SEM) and partial least squares (PLS) analysis. To explore the relationships between variables, the collected data was imported into SmartPLS4 and analysed using path modelling techniques. Before the analysis, data was rigorously cleaned to ensure its accuracy and reliability. This process involved identifying and addressing outliers and inconsistencies within the collected responses. 158 responses were selected after cleaning the data.

4.1 Measurement Model Analysis

The measurement model serves as the foundation upon which the structural model is built, playing a pivotal role in assessing the reliability and validity of the latent constructs under investigation. Through a rigorous assessment of the measurement model, the accuracy and integrity of the research findings were ensured, thereby laying the groundwork for robust structural equation modelling (SEM) analysis.

4.1.1 Construct reliability

The concept of reliability relates to the steadiness and uniformity of a measuring tool which signifies the consistency of the data. Cronbach's Alpha and Composite Reliability are two standard gauges of reliability. Both metrics must surpass 0.700 to validate the reliability of the data. The results for Cronbach's Alpha and Composite Reliability are outlined in Table 1. Cronbach's Alpha ranges from 0.739 to 0.954, while Composite Reliability ranges from 0.831 to 0.978. Both reliability measures exceed the necessary threshold of 0.700, affirming the establishment of reliability for the study.

Table 1 - Construct Reliability

	Cronbach's Alpha	Composite Reliability
VC	0.739	0.831
EB	0.873	0.897
SI	0.839	0.888
EC	0.751	0.833
IA	0.869	0.855
PRVC	0.926	0.962
PREB	0.954	0.978
PRSI	0.840	0.901
PREC	0.950	0.975
PRIA	0.953	0.976
PI	0.744	0.835

4.1.2 Construct Validity

Validity refers to the extent to which a scale accurately measures the intended concept. This is assessed by two measures, namely, Convergent and Discriminant Validity. Convergent validity pertains to how closely related different methods or measures of the same concept are in producing similar or converging outcomes. To confirm convergent validity, researchers usually seek strong correlations between different signs of a concept. The Average Variance Extracted (AVE) is calculated as the average of the squared loadings of each sign linked to a concept. Convergent validity is established when the Average Variance Extracted (AVE) is greater than 0.50. Table 2 shows the convergent validity for the study and indicates that validity is established for the study.

Table 2 - Construct Validity

	Average Variance Extracted (AVE)
VC	0.552
EB	0.695
SI	0.665
EC	0.555
IA	0.611
PRVC	0.926
PREB	0.956
PRSI	0.820
PREC	0.951
PRIA	0.953
PI	0.567

4.1.3 Model Fit

When evaluating model fit in SmartPLS4, two important indices are utilized: Standardized Root Mean Square Residual (SRMR) and Normed Fit Index (NFI). The SRMR assesses the variance between observed and predicted covariance matrices, where values ≤ 0.05 are considered indicative of a good fit, while values ranging from 0.05 to 0.09 suggest an acceptable fit. The NFI evaluates the overall fit of the model by comparing the discrepancy between the estimated model and a null model, with values closer to 1 (≥ 0.90) indicating a better fit. Table 3 indicates that model fit has been established for the study.

Table 3 - Model Fit

	Saturated model	Estimated model
SRMR	0.070	0.070
NFI	0.932	0.932

4.2 Structural Model Analysis

Assessing the structural path model will evaluate path coefficients and their statistical significance. Structural model analysis through SmartPLS4 using the powerful technique of bootstrapping provides a comprehensive analysis of the structural model to validate study findings.

Table 4 depicts the results obtained for assessment of direct relationships. Three common statistical criteria were used to assess relationships between variables which are Beta (β) coefficient, T statistics, and P values. These criteria collectively provided insight into the significance and strength of relationships between variables in a statistical analysis.

Table 4 - Assessment of Direct Relationships

Hypothesis	Relationship	Decision
H1	VC -> PI	Supported
H2	EB -> PI	Supported
H3	SI -> PI	Not supported
H4	EC -> PI	Supported
H5	IA -> PI	Supported

The results reveal that vehicle characteristics, economic benefit, environmental concern and infrastructure availability of an EV have a positive significant impact on the purchase intention of an EV.

Table 5 depicts the results obtained for assessment of moderating relationships. Three common statistical criteria were used to assess relationships between variables which are Beta (β) coefficient, T statistics, and P values. These criteria collectively provided insight into the significance and strength of relationships between variables in a statistical analysis.

Table 5 - Assessment of Moderating Relationships

Hypothesis	Relationship	Decision
H6	PREC x EC -> PI	Supported
H7	PREB x EB -> PI	Supported
H8	PRSI x SI -> PI	Not supported
H9	PREC x EC -> PI	Not supported
H10	PRIA x IA -> PI	Not supported

The results reveal that the perceived risk significantly moderates (weakens) the effect of vehicle characteristics and economic benefit on the purchase intention of an EV.

5. Discussion

5.1 Overview

The study aimed to uncover the factors influencing consumer purchase intention of EVs among current conventional fuel vehicle owners in Sri Lanka and to assess the impact of perceived risk on EV adoption. Grounded in existing theoretical frameworks and supported

by prior literature, the research aimed to fill gaps in understanding. Using empirical data, the study developed hypotheses based on the theory of planned behaviour, exploring the relationship between purchasing factors and EV purchase intention. To analyse these relationships and effects, the study utilized SmartPLS4, a tool based on Partial Least Squares (PLS)-Structural Equation Modelling.

The first objective of this research was to identify the key factors that influence the consumer purchase intention of EVs in the context of current conventional fuel vehicle owners switching to EVs. Through data analysis, it was found that vehicle characteristics, economic benefits, environmental concerns and infrastructure availability towards an EV have a positive impact on the purchase intention of an EV. Furthermore, it was found that social influence toward an EV does not impact the purchase intention of an EV.

Vehicle characteristics is a factor that positively influences purchase intention. Consumers prioritize factors such as higher fuel efficiency, good battery capacity, higher driving range, and less attention to maintenance when considering EVs over conventional vehicles.

Economic benefit, which include cost savings, lower maintenance requirements, potential government incentives, and better value for money, also positively influences purchase intention.

Environmental concern is another factor that positively influences purchase intention. Consumers are aware of air pollution, carbon emissions, climate change, and the impact on wildlife and ecosystems of fossil fuel combustion. They also understand that using EVs will make them environmentally responsible people. Ethical considerations and a desire to contribute to environmental conservation drive consumers' preference for EVs with lower carbon footprints.

Infrastructure availability is another key factor influencing purchase intention. Charging stations that are easily accessible and available help alleviate range anxiety, thus increasing the practicality of owning an EV for consumers. An extensive charging infrastructure demonstrates dedication from both governments and businesses, providing consumers with confidence in the sustainability of their EV investment in the long run. This accessibility and convenience influence consumer decisions, motivating purchases of EVs.

The second objective of this research was to identify the moderating effects of perceived risk on the relationships between the influencing factors and the purchase intention. Through data analysis, it was identified that perceived risk weakens the effect of vehicle characteristics and economic benefits on the purchase intention of an EV. Furthermore, the findings show that the perceived risk involved with vehicle characteristics, social influence, and environmental concern does not impact or weaken the purchase intention of EVs.

The uncertainty of resale value, and uncertainty of government incentives or tax benefits are significant barriers to the adoption of EVs. To make EVs more accessible, persistent financial incentives, subsidies, and tax breaks can be introduced.

Infrastructure availability also moderates the relationship between influencing factors and EV purchase intention. Consumers are concerned about the reliability of charging infrastructure and the competency of service organizations, which can hinder EV usability and convenience. Addressing these issues is crucial for promoting EV uptake.

One of the primary limitations of this research was its focus on the context of Western Province of Sri Lanka. While this provides valuable insights into EV adoption dynamics within a specific geographic and socio-economic context, the findings may not be directly generalizable to other regions of Sri Lanka or world with different infrastructural, cultural, and regulatory environments. Future research could explore cross-regional or cross-country comparisons to identify similarities and differences in EV adoption drivers and effects of perceived risk across diverse contexts.

The utilization of quantitative survey-based methodologies in this study may introduce limitations associated with self-reporting biases, social desirability effects, and response validity. To address these potential limitations, future research endeavours could adopt mixed-method approaches, integrating qualitative interviews, focus groups, and observational research. By complementing survey findings with qualitative insights, researchers can gain a deeper and more nuanced understanding of consumer behaviours and decision-making processes pertaining to EV adoption.

5.2 Recommendations

The research findings hold several significant recommendations for various stakeholders involved in the automotive industry, government agencies, and environmental organizations.

Producers and promoters of EVs have the opportunity to utilize the results of this study to customize their marketing tactics and range of products. Emphasizing the financial advantages, environmental benefits, and technological aspects of EVs may increase their attractiveness to customers. Furthermore, allocating resources towards research and development to tackle perceived drawbacks related to economic benefits and infrastructure accessibility can assist in overcoming obstacles to adoption and boosting consumer trust in EVs.

Government entities and private financiers involved in infrastructure development can utilize these research results to inform their strategic and financial choices. Acknowledging the significance of charging infrastructure accessibility in influencing EV adoption, decision-makers can give precedence to the expansion of charging grids, especially in urban settings and along key transportation corridors. This entails funding rapid-charging stations and offering incentives for the installation of residential charging units to alleviate concerns about driving range among prospective EV purchasers.

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