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ECO-FRIENDLY CARS' PURCHASES: THE ROLE OF CONSUMER ENVIRONMENTAL CONCERN, MONETARY POLICY, AND VALUE PERCEPTIONS

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ABSTRACT

In the automotive market environment of Indonesia, a more in-depth insight into the factors that influence the purchase intention of eco-friendly cars is essential. Environmentally friendly cars are increasingly gaining attention amidst global environmental and climate change concerns. The research method used was a survey with data collection through a questionnaire distributed to 300 respondents by using purposive sampling. The measurement scale in this study used a 7-point Likert scale. Most respondents are female, comprising 56 percent, compared to 44 percent of male respondents. Most respondents with entrepreneurial backgrounds and bachelor's degrees fall within the productive age range of 35 to 45 years. Additionally, a significant portion of the respondents earns an annual income ranging from 5 to 10 million Indonesian Rupiah. The analysis of the variance-based SEM method, PLS-SEM, shows that consumer environmental concern, monetary incentive policy measures, and perceived value significantly contribute to consumer purchase intentions. This research aims to positively contribute to advancing the eco-friendly car industry, bolster sustainable government policies, and shape consumer perceptions favorably towards greener transportation solutions. The study contributes valuable insights to this field's existing literature and research. The empirical basis and findings derived from this research can serve as a reference for future studies on eco-friendly cars, providing a foundation for further exploration and understanding sustainable mobility choices.

Keywords: *Consumer Environmental Concern, Monetary Incentive Policy Measures, Value Perception, Purchase Intention, Environmentally Eco-Friendly Cars*

1. INTRODUCTION

The adoption of electric vehicles is expected to be one of the answers to the problem of environmental pollution caused by carbon emissions from vehicles, which exacerbates air pollution, especially in big cities in Indonesia. Many companies have consumed a significant volume of fossil fuels, and air pollution has become a severe problem due to increasing civilization and industrialization worldwide (Anderson et al., 2016).

Presidential Regulation No. 55 (2019) in Indonesia outlines incentives for electric vehicles (Battery Electric Vehicle or KBLBB) with domestic component levels (TKDN) of 40% or more, offering a government-covered VAT of 10%, resulting in a 1% VAT payment. For KBLBB with TKDN between 20% and less than 40%, a 5% government-covered VAT is applicable, totaling 6%. This incentive is valid from April to December 2023, following Minister of Finance Regulation (PMK) Number 38 of 2023 (Humas Sekretariat Kabinet Republik Indonesia, 2023). Based on emission levels from 2021, their current target is a 15% reduction by 2025. By 2050, all polluting vehicles must be off the road to prevent catastrophic climate change. As such, the sale of new fossil fuel vehicles must be halted by 2035 (Bhardwaj et al., 2020). In addition to environmental concerns, consumers' perceptions

of eco-friendly cars also shape their purchase intentions. Factors such as car performance, battery life, mileage, charging facilities, and driver comfort are aspects that consumers consider when choosing an eco-friendly car.

Research by Bang et al., (2000) and Jeong et al., (2018) found that consumer environmental concerns are significantly related to purchase intention, and Ye (2022) research proved a positive relationship between consumer environmental concerns and monetary incentive policy measures on purchase intention. On the other hand, research by Ng et al., (2018a) and Vainio et al., (2014) showed a significant relationship between perceived value and purchase intention. In contrast, studies by Li et al., (2018) and Newton et al., (2015) show empirical findings that do not support a significant relationship between consumer environmental concern and purchase intention for electric vehicles. Research by Miranda et al., (2020) shows that the perceived value of electric cars has a negative relationship with purchase intention. Potential gaps are seen in explaining research inconsistencies between the variables of consumer environmental concern and perceived value that influence the purchase intention of electric vehicles.

This study investigates the impact of consumer environmental concerns, monetary incentive policies, and perceived value on the purchase intention of eco-friendly cars in Jakarta. The research contributes valuable insights for manufacturers to develop targeted marketing strategies, supports the eco-friendly car industry, advocates sustainable policies, emphasizes the role of monetary incentives, and provides empirical foundations for future research in the literature on consumer behavior towards eco-friendly cars.

This research is based on the Theory of Planned Behavior (TPB) which has been used as a reference to explain the influence relationship between consumer environmental concerns, monetary incentive policy measures, perceived value and purchase intention (Huang & Ge, 2019a; Ng et al., 2018a).

According to Maichum et al. (2017), environmental concern is defined as a person's understanding of environmental issues and attitudes to taking action to address these issues. According to Vainio et al., (2014), environmental concern is defined as an individual's overall value orientation towards the natural environment, level of concern for the future of the environment, and how humans affect the environment. even though consumer concern for environmental issues is increasing, research has not conclusively proven that individuals will be prepared to make greater environmental sacrifices. Environmental concern is defined by Franzen et al., (2010) and Peisker (2023) as a person's awareness that the surrounding environment is in trouble due to pollution or resource exploitation.

Companies provide subsidies to encourage customers to buy electric cars and appliances. Electric companies also provide incentives, rebates, and subsidies for transportation electrification. Reduced prices for off-peak charging of electric vehicles is one of the most popular incentives for example, some electricity providers offer cheaper per kilowatt-hour rates during off-peak hours (Igleheart, 2022).

Many countries have set goals and implemented policies encouraging the use of electric vehicles. Therefore, electric vehicles may become a sizable part of the vehicle portfolio (Bakker & Jacob Trip, 2013). With subsidy policies, manufacturers are influenced by

customers' environmental concerns, including product selection, input choice, emissions intensity, and environmental performance (Hammami et al., 2018).

Subsidies and tax breaks are just one of the many financial incentives offered to electric car consumers. Except for South Africa, in some instances, such as in Canada or Belgium, these measures also vary within countries. There are certain differences between each state in the United Stat (Rietmann & Lieven, 2019). These incentive policy measures directly affect governments' and consumers' short- and long-term budgets, and help electric vehicles overcome cost barriers. The effect of fiscal incentives on the total cost of ownership, net tariffs and sales of eight Electric Vehicle combinations in eight European countries was recently a study topic (Shafiei et al., 2018).

A randomized choice experiment with 247 respondents was conducted to investigate the efficacy of several prospective policy incentives in China (Wang et al., 2018). While direct tax incentives on car prices can have an impact, they are too expensive to be economical. On the other hand, rising fuel costs are a much more important incentive to increase the market share of hybrid vehicles. There are various legislative incentives aimed at car manufacturers, individual consumers, business consumers, and electric vehicle charging infrastructure providers that are intended to increase sales (Diamond, 2009). Strong support for regulatory policies, one of which is tax subsidies for environmentally friendly vehicles (Rhodes et al., 2017).

The proportion between the quality and results of the product or service that consumers value and the price and costs that must be incurred, the main priority of perceived value, influences consumer purchase intentions. A consumer's desire to purchase a good or service may be influenced by how much the consumer values the good or service. Since consumers value goods based on the economic benefits provided, consumers of green products will perceive green product types to be significantly more attractive, better quality, and have higher economic value (Tjokrosaputro & Cokki, 2020).

Customer perception of product or service value, or perceived value, can be described as the trade-off between perceived benefits and costs. Functional, social, emotional, epistemic, and conditional value are the five theoretical categories of perceived value (Chen & Lin, 2019). Value perception has two point of views. The first includes (1) a unidimensional perspective: perceived value is the result of an overall evaluation of the consumer's utility regarding a particular good or service, and (2) a multidimensional perspective: the consumer's evaluation considers notions of price, quality, benefits, exchange, and hedonic motivations.

The second perspective provides a more insightful understanding based on the behavioral notion of value, which is viewed broadly and in the context of its constituent elements (Watanabe et al., 2020). Consumer interest and risk association with the product should be considered in one dimension, focusing on the overall product evaluation, not on one dimension. Price functional value, quality functional value, emotional value, and social value are components of perceived value (Chae et al., 2020). Consideration of perceived value from an economic perspective based on the price consumers are willing to pay for a product or service and the value received as a benefit from the offering (Park et al., 2021).

Purchase intention is defined as a customer's chance of obtaining an item through social commerce or as their general willingness to pay for an item or service (Chae et al., 2020).

The importance of purchase intention, scholars have invested a lot of time and energy into researching the various elements that influence customer purchase intention, such as product information, cultural differences, perceived quality, and perceived risk (J. Li et al., 2022). Purchase intention, also known as customer or buyer intent, measures each buyer's propensity to purchase a particular good or service. It is the sum of all cognitive, affective, and behavioral actions taken while taking, buying, and using a particular product, service, idea, or action. The concept is simple, but not as simple as it sounds in the real world. To answer whether someone intends to buy an item, a yes or no answer is not enough to explain intentions (Peterson, 2021). Purchase intention evaluates the implementation of new distribution channels to assist managerial decisions on the feasibility of the idea for further development as well as the area and centre of consumer segmentation (Peña-García et al., 2020). Individual beliefs and attitudes can be influenced by purchase intentions, which are individuals' anticipated or planned future behavior (SOHN & KIM, 2020).

Bockarjova et al., (2014) in a June 2012 study involving 2.974 car owners in the Netherlands, researchers assessed purchase intentions for electric vehicles. The study considered concerns related to the perceived environmental harm caused by burning electric vehicles. Results revealed that environmental concerns had a more dominant influence on purchase intentions. Bang et al. (2000) surveyed 205 respondents from the car community in Hong Kong to examine perspectives on green energy. The findings indicated that consumers who recognized the positive environmental impact of green products were more likely to intend to purchase such products and were also more aware of their willingness to pay a higher price (Bang et al., 2000). In a study involving 369 participants in China, it was explained that environmental concern significantly influenced consumer intention to buy environmentally friendly electric vehicles (He et al., 2018).

The study by Huang et al. (2019) reveals that Incentive-based policy measures significantly influence customer purchase intentions, particularly in the context of electric vehicles. Based on a study of 502 respondents in Beijing, previous research highlighted the impact of purchase subsidies, parking fee deductions, tax incentives, and exclusive driving rights as key policies that affect customers' willingness to buy electric vehicles. In a previous study conducted by Zhao et al., (2019) on 206 respondents in China, stated that to assess the impact of non-monetary incentive policy measures and monetary incentive policy measures on electric vehicle purchase intentions and expand previous studies and separate non-monetary and monetary incentive policy measures. According to Huang et al., (2019) Beijing's electric vehicle incentive program encompasses measures like dedicated license plates, traffic restriction exemptions, purchase subsidies, and tax exemptions. The study categorizes these incentives into monetary and non-monetary measures to assess their impact on consumer purchase intentions. Non-monetary measures, such as dedicated license plates and traffic restriction exemptions, enhance consumer convenience in acquiring and using electric vehicles. Financial incentive policy measures such as direct purchase subsidies, tax exemptions, parking fee reductions, and road construction fee exemptions, aim to reduce the cost of purchasing and operating electric vehicles. This research survey with 1.080 respondents in China found a significant positive correlation between incentive policies and purchase intention (Habich-Sobiegalla et al., 2019).

Perceived value can identify the preferences of 502 consumers in northern Taiwan towards services or purchase intentions in the future period, which can then be used as a basis for determining appropriate marketing strategies in competitiveness (CHEN & LIN, 2019).

Zhao et al., (2018) examined 1.132 respondents in China - Chengdu, explaining that customer perceptions of the benefits offered by products with perceived value are significant factors in the purchase intention of environmentally friendly products. A research study conducted by Toni et al., (2018), the driving factors of perceived value influencing consumer intentions with a survey of 256 consumers in Brazil, provided significant results between perceived value and purchase intentions. Research on 460 respondents in Korea shows that consumer intentions will be higher when purchasing based on perceived value (Chae et al., 2020).

2. RESEARCH METHOD

This study tested the relationship among Consumer Environmental Concern, Monetary Incentive Policy, Value Perception towards Purchase Intention. The relationship between each construct is explained in the research model as follow (Figure 1).
Below are the hypotheses tested in this study.

H_1 : Consumer Environmental Concern positively affects Purchase Intention.
H_2 : Monetary Incentive Policy positively affects Purchase Intention.
H_3 : Value Perception positively affects Purchase Intention.

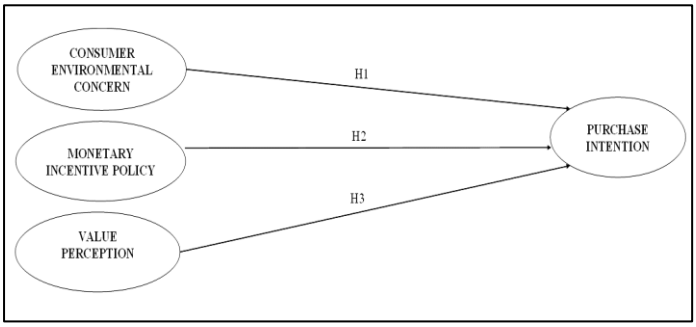

Figure 1. Research Model

The research method used was a survey with data collection through a questionnaire through Google Form distributed to 300 respondents by using purposive sampling. Sample collection with 7 Likert scale indicators will be processed using a structural equation modeling analysis approach to increase the latent construct of the variance explained by the dependent variable (Hair et al., 2017). This study used smartPLS SEM (Partial Least Square - Structural Equation Modeling) software. PLS aims to assist researchers in supporting hypotheses and explaining whether there is a relationship between latent variables or not, measuring assumptions on errors, having the ability to handle non-recursive paths, and providing further clues about the direction of research and modelling in the modification index (Pandoyo & Moh Sofyan, 2018). The variables' operationalization to measure consumer environmental concern used 3 indicators adapted from Wu et al., (2019) to measure Monetary Incentive Policy Measures used 3 indicators adapted from Huang & Ge (2019). To measure Value Perception used 3 indicators adapted from Ng et al., (2018) and to measure Purchase Intention used 3 indicators adapted from Huang & Ge (2019). The variable operationalization and research indicators are presented in table 1 below:

Tabel 1. Variable Operationalisation and Research Indicators

Variable	Indicators	Code	Reference
Consumer Environmental Concern (X1)	1. I am very concerned about environmental pollution that impacts health.	CEC1	(Wu et al., 2019)
	2. In my opinion, one of the main causes of air pollution is car exhaust emissions.	CEC2	
	3. I support the implementation of low-carbon means of transport to protect the environment.	CEC3	
Monetary Incentive Policy Measures (X2)	1. By buying an electric vehicle, I receive a subsidy from the government.	MIPM1	(Huang & Ge, 2019b)
	2. I am getting a higher loan value from a financial company by purchasing an electric vehicle.	MIPM2	
	3. By purchasing an electric vehicle, I receive a tax exemption.	MIPM3	
Value Perception (X3)	1. I choose to buy an electric car because of the low maintenance costs.	VP1	(Ng et al., 2018b)
	2. I am interested in the design of electric cars.	VP2	
	3. The convenience of an electric car is my choice.	VP3	
Purchase Intention (Y)	1. I look forward to introducing more electric vehicle brands and models to the market.	PI1	(Huang & Ge, 2019b)
	2. I will buy an electric vehicle in the future.	PI2	
	3. I would recommend that friends around me buy an electric vehicle.	PI3	

3. RESULTS AND DISCUSSIONS

According to the results of PLS-SEM, This research uses validity and reliability tests for outer model analysis. Convergent validity can be seen in the loading factor value> 0.70 and AVE value> 0.5, (Ghozali & Latan, 2020) discriminant validity can be seen from the Heterotrait-Monotrait Ratio (HTMT) value, which is less than 0.90 (Hair et al., 2017) with the comparison of the AVE of each construct having a value greater than the correlation value between constructs. In reliability testing, Cronbach's Alpha >0.6 and composite reliability value >0.70(Hair et al., 2017). The Outer model results are presented in Table 2 below:

Tabel 2. Outer Model

Variables	Indicators	Loadings	CA	CR	AVE	HTMT			
						CEC	MIPM	PI	VP
Consumer Environmental Concern	CEC1	0.903	0.878	0.925	0.803				
	CEC2	0.913							
	CEC3	0.872							
Monetary Incentive Policy Measures	MIPM1	0.917	0.885	0.929	0.814	0.847			
	MIPM2	0.930							
	MIPM3	0.859							
Purchase Intention	PI1	0.901	0.872	0.921	0.796	0.830	0.736		
	PI2	0.905							
	PI3	0.871							
Value Perception	VP1	0.917	0.858	0.910	0.771	0.441	0.140	0.390	
	VP2	0.879							
	VP3	0.836							

Notes: Loading: Standardized loading, CA: Cronbach's Alpha, CR: Composite Reliability, AVE: Average Variance Extracted, HTMT: Heterotrait-Monotrait Ratio of Correlations.

Overall, each indicator has a Loading Factor value declared valid for confirmatory research if it shows results greater than 0.7 than anticipated (Ghozali & Latan, 2020). Two different methods are used to measure construct reliability: Cronbach's Alpha (an indicator of internal consistency reliability) and composite reliability. The construct is considered reliable if the composite reliability value is more than 0.7 and the Cronbach's Alpha value is greater than 0.6 (Ghozali & Latan, 2020). The AVE value on consumer environmental concern is 0.803, which means that the magnitude of the variation in the measurement items CEC1, CEC2, CEC3 contained by the consumer environmental care variable is 80.3% because the AVE value of consumer environmental care is 0.803 ≥ 0.5, the convergent validity requirements have been met properly. In addition, based on the Heterotrait-Monotrait Ratio (HTMT) value, which is less than 0.90, discriminant validity is declared acceptable (Hair et al., 2017).

Tabel 3. Collinearity Statistics

Inner Model List	VIF
CEC → PI	4.097
MIPM → PI	3.491
VP → PI	1.348

Multicollinearity analysis is designed to determine if there is a correlation between independent variables in the regression model. A qualified regression model is unsuitable if there is no correlation between the independent variables. Simple diagnostics of the absence of multicollinearity in the regression models data with a tolerance value greater than> 0.1 and VIF < 10 (Hair et al., 2010). Based on the VIF < 10 results, it states that it is entirely independent and there is no multicollinearity. Then the regression model is eligible to be applied in testing. The multicollinearity test results are presented in table 3 above. Inner Model Analysis assesses the relationships between latent variables in a structural model, examining their connections and influences. It evaluates the validity and reliability of constructs measured by indicators linked to latent variables. This analysis gauges how well the constructed model aligns with the collected data and tests the hypotheses data. (Ghozali & Latan, 2020). T-statistics and probability values are crucial in hypothesis testing. Bootstrapping can yield these values for testing hypotheses. If the T-statistics surpass the t-table values, it implies a significant coefficient impact. The t-value benchmarks for significance are 1.65 (10%), 1.96 (5%), and 2.58 (1%). Acceptance of the hypothesis (H1) and rejection of the alternative hypothesis (H0) occur when the t-statistic exceeds 1.69. A p-value less than 0.05 indicates rejection of H0 and acceptance of H1. The t-statistic, also known as the t-value, measures the difference between the sample mean and expected value in standard error units. A larger t-statistic suggests more robust evidence against chance. The p-value gauges the strength of evidence against the null hypothesis, with a lower p-value indicating stronger evidence against chance under the null hypothesis (Ghozali & Latan, 2020; Hair et al., 2017).

f square (f^2) measures how much an independent variable in a regression model affects the dependent variable's variation compared to a model without it. Commonly applied in multiple regression, higher f^2 values indicate a stronger impact of the independent variable on the dependent variable's variation. Values like 0.02 suggest a negligible impact, 0.15 signify a moderate impact, and 0.35 represent a significant impact. (Hair et al., 2017). R Square is a statistical metric gauging the regression model's ability to elucidate variations in the dependent variable. Ranging from 0 to 1, a higher value signifies a more potent explanatory effect of the independent variable. Standard thresholds categorize R Square

values as strong (0.75), moderate (0.50), or weak (0.25) (Ghozali & Latan, 2020). According to Shmueli et al., (2019), the PLSpredict algorithm was created. This approach generates and assesses predictions using PLS path model estimations using holdout samples and training samples. Using the current implementation of the PLSpredict algorithm in the SmartPLS software, researchers can evaluate the predictive performance of their PLS path model for the manifest variables (MV or indicators) and the latent variables (LV or constructs) by obtaining k-fold cross-validated prediction errors and prediction error summaries statistics such as the mean absolute error (MAE), the root mean square error (RMSE), and the mean absolute percentage error (MAPE).

The Inner Model test results are presented in table 4 below:

Tabel 4. Inner Model

	Relationship Variabels	Path	f^2		t-statistics	p-value	Explanation
H 1	Consumer Environmental Concern → Purchase Intention	0.498	0.244	Moderate	8.413	0.000	Supported
H 2	Monetary Incentive Policy Measure → Purchase Intention	0.345	0.137	Weak	6.297	0.000	Supported
H 3	Value Perception → Purchase Intention	0.144	0.062	Weak	4.561	0.000	Supported

Regarding the MV findings, note that all three criteria are accessible, however for the LV results, only the RMSE and MAE may be computed. The predicting abilities of various PLS path models may be compared thanks to these factors. Scientists may assess the predictive power of their model with the help of PLSpredict's out-of-sample predictions. Thus, PLSpredict must to be considered when assessing the outcomes of PLS-SEM. The R Square and PLSpredict model test results are presented in Table 5 below:

Tabel 5. R Square and Q Square

Variabel	R-square	R-square adjusted	Category	Percentage	RMSE	MAE	Category
Purchase Intention (PI)	0.752	0.749	Strong	**75.2%**	0.509	0.341	Medium predictive power

After testing them in this study, all hypotheses were supported with statistical significance (p = 0.000). This indicates that the hypothesis is consistent with the studies that have been referenced. The MV Prediction Summary overview of purchase intention shows that most indicators have 3 out of 6 measurements; PLS SEM has lower RMSE and MAE than linear regression models (LM), indicating that the PLS SEM model has medium predictive power. The R square values show a percentage of 75.2% with a strong category, meaning that the ability of the independent variables, namely Consumer Environmental Concerns, Monetary Incentive Policy Measures, and Value Perceptions in explaining the Purchase Intention variable is 75.2%. This means that 24.8% of the influence is explained by other variables outside those discussed in this study. Some other factors that can be attributed such as individual psychological factors, consumer personal experience, socio-culture, external environment, perceived product quality, marketing communication, macroeconomic conditions, risk perception and so on. The results of testing the hypothesis of this research are following the research by Bang et al., (2000) and Jeong et al., (2018) found that consumer environmental concerns are significantly related to purchase intention, and Ye (2022)

research proved a positive relationship between consumer environmental concerns and monetary incentive policy measures on purchase intention.

On the other hand, research by Ng et al., (2018a) and Vainio et al., (2014) showed a significant relationship between perceived value and purchase intention. In contrast, studies by Li et al., (2018) and Newton et al., (2015) show empirical findings that do not support a significant relationship between consumer environmental concern and purchase intention for electric vehicles. Research by Miranda et al., (2020) shows that the perceived value of electric cars has a negative relationship with purchase intention.

4. CONCLUSIONS AND SUGGESTIONS

Based on the results of the study "the effect of consumer environmental concerns, monetary incentive policy measures and Perceptions of Value on purchase intention for environmentally friendly cars in Jakarta", the following conclusions are that consumer environmental concerns significantly affect the purchase intention of eco-friendly cars in Jakarta, monetary incentive policy measures significantly affect the purchase intention of eco-friendly cars in jakarta, value perception significantly affects purchase intention of eco-friendly cars in jakarta.

This research suggests the following respondents' focus is primarily on purchase intention, evidenced by the highest mean value of 5.99, indicating substantial agreement towards future electric vehicle purchases. In contrast, perceived value isn't a primary concern, with the lowest mean value of 3.95, suggesting respondent neutrality towards low maintenance costs, policy Evaluation for Monetary Incentives: Provide low-interest loans for electric vehicles, Discontinue trade-ins for fossil-fueled vehicles, Reduce fees for charging electric vehicle batteries, Ensure even distribution of charging stations, Apply low taxes for electric vehicles, Establish special anti-congestion lanes and socialization for Environmental Awareness: Develop environmental education campaigns, Collaborate with government and environmental organizations.

This research aims to contribute positively to the development of the eco-friendly car industry, supporting sustainable policies and influencing consumer perceptions toward greener transportation. It contributes to the literature on environmental concerns, monetary incentives, and value perceptions influencing the purchase intention of eco-friendly cars in Jakarta. While the study has limitations, focusing on Jakarta and potential influences on variables, future research can enhance results by expanding the sample size, considering diverse demographics, and incorporating additional relevant variables. The findings are context-dependent and subject to market trends and variable shifts.

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