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Research Paper

Development of a Model of Intention to Adopt Electric Motorcycles in Indonesia

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Abstract

Indonesia's economic sector continues to rely on carbon-emitting fossil fuels. The government is speeding up electrification by encouraging people to switch from traditional to electric automobiles. Electric motorcycles are one option for lowering CO_2 emissions. Many researchers have investigated the value attributes affecting consumers' attitudes and behavior around electric motorcycles. The structural model was created using the Partial Least Square – Structural Equation Model (PLS-SEM). The questionnaires were circulated through the internet, and 1,223 valid responses were received. Researching people's interest in environmentally friendly vehicles and the growing ecosystem of electric vehicles will indicate that the electric motorcycle business has a bright future. This research also shows that attitude is a major impact on electric motorcycle purchase intention and infrastructure, and subjective norms and perceived behavioral control have a direct effect on electric motorcycle purchase intention. Cost and technology do not influence a person in determining his desire to buy an electric vehicle.

Keywords: Purchase intention; Theory of planned behaviour; Electric motorcycle; PLS-SEM

1. Introduction

Global economic growth accompanied by global energy consumption can lead to an increase in global carbon emissions. The majority of the economic sector in Indonesia utilizes fossil fuels. The transportation sector is the second largest emitter and contributed 24% of carbon emissions based on fuel combustion in 2016 [1]–[3]. This research focuses on the growth of motorcycles in Indonesia as a developing country. Based on data from the Badan Pusat Statistik (BPS), the number of motorcycles in Indonesia reached 143.8 million units in 2021.

Currently, governments in all countries are campaigning for the reduction of carbon gas emissions in the transportation sector by switching to alternative energy sources [4]–[6]. Switching energy sources is expected to reduce the level of CO_2 gas disposal. The Indonesian government through the national electrification program hopes that electric vehicles can be a solution to the issue of global carbon emissions. This is explained in Presidential Regulation Number 55 of 2019 regarding the acceleration of the battery-based electric motor vehicle program for road transportation. Based on Government Regulation Number 61 In 2011, the government targets to reduce CO_2 emissions by 0.038 to 0.056 gigatons during 2010-2020 [7].

There are two types of electric motorcycles, the first called new design electric motorcycles and convertible electric motorcycles. The basic idea of converting electric motorbikes is to reduce carbon emissions by replacing the ICE engine in old motorbikes with a source of electric power. The new design electric motorcycle is a vehicle that uses battery technology for its operation. Meanwhile, a convertible electric motorcycle is a conventional motorcycle whose engine components are replaced with a conversion kit as an energy source [8].

A study of market share of electric motorcycles in Surakarta, Indonesia shows that people respond positively to the presence of electric motorcycles [9]. This shows that the market opportunity for electric vehicles is quite large. Along with the development of electric vehicle technology, research on the standardization of electric vehicles and batteries is also growing.

Research on the adoption of electric vehicle technology has also been carried out by various countries using several methods [10]. Sang dan Bekhet [11] use multiple linear regression method to determine the intention to use electric vehicles in Malaysia, She et al. [12] used the structural equation model (SEM) method to determine the inhibiting factors for the adoption of electric vehicles in China, Berkeley et al. [13] used exploratory factor analysis methods and multivariate regression models to determine the factors that influence electric vehicle drivers in the UK, and Giansolati et al. [14] used Principal Component Analysis to determine the inhibiting factors for the adoption of electric vehicles in Italy.

This study focuses on developing a model for the adoption of electric vehicles in Indonesia, identifying the factors that influence the purchase intention of electric motorcycles in Indonesia, and finding out the opportunities for the adoption of electric motorcycles in Indonesia. This research is still relevant to market conditions where the adoption of electric motorcycles is still at an early stage but the potential for buyers is quite large. This research can be the right policy recommendation for the government and entrepreneurs on the development of electric vehicles in Indonesia. Entrepreneurs in the field of electric vehicles, especially electric motorcycles can also develop technology and marketing based on significant factors to support market growth. Data processing uses structural equation model (SEM) with SmartPLS 3 software to test the specification of the hypothesis about the factor structure for a set of variables. SEM constructs unobserved latent variables from the indicators and also examines the relationship between latent variables [12].

2. Methods

The data in this study are primary data obtained from an online survey conducted to find out the factors that influence the purchase intention of electric motorcycles in Indonesia.

2.1. *Conceptual Framework*

We divide the factors that influence the purchase intention of electric motorcycles into 6 factors, they are: attitude, subjective norm, perceived behavioral control, cost, technology, and infrastructure. Habich-Sobiegalla et al. [15] conducted a cross-country survey (China, Brazil, Russia) to determine the purchase intention of electric vehicles based on micro level factors, macro level factors, product level factors, and technological factors. Mohamed et al. [16] reviews the characteristics of electric vehicle adopters in Canada by considering attitude factors, subjective norm factors, perceived behavioral control factors, and behavioral moral norms factors. Rezvani et al. [17] conducted a literature study of 16 articles on the adoption of electric vehicles and identified factors that influence adoption interest, namely technology, cost, context, as well as individual and social habits. Rahmanasari [18] conducted an analysis of the adoption model of electric motorcycle technology in Indonesia to determine the factors that influence the intention of adoption and actual adoption. The result is known that attitude factors, subjective norms, perceived behavioral control, and behavioral moral norms have a significant effect on adoption intentions, and adoption intentions affect actual adoption. The four studies only discuss the psychological factors that influence the adoption interest and interest in buying electric vehicles. Singh et al. [19] states that there are 4 categories of factors that influence interest in the adoption of electric vehicles, they are demographic factors, situational factors, contextual factors, and psychological factors. However, there are not many studies that discuss the effect of the combination of these four factors. In addition, the relationship between these factors will be discussed in the next section. In this study, the authors combine situational, contextual, and psychological factors that influence the purchase intention of an electric motorcycle from a consumer perspective. The conceptual framework is shown in **Figure 1**. This study contains the hypothesis that the purchase intention of an electric motorcycle is directly influenced by factors of attitude, subjective norm, perceived behavioral control, cost, technology,

and infrastructure directly. Based on the conceptual framework discussed above, the research hypothesis is shown in **Table 1**.

2.1.1. *Attitude*

Attitude toward behavior in research on adoption intention is defined as a positive evaluation or negative behavior of adoption [20]. Several studies also state that attitude is a significant variable affecting behavioral interest. Mohamed et al. [16] conducted a study on 3505 samples of respondents and the results showed that the analyzed attitude was the most influential factor in electric vehicle adoption. People's decision to own an electric vehicle is a good one and it is more cost-effective. The purchase of electric vehicles is also able to reduce the rate of climate change and fuel consumption, thereby supporting an attitude of environmental concern.

2.1.2. *Subjective Norm*

According to Asadi et al. [21], the definition of subjective norm is the perception of consumers based on their behavior towards purchasing electric vehicles from the perception of the closest person. Adnan et al. [22] and Xu et al. [23] found a positive relationship between subjective norms and interest behavior. Wang et al. [20] using TPB theory shows that behavioral control and subjective norms are factors that significantly affect adoption interest.

2.1.3. *Perceived Behavioural Control*

Mohamed et al. [16] conducted a survey to determine the factors that influence the diffusion of electric vehicles in Canada and the results showed that behavioral control had a significant effect. Ajzen [24] explains that behavioral control is the level of comfort and difficulty felt by individuals and is associated with certain behaviors. In this case, behavioral control consists of technology perception, price, knowledge of electric vehicles, and ability to show adoption behavior.

2.1.4. *Cost*

Cost factors related to the adoption of electric vehicles include variations in vehicle purchase prices, maintenance costs, and battery rental costs [25]. She et al. [12] found that the inhibiting factors for the adoption of electric vehicles were the high purchase price, high battery costs, poor understanding of fuel costs and maintenance cost.

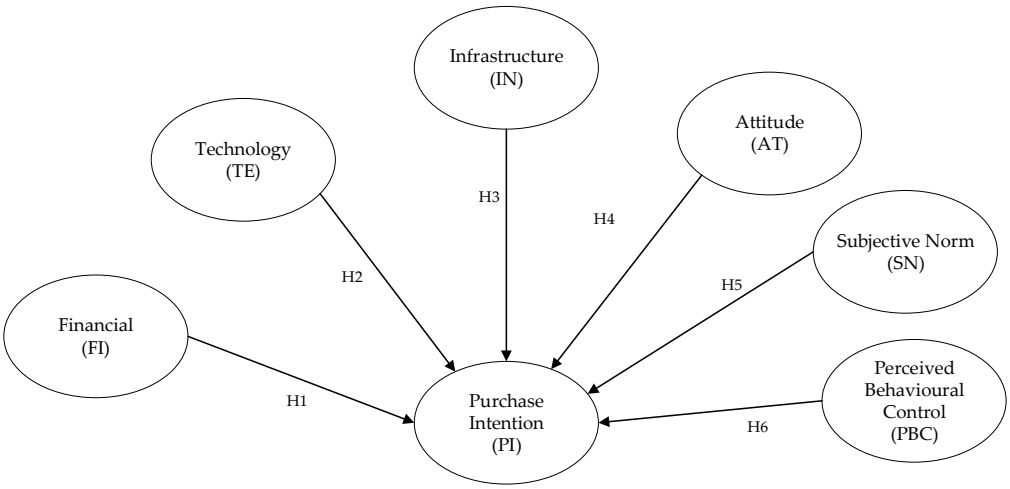

Figure 1. Conceptual framework

Table 1. Hypotheses and the expected outcome

Code	Hypotheses
H1	Attitude factors have a significant positive effect on the purchase intention of EMs
H2	Subjective norm factors have a significant positive effect on the purchase intention of EMs
H3	Perceived behavioural control factors have a significant positive effect on the purchase intention of EMs
H4	Cost factors have a significant positive effect on the purchase intention of EMs
H5	Technology factors have a significant positive effect on the purchase intention of EMs
H6	Infrastructure factors have a significant positive effect on the purchase intention of EMs

It means that consumers only infrequently make purchasing decisions based on fuel economy, and rarely conduct a rational financial analysis when purchasing vehicles. According to Browne et al. [26] the high price of electric vehicles is caused by the high price of lithium batteries. However, using lithium batteries will increase battery capacity and vehicle mileage, especially the battery life until 5-7 years [27], [28].

2.1.5. *Technology*

She et al. [12] explained that technological factors that are always evolving can be an obstacle to the growth of research on electric vehicles. Therefore, this factor is considered significant because it can help improve marketing analysis and advertising of electric vehicles. Zhang et al. [29] stated that vehicle performance is related to consumer ratings of mileage capacity, power, charging duration, safety, and battery health. Quak et al. [30] mentioned that the decline in battery prices could be a driver for the adoption of electric vehicles.

2.1.6. *Infrastructure*

The existence of a charging-station infrastructure is something that cannot be separated from the electric vehicle ecosystem. Kumar and Alok [31] state that the charging infrastructure to support the mobility of electric vehicles consists of 2 types, namely fast and slow. Several literature studies also explain that without adequate charging infrastructure it will hinder the diffusion of electric vehicles [13], [28]. The availability of charging stations in public places [32], at work [12], and at home [33] is required by electric vehicle users to recharge their vehicle batteries. Krupa et al. [34] also mentions that the existence of a service station for routine maintenance and breakdowns affects the adoption of electric vehicles.

2.2. *Questionnaire and Survey*

By considering sociodemographic factors, the questionnaire was prepared by level 5 Likert scale with answer choices from strongly disagree (1) to strongly agree (5). There are 7 construct variables in this study: attitude, subjective norm, perceived behavioral control financial, technology, infrastructure, and purchase intention. Attitude factor consists of attitude towards purchasing decisions [16], [22], [35], a more cost-effective choice of attitude [16], attitude to reduce fuel consumption [22], [35], environmental-friendly vehicle selection attitude [22], [35], attitude towards vehicle selection that can reduce climate change [16], and support for improving government policies [35]. The subjective norm factor consists of indicators of influence from the closest people [16], [22], social pressure [16], self influence on people around [22], and the influence of those around you on yourself [35]. Perceived behavioral control factors consist of indicators of purchasing decisions on the warranty [16], purchasing decisions on travel needs accommodation [16], purchasing decisions on the maintenance and repair of electric motorcycles [22], purchase decision control [36], purchase decision control [22], future purchasing ability [35], and the ability to buy without any difficulties [37]. The cost factor consists of an indicator of the original price of an electric motorcycle without any purchase subsidies [28], battery replacement fee when the old battery has run out [27], the electricity cost for electric motorcycle energy compared to the fuel cost (gasoline) [26], and routine maintenance costs for electric motorcycles excluding repair costs due to accidents [38]. The technological factor consists of an indicator of the furthest mileage after the electric motorcycle battery is fully charged on a single charge [29], maximum speed of electric motorcycle [38], the total time to fully charge the electric motorcycle [39], feeling of safety when riding an electric motorcycle is related to sound (dB) [39], and battery life [40]. The infrastructure factor consists of indicators of the availability of charging in public places [32], charging availability at work [12], charging availability at residence [33], and availability of service points for routine maintenance from damage [34]. The purchase intention factor consists of indicators of the desire to buy and recommend to others [12].

The survey was given to 1,223 respondents spread across 10 provinces in Indonesia. The 10 provinces are the provinces with the most motorcycle sales in Indonesia, they are West Java, East Java, Central Java, DKI Jakarta, North Sumatra, West Sumatra, South Sumatra, South Sulawesi, DI Yogyakarta, and Bali. The large number of motorcycle population in Indonesia causes researchers to use cluster sampling.

Dissemination of the questionnaire using the Facebook Ads feature. Respondent criteria are 18 years old, have Valid Driving License, and domiciled in one of the 10 provinces that have been mentioned.

2.3. *Structural Equation Model (SEM)*

The statistical method used to analyze the factors is the Structural Equation Model (SEM) which is the second generation of multivariate analysis [41]. SEM is divided into two types, namely covariance-based SEM (CB-SEM) and partial least squares SEM (PLS-SEM). CB SEM is used to confirm the theory by measuring how well the proposed theoretical framework can estimate the covariance matrix for the sample data and the results depend on the maximum likelihood value as an estimation method [42]. PLS SEM is usually used in exploratory research to develop theoretical models by defining the variation of the dependent variable when testing the model [43]. PLS SEM is also considered suitable for the early stages of research compared to CB SEM as in the study on consumer buying intentions for electric vehicles conducted by Adnan et al. [22]. In contrast to CB SEM, PLS SEM does not produce a goodness of fit index value but assesses predictive validity by examining R^2 and the structural path [44].

3. Results and Discussion

The questionnaire was distributed online in 2020 and received 1,443 respondents, but only 1,223 respondents' answers met the data processing requirements. This is because the respondents did not pass the screening questions. **Table 2** shows the demographics of the respondents.

Table 2. Respondent demographics

Demographic	Item	Frequency	Percentage (%)
Domicile	Jawa Barat	345	28.2
	Jawa Timur	162	13.2
	DKI Jakarta	192	15.7
	Jawa Tengah	242	19.8
	Sumatera Utara	74	6.1
	DI Yogyakarta	61	5.0
	Sulawesi Selatan	36	2.9
	Bali	34	2.7
	Sumatera Barat	26	2.1
	Sumatera Selatan	51	4.1
Marital status	Single	370	30.3
	Married	844	69..0
	Other	9	0.7
Age	17-30	655	53.6
	31-45	486	39.7
	46-60	79	6.5
	>60	3	0.2
Gender	Male	630	51.5
	Female	593	48.5
Last education level	SMP/SMA	701	57.3
	Diploma	127	10.4
	S1	316	25.8
	S2	68	5.6
	S3	11	0.9
Occupation	Student	175	14.3
	Civil servants	88	7.2
	Private employees	415	33.9
	Entrepreneur	380	31.1
	Others	165	13.5
Monthly income (IDR)	0	154	12.6
	< 2.000.000	226	18.5
	2.000.000-5.999.999	550	45.0
	6.000.000-9.999.999	199	16.3
	9.000.000-19.999.999	71	5.8
	≥ 20.000.000	23	1.9

3.1. Descriptive Statistic

Table 3 shows descriptive statistics result. Calculation of descriptive statistics using SPSS 26 software. Based on the calculation of the minimum, maximum, and average values, it is obtained that the variables AT3 (purchase decision), AT4 (environmentally friendly), and AT5 (reduction in climate change) have the highest average answers. These results indicate that the majority of respondents consider attitudes before deciding to buy an electric motorcycle.

Cost factors, which consist of FI1 (purchase price) and FI2 (battery price) occupy the final rank of factors that influence the purchase of electric motorcycles by consumers. This shows that the price of electric motorcycles and batteries is not in accordance with the respondent's budget. People still think that the price of electric motorcycles is still expensive when compared to conventional motorcycles. The cost of replacing a battery every 3 years reaches IDR 7,500,000, this value is still considered expensive for some respondents so that the purchase price of electric motorcycles and batteries is one of the inhibiting factors for the Indonesian State to adopt an electric motorcycle.

Subjective norm factor, which called SN2 (social pressure) also has a low answer average. This is supported by previous research conducted by Ajzen [24] which states that if attitudes, behavioral control, and subjective norms are associated with interests/intentions, the relationship between subjective norms and interests/intentions is relatively weak. So that personal factors (attitude and behavioral control) are the main factors that influence purchase intention.

Technological factors including TE5 (battery life), TE2 (power), and TE3 (charging time) also rank last in descriptive statistics, but the average for these three variables is over 4. This result shows that most respondent consider that electric motorcycle technology is not following their standards though respondents have not fully trusted the performance of electric vehicle. It shows that the charging time which took 3 hours was too long for most respondents.

Table 3. Descriptive statistics result

Variable	*Average*	*Rank*
AT3	4.61	1
AT4	4.59	2
AT5	4.58	3
AT6	4.51	4
AT2	4.45	5
PBC4	4.44	6
PBC5	4.41	7
PBC6	4.38	8
SN1	4.36	9
PBC3	4.35	10
PBC1	4.34	11
AT1	4.32	12
TE4	4.32	13
FI3	4.25	14
TE1	4.24	15
SN3	4.23	16
PBC7	4.23	17
IN4	4.21	18
FI4	4.20	19
SN4	4.17	20
IN3	4.16	21
IN2	4.11	22
PBC2	4.10	23
IN1	4.10	24
TE5	4.09	25
TE2	4.06	26
TE3	4.03	27
FI1	3.88	28
SN2	3.71	29
FI2	3.50	30

Descriptive statistics are also used to find out respondents' responses regarding the adoption of electric motorcycles. 45,60% of respondents have a strong desire to adopt electric vehicles. The interesting thing from the descriptive statistical analysis is that although the enthusiasm for using electric motorcycles is still in the simulation stage, the acceptance by the community is good. **Table 4** shows respondents' responses to interest in buying electric motorcycles.

3.2. Estimation Model

The first step is to test the reliability and validity of the construct variable which consists of several indicators using SPSS 26. The results show that all variables have Cronbach's alpha (α) > 0.6 which means that the sample data used is reliable. The next step is data processing using SMART PLS. The structural model is estimated to use an iterative procedure to maximize the strength of the relationship between the independent and dependent variables. The PLS path model is divided into 2 linear relationships, namely inner and outer models. Smart PLS 3.0 is used to analyze the model by assessing the reliability and validity, then testing the structural model. At the final stage, test the significance of the path coefficients and loadings using the bootstrapping method [41]. **Table 5** shows construct reliability test result.

Table 4. Descriptive statistic of purchase intention

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Willingness to buy	0.30%	2.00%	15.90%	36.10%	45.60%
Willingness to recommend	0.40%	1.50%	13.20%	34.30%	50.70%

Table 5. Construct reliability test results

Construct	Kode	Outer Loading	AVE	CR
Attitude	AT1	0.822	0.938	0.715
	AT2	0.854		
	AT3	0.855		
	AT4	0.839		
	AT5	0.846		
	AT6	0.856		
Cost	CO1	0.806	0.864	0.613
	CO2	0.781		
	CO3	0.761		
	CO4	0.782		
Infrastructure	IN1	0.888	0.931	0.771
	IN2	0.900		
	IN3	0.877		
	IN4	0.846		
Perceived Behavioural Control	PBC1	0.796	0.925	0.638
	PBC2	0.745		
	PBC3	0.801		
	PBC4	0.815		
	PBC5	0.838		
	PBC6	0.817		
	PBC7	0.775		
Purchase Intention	PI1	0.928	0.926	0.863
	PI2	0.930		
Subjective Norm	SN1	0.790	0.878	0.644
	SN2	0.685		
	SN3	0.868		
	SN4	0.855		
Technology	TE1	0.782	0.888	0.612
	TE2	0.786		
	TE3	0.799		
	TE4	0.755		
	TE5	0.790		

Table 6 shows the Fornell-Larcker values. Fornell-Larcker is a method that compares the square root value of the AVE of each construct and the correlations between other constructs [45]. For example, the infrastructure variable has an AVE value of 0.931 and the square root value is 0.771. If the AVE square root value of each construct is greater than the correlation value between constructs and other constructs in the model, then the model is said to have a good discriminant validity value. Convergent values and discriminant validity can be calculated by testing all constructs based on the CR and AVE values. The following are the results of discriminant validity testing.

3.3. *Structural Model*

This study uses SmartPLS 3.0 to analyze the SEM model with a total sample of 5000 for the bootstrap process. The R2 value of the coefficient of each relationship is estimated. The structural fit test which consists of the hypothesis of the relationship between the construct variables was also analyzed using the R2 value. Structural model testing is done by removing some of the construct variables that make the model unfit for testing. Researchers have made up to 6 iteration models, then this model is the most appropriate by considering every part of the variable.

Figure 2 shows the result of the estimated path analysis. There are two types of numbers in the

Table 6. Fornell-Larcker value

	AT	CO	IN	PBC	PI	SN	TE
AT	0.846						
CO	0.496	0.783					
IN	0.562	0.549	0.878				
PBC	0.765	0.563	0.615	0.799			
PI	0.709	0.510	0.609	0.671	0.929		
SN	0.682	0.501	0.558	0.713	0.627	0.803	
TE	0.584	0.672	0.649	0.645	0.589	0.603	0.782

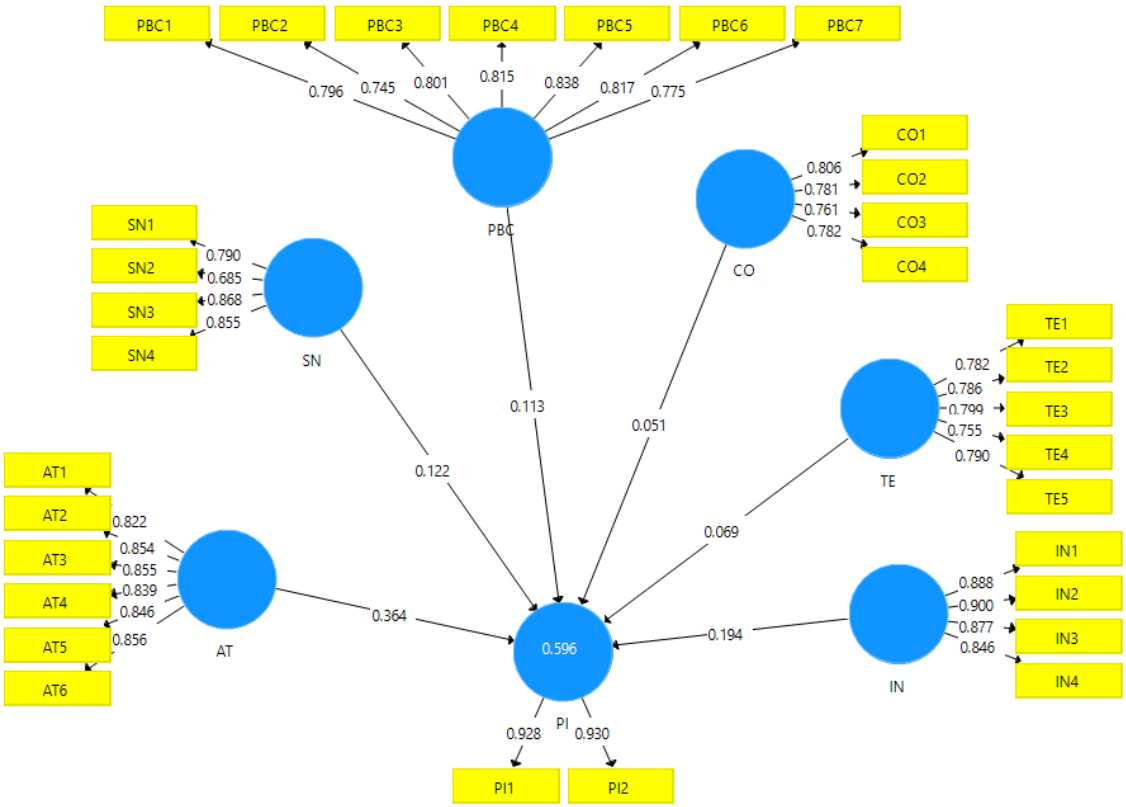

Figure 2. PLS algorithm result

picture, namely the first number in the circle is the value of the coefficient of determination (R2) which shows how much variance the dependent latent variable is explained by the independent latent variable. While the numbers in the arrows are path analysis coefficients that show the magnitude of the influence of one latent variable on another latent variable. The AT variable (0.364) has the greatest impact on the interest in buying electric motorcycles, then followed by the IN variable (0.194), SN variable (0.122), PBC variable (0.113), TE variable (0.069), and variable CO (0.051). **Table 7** is the result of hypothesis testing.

3.4. Respondent Personal Characteristics

Respondents were categorized based on demographics (domicile, age, gender, marital status, education, occupation, and income). To find out the personal characteristics that significantly affect purchase intention, a chi-square test was carried out according to **Table 8**.

The domiciles in this study are divided into 10 provinces which represent the regions in Indonesia that have the highest motorcycle sales figures. Based on the chi-square test, it is known that a person's domicile does not affect the decision to purchase an electric motorcycle. There is no effect of age, gender, and education level on the desire to buy and recommend electric vehicles [36]. Marital status, occupation, and income have an influence on the desire to buy and recommend electric vehicles to others [20]. Consumers with high incomes are interested in buying electric vehicles and accept the still high price of electric vehicles. Marital status affects the number of members in a family who can drive electric vehicles. While the income per month is related to the level of expenditure made by a person. Some-

Table 7. PLS-SEM hypothesis test results

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistic (| O/STDEV |)	P Values	Result
AT -> PI	0.364	0.363	0.038	9.575	0.000	Accept
CO -> PI	0.051	0.053	0.029	1.799	0.072	Reject
IN -> PI	0.194	0.191	0.036	5.351	0.000	Accept
PBC -> PI	0.113	0.114	0.045	2.541	0.011	Accept
SN -> PI	0.122	0.122	0.035	3.495	0.000	Accept
TE -> PI	0.069	0.070	0.040	1.748	0.081	Reject

Table 8. Chi-squared test for significance of respondent perception

		PI1	PI2
D1 (Domicile)	Qp^2	0,274	0,314
	df	36	36
	P-value	40.620	39.567
D2 (Age)	Qp^2	0,839	0,602
	df	12	12
	P-value	7.274	10.155
D3 (Gender)	Qp^2	0,699	0,594
	df	4	4
	P-value	2.200	2.789
D4 (Marital Status)	Qp^2	**0,001**	**0,000**
	df	8	8
	P-value	26.898	30.193
D5 (Education)	Qp^2	0,777	0,247
	df	16	16
	P-value	30.193	19.423
D6 (Occupation)	Qp^2	**0,004**	**0,007**
	df	16	16
	P-value	34.623	33.140
D7 (Income)	Qp^2	**0,000**	**0,002**
	df	20	20
	P-value	55.099	42.991

one with a high income tends to be willing to pay for an electric vehicle to support environmental concerns.

3.5. Discussion

Electric vehicles are technological innovations that have potential environmental benefits if they are generated by renewable energy. To achieve these environmental benefits, it is necessary to deploy electric vehicles. Currently, the market share of electric vehicles in Indonesia is still low, and not many drivers have experience driving using electric vehicles. Therefore, this study aims to explore information on who has the potential customer to adopt electric vehicles and introduce the benefits of electric vehicles to others to expand the market. Model development involves psychological, situational, and contextual factors. Based on calculations using SEM, the results show that the attitude factor is the main influence on a person's adoption interest.

4. Conclusion

Changing from conventional motorcycles to electric motorcycles may help lower atmospheric carbon emissions. By announcing a number of rules involving electric motorbikes, the government has started to assist in the acceleration of vehicle electrification, particularly in Indonesia. However, Indonesia currently has a low adoption rate for electric vehicles, thus there isn't a lot of infrastructures to support the ecosystem for these vehicles.

This study aims to prove the significant influence of financial factors, technology, infrastructure, attitudes, subjective norms, and behavioral control on the adoption of electric motorcycles in Indonesia. This model consists of 6 hypotheses to explore the direct influence on interest in purchasing electric motorcycles by the public. The results show that the attitude factor has the greatest influence on the purchase intention of an electric motorcycle.

This study also discusses technological factors such as mileage capacity and battery life that need to be considered by entrepreneurs engaged in vehicle conversion. This will create several categories of electric motorcycles with varying selling prices. In addition, government support, especially in the provision of charging station infrastructure, is needed to accelerate the adoption of electric motorcycles in Indonesia.

The author finds that in this study there are still limitations, so this can be an opportunity for further research. This research is based on an online survey regarding consumer preferences for the presence of electric motorcycles in Indonesia. Respondents are conventional motorcycle users who see at a glance the use of electric motorcycles. This of course creates a gap between buying interest and actual behavior. In addition, this study only reviews the direct relationship between technology, finance, infrastructure, attitudes, subjective norms, and behavioral control. Further research is expected to explore the indirect relationship between latent variables.

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Author's Declaration

Authors' contributions and responsibilities

The authors made substantial contributions to the conception and design of the study. The authors took responsibility for data analysis, interpretation and discussion of results. The authors read and approved the final manuscript.

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All data are available from the authors.

Competing interests

The authors declare no competing interest.

Additional information

No additional information from the authors.

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