Factors Influencing Purchase Intention To Buy Electric Motorcycles In Indonesia With Attitude As A Mediation Variable

Indro Pramono[1*], Maya Ariyanti[2], Dedi Iskamto[3]

[1-3]School of Economics & Business, Telkom University, Indonesia
Coresponden author:
Email: Indropramono244@gmail.com

Abstract
The adoption of electric motorcycles in Indonesia requires further study. Electric vehicles (EVs) are widely regarded as the most suitable green technology for application in the automotive sector, offering a means to reduce energy consumption and CO2 emissions. This study develops a model of electric motorcycle adoption intention based on the Theory of Planned Behavior (TPB). The objective of this research is to identify the factors influencing consumer intentions to adopt electric motorcycles. Data were collected through a questionnaire distributed to 390 respondents. The research hypotheses were tested using Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings reveal that environmental concerns, perceived economic benefits, social influence, and brand awareness have a significant positive impact on consumer attitudes toward electric motorcycles. However, government policies do not significantly affect consumer attitudes or interest in purchasing electric motorcycles in Indonesia. Additionally, perceived risk demonstrates a negative correlation with attitudes, indicating that concerns such as limited range, inadequate charging infrastructure, and battery life issues negatively affect consumer perceptions. Meanwhile, consumer attitudes were found to have a significant positive influence on purchase intentions. These findings provide valuable insights for both the government and electric motorcycle manufacturers. Understanding consumer behavior is essential for designing effective strategies to promote electric motorcycle adoption in Indonesia.

Keywords *: Electric Vehicle, Electric Motorcycle, Attitude, Purchase Intention and TPB.*

1. INTRODUCTION

The transportation sector, which is estimated to have 1.2 billion vehicles worldwide, contributes 23% of global greenhouse gas emissions. This number is expected to continue growing, reaching 2 billion vehicles by 2040 [[1]]. The majority of vehicles on the road use internal combustion engines that produce exhaust emissions. The use of these vehicles contributes to air pollution and greenhouse gas emissions, which in turn causes an increase in the Earth's temperature. This rise in temperature, driven by global warming from greenhouse gases, has drawn the attention of world leaders and was addressed in the Paris Climate Agreement of 2015. The agreement stipulates that the parties involved aim to limit the increase in the Earth's average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the increase further to 1.5°C (Article 2) [[2]]. The efforts of the Paris Agreement are centered around the Net Zero Emissions (NZE) program, which requires industrialized and developed countries to achieve net zero emissions by 2050 [[3]]. Meanwhile, the transportation sector is the second-largest consumer of energy (fuel), accounting for approximately 25% of total energy consumption [[4]]. Electric vehicles (EVs) have emerged as an environmentally friendly innovation, expected to provide a sustainable solution to global challenges such as energy scarcity and environmental pollution. Based on their energy source and propulsion system, Electric vehicles classified into three types: Pure Electric Vehicles (PEVs), also known as Battery Electric Vehicles (BEVs); Hybrid Electric Vehicles (HEVs); and Fuel Cell Electric Vehicles (FCEVs) [[5]]. According to statistical data from the International Energy Agency (IEA) in 2021, over 4 million electric vehicles were sold during the 2020-2021 period, reflecting a 200% increase in sales compared to 2019-2020 [[6]]. China ranks first, accounting for 50% of the global electric

vehicle population. However, the number of two-wheeled electric vehicles is not as high as that of electric cars. According to data from the Global Electric Vehicle Outlook 2022, China had the largest number of two-wheeled electric vehicles in 2021, with approximately 9.5 million units [[6]]. This number accounts for nearly 50% of the global population of two-wheeled electric vehicles. In 2021, the number of fuel-powered vehicles in Indonesia was approximately 142 million, with motorcycles comprising 31 million of these vehicles. Compared to 2015, the number of fuel-powered vehicles increased by 35%. If this upward trend continues at the same rate as from 2015 to 2021, it is estimated that by 2060, the number of fuel-powered vehicles will reach 418 million [[7]]. Indonesia is the third-largest motorcycle market in the world, with annual motorcycle sales of approximately 8 million units [[8]]. The majority of motorcycle sales consist of fuel-powered motorcycles. Of the total number of motorcycles, the population of electric motorcycles in Indonesia is only around 74,988 units [[9]]. The Indonesian government has set a target for one million four-wheeled electric vehicles (EVs) to be in operation by 2035. In 2024, the government also allocated a quota of 50,000 electric motorcycle purchase subsidies for the public [[10]]. The subsidy provides a discount of seven million rupiah on the purchase price of an electric motorcycle. Despite the government implementing various programs to support the sale of electric motorcycles, the actual number of electric motorcycle purchases in 2023 was only around 11,532 units, far short of the target of 200,000 units [[10]]. As of February 2024, there are over 50 models of electric motorcycles available in Indonesia, offered by various manufacturers. The Indonesian government has introduced several policies to support the acceleration of electric vehicle adoption, including Presidential Regulation No. 55 of 2019, which focuses on the acceleration of the Battery Electric Motor Vehicle program for road transportation, and Presidential Instruction No. 7 of 2022, which mandates the use of Battery Electric Motor Vehicles as official operational vehicles and/or personal vehicles for central and regional government agencies. Additionally, the government has implemented a subsidy of IDR 7 million for individuals purchasing electric motorcycles, while new electric cars are exempt from VAT [[11]]. Nevertheless, the sales of electric motorcycles are still far from meeting expectations. Several factors contribute to the low sales of electric motorcycles in Indonesia, one of which is the perception that the purchase price and maintenance costs are still too high for some people. According to data released by the Ministry of Transportation, as reported by the Indonesian Motorcycle Industry Association (AISI), electric motorcycle sales in Indonesia reached approximately 31,827 units by October 2022 [[12]]. Meanwhile, the government, through the Ministry of Industry, has set a target of 12 million two-wheeled and three-wheeled electric vehicles in operation by 2025. However, when we examine the data, the ratio between the target and actual sales realization is still very low, at approximately 0.3%[[13]]. In terms of sales, the target for electric motorcycle sales is still far from being met. The government's target is 200,000 units, but as of October 2023, only 15,000 units have been sold. This represents just 7.5% of the target [[14]]. The number of electric motorcycles in Indonesia is still far from the government's target. According to the Minister of Energy and Mineral Resources, there were 74,988 electric motorcycles in circulation in Indonesia as of October 2023 [[15]]. Meanwhile, the Indonesian government expects the population of electric motorcycles to reach 5 million new units and 6 million converted units by 2025. Although the government has implemented a series of policies to encourage the adoption of electric motorcycles, their sales remain relatively low. This study aims to identify the factors influencing people's interest in purchasing electric motorcycles in Indonesia. The findings are expected to assist stakeholders in formulating effective policies to increase public interest in buying electric motorcycles. This research is planned to be conducted in Indonesia, one of the more developed countries in the world. The rationale for choosing Indonesia as the research location is that the majority of Indonesians rely on two-wheeled vehicles for their daily activities. The focus of this

study is on electric motorcycles, as the majority of Indonesians currently use conventional motorcycles for daily commuting. To better understand the factors influencing the public's interest in purchasing electric vehicles, more comprehensive research is needed to identify which factors most significantly affect Indonesian consumers' purchasing decisions. This article is structured as follows: Section 2 reviews the key research on electric vehicle adoption and critically evaluates its findings. Section 3 presents the conceptual framework of the study, and Section 4 outlines the research methodology. Section 5 presents the data analysis and conclusions, while Section 6 discusses the study's conclusions, limitations, and offers directions for future research.

II. LITERATURE REVIEW

Several studies have been conducted to understand the antecedents of the intention to adopt electric vehicles (EVs) [[16],[17],[18]]. Based on these studies, the intention to purchase an electric vehicle is influenced by two main factors: the technical aspects related to the technology adopted, and external factors associated with the product. The first factor includes aspects of the vehicle that affect consumer purchasing intentions, such as its performance, battery life, charging time, and the distance that can be traveled on a single charge. Technical aspects unrelated to the product include infrastructure readiness, as a sufficient level of infrastructure development is necessary to support the widespread adoption of electric vehicles [[17]]. The main external factors influencing purchase intention are consumer-related factors. These include consumers' environmental concerns, demographics, and perceptions of price [[17],[18]]. Finally, there are other factors unrelated to the product and customers that influence the intention to purchase an electric vehicle (EV). This category includes social influence, potential financial benefits, and government intervention [[18]]. In fact, governments can implement policies to reduce emissions and dependence on fossil fuels, thereby offering benefits for purchasing and owning electric vehicles. Various types of electric vehicles have been introduced in several countries. However, the adoption rate of electric vehicles remains quite low compared to that of fuel-powered vehicles [[19]]. Prospective buyers of electric vehicles perceive higher prices, limited range, and the time required to charge the battery as disadvantages when compared to conventional vehicles [[20]]. Many previous studies on electric vehicles have indicated that consumer adoption depends on psychological factors such as attitudes, environmental concerns, awareness, symbolism, self-identity, emotional responses, and the diffusion of innovation [[21]].Habich-Sobiegalla et al. (2018) conducted a study that developed a research framework incorporating micro-level factors, macro-level factors, and product-level factors that influence interest in using electric vehicles [[22]]. Their findings showed that micro-level factors, such as personal factors, are less important compared to macro-level and product-level factors. Macro-level factors include charging infrastructure and government policy incentives, while product-level factors encompass battery life, purchase cost, driving range, and charging time. Higueras-Castillo et al. (2021) examined product factors such as minimum range, charging time, noise level, and acceleration, as well as contextual factors such as price, perceived benefits, incentives, and infrastructure. Their findings indicated that driving range, government incentives, and reliability were the most influential predictors of purchase intention [[23]]. The factors influencing purchase intention can be divided into three categories: product-related factors, non-product-related factors, and customer-related factors. The first product-related factor that affects the purchase intention of electric motorcycles is the performance guaranteed by the product itself. This factor is crucial for potential customers as it pertains to how the product performs on the road. It is related to various aspects, such as the speed and driving range of electric motorcycles. Customers are more likely to feel safer and more comfortable with products that can ensure reliable performance [[24]]. Other factors related to the product include its price and quality. The price is considered more favorable when it is lower

and comparable to the quality offered, while the quality must be high, as motorcycles with good quality tend to have a longer lifespan [[26]]. Consumer perceptions and characteristics have been shown to have a significant impact. The first case involves perceived value, which is positively influenced by perceived quality and negatively influenced by perceived risk, as well as perceived benefits [[25]]. In addition, consumer perceptions of the environmental benefits of electric motorcycles also influence their purchase intentions. On the other hand, consumer characteristics such as knowledge of electric motorcycles, income, and education level were found to be key determinants of adoption intention [[26]]. Similar to the findings for electric vehicles, non-product factors that significantly influenced adoption intentions included the infrastructure system. The development of charging stations, repair services, and battery recycling systems were key drivers of the intention to purchase electric motorcycles. Additionally, sales promotions and advertising played a crucial role in influencing consumer behavior. Effective sales promotions and advertising can help reach potential buyers, create more attractive offers, and ultimately influence people's willingness to purchase electric motorcycles [[24]]. In previous research on purchase intention in the electric vehicle market, particularly concerning electric motorcycles, there has been a clear focus on both technical factors related to the product, such as emission reduction and range coverage, and external factors, such as government policies and environmental concerns. External factors also include customer demographics, mindsets, and other forces that influence electric vehicle purchase intentions. Several studies have shown that various factors affect consumers' interest in purchasing electric vehicles. Higueras-Castillo et al. (2020) noted that environmental concern, perceived economic benefits, attitude, charging infrastructure, and government incentives all impact consumer purchase intentions [[23]]. Asadi et al. (2020) conducted a study in Malaysia and found that perceived value, attitude, perceived consumer efficacy, subjective norms, and awareness of outcomes significantly affect consumer adoption intentions [[28]]. Lashari (2021) conducted a similar study in South Korea and showed that Attitudes and Perceptions regarding the Environment and Economic Benefits of using electric vehicles significantly affect purchase intention towards electric vehicles [[29]]. Research on purchase intentions related to electric motorcycles is still limited. In Asia, people tend to prefer motorcycles over cars due to their relatively low prices, fuel efficiency, and inexpensive operational costs [[31]]. Mamun et al (2020) conducted a study related to consumer interest in purchasing electric motorcycles. The results of their study showed that Environmental Concern, Subjective Norms, Attitudes, Perceived Behavioral Control, and Monetary Benefits had a positive and significant influence on interest towards electric motorcycles [[32]]. Utami et al (2020) conducted a study related to electric motorcycles in Indonesia and showed that Availability of charging facilities at work, Availability of charging facilities at home, purchase incentive policies, and charging price discounts influenced interest in adopting electric motorcycles in Indonesia [[33]]. Will et al (2021) conducted a similar study and found that driving experience, ease of parking, and low maintenance costs influenced the public's interest in purchasing electric motorcycles [[34]].

2. Conceptual Framework and Research Hypotheses

The research framework for this study is based on a modified Theory of Planned Behavior. While most previous studies have focused solely on consumer intention to purchase electric cars, this study investigates consumer intention to purchase electric motorcycles. The variables used in developing the framework were derived from a literature review on consumer adoption of electric vehicles. In this study, Environmental Concern, Perceived Economic Benefit, Social Influence, Perceived Risk, Government Policy, Brand Awareness, and Attitude are identified as factors influencing the intention to purchase electric motorcycles. The conceptual model is presented in the figure below.

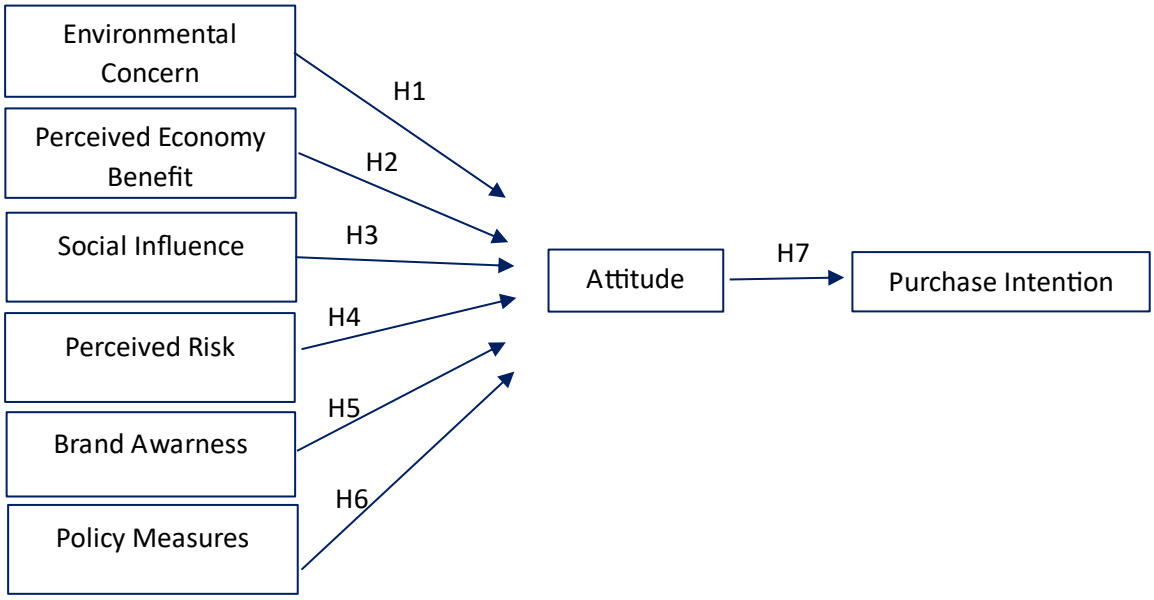

Fig 1. Research Framework

2.1 Environmental Concern

The Environmental concern parameter is included in the model to determine its influence on attitudes in purchasing intentions of electric vehicles. According to Bonisoli et al (2024), Electric vehicles (EV) are vehicle technologies that can help reduce greenhouse gas emissions in the transportation sector as well as local emissions [**Error! Reference source not found.**]

H1 Environmental concern has a significant positive effect on consumer attitudes in purchasing electric motorcycles

2.2 Perceived Economic Benefit / Perceived Economic Benefits

The purchase price parameter is also included in the model to assess its effect on attitudes toward purchasing intentions for electric vehicles. Choo et al. (2017) have evaluated that price is one of the key factors influencing prospective buyers' decisions when planning to purchase an EV [[35]]. When compared to fuel-powered vehicles, electric vehicles are priced higher, which can impact individual purchasing intentions. Mustaghfirin, M., & Ariyanti, M. (2022) also stated that price is a significant factor that positively affects purchase intention [[36]]

H2 Perceived Economic Benefit has a significant positive effect on consumer attitudes in purchasing electric motorcycles

2.3 Social Influence

Tu and Yang's (2019) study showed that subjective norms have a significant impact on electric vehicle purchasing decisions [[38]]. Khazaei and Tareq's (2021) study in Malaysia showed that social approval is one of the important factors in the adoption of battery electric vehicles by consumers [[39]]. Therefore, social influence can impact individuals' attitudes and intentions towards electric two-wheelers, as this is a new technology.

H3 Social influence has a significant positive effect on consumer attitudes towards electric motors

2.4 Perceived risk

Perceived risks include limited charging facilities, limited range, and a short battery lifespan. The lack of Charging infrastructure is often considered a significant barrier to purchasing electric vehicles. Jain et al (2022) study showed perceived risk negatively affects adoption intention of EVs in India [**Error! Reference source not found.**]. Previous research findings suggest that the availability of charging infrastructure will increase EV purchase intentions. Hoen at Yang

(2020) stated that perceived risks in using electric motorcycles include low safety, short battery life, and long charging times, which are some of the perceived barriers to using electric motorcycles [[40]]

H4 Perceived risk has a negative effect on consumer attitudes towards electric motorcycles.

2.5 Brand Awareness

Ye et al (2025) stated that brand awareness like brand country of origin and brand novelty impact consumers' purchase intentions and highlight the heterogeneity of preferences related to brand country of origin and brand novelty [[58]]. Wang et al. (2018) conducted a study in China which showed that several factors such as technical performance, advertising, after-sales service, purchasing channels and brand effects affect EV acceptance [**Error! Reference source not found.**1]. Jabbari et al. (2017) stated that consumer dissatisfaction with dealer experience, unavailability of sample models at dealers and limited model variety are the main reasons for refusing to purchase EVs [[41]]. Fitriany, N., & Ariyanti, M. (2024) stated that element of Brand Awareness like Sales Promotion and Product Variety are also ways to increase Public Purchase Interest [[43]]

H5 Brand Awareness has a significant positive effect on consumer attitudes in buying motorcycles

2.6 Government Policy

Government policy parameters are included in the model to determine their effect on attitudes in purchasing intentions for electric vehicles. Higueras - Castillo et al (2020) stated that Government Incentives/Government Policies, Reliability and Milea ge affect people's purchasing interest [[23]]. Chatterjee et al (2024) also stated that Government Policy affects interest in electric vehicles [[44]].

H6 Government policy has a significant positive effect on consumer attitudes in purchasing electric motorcycles

2.7 Attitude / Attitude

Attitude parameters are included in the study to determine their effect on the intention to purchase electric vehicles. Yang et al. (2020) showed that consumer attitudes are positively related to the intention to purchase electric vehicles in China [[40]]. Khurana et al. (2019) also showed that attitudes greatly influence the adoption of electric vehicles in India. In this study, Attitude is believed to influence the intention to purchase electric vehicles [[44]]

H7 Attitude has a significant positive effect on consumer attitudes in purchasing electric motorcycles

III. RESEARCH METHOD

a. Data collection and Sample size

The sampling procedure used in this study is a non-probability sampling method. The data collected for this study is primary data, obtained through an online survey to identify the factors influencing the purchase of electric motorcycles in Indonesia. The data was gathered using a purposive sampling technique, which is a type of non-probability sampling. Identifying all potential motorcycle buyers in Indonesia would be time-consuming and costly. Therefore, a purposive sampling technique was employed to collect data from selected respondents. The questionnaire was developed by reviewing various adoption scales and metrics mentioned in the literature. It was divided into two sections. The first section contained personal information about the participants, including their name, age, gender, education, income, and occupation. The second section addressed factors such as environmental concern, perceived economic benefits, social influence, perceived risk, brand awareness, government policy, attitude, and purchase intention. A five-point Likert scale was used, where “strongly disagree” was assigned a value of

1, and "strongly agree" was assigned a value of 5. In this study, the population consisted of all conventional motorcycle owners and people who do not own a motorcycle in Indonesia. Conventional motorcycle users are familiar with the functions of motorcycles and understand what is important when using them on the road. Meanwhile, individuals who do not own a motorcycle were chosen because they represent potential users of electric motorcycles. The population of motorcycle users in Indonesia in 2023 was approximately 36 million (BPS). A sample size that is too large could make it difficult to achieve an appropriate goodness of fit. This study follows the sampling guidelines suggested by Hair, which is a widely recognized method. According to Hair et al. (2021), selecting an excessively large sample can make it challenging to obtain a suitable model, and a good sample size is recommended to be around 100-200 respondents[[46]]. According to Hair et al. (2021), the number of respondents can be determined using the formula: number of indicators + number of latent variables × 5 to 10 times. Therefore, the minimum sample size for this study is 350 respondents. However, having more respondents than the minimum requirement is even better.

b. Development of the questionnaire

This research framework involves five variables that directly influence attitudes and intentions to purchase electric motorcycles. The variables used in this study are environmental concerns, perceived economic benefits, social influence, perceived risk, attitudes, and purchase intentions. All measures for these six constructs were developed by referring to the item scales used by previous researchers to measure electric motorcycle purchase intentions. All variables are measured using a Likert scale, where "strongly disagree" is assigned a value of 1 and "strongly agree" is assigned a value of 5.

c. Data Analysis method

The data analysis method used in this study is Partial Least Squares Structural Equation Modeling (PLS-SEM), utilizing Smart PLS software. This method is widely used in social science research for Structural Equation Modeling. The conceptual model needs to be tested to determine whether the latent variables, or constructs, have been properly measured through the items and to test the relationships, or paths, between constructs. The procedure for testing the inner and outer models is called the two-step approach. The first step involves evaluating the measurement model (or outer model), and the second step involves assessing the inner model, which tests the relationships between constructs using multiple regression. PLS-SEM is a type of Structural Equation Modeling that employs a causal prediction approach. This approach focuses on prediction when estimating statistical models with structures designed to provide causal explanations. PLS-SEM is now widely accepted across many social science disciplines, including marketing management. PLS-SEM is run using Smart PLS software. Although PLS-SEM is commonly applied with smaller sample sizes, Hair also notes that the appropriateness of using a smaller sample size depends on the nature of the population.

IV. DATA ANALYSIS AND INFERENCE

a. Respondent Profile

The data collected in this study were obtained from an online questionnaire designed to identify the factors influencing the purchase of electric motorcycles in Indonesia. A total of 450 respondents completed the questionnaire between August 26, 2024, and October 19, 2024. Of these, 390 respondents were deemed valid, representing 86% of the total. The table below presents the profile of the respondents who completed the questionnaire.

Table Respondent's Profile

Demographic Attributes	Frequency	Percentage

Gender	Male	218	56%
	Female	172	44%
Age	<20	79	19%
	21-30	145	35%
	31-40	133	32%
	41-50	33	8%
	>50	21	5%
Occupation	Student	109	28%
	Government Job / state-owned company employee	126	32%
	Private Employee	85	22%
	Entrepreneur	25	6%
	Retired	3	1%
	Housewife	11	3%
	Unemployment	9	2%
	other	22	6%
Educational Qualification	Senior High School	137	35%
	Diploma	47	12%
	Bachelor	180	46%
	Post Graduate	26	7%
Monthly Family Income	<Rp 5.000.000,00	195	50%
	Rp 5.000.000,00 - Rp 10.000.000,00	78	20%
	Rp 10.000.000,00 - Rp 15.000.000,00	37	9%
	>Rp 15.000.000,00	80	21%

b. Assessment of Measurement Model (Outer Model)

Convergent Validity and Reliability

Convergent validity assesses whether a construct is correlated with related variables and not with unrelated constructs [[49]]. According to Hair et al. (2021) [[46]], the factor loading of each item should ideally be above 0.5 and should be related to its respective latent construct variables. A loading above 0.708 is recommended, as this indicates that more than 50 percent of the indicator variance is explained by the construct, providing an acceptable level of item reliability [[49]]. The convergent validity of the construct is assessed by examining the Average Variance Extracted (AVE) and Composite Reliability (CR) values. Both Cronbach's alpha and Composite Reliability (CR) values should exceed the threshold of 0.70 [[49]]. The values for Cronbach's alpha, AVE, and CR are shown in the table below.

Variable	Indikator	Outer Loading (> 0,5)	Average variance extracted (AVE)	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)
Environment Concern	**EC1**	0.834	0,622	0,696	0.701	0.831
	EC2	0.786				
	EC3	0.744				
Perceived Monetary Benefit	**PMB1**	0.818	0.587	0,764	0.768	0.85
	PMB2	0.707				
	PMB3	0.746				
	PMB4	0.788				
Social Influence	**SI1**	0.845	0,737	0,822	0.822	0.894

	SI2	0.884				
	SI3	0.846				
Perceived Risk	**PR1**	0.79	0,578	0,76	0.777	0.845
	PR2	0.818				
	PR3	0.715				
	PR4	0.712				
Brand Awareness	**BA1**	0.793	0,699	0,892	0.892	0.921
	BA2	0.87				
	BA3	0.845				
	BA4	0.862				
	BA5	0.807				
Policy Measures	**PM1**	0.854	0,74	0,825	0.829	0.895
	PM2	0.891				
	PM3	0.835				
Attitude	**ATT1**	0.834	0,753	0,918	0.919	0.939
	ATT2	0.888				
	ATT3	0.893				
	ATT4	0.859				
	ATT5	0.865				
Purchase Intention	**PUIN1**	0.818	0,728	0,813	0.822	0.889
	PUIN2	0.9				
	PUIN3	0.84				

i. Discriminant validity

Discriminant validity is part of Construct validity. Discriminant validity explains how one latent variable differentiates from other latent variables [[50]]. Discriminant validity is evaluated with the help of Fornel and Larcker criteria [[51]]

Variabel	***EC***	***PMB***	***SI***	***PR***	***BA***	***PM***	***ATT***	***PUIN***
EC	0,789							
PMB	0,579	0,766						
SI	0,55	0,622	0,859					
PR	0,395	0,391	0,355	0,76				
BA	0,409	0,531	0,547	0,28	0,836			
PM	0,25	0,344	0,396	0,074	0,423	0,86		
ATT	0,642	0,685	0,683	0,345	0,6	0,367	0,868	
PUIN	0,506	0,636	0,684	0,21	0,651	0,381	0,751	0,853

c. Inner Structure Model Analysis

Inner model testing is a structural model used to predict the relationships between variables. During this testing phase, several tools are used, including the R-square value and the t-statistic test. The t-statistic test parameters are derived using the bootstrapping method. The R-square value measures the proportion of variation in the dependent variable explained by the independent variables. A higher R-square value indicates a better prediction model. An R-square value is considered strong if it is 0.75 or higher, moderate if it is 0.50, and weak if it is 0.25 or lower.

	R-square	R-square adjusted
Attitude	0.652	0.647
Purchase Intention	0.565	0.563

Hyphothesis	Variable	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Keterangan
H1	**EC -> ATT**	0.265	0.264	0.041	6.499	0	**Accepted**
H2	**PMB -> ATT**	0.257	0.256	0.045	5.743	0	**Accepted**
H3	**SI-> ATT**	0.259	0.258	0.052	4.946	0	**Accepted**
H4	**PR -> ATT**	-0.012	-0.008	0.034	0.348	0.728	Rejected
H5	**BA -> ATT**	0.208	0.208	0.053	3.909	0	**Accepted**
H6	**PM -> ATT**	0.022	0.024	0.036	0.61	0.542	Rejected
H7	**ATT -> PI**	0.751	0.752	0.026	28.89	0	**Accepted**

IV. RESULT AND DISCUSSION

Hypothesis 1 is accepted based on the results, the T statistic value for Environmental Concern obtained a value of 6.499 > 1.65) and the p-value is 0.0 with a significance level of α = 5%. So the results of the T statistic and p-value are significant because 0.00 <0.05. it can be concluded that there is a positive and significant influence between Environmental Concern and Attitude. This shows that if more people care about the environment, their attitude towards electric motorbikes will be higher. Several big cities in Indonesia are experiencing the same problem towards environmental pollution. Electric motorbikes are expected to be a solution to reduce environmental pollution.The findings of this study are also in line with previous research conducted by Bonisoli et al (2024) [[56]]. Bonisoli et al (2024) shows environmentalism significantly influences attitudes and purchase intention, indicating environmental concern's pivotal role in shaping electric motorcycles' attitudes and purchase intentions [[56]]. Similar research by Jayasingh (2021) shows that if consumers care more about the environment, their attitude towards electric two-wheeled vehicles will be higher [[48]]. Mamun et al (2020) conducted a similar study and found that Environmental Concern has a positive effect on attitudes in young people in Malaysia [[32]]. Wang et al (2016) stated that if consumers care more about the environment, their attitude towards Electric Motorcycles will be high [[52]]. Therefore, the Environmental Concern Hypothesis has a significant positive effect on consumer attitudes in purchasing electric motorcycles and can be accepted.

Hypothesis 2 is accepted based on the results, the T statistic value for Perceived Economic Benefit is 5.743> 1.65 and the p-value is 0.0 with a significance level of α=5%. So the results of the T statistic and p-value are significant because 0.00 <0.05 so it can be concluded that there is a positive and significant influence between Perceived Economic Benefit and Attitude. It indicates consumers feel electric motorcycle has more benefit than conventional motorcycle such as fuel cost and maintenance cost. The findings of this study are also supported by previous research conducted by Yang et al (2020) *[[40]]* . Yang et al (2020) stated that if consumers feel the economic benefits of the electric vehicles they buy, electric vehicles are believed to be able to reduce fuel costs and maintenance costs when compared to conventional fuel vehicles *[[40]]*. A similar study by Choo et al (2024) found positive associations between the intention to use EVs and factors such as perceived enjoyment, perceived benefit, trust, and environmental knowledge [[53]] This result is also in line with the research conducted by Jayasingh (2021) which states that

if the economic benefits felt by consumers towards electric two-wheeled vehicles are high, then their attitude towards electric two-wheeled vehicles will also be high [[48]]. Therefore, the Perceived Economic Benefit has a significant positive effect on consumer attitudes in purchasing electric motorcycles can be accepted.

Hypothesis 3 is accepted based on the results, the T statistic value for Social Influence obtained a value of 4.946> 1.65 and the p-value was 0.0 with a significance level of α = 5%. So the results of the T statistic and p-value are significant so that it can be concluded that there is a positive and significant influence between Social Influence and Attitude. It indicates social influence affected consumer's attitude towards electric motorcycle. The findings in this study are also supported by previous research conducted by Wang and Zhou (2019). Wang and Zhou (2019) showed that social approval significantly influences consumer adoption of electric motorcycles [[30]]. This is in line with the research of Khazaei and Tareq (2021) in Malaysia which showed that social approval is an important factor in the adoption of battery electric vehicles by consumers [[53]]. Research by Tu and Yang (2019) also shows that Social Influence and subjective norms have a significant impact on electric vehicle purchasing decisions [41]. Therefore, the Hypothesis of Social Influence has a significant positive effect on consumer attitudes towards electric motors can be accepted.

Hypothesis 4 is rejected based on the results, the T statistic value for Perceived Risk obtained a T statistic value of 0.348< 1.65, the original sample is negative and the p-value is 0.728 with a significance level of α = 5%. It indicates that consumers will develop a more negative attitude towards electric vehicles if the risk perception towards electric vehicles is higher. This result is different with Yang (2020) who stated that Perceived Risk has a significant negative correlation with consumer attitudes towards electric vehicles [[40]]. This result is also different with the results of research conducted by Jayasingh (2021) which states that if there are too many risks of motorcycle , then the public's attitude towards electric motorcycles will increase [[48]]. Wang (2018) also stated that perceived risk has a negative correlation with people's purchasing interest in electric motorcycles [**Error! Reference source not found.**].

Hypothesis 5 is accepted based on the results, the T statistic value for Brand Awareness obtained a T statistic value of 3.909> 1.65 and a p-value of 0.0 with a significance level of α = 5%. So the results of the T statistic and p-value are significant because 0.00 <0.05 so it can be concluded that there is a positive and significant influence between Brand Awareness and Attitude. It indicates that if motorcycle more known in society, such as much promotion and more advertisement, the consumer's attitude will be high. The more types of electric motorcycles are available in the market, the higher the public awareness will be. The findings of this study are supported by previous research conducted by Wang et al. (2018), which stated that brand awareness influences the acceptance of electric vehicles in the community. Individuals with high brand awareness of electric motorcycles tend to have a positive attitude toward them [**Error! Reference source not found.**]. This aligns with the research by Fitriany, N., and Ariyanti, M. (2024), which found that electronic service quality, sales promotion, and product variety are effective ways to increase public purchase interest [[36]]. Therefore, the hypothesis that brand awareness has a significant positive effect on consumer attitudes toward purchasing electric motorcycles is supported.

Hypothesis 6 is rejected based on the results, the T statistic value for Government Policy (Policy Measures) obtained a T statistic value of 0.026 <1.65 and a p-value of 0.542 with a significance level of α=5%. So the results of the T statistic and p-value are not significant because 0.542> 0.05 so it can be concluded that H6 is rejected. The results of this study differ from the results of the study conducted by Higueras - Castillo et al (2020) which stated that Government Incentives/Government Policies, Reliability and Mileage affect people's purchasing interest [[23]].

The findings in this study are also different from the results of previous research conducted by Chatterjee et al (2024) which stated that Government Policy affects interest in electric vehicles [[44]]. This difference in results is possible because the study conducted by Chatterjee (2024) was an incentive for electric cars [[44]]. Government incentives for electric cars may include toll discounts, access to charging infrastructure, sales tax incentives, and permission to use bus lanes. However, these incentives have not yet been extended to electric motorcycles in Indonesia.

Hypothesis 7 is accepted based on the results, the T statistic value for Attitude was obtained (28.89) > 1.65 and the p-value was 0.0 with a significance level of α = 5%. So the results of the T statistic and p-value are significant because 0.00 <0.05 so it can be concluded that there is a positive and significant influence between Attitude and Purchase Intention. The findings of this study are consistent with the results of previous research conducted by Jayasingh (2021). Jayasingh (2021) stated that consumers who have a higher attitude towards electric motorcycles to buy and use them are more willing to buy electric vehicles [[48]]. Similar research conducted by Yang (2020) stated that Attitude is the most important factor influencing interest in buying electric vehicles [[40]]. Zaremohzzabieh (2022) also stated that Attitude influences interest in purchasing electric vehicles [[55]]

V. CONCLUSION AND LIMITATION

- Conclusion

This study aims to identify the factors influencing interest in purchasing electric motorcycles in Indonesia. Several research variables are included in the proposed research model. The study adopts the Theory of Planned Behavior (TPB) framework, with the addition of several variables. The results, analyzed using Smart PLS, show that variables such as Environmental Concern, Perceived Economic Benefit, Social Influence, and Brand Awareness have a significant positive effect on people's attitudes toward buying electric motorcycles. These findings align with the results of previous studies. However, Perceived Risk demonstrates a negative correlation, indicating that people perceive risks associated with electric motorcycle technology, including limited range, a lack of charging stations, and restricted battery life. Electric motorcycle technology in Indonesia is still relatively new compared to conventional motorcycles. The majority of Indonesians rely on conventional motorcycles for daily activities, emphasizing the need for guarantees of convenience and safety to encourage the transition to electric motorcycles. Electric motorcycle manufacturers are advised to enhance promotional efforts, highlighting features such as the ease of use, a straightforward charging process, and sufficient range to mitigate the perceived risks among consumers. Government policy does not have a significant effect on people's attitudes toward electric motorcycles in Indonesia. While the government has introduced policies such as purchasing subsidies and tax cuts, these measures are not perceived by the public as significant factors influencing their interest in purchasing electric motorcycles. The government should consider alternative, more effective strategies to ensure subsidy policies are better targeted and impactful. Attitude has a significant positive effect on public interest in purchasing electric motorcycles. This indicates that individuals with a positive attitude toward electric motorcycles are more likely to express interest in purchasing them. An important contribution of this study is the inclusion of Government Policy and Brand Awareness variables. The Government Policy variable, typically used in electric car research, is particularly relevant in the context of Indonesia, where motorcycles are the primary mode of transportation for many. The Brand Awareness variable was included to examine how product variations in electric motorcycles influence interest. The growth of electric motorcycle manufacturers in Indonesia has been promising, as evidenced by the availability of more than 50 different types of electric motorcycles on the market.

a. Limitations and Further studies

The limitation of this study may indicate some future research dimensions;

1. This research only uses six variables based on the literature review. Other variables, such as Electric Motor Performance, Consumer Knowledge of Electric Motors, and Non-Financial Benefits, were not included in this study. Future research should consider incorporating these variables to determine which ones have a greater influence on attitudes toward buying electric motorcycles.
2. The second limitation is that the majority of respondents in this study are from several large cities in Java, such as Bandung, Jakarta, and Surabaya. These respondents generally have a higher level of awareness and a greater willingness to adopt new technologies. Future research should collect data from respondents outside Java, as Indonesia is an archipelagic country with diverse regions that may have different characteristics compared to respondents in Java.
3. The third limitation is the scarcity of references specifically focused on electric motorcycles, as the number of studies on electric motorcycles is significantly smaller compared to research on electric cars. This is because electric car technology was introduced earlier. This study still combines references and variables related to both electric cars and electric motorcycles. Future research is recommended to utilize references specifically focused on electric motorcycles to better understand the factors influencing consumer interest in this technology.

REFERENCE

[1]. Singh, S., Rao, D. G., & Dixit, M. (2023). Future of Transportation-A Comparison between Internal Combustion Engine, Electric Vehicles and Fuel Cell Vehicles.

[2]. UNFCCC (20150. *The Paris Agreement* [Online]. Tersedia : https://unfccc.int/process-and-meetings/the-paris-agreement [26 Januari 2024]

[3]. Aprilianto, R. A., & Ariefianto, R. M. (2021). Peluang dan tantangan menuju net zero emission (NZE) menggunakan variable renewable energy (VRE) pada sistem ketenagalistrikan di Indonesia. J. Paradig, 2(2), 1-13.

[4]. U.S. Energy Information Administration. (2023). *International Energy Outlook 2023* [online] Tersedia: https://www.eia.gov/outlooks/ieo/pdf/ IEO2023_Narrative.pdf. [diakses 18 Desember 2023]

[5]. Chan, C. C., & Chau, K. T. (2001). *Modern electric vehicle technology* (Vol. 47). Monographs in Electrical and E.

[6]. IEA. (2022) Global EV Outlook 2022 International Energy Agency: Paris, France

[7]. Badan Pusat Statistik. *Jumlah Kendaraan Bermotor di Indonesia*.[Online]. Tersedia : https://www.bps.go.id/indicator/17/57/1/jumlah-kendaraan-bermotor.html. [diakses 18 Desember 2023]

[8]. MCD Team. (2024). Indonesia 2024. *Two-Wheeler Market Starts Slow (-3.9%) While Yadea Inaugurate Operations.* [online]. Tersedia : https://www.motorcyclesdata.com/2023/10/21/indonesia-motorcycles/ [24 April 2024]

[9]. CNN Indonesia (2024). *Popularsi Motor Listrik di Indonesia nyaris 75 ribu unit* [Online]. Tersedia : https://www.cnnindonesia.com/otomotif/ 20240126131720-603-1054724/popularsi-motor-listrik-di-indonesia-nyaris-75-ribu-unit. [26 Januari 2024]

[10]. CNN Indonesia (2024). *Pemain Bertambah, kuota Subsidi Motor Listrik 2024 malah turun.* [Online] Tersedia : https://www.cnnindonesia.com/otomotif/ 20240110094711-603-1047534/pemain-bertambah-kuota-subsidi-motor-listrik-2024-malah-turun [10 Januari 2024]

[11]. CNN Indonesia. (2023). Atur an Insentif Pabrik Kendaraan Listrik dikebut, Selesai bulan ini. [Online] Tersedia : https://www.cnnindonesia.com/otomotif/20231011085639-603-1009723/atur an-insentif-pabrik-kendaraan-listrik-dikebut-selesai-bulan-

ini#:~:text=Pemerintah%20memberikan%20insentif%20pajak%20untuk,10%20persen%20pada%20tahun%20ini [11 Oktober 2023]

[12]. Asosiasi Industri Sepeda Motor Indonesia. (2023). *Target Produksi 2 Juta Motor Listrik di 2025* [Online]. Tersedia : https://www.aisi.or.id/target-produksi-2-juta-motor-listrik-di-2025/ [20 Februari 2023]

[13]. Junida, A. I (2023). *Menperin: Kandungan lokal kendaraan listrik capai 80 persen pada 2030* [Online] Tersedia : https://www.antaranews.com /berita/3719184/menperin-kandungan-lokal-kendaraan-listrik-capai-80-persen-pada-2030 [9 September 2023]

[14]. Pamungkas, S. (2023). *Penjualan Motor Listrik di Tahun Ini Masih Jauh dari Target* [Online]. Tersedia : https://www.liputan6.com/otomotif/read/5467889 /penjualan-motor-listrik-di-tahun-ini-masih-jauh-dari-target?page=2 [29 November 2023]

[15]. Nainggolan, M. J. (2023) *Segini Jumlah Kendaraan Listrik yang Beredar di Indonesia, Motor Listrik Masih Dominan* [Online] Tersedia : https://www.suara.com/otomotif/2023/11/26/211000/segini-jumlah-kendaraan-listrik-yang-beredar-di-indonesia-motor-listrik-masih-dominan [26 November 2023]

[16]. Jansson, J., Nordlund, A. & Westin, K. (2017). Examining Drivers of Sustainable Consumption: The Influence of Norms and Opinion Leadership on Electric Vehicle Adoption in Sweden, Journal of Cleaner Production, vol. 154, pp.176–187.

[17]. Junquera, B., Moreno, B. & Álvarez, R. (2016). Analyzing Consumer Attitudes towards Electric Vehicle Purchasing Intentions in Spain: Technological Limitations and Vehicle Confidence, Technological Forecasting and Social Change, vol. 109, pp.6–14.

[18]. Sang, Y.-N. & Bekhet, H. A. (2015). Modelling Electric Vehicle Usage Intentions: An Empirical Study in Malaysia, Journal of Cleaner Production, vol. 92, pp.75–83.

[19]. Ye, F.; Kang, W.; Li, L.; Wang, Z. (2021) Why do consumer choose to buy electric vehicles? A paired data analysis of purchase intention configurations. Transp. Res. Part A, 147, 14–27.

[20]. Will, S.; Luger-Bazinger, C.; Schmitt, M.; Zankl, C. (2021) Towards the Future of Sustainable Mobility: Results from a European Survey on (Electric) Powered-Two Wheelers. Sustainability, 13, 7151.

[21]. Rezvani, Z.; Jansson, J.; Bodin, J. (2015) Advances in consumer electric vehicle adoption research: A review and research agenda. Transp. Res. Part D: Transp. Environ., 34, 122–136.

[22]. Habich-Sobiegalla, S.; Kostka, G.; Anzinger, N. (2018) Electric vehicle purchase intentions of Chinese, Russian and Brazilian citizens: An international comparative study. *J. Clean. Prod*, 205, 188–200.

[23]. Higueras-Castillo, E.; Guillén, A.; Herrera, L.-J.; Liébana-Cabanillas, F. (2020) Adoption of electric vehicles: Which factors are really important? *Int. J. Sustain. Transp.*, 15, 799–813.

[24]. Walone, L. N. G. (2016). Analyzing the Consumer Purchase Intention in Selecting Motorcycle Brand Using Analytical Hierarchy Process (AHP) Approach, 3, Jurnal Berkala Ilmiah Efisiensi, e-journal] vol. 16, no. 3, Available Online:https://ejournal.unsrat.ac.id/index.php/jbie/article/view/13185

[25]. Chen, H.-S., Tsai, B.-K. & Hsieh, C.-M. (2017). Determinants of Consumers' Purchasing Intentions for the Hydrogen-Electric Motorcycle, 8, Sustainability, vol. 9, no. 8, p.1447.

[26]. Zhu, L., Song, Q., Sheng, N. & Zhou, X. (2019). Exploring the Determinants of Consumers' WTB and WTP for Electric Motorcycles Using CVM Method in Macau, Energy Policy, vol. 127, pp.64–72.

[27]. Lévay, P.Z.; Drossinos, Y.; Thiel, C. (2017) The effect of fiscal incentives on market penetration of electric vehicles: A pairwise comparison of total cost of ownership. *Energy Policy*, 105, 524–533.

[28]. Asadi, S.; Nilashi, M.; Samad, S.; Abdullah, R.; Mahmoud, M.; Alkinani, M.H.; Yadegaridehkordi, E. (2021) Factors impacting consumers' intention toward adoption of electric vehicles in Malaysia. *J. Clean. Prod.* 282, 124474.

[29]. Lashari, Z. (2021); Ko, J.; Jang, J. Consumers' Intention to Purchase Electric Vehicles: Influences of User Attitude and Perception. Sustainability, 13, 6778.

[30]. Jian, W.; Zhou, W. (2019) Factors Influencing the Purchase Willingness towards Electric Vehicles in China; Uppsala University: Uppsala, Sweden,

[31]. Jou, R.-C.; Chen, T.-Y. (2014) Factors affecting public transportation, car, and motorcycle usage. *Transp. Res. Part A Policy Pr*, 61, 186–198

[32]. Al Mamun, A., Zainol, N. R., & Hayat, N. (2020). Electric Scooter-An Alternative Mode of Transportation for Malaysian Youth.

[33]. Utami, M.W.D.; Yuniaristanto, Y.; Sutopo, W. (2020) Adoption Intention Model of Electric Vehicle in Indonesia. *J. Optimasi Sist. Ind.*, 19, 70–81.

[34]. Will, S.; Luger-Bazinger, C.; Schmitt, M.; Zankl, C. (2021) Towards the Future of Sustainable Mobility: Results from a European Survey on (Electric) Powered-Two Wheelers. Sustainability, 13, 7151.

[35]. Bonisoli, L., Cruz, A. M. V., & Elizalde, D. K. R. (2024). Revving towards sustainability: Environmentalism impact on electric motorcycle adoption. Journal of Cleaner Production, 435, 140262.

[36]. Choo, S. Y., Vafaei-Zadeh, A., Hanifah, H., & Thurasamy, R. (2024). Predicting electric vehicles adoption: A synthesis of perceived risk, benefit and the NORM activation model. Research in Transportation Business & Management, 56, 101183.

[37]. Mustaghfirin, M., & Ariyanti, M. (2022). Influence of brand image, price, promotion, quality and content on purchase intention of homeLTE service. In Acceleration of Digital Innovation & Technology towards Society 5.0 (pp. 110-116). Routledge.

[38]. Tu,J.-C.; Yang, C. (2019) Key Factors Influencing Consumers' Purchase of Electric Vehicles. Sustainability, 11, 3863

[39]. Khazaei, H.; Tareq, M.A. (2021) Moderating effects of personal innovativeness and driving experience on factors influencing adoption of BEVs in Malaysia: An integrated SEM–BSEM approach. Heliyon, 7, e08072.

[40]. Jain, N. K., Bhaskar, K., & Jain, S. (2022). What drives adoption intention of electric vehicles in India? An integrated UTAUT model with environmental concerns, perceived risk and government support. *Research in Transportation Business & Management*, *42*, 100730.Yang, Chun; Tu, Jui-Che; Jiang, Qianling (2020) The influential factors of consumers' sustainable consumption: A case on electric vehicles in China. *Sustainability.*

[41]. Yang, Chun; Tu, Jui-Che; Jiang, Qianling (2020) The influential factors of consumers' sustainable consumption: A case on electric vehicles in China. Sustainability.

[42]. Jabbari, P., Chernicoff, W., & MacKenzie, D. (2017). Analysis of electric vehicle purchaser satisfaction and rejection reasons. *Transportation Research Record*, *2628*(1), 110-119.

[43]. Fitriany, N., & Ariyanti, M. (2024). The Influence of Electronic Service Quality, Sales Promotion, and Product Variation on Purchase Decisions and Satisfaction: a Study on BUKALAPAK. *International Journal of Current Science Research and Review*, *7*(02), 1256-1261.

[44]. Chatterjee, S., Chaudhuri, R., Vrontis, D., & Bresciani, S. (2024). Exploring the effect of government incentives on electric vehicle purchase intention in smart cities. Journal of Cleaner Production, 477, 143841.

[45]. Khurana, Anil; Kumar, Vv Ravi; Sidhpuria, Manish. (2020) A study on the adoption of electric vehicles in India: the mediating role of attitude. *Vision*, 24.1: 23-34.

[46]. Hair, J. F., Hult, T., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray , S. (2021). Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R. Springer International Publishing.

[47]. Straub, D.W. Validating Instruments in MIS Research. MIS Q. Manag. Inf. Syst. 1989, 13, 147

[48]. Jayasingh, S., Girija, T., & Arunkumar, S. (2021). Factors influencing consumers' purchase intention towards electric two-wheelers. *Sustainability*, *13*(22), 12851.

[49]. Hair, J. F., Babin, B. J., & Krey, N. (2017). Covariance-Based Structural Equation Modeling in the Journal of Advertising: Review and Recommendations. Journal of Advertising, 46(1), 163–177. https://doi.org/10.1080/00913367.2017.1281777

[50]. Taherdoost, H. (2016). Validity and reliability of the research instrument; how to test the validation of a questionnaire/survey in a research. International Journal of Academic Research in Management (IJARM), 5.

[51]. Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. Journal of Marketing Research, 18(1), 39-50.
[52]. Wang, S., Fan, J., Zhao, D., Yang, S., & Fu, Y. (2016). Predicting consumers' intention to adopt hybrid electric vehicles: using an extended version of the theory of planned behavior model. Transportation, 43, 123-143.
[53]. Choo, S. Y., Vafaei-Zadeh, A., Hanifah, H., & Thurasamy, R. (2024). Predicting electric vehicles adoption: A synthesis of perceived risk, benefit and the NORM activation model. Research in Transportation Business & Management, 56, 101183.
[54]. Khazaei, H.; Tareq, M.A. (2021) Moderating effects of personal innovativeness and driving experience on factors influencing adoption of BEVs in Malaysia: An integrated SEM–BSEM approach. Heliyon, 7, e08072.
[55]. Zaremohzzabieh, Z., Ismail, N., Ahrari, S., & Samah, A. A. (2021). The effects of consumer attitude on green purchase intention: A meta-analytic path analysis. Journal of Business Research, 132, 732-743.
[56]. Bonisoli, L., Cruz, A. M. V., & Elizalde, D. K. R. (2024). Revving towards sustainability: Environmentalism impact on electric motorcycle adoption. Journal of Cleaner Production, 435, 140262.
[57]. Chatterjee, S., Chaudhuri, R., Vrontis, D., & Bresciani, S. (2024). Exploring the effect of government incentives on electric vehicle purchase intention in smart cities. Journal of Cleaner Production, 477, 143841.
[58]. Ye, N., Zhang, M., Huang, X., Li, W., & Hou, L. (2025). Exploring Chinese consumers' brand preference and willingness-to-pay for electric vehicles: A discrete choice experiment. *Research in Transportation Business & Management*, *59*, 101282.